

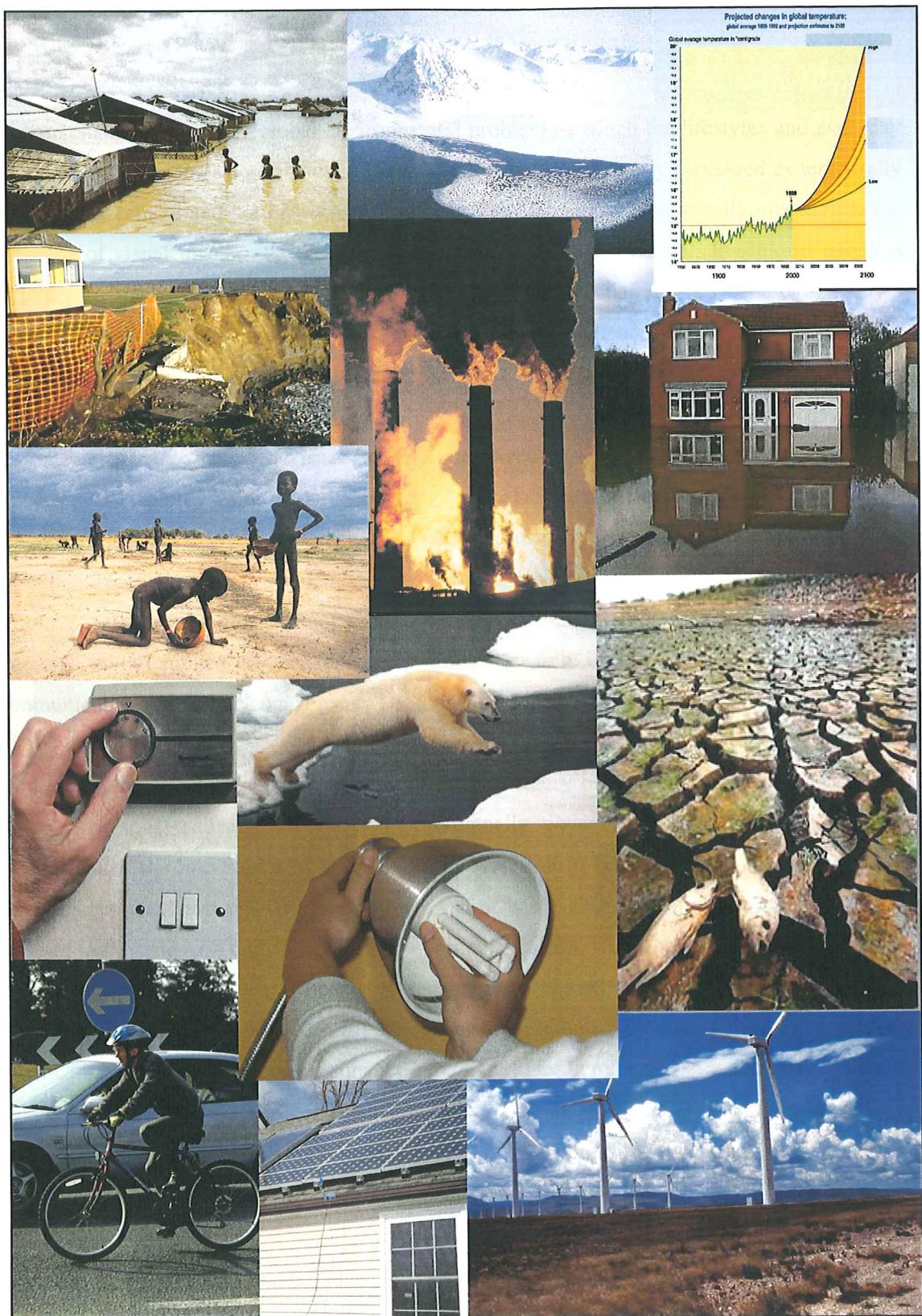
**Imag(in)ing climate change:
Exploring people's visual imagery, issue salience and personal efficacy**

Sophie Nicholson-Cole

December 2004

A thesis submitted for the degree of Doctor of Philosophy to the
School of Environmental Sciences of the University of East
Anglia

*This thesis is dedicated to the
memory of Ian Langford.*



Imag(in)ing climate change: exploring people's visual imagery, issue salience and personal efficacy

Abstract

Climate change is a serious global environmental problem to which the lifestyles and everyday behaviour of individuals contributes. However, the issue is commonly perceived as temporally and spatially remote and not of personal concern. This research systematically investigates the influence of visual imagery on the way people relate to climate change. It explores people's outlooks on the issue and assesses the potential for visual images – so central to today's information culture – to stimulate a sense of its importance (salience) and of feeling able to do something to reduce its future causes (efficacy).

The interrelationship between visual imagery, perceived issue salience and sense of personal efficacy was explored using a multi-method, qualitative research design that involved semi-structured interviews, visual Q-sorts and focus group discussions. Reflective interviews were subsequently conducted. The methodology offers a novel and robust approach to exploring people's outlooks on climate change and their responsiveness to dealing with it. It has the potential to be applied to, for example, future research in the field of climate change communication and public engagement.

While participants were found to have rich mental imagery of climate change, they had little sense of personal salience or efficacy. Emotionally powerful images that most strongly communicated the importance of climate change were felt to be disempowering. Conversely, those images that most readily conveyed a sense of being able to take action did not incite a sense of issue salience. Only when presented in combination were the images found to induce feelings of both salience *and* efficacy, of engagement. Nonetheless, images were unlikely to move participants to feel more than trivially engaged with the issue because they still perceived significant barriers to making a personal commitment. Until enveloped in a political, economic and cultural environment, that signals serious societal commitment to climate change mitigation, people are unlikely to voluntarily adopt low-carbon lifestyles.

Acknowledgements

My thanks go to Tim O'Riordan and Peter Simmons for their guidance throughout the duration of this research and their tireless help and encouragement in bringing this thesis together. Sadly, Ian Langford is not here to see the finished product. His spirit and enthusiasm as a great friend and supervisor were among, if not the strongest drivers of this adventurous piece of work and its completion. Ian had a profound effect on my approach to this research and my perspective on life in general and I will never forget his faith in my ability to succeed. Thanks also go to Simon Torok who also provided valuable supervisory input and whose interests and ideas are also reflected in this research.

This research would not have been possible without the financial backing of the Economic and Social Research Council from whom I obtained a studentship, and the base provided by the School of Environmental Sciences. The Centre for Environmental Risk and in particular the Tyndall Centre for Climate Change Research, have given me much support and confidence in my research. Of course my thanks go to all the participants who enabled this research to happen. My gratitude also goes to Jean Hall and Jonathan Hooton for their help with recruiting participants. Powergen and London Electricity kindly provided me with vast quantities of low-energy light bulbs, which participants were very pleased to receive.

An enormous thank you goes to all the kind people who have given up their time to proof-read and who have provided encouragement, useful comments and valuable advice in the final stages of writing up.

Throughout, my friends and colleagues here at UEA have been an inspiration. From crises in the office to great parties and beers in the square, they have all made the PhD experience possible and enjoyable. As have all my great mates outside UEA, they know who they are. Alex and I have travelled much of this journey together; Nicki, Paul, Pete and so many others have helped, encouraged and joined us for laughs along the way. Thanks also go to Hannah, my life-long friend and her father Henry, who is sadly also unable to see the results of my endeavour in which he had so much belief. My family have been incredibly supportive throughout the highs and lows. I cannot thank my parents enough for their constant encouragement throughout my lengthy stint in education and particularly during the course of this research. In particular, Mum for her careful proof-reading of every word, and Dad for making the last minute logistics so much more bearable than they might have been.

Finally, thanks go to Luke for being the most brilliant incentive to finish and for bringing so much fun into the final months.

Contents

Abstract	i
Acknowledgements	ii
Lists of: Appendices	vi
Figures	vii
Tables	viii
Boxes	viii
Abbreviations	ix
Chapter one – Our climate future	1
1.1 Introduction	1
1.2 A background to the climate change issue	2
1.2.1 Controversy and disagreement	3
1.2.2 Choosing our climate future	5
1.2.3 Decarbonisation for the UK	6
1.2.4 Decarbonisation for the individual	7
1.2.5 Moving towards engagement?	8
1.3 This research	9
1.3.1 Research objective, guiding themes and research questions	10
1.3.2 Research methodology	11
1.4 The structure of this thesis	11
Chapter two – The attitude-behaviour gap	13
2.1 Introduction	13
2.2 Perceptions of climate change	13
2.2.1 Concern	13
2.2.2 Action	15
2.2.3 Reasons for lack of personal concern and motivation to take action	16
2.2.3.1 Lack of knowledge about the causes and consequences	16
2.2.3.2 Scale of the issue – distance in time and space	18
2.2.3.3 Perceived issue uncertainty	19
2.3 Constructing outlooks on climate change	20
2.3.1 The mass media	20
2.3.2 Experiential and social contributions	23
2.4 The consequences for engagement	24
2.4.1 Different levels of engagement	24
2.4.2 Barriers to engagement	26
2.5 Exploring the attitude-behaviour gap	31
2.5.1 The Theory of Reasoned Action	32
2.5.2 The Theory of Planned Behaviour	32
2.5.3 Barriers to action on climate change in relation to the Theory of Planned Behaviour	35
2.6 Conclusions	40

Chapter three – Imag(in)ing climate change	41
3.1 Introduction	41
3.2 A visual approach	42
3.2.1 Environmental issues and imagery in the media, education and advertising	43
3.2.1.1 Mass media	44
3.2.1.2 Environmental interest groups	45
3.2.1.3 Education	46
3.2.1.4 Advertising	46
3.3 Images in mind	47
3.3.1 What is mental imagery?	48
3.3.2 Differential meaning and interpretation	50
3.4 Constructing outlooks on climate change	51
3.4.1 How do people's mental imagery of climate change and their perceptions of the issue come about?	52
3.4.2 Social Representations Theory and the mental models approach	53
3.4.2.1 Social Representations Theory	53
3.4.1.2 Mental models	56
3.5 Environmental communication for public engagement?	59
3.5.1 Contributions from the Social Representations Theory and mental models approach	59
3.5.2 Communicating environmental information – image characteristics and opportunities for the visual communication of climate change	63
3.5.3 Ethical considerations	69
3.6 Conclusions	70
Chapter four - Methodology	72
4.1 Introduction	72
4.2 Methodological foundations	73
4.2.1 The background to my methodology	73
4.2.2 My methodological approach	75
4.3.3 Multi-method approach	77
4.3 Images in methodology	80
4.3.1 Research using mental imagery elicitation	81
4.3.2 Research using images as a tool	83
4.4 Sample and setting	83
4.5 Semi-structured interviews	86
4.5.1 Question design	86
4.5.2 Piloting and carrying out the interviews	89
4.5.3 Data management and analysis	90
4.6 Q-methodology	91
4.6.1 Design of the Q-sorts	92
4.6.2 Piloting and carrying out the Q-sort	95
4.6.3 Analysis and interpretation of the Q-data	98
4.7 Focus group discussions	98
4.7.1 Design of the focus group discussions	100
4.7.2 Piloting and carrying out the focus group discussions	102
4.7.3 Considerations for analysis	106
4.8 Research validity	107
4.9 Conclusions	113

Chapter five – Semi-structured interviews: analysis and results	115
5.1 Introduction	115
5.2 Data analysis	115
5.2.1 The coding and categorisation of the interview data	116
5.2.2 Analytical challenges	116
5.3 Results	118
5.3.1 General and personal concerns, future outlook on life, imagery of the future	120
5.3.2 Issue salience	122
5.3.3 Personal efficacy	130
5.3.4 Climate change imagery	137
5.4 Individual profiling	144
5.4.1 Mapping participants	144
5.4.2 Incorporating imagery	147
5.4.3 Individual cases	150
5.5 Conclusions	157
Chapter six – Q-methodology: analysis and results	158
6.1 Introduction	158
6.2 Image selection	158
6.2.1 Image classification derived from the interview data	159
6.2.2 Image classification based on climate change science	160
6.2.3 Image classification based on expert consultation	160
6.2.4 Image classification based on a review of environmental NGO campaign material from environmental NGO's	161
6.3 Analysis	163
6.4 Results	165
6.4.1 Salience	165
6.4.1.1 Salience – factor one	166
6.4.1.2 Salience – factor two	170
6.4.1.3 Salience – summary	174
6.4.2 Efficacy	175
6.4.2.1 Factors one and two – able to make a difference	175
6.4.2.2 Factors one and two – unable to make a difference	178
6.4.2.1 Efficacy - summary	181
6.5 Interpretation of results	182
6.6 Conclusions	184
Chapter seven – Focus group discussions: analysis and results	185
7.1 Introduction	185
7.2 Designing the focus groups	185
7.2.1 Question characteristics: simplicity, openness and sequencing	186
7.2.2 Question design	188
7.3 Analysing the focus group data	193
7.4 Results	196
7.4.1 Ice breaker and Q-sort feedback	196
7.4.2 Explanation of Q factors and image interpretation	197
7.4.2.1 Issue salience	197
7.4.2.2 Personal efficacy	202
7.4.3 Engaging and motivating imagery and beyond	205
7.4.4 Other issues – differential interpretations and other issues of importance to participants	212
7.5 Group dynamics and reflection	214
7.6 Conclusions	217

Chapter eight – Integrated analysis	219
8.1 Introduction	219
8.2 Integrating the results	219
8.2.1 Individual profiles	221
8.3 Reflections on participation	228
8.3.1 Results of the discussion group feedback	229
8.3.2 Results of the follow-up interviews	230
8.4 Conclusions	234
Chapter nine	235
9.1 Introduction	235
9.2 Methodological reflection	235
9.3 Discussion	237
9.3.1 People's outlooks on climate change	237
9.3.2 Climate change images = salience and efficacy?	241
9.3.3 Implications for communicating climate change	245
9.3.4 Barriers to engagement	247
9.4 Conclusions and wider implications	253
Bibliography	257
Appendices	278
List of appendices	
Appendix 1 Interview guide	278
Appendix 2 Excerpt from interview transcript	281
Appendix 3 The images used in this study	282
Appendix 4 Q-materials	290
a) Q-instructions	291
b) Q-matrix (or quasi-normal distribution into which participants sort the stimuli)	295
Appendix 5 Focus group guide	296
Appendix 6 Examples of code diversity	299
Appendix 7 Categorical breakdown of interview data by theme	300
a) Breakdown of the main categories for general and personal concerns, future outlook, future imagery	300
b) Breakdown of the main salience categories	301
c) Breakdown of the main efficacy categories	303
d) Breakdown of the main imagery categories	305
Appendix 8 Detailed breakdown of some selected categories	307
a) General and personal concerns: Priorities in life / personal daily concerns	307
b) SALIENCE: Not important / don't think about it because...	310
c) EFFICACY: What would increase personal efficacy?	312
d) IMAGERY: Solutions	315
Appendix 9 Participant profile	317
a) Summary of interview (two different formats)	317
b) Summary of Q-sort	325
c) Summary of focus group	327
c) Summary of feedback interview	329
d) Summary profile	330
Appendix 10 Imagery categorisation	331
a) The scientific basis (present changes & future projections)	332

b) Consultation with climate change experts and summary of various image qualities following expert consultation	333
c) Imagery employed in climate change campaigns by Greenpeace and Friends of the Earth	336
d) Overall image classification (with details)	337
Appendix 11 Variations on Q-sort instructions	339
Appendix 12 Results material from the Q-sorts	340
a) Scree plots depicting the factor outputs from both Q-sorts	340
b) Loading participants for salience factors	341
c) Loading participants for efficacy factors	341
d) Factor arrays	342
e) Most extremely ranked images for all factors (salience and efficacy)	343
Appendix 13 Salience factor one – model Q-sort	344
Appendix 14 Quotes to illustrate motivating factors (aside from imagery)	346
Appendix 15 Questions used in follow-up interviews	348

List of figures

Figure 1.1 The focus of this research	7
Figure 1.2 The structure of this thesis	12
Figure 2.1 The Theory of Reasoned Action	32
Figure 2.2 The Theory of Planned Behaviour	33
Figure 2.3 Barriers between environmental concern and action	36
Figure 3.1 The roles of mental imagery and images of climate change in the research	41
Figure 3.2 The emphasis of Social Representations Theory	54
Figure 3.3 Social representations of climate change	55
Figure 3.4 The interaction between images, imagery and perceptions of climate change	71
Figure 4.1 The methodological process	79
Figure 4.2 The bottom-up methodological approach taken in this research	80
Figure 4.3 The role of climate change imagery in the research methodology	81
Figure 4.4 Design of the interview questions in relation to the themes of the research	87
Figure 4.5 Q-sort conditions of instruction	96
Figure 4.6 Design of the focus group questions in relation to the themes of the research	101
Figure 4.7 The structure of the results and analysis chapters in this thesis	114
Figure 5.1 Interconnectedness of main salience categories	125
Figure 5.2 Efficacy categorisation	130
Figure 5.3 Climate change imagery	138
Figure 5.4 Overlap between themes	143
Figure 5.5 Mapping of participants on a salience-efficacy framework	146
Figure 5.6 Imagery and S-E characteristics associated with participants mapped towards the extreme ends of the framework	149
Figure 5.7 The individuals profiled in this chapter and key for interpretation	150
Figure 5.8 Simon – interview profile	152
Figure 5.9 Sara – interview profile	154
Figure 5.10 Erica – interview profile	156
Figure 7.1 Debating extracts – are these images really motivating?	209
Figure 8.1 Research overview: methods, results, emerging patterns	220
Figure 8.2 Individual profile summary for Kathryn (KR, high school student)	223
Figure 8.3 Individual profile summary for Tanja (TG, young professional)	225
Figure 8.4 Individual profile for Karen (KaT, working class mother)	227
Figure 8.5 Quotations summarising the reflective interviews	233
Figure 9.1 The setting of personal climate change imagery, salience and efficacy	240
Figure 9.2 Social representations of climate change mediating people's propensity for issue salience and personal efficacy	242
Figure 9.3 Contemporary barriers to action on climate change	250
Figure 9.4 Barriers to engagement and the Theory of Planned Behaviour	251

List of tables

Table 4.1 Relationship between research questions and methods	73
Table 4.2 Rationale for the choice of sample groups	85
Table 4.3 Participant recruitment and details of the arrangement of fieldwork	85
Table 4.4 Summary of focus group participation	104
Table 5.1 Main categories arising from the interview data	119
Table 6.1 Image classification based on descriptive interview data	159
Table 6.2 Overall image classification	161
Table 6.3 Strongly ranked images for salience factors one and two	165
Table 6.4 Strongly ranked images for efficacy factors one and two	175
Table 7.1 Types of focus group questions and their application in this study	188
Table 7.2 Most motivating sets of pictures for each group	207
Table 7.3 Motivating / un-motivating image characteristics	209
Table 7.4 Motivating factors (aside from imagery)	211
Table 7.5 Measures taken to ensure successful focus groups	216
Table 9.1 Barriers to engagement	248

List of boxes

Box 1.1 Research themes, objective and questions	10
Box 2.1 Typologies to illustrate four perspectives on climate change	25
Box 2.2 Denial and displacement as justifications for feeling disengaged	30
Box 3.1 Incentives for taking a visual approach	42
Box 4.1 Methodological preferences	76
Box 4.2 Summary of the interview questions	88
Box 4.3 The Q-sorting procedure	97
Box 4.4 Aims and objectives of the focus group discussions	99
Box 4.5 Measures taken to maximise focus group attendance	103
Box 4.6 Summary of the structure of the focus groups	105
Box 4.7 Criteria for evaluating research	107
Box 4.8 Problems facing the exploration of people's notions of climate change	110
Box 4.9 Strategies for increasing interview reliability	111
Box 5.1 The code and categorisation validation process	117
Box 5.2 Considerations arising during the salience-efficacy mapping of participants	145
Box 7.1 Design requirements for the focus group questions	186
Box 7.2 Opening questions for design objective one: ice breaker and Q-sort feedback	189
Box 7.3 Introductory questions for design objective two: explanation of Q factors and image interpretation	190
Box 7.4 Transitory and key questions for design objective three: engaging images, wider motivations	192
Box 7.5 Ending questions for design objective four: wrap-up and assessment of participation	192

List of abbreviations

DEFRA	Department for Environment, Food & Rural Affairs
DETR	Department for Environment, Transport and the Regions
DoE	Department of the Environment
DoH	Department of Health
DTI	Department of Trade and Industry
EC	European Commission
ENCAMS	Environmental Campaigns (the environmental charity which runs the Keep Britain Tidy campaign)
ESEF	European Science and Environment Forum
GM	Genetically modified
IPCC	Intergovernmental Panel on Climate Change
MORI	Market and Opinion Research International
NGO	Non-governmental organisation
OECD	Organisation for Economic Co-operation and Development
OST	Office of Science and Technology
POST	Parliamentary Office for Science and Technology
Q	Q-methodology
RCEP	Royal Commission on Environmental Pollution
SDC	United Kingdom Sustainable Development Commission
UKCIP02	United Kingdom Climate Impacts Programme 2002
UN	United Nations
U.S.	The United States of America
WCED	World Commission on Environment and Development

Chapter One – Our climate future

“...our long-term security is threatened by a problem at least as dangerous as chemical, nuclear or biological weapons, or indeed international terrorism: human-induced climate change.” (Houghton, 2003)

1.1 Introduction

Climate change is considered by many to be the most serious threat to the sustainability and well-being of the world’s environment and its people. In the words of Prime Minister Tony Blair, “it remains unquestionably the most urgent environmental challenge” and in the long term, “the single most important issue that we face as a global community” (2003; 2004 respectively). Dealing with climate change is becoming prominent, not only on the environmental agenda but also in political, social and economic spheres. This is being driven by a realisation that patterns of social relationships, cultures, political practices and economic institutions are all part of the cause of climate change as well as being subject to its potential effects (e.g. IPCC, 2001a). Beyond natural variability in the Earth’s climate system, human activities (e.g. the combustion of fossil fuels and consequent emission of greenhouse gases) are playing a significant role in causing present climatic changes and those projected for the future. The research considers that, as well as adapting to the anticipated changes the human race has a duty to take mitigative action by reducing these emissions – that we have a choice as to what our climate future will be (see King, 2004). A mitigative approach involves decarbonising our way of life and looking towards a more sustainable existence extending from an international perspective, to the local level. This research concerns the social issues at individual and personal levels that surround the production of greenhouse gases, and hence, climate change. The thesis presents an exploration of people’s outlooks on climate change from the point of view of individuals living in Norwich, UK, but set against a backdrop which recognises the importance of the issue as part of a worldwide sustainable development agenda.

This chapter sets the scene for the thesis by presenting some background to the science and politics of climate change; the reason it is considered a problem and why dealing with it has become an issue of social and political contention at global to local levels. It explains the mitigative focus of the research, what decarbonisation might involve for the UK over the next 50 years, and the need for public and individual engagement with the issue. A presentation of the objective of the research and an explanation of the research questions follow, together with an introduction to the exploratory methodological approach. The chapter ends with an outline of the structure of the thesis.

1.2 A background to the climate change issue

“There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities.” (IPCC, 2001a:5)

In 1988, the World Meteorological Organization and the United Nations Environment Programme established the Intergovernmental Panel on Climate Change (IPCC) to assess scientific information on climate change, its environmental and socio-economic impacts, and to formulate response strategies (Munasinghe, 2001). The IPCC released their first report in 1990 (IPCC, 1990), which recognised that human activities were changing the world’s climate. A second IPCC report was released in 1995 (IPCC, 1996) which recommended that significant changes in the understanding of emissions driving forces and methodologies be addressed. In 2000, the IPCC published a Special Report on Emissions Scenarios (SRES) (IPCC, 2000). The scenarios give projections for a plausible range of future greenhouse gas emissions depending on different rates of growth and global change; they cover a wide range of uncertainty about the way we might progress in the future. The IPCC Third Assessment Report (IPCC, 2001a, 2001b, 2001c, 2001d) is the most recent and describes the current state of understanding of the climate system. It makes even clearer the link between human activity and climate change, giving projections for the climatic changes we might expect in the future, their associated uncertainties and an analysis of possible climate change adaptation and mitigation options (all estimated based on the SRES scenarios). It is impossible to predict for certain what kind of climate future we will be experiencing in 50 or 100 years because the driving forces of climate change are so complex and the extent of their effects ambiguous. Therefore, as well as assessing the state of current research and making projections for future climate change, the IPCC seeks to answer questions concerning: how climate change impacts, adaptation and mitigation will affect future sustainable development prospects; and how climate change responses might be better integrated into emerging sustainable development strategies (Munasinghe, 2001)¹.

“On 9 May 1992, the world’s governments adopted the UN Framework Convention on Climate Change. In doing so, they took the first step in addressing one of the most urgent environmental problems facing humankind.” (United Nations, 2002:5)

Climate change hit the political agenda with the formulation of the United Nations Framework Convention on Climate Change (UNFCCC) (United Nations, 1992), agreed at the Earth Summit in Rio de Janeiro in 1992. The UNFCCC defines climate change as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global

¹ The IPCC (IPCC, 2001a:3) define mitigation as: “an anthropogenic intervention to reduce the sources of greenhouse gases or enhance their sinks.” It has also been defined as the prevention of future climate impacts on society through the limitation of greenhouse gas emissions (Pielke, 1998). Adaptation concerns adjustments in individual, group, and institutional behaviour in order to reduce society’s vulnerabilities to climate.

1.2 A background to the climate change issue

“There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities.” (IPCC, 2001a:5)

In 1988, the World Meteorological Organization and the United Nations Environment Programme established the Intergovernmental Panel on Climate Change (IPCC) to assess scientific information on climate change, its environmental and socio-economic impacts, and to formulate response strategies (Munasinghe, 2001). The IPCC released their first report in 1990 (IPCC, 1990), which recognised that human activities were changing the world’s climate. A second IPCC report was released in 1995 (IPCC, 1996) which recommended that significant changes in the understanding of emissions driving forces and methodologies be addressed. In 2000, the IPCC published a Special Report on Emissions Scenarios (SRES) (IPCC, 2000). The scenarios give projections for a plausible range of future greenhouse gas emissions depending on different rates of growth and global change; they cover a wide range of uncertainty about the way we might progress in the future. The IPCC Third Assessment Report (IPCC, 2001a, 2001b, 2001c, 2001d) is the most recent and describes the current state of understanding of the climate system. It makes even clearer the link between human activity and climate change, giving projections for the climatic changes we might expect in the future, their associated uncertainties and an analysis of possible climate change adaptation and mitigation options (all estimated based on the SRES scenarios). It is impossible to predict for certain what kind of climate future we will be experiencing in 50 or 100 years because the driving forces of climate change are so complex and the extent of their effects ambiguous. Therefore, as well as assessing the state of current research and making projections for future climate change, the IPCC seeks to answer questions concerning: how climate change impacts, adaptation and mitigation will affect future sustainable development prospects; and how climate change responses might be better integrated into emerging sustainable development strategies (Munasinghe, 2001)¹.

“On 9 May 1992, the world’s governments adopted the UN Framework Convention on Climate Change. In doing so, they took the first step in addressing one of the most urgent environmental problems facing humankind.” (United Nations, 2002:5)

Climate change hit the political agenda with the formulation of the United Nations Framework Convention on Climate Change (UNFCCC) (United Nations, 1992), agreed at the Earth Summit in Rio de Janeiro in 1992. The UNFCCC defines climate change as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global

¹ The IPCC (IPCC, 2001a:3) define mitigation as: “an anthropogenic intervention to reduce the sources of greenhouse gases or enhance their sinks.” It has also been defined as the prevention of future climate impacts on society through the limitation of greenhouse gas emissions (Pielke, 1998). Adaptation concerns adjustments in individual, group, and institutional behaviour in order to reduce society’s vulnerabilities to climate.

atmosphere and which is in addition to natural climate variability over comparable time periods" (Pielke, 1998:160). It had the stated objective of stabilizing greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system (United Nations, 1992). Under the convention, all developed countries agreed to aim to reduce their greenhouse gas emissions to 1990 levels by 2000. The Kyoto Protocol was adopted in 1997 to formulate arrangements for the first legally binding national commitments; constraints on greenhouse gas emissions, and mechanisms aimed at cutting the costs of reducing such emissions. Many developed countries agreed on targets that will collectively reduce their emissions of six greenhouse gases by 5.2% below 1990 levels over the period 2008-2012 (United Nations, 2002). The Kyoto Protocol commits the European Union to reduce its emissions of greenhouse gases to 8% below 1990 levels during this period. Member states reallocated this target to reflect national circumstances, which led to an increase in the UK's commitment to reduce emissions by 12.5% in this time period (DETR, 2000). The UK Department of Trade and Industry (DTI, 2002) report that in 2000, UK greenhouse gas emissions were 13% below 1990 levels therefore taking the UK below the target level under the Kyoto Protocol. The Government then set a domestic goal to extend the UK's commitment and to cut emissions of carbon dioxide by 20% below 1990 levels by 2010². It is estimated that the policies in the programme could reduce greenhouse gas emissions by 23% below 1990 levels by 2010. However, the quoted targets are unlikely to achieve substantial, long-term cuts in emissions. The Royal Commission on Environmental Pollution (RCEP, 2000) for example, argue that the reduction so far has been largely fortuitous and that it will be difficult to maintain the reductions over the next 20 years. The Commission propose (*ibid.*) that to arrest the rise in global emissions, and limit climate change, the UK should aim to reduce its emissions of greenhouse gases by as much as 60% by 2050 (see also Blair, 2003; DETR, 2000; DTI, 2003; King, 2004)³.

1.2.1 Controversy and disagreement

"As the world's only remaining super-power, the United States is accustomed to leading internationally coordinated action. But at present, the U.S. government is failing to take up the challenge of global warming." (King, 2004:177)

With an overwhelming and growing scientific consensus that human activity is affecting the climate system, it is becoming increasingly accepted that national programmes of decarbonisation need to be initiated as part of international political moves such as the Kyoto

² This is outlined in the UK Climate Change Programme (DETR, 2000) which sets out a package of policies and measures to: improve businesses' use of energy, stimulate investment and cut costs; stimulate new, more efficient sources of power generation; cut emissions from the transport sector; promote better energy efficiency in the domestic sector, saving households money; improve energy efficiency requirements of the Building Regulations; continue cutting emissions from agriculture; ensuring that the public sector takes a leading role.

³ The European Commission (EC, 2002) states that the EU aims to cut greenhouse emissions by 70% in the longer term; the UK Climate Change Programme (DEFRA, 2001) states that in the long term developed countries may need to make an even deeper reduction, perhaps by over 90%.

Protocol. However, this acceptance is not unanimous; there is much international disagreement over whether anything should be done about climate change, what should be done and who should do it. In May 2002, the EU member states completed their ratification procedures (DTI, 2002), but the Protocol will only become legally binding when it has been ratified by 55 of the signatories; who between them must have accounted for at least 55% of developed countries' 1990 emissions. The position of the U.S. and President George W. Bush's refusal to address climate change undermines the success of the Kyoto protocol. During his first months in office, President Bush unilaterally pulled the U.S. out of Kyoto arguing that it would damage the U.S. economy. Political pressure for the US to commit is growing; without it, almost all other developed countries must ratify the treaty if it is to come into force⁴.

“The Kyoto Process will always be flawed so long as the United States stands aloof.” (Jordan and O’Riordan, 2003:149)

Climate change research and policy makers at all levels face challenges due to the long-term nature and manifold uncertainties surrounding the issue. These challenges present a difficulty in apportioning responsibility for taking political action to mitigate climate change in the future. Climate change extends beyond the lifetime of any government, yet it has to be central in the politics of each country (Blair, 2004). The uncertainties are often taken as a basis for questioning the extent to which humanity can be blamed and whether serious action on emissions reduction should be taken. For example, Lomborg (2001) considers that directing resources towards a problem that potentially might not materialise in the future would preclude the investment of these same resources in the advancement of economic development and well-being of human societies (see also Hammitt and Harvey, 2000). A minority of scientists and powerful lobbying groups subscribe to this alternative perspective, maintaining that there is no real proof that human beings are drastically altering the climate, let alone what impacts there may be, or that the consequences of climate change will be positive. For example, ‘contrarian’ lobbying groups such as the European Science and Environment Forum (ESEF, 2001) emphasise the uncertainty of climate change science and argue the need for a more certain scientific basis before action should be taken. Such groups recommend that one can warrant postponing any action in the present until more evidence and guidance is obtained (e.g. the North American oil industry is a strong advocate of this line).

⁴ The U.S. is responsible for more than 20% of the world’s emissions although it contains only 4% of the global population (King, 2004). The UK accounts for around 2% of emissions (DTI, 2003).

1.2.2 Choosing our climate future

Is it really worth letting the ‘experiment of climate change’ proceed without any restrictions? How certain is certain enough? Dotto (2000) maintains that the debate over global warming has been derailed by ‘waiting for proof’ arguments abetted by the refusal of actors to deal with scientific uncertainty realistically. Many argue that we are certain enough that climate change will be exacerbated in the future, to a greater or lesser extent depending on actions taken to alter the current contribution of human activities (e.g. King, 2004). For example, Hulme (2000) proposes that future climate is largely what we choose to make it.⁵ The research presented here concentrates on the role of mitigative action to reduce the future influence of human activities on the climate system (IPCC, 2001d; O’Riordan *et al.*, 2001; Spencer, 1998). Munasinghe (2001) argues that the capacity to mitigate climate change, and the associated costs depend critically upon the underlying development path, which is significantly influenced by policies and actions. This is re-affirmed by the SRES approach (IPCC, 2000) which suggests we have various alternative development futures upon which the extent of climate changes in the future will be largely dependent⁶. Emissions reduction is a central component. Houghton (1998) notes that a real challenge is to realise that it is necessary to take action now because of the long time scale involved in actually making the changes. Arguments for a precautionary approach include issues of justice in the present and intergenerational equity because climate change raises implications for the way in which benefits and burdens will be distributed throughout the world and amongst future generations. The future costs of climate change are not expected to be shared equally amongst nations⁷ or generations (e.g. see Carter, 2001; Page, 1999).

One of the key components of mitigation or decarbonisation is technological advance, but policies based on making efficiency gains cannot effect any significant mitigation of the oncoming climate change (Di Fazio, 1998; RCEP, 2000). Serious change is necessary across the board. The IPCC points out that changes have to be made in governance, lifestyles and economic activity; pricing and regulation mechanisms and lifestyle change are paramount

⁵ Hulme suggests that the actual process of estimating future climate alters the very driving forces that shape the planet because of the resulting influence on science, politics, etc., (see also Demeritt, 2001).

⁶ Each storyline assumes a distinctly different direction for future developments. Together they cover a wide range of key future characteristics including demographic change, economic development and technological change. A scenario based on socio-economic changes towards low emissions future (the B2 storyline and scenario family) describes a world in which the emphasis is on local solutions to economic, social, and environmental sustainability. The A1 storyline and scenario family for example, describes a future world of very rapid economic growth and the introduction of new and more efficient technologies, etc.

⁷ Countries that have caused the bulk of emissions in the past are not the ones most likely to suffer the worst impacts. As King (2004) states, climate change is no respecter of national boundaries. Having contributed least to greenhouse gas emissions, developing countries have the weakest adaptive capacity and will be most vulnerable to climate changes (Munasinghe, 2001; OECD, 2001). Developing countries cannot be expected to be restricted to a lower per capita use of energy than the industrialised world; the most recent IPCC report states that developed countries and countries with economies in transition should limit and reduce their greenhouse gas emissions before developing countries (Gummer, 1998; IPCC, 2001d).

(IPCC, 2001d)⁸. Development paths leading to low emissions will depend on a wide range of policy choices and require changes in all sectors as part of broad and long-term sustainable development strategies. Moves toward climate change mitigation will only be achieved by international, national and local action, involving all sectors of society and changes in individual behaviour. Policy moves in line with decarbonisation objectives will have a great impact on carbon intensive Western lifestyles. In an age where many wish to raise their material standards of living, we will have gradually to learn to consume less and live quite differently.

1.2.3 Decarbonisation for the UK

The Energy White Paper (DTI, 2003) confirmed the UK Government's backing for the 60% reduction target first proposed by the RCEP (RCEP, 2000). However, the UK is currently poorly prepared to face the long-term challenge of reducing emissions. The UK Sustainable Development Commission, in a policy audit of the UK Climate Change Programme (SDC, 2003), finds that while the UK will achieve its Kyoto Protocol target over the period 2008-12, without further measures it will fall short of the Government's goal of reducing carbon dioxide emissions by 20% from 1990 levels by 2010. This is because the fuel switching measures taken and planned for the coming years will realise the Kyoto target but will not ensure longer term cuts in emissions. The RCEP argues, as does the Sustainable Development Commission, that we should adopt a more long-term strategy and integrate energy and environmental policies. While there is currently an expectation that the development and deployment of new technologies will deliver a reduction in emissions, technical approaches are highly unlikely to deliver a 60% reduction and without a greater commitment, long-term cuts in emissions will not be realised.

A hugely significant problem facing decarbonisation efforts in the UK and other western countries is that access to abundant and instantly available energy underlies our entire way of life, and its impact on our environment is growing. Significant emissions reduction will involve major adjustments to the way we live and work, and real change throughout our political, economic and social systems. The UK Energy White Paper (DTI, 2003) highlights that the 60% decarbonisation target for 2050 will mean using less energy as well as adapting systems and infrastructure to accommodate renewables, and using energy more efficiently. It emphasises that by 2020 people will be more aware of climate change and the important part they can play in reducing carbon emissions. This particularly focuses on economics, with the suggestion that carbon content will increasingly become a commercial differentiator as the cost of carbon is reflected in prices and people choose lower carbon options. The research presented in this

⁸ Methods including carbon sequestration and trading are presented as potential mechanisms for allowing time for other more long-term options to be established and implemented.

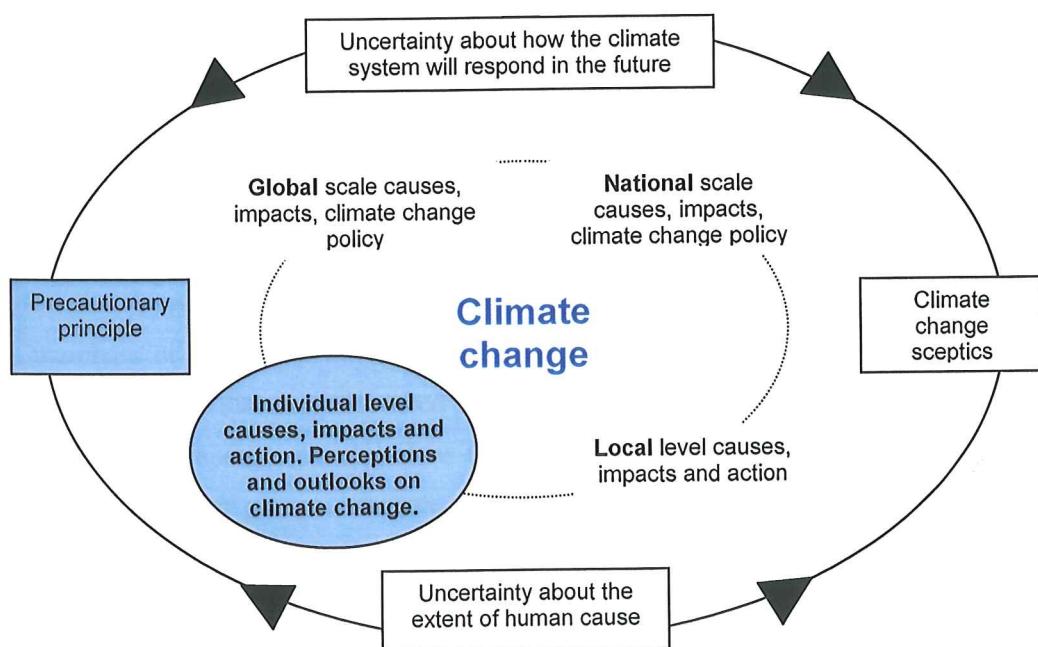
thesis argues that public perceptions of climate change in the context of decarbonisation and likely patterns of response are a lot more complex.

1.2.4 Decarbonisation for the individual

“Social learning and innovation, and changes in institutional structure could contribute to climate change mitigation. Changes in collective rules and individual behaviours may have significant effects on greenhouse gas emissions...” (IPCC, 2001a:299)

The research presented in this thesis considers the prospect of mitigation as part of a climate change strategy for the UK from an individual point of view. It explores the way people perceive the prospect of climate change and the social consequences it may bring in terms of its impacts and what can be done about the issue. It also explores the ways in which people's everyday perceptions and behaviour relate to the global environmental and social issue of climate change (see figure 1.1). Whilst taking an international and national perspective on climate change mitigation, it is also of great importance to address climate change at local and individual levels because climate change impacts and mitigative responses will materialise in this arena as well as more globally. Understanding people's outlooks on climate change in relation to their own lives is important if engagement with climate change is to be brought about and if policy is to be accepted; crucial if the UK is to have a chance of reaching its 60% emissions reduction target.

Figure 1.1 The focus of this research



Individual demands, desires and decisions play a significant role in accounting for climate change. As well as making processes more efficient and implementing emissions reductions at the national level, individuals need to change the direction of their lifestyle choices, make behavioural changes and reduce the amount of energy they are using⁹.

Mitigation policy will affect people's choices in relation to housing, mobility, leisure, etc. The success of policies to limit climate change depend very much on social preferences, and taking serious action on global climate change is likely to be socially controversial because of the possible implications for lifestyle and consumption patterns. Reorganising society to reduce greenhouse emissions even slowly will be very difficult because of the great dependence of human activities on combustion technologies, and the wider political and economic challenges of global co-operation in the face of climate change (Peterson *et al.*, 1997; RCEP, 2000). Stoll-Kleeman *et al.* (2001), for example, find that the public may experience psychological tensions created by their concern about the future and climate change on one hand, and a preference for a high emissions lifestyle on the other (also Rachlinski, 2000).

Making the changes that would be required for a 60% emissions reduction is not an easy challenge (politically or socially). It is possible that substantial change might have ultimately to be initiated by external forces. Jaeger & Kasemir (1996) for example, argue that significant reductions in greenhouse gas emissions could only be achieved using taxation, but that such measures are unlikely to be realised for economic and political reasons (legislation intended to raise the cost of living is unlikely to be passed in a democracy). There is a fine line between imposing external regulation in order to initiate change, and meeting resistance to regulation which is deemed unpopular or which suggests undesirable change, because it is antagonistic to the way in which people are accustomed to living.

1.2.5 Stimulating engagement?

The literature suggests that even amongst the most aware and apparently concerned, there are barriers that prevent people from actually changing their behaviour. This thesis takes the view that members of the public not only need to accept the policy implications associated with decarbonisation but that they also need to feel empowered to take responsibility for their own reductions in greenhouse gas emissions (by reducing and making more efficient their energy use). Communication plays a vital role in the transition to a low-carbon society. Education and public awareness policies are an essential complement to other greenhouse gas mitigation and adaptation policies (OECD, 2001). Raising awareness means more than simply telling people the facts. It also means establishing the link between day-to-day energy uses with the broader

⁹ Poortinga *et al.* (2003) state that in the second half of the 20th century for example, household energy use has increased considerably and is still rising.

symptoms of climate change and making clear through dialogue and other interactions that individuals have a role to play.

Stoll-Kleemann *et al.* (2001) remind us that there are various powerful tools now available to help citizens visualise and consider the consequences of their prolonged ‘misplaced’ actions. Visualisations of climate change for example, have great potential to be used more extensively as a means to communicate and stimulate individual senses of engagement with climate change and different policy options. The proliferation of visual media indicates just how powerful the visual medium can be in communicating to the public in various ways and for various purposes (e.g. for entertainment, advertising, education, etc.). Visual symbols of climate change are plentiful and have been used to communicate in particular the impacts of climate changes around the world. For example, environmental NGO’s have used pictures of melting ice caps, floods and droughts in communicating climate change, and dramatic imagery was used in the recent Hollywood film *The Day After Tomorrow* (Emmerich, 2004).

Rogers (2000) notes that understanding the audience that receives information about scientific issues remains the weak link in the science communication process. Visually communicating messages designed to engage people with climate change necessitates an understanding of how visual imagery can mediate people’s outlooks on climate change in relation to their own lives. Bord *et al.* (1998) suggest that people’s prior perceptions and attitudes towards climate change will have an impact on the success of strategies to communicate to the public the implications of climate change. This is because people’s feelings of engagement with climate change are rooted in their prior perceptions of the issue. It is therefore important for those responsible for climate change communication and climate change policy to have an understanding of people’s outlooks on the issue in relation to their own lives in order to develop a better sense of how the public might be effectively engaged with the issue. However, investigations of people’s perceptions of climate change have not previously examined the role of visual imagery. This study aims to initiate further research into public engagement with climate change, particularly that concerning the role or use of visual images in communication.

1.3 This research

Climate change is seen as an important problem by the scientific community and a real problem to which the behaviour of individuals in society contributes. The literature suggests that for the majority of people, climate change is not seen as very personally important and they do not see themselves as having to do anything about it (e.g. Stoll-Kleeman *et al.*, 2001). There are two principal components which define this research problem. The first is a question of awareness and whether people have a sense that climate change is real or important, which I refer to as

their sense of the *salience* of the problem. The second concerns the issue of behavioural change and how it might be possible to influence people's sense of being able to do something to reduce the causes of climate change, which I refer to as their sense of *efficacy*. This research aims to explore people's outlooks on climate change and how visual imagery might be employed to bring about a sense that climate change is important and that they can do something about it. The methodology of this thesis employs an investigation of people's mental imagery, the visions that spring to mind when they think about climate change. This provides the basis for exploring their reactions to climate change images in terms of issue salience and personal efficacy.

1.3.1 Research objective, guiding themes and research questions

This research is guided by three key themes: salience, efficacy and imagery. These and the above statement of research have remained constant, guiding the exploration and learning about people's outlooks on climate change, and from these the specific research questions were developed. The research themes, objective and questions are presented in box 1.1.

Box 1.1 Research themes, objective and questions

Salience: How personally important climate change is in relation to other issues in life.	Efficacy: How personally able one feels to reduce the causes of climate change. Linked to perceptions of the causes of climate change and whose responsibility it is to do something about it.	Imagery: How people imagine climate change when they think and talk about the issue. How they respond to images of climate change.
--	---	---

Research objective: *to explore people's outlooks on climate change and the potential for visual images to stimulate issue salience and personal efficacy.*

- **How do people relate to climate change in terms of salience, efficacy and imagery?**
 - *How important is climate change, in the context of other concerns? (Salience);*
 - *How far do people see themselves being able to do anything about reducing the causes of climate change? (Efficacy);*
 - *What imagery comes into people's minds when they talk and think about climate change?*
 - *In what ways, if at all, do these themes connect to extend people's commitment to responding to the causes and outcomes of climate change?*
- **Can images of climate change move people to feel engaged (both feelings of salience and efficacy) with climate change?**
 - *Can images bring about both senses of salience and efficacy, engaging people over the long term with the causes and consequences of climate change?*
 - *What else would have to be done for people to feel senses of salience and efficacy with regard to the causes and consequences of climate change?*

1.3.2 Research methodology

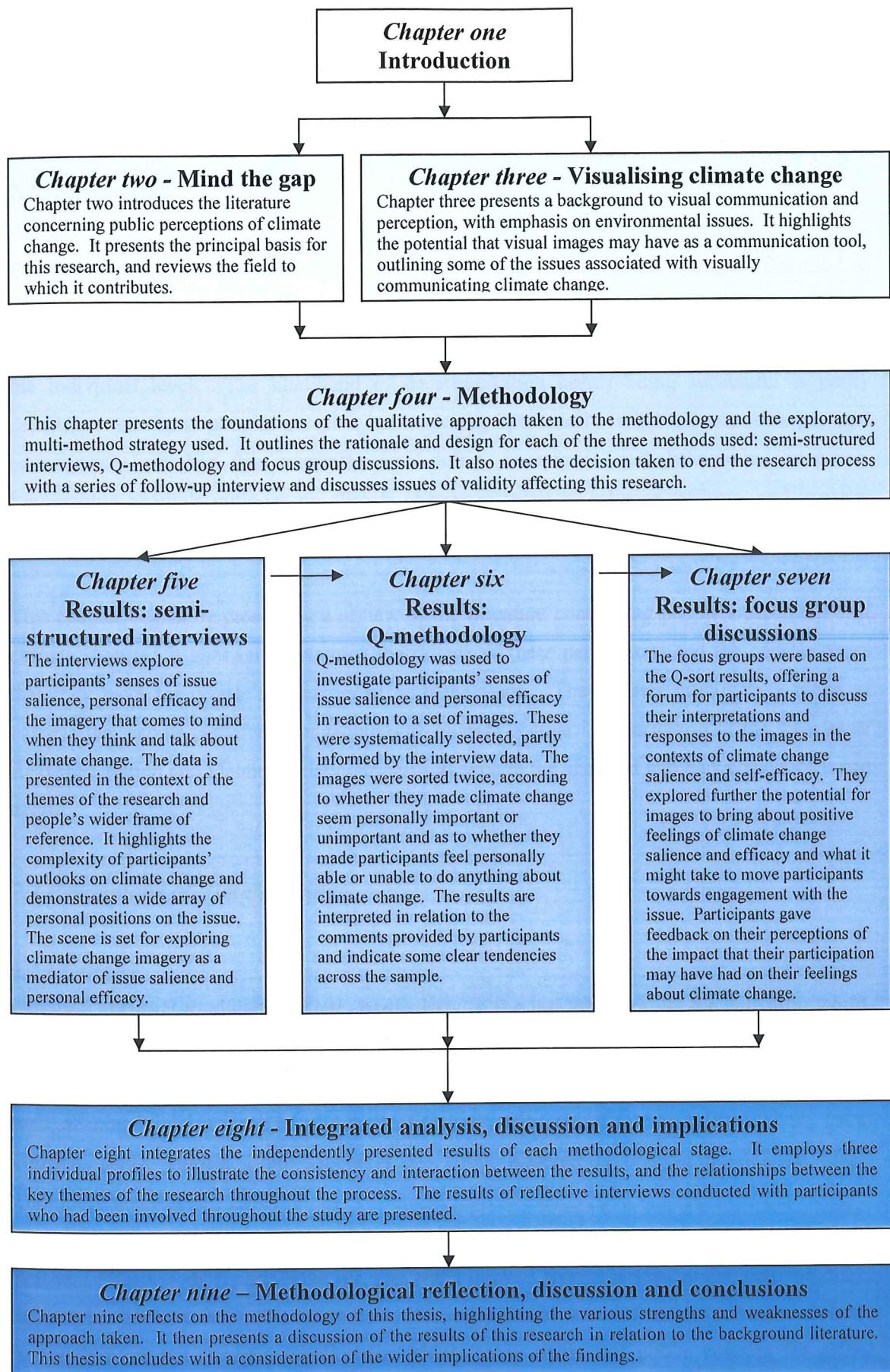
The methodology of this thesis takes an exploratory approach to researching people's perceptions of climate change. The research questions link the visual dimension of this research with people's outlooks on climate change in two ways, both reflected in the structure of the methodology: first, by exploring people's mental imagery through verbal elicitation; second, by studying their reactions to images of climate change in the contexts of salience and efficacy. In the past, image-based research has played a minor role in qualitative research (Prosser, 1998), particularly in the study of people's perceptions of the climate change issue. This research therefore provides a novel perspective.

The research design has evolved, in accordance with the exploratory aims of the study, in a flexible but principled way, guided by the basic research questions. As Denzin & Lincoln (2000:368) propose, "...a priori design commitments may block the introduction of new understandings". The methodology follows a sequential process involving three different methods of data collection over a period of 12 months: semi-structured interviews to provide the foundations for the rest of the study; Q-methodology to bridge climate change imagery and people's senses of issue salience and personal efficacy; focus group discussions re-visiting these results and exploring the issue of climate change engagement further. These principal stages of research were later followed-up with some brief concluding interviews. Returning to the same participants at each stage enabled an in-depth exploration into their outlooks in terms of issue salience, personal efficacy and climate change imagery to be carried out.

1.4 The structure of this thesis

This chapter has outlined the rationale for the research reported in this thesis, setting the scene and outlining the methodological direction taken. It has presented a background to the climate change issue and the prospects for dealing with it in the future, explaining the framework within which this research lies and the major assumptions underpinning it. Figure 1.2 outlines the structure of the rest of this thesis. It highlights the sequential and exploratory approach taken in the methodology, each stage building on its precursors.

Figure 1.2 The structure of this thesis



Chapter two – Public perceptions of climate change

“...more attention needs to be given to the social and psychological motivations as to why individuals erect barriers to their personal commitment to climate change mitigation, even when professing anxiety over climate futures.” (Stoll-Kleemann *et al.*, 2001:107)

2.1 Introduction

Everyday personal choices are important in determining future climate change. The need to reduce our individual levels of energy consumption has been argued in chapter one. Climate change mitigation measures need to be collective and will incorporate major lifestyle changes at the individual level. The likelihood of decarbonisation policy being successful is partly dependent on how people perceive and identify personally with climate change, and consequently whether this translates into policy acceptance and behavioural response. Researching people's outlooks on climate change in terms of salience, efficacy and imagery necessitates an awareness of these perceptions.

This chapter begins by presenting a review of the literature concerning people's perceptions of climate change. It goes on to examine the drivers of these perceptions and the consequences that they have for people's engagement with the issue. The chapter highlights a range of barriers that people perceive to engaging with climate change. A discussion of the theories of Reasoned Action and Planned Behaviour helps to explain the apparent gap between concern and action.

2.2 Perceptions of climate change

2.2.1 Concern

Growing attention to climate change, particularly in the last 20 years, by the scientific world, NGO's, policy-makers and the media have placed global warming on the policy and public agenda. Climate change has become a concern not just among experts but among lay people as well, accompanied by a rise in public attention and awareness of the issue (Bord *et al.*, 1998; DEFRA, 2002; Gooch, 1996; Jaeger *et al.*, 2000; Kasemir *et al.*, 2000a; Schultz, 2001; Thompson and Rayner, 1998).

A recent MORI study reports however, that while climate change is seen as the most important environmental issue facing the world today, most see global warming as less serious than other issues (Norton and Leaman, 2004). The MORI study states that public concern for global

environmental issues as a whole has declined somewhat as a result of 9/11 and the war against terrorism, which has come to dominate public concern in Britain. The report notes that concerns about defence / foreign affairs and the delivery of public services (health and education) have become more important since the early 1990's; few Britons saw global warming as a threat to their local environment. MORI also report that while awareness of the issue is high, understanding of the causes and awareness of the international framework for tackling climate change is low.

Awareness and concern about climate change is also contingent on local and personal circumstances and social concerns; while a large percentage of people express concern about climate change, they express greater concern for a host of other issues (Poortinga and Pidgeon, 2003). Climate change is not addressed in isolation but as part of a multitude of other considerations, and is judged by people relative to other demands in everyday life. The literature suggests that climate change and other environmental issues occupy a back seat in comparison to other issues and immediate concerns in people's everyday lives (Lorenzoni and Langford, 2001b; Murlis and Davies, 2001; Seacrest *et al.*, 2000). Bord *et al.* (1998; 2000) find that global warming features as the lowest in a relative ranking of perceived personal threat next to other social, health and environmental issues. They conclude, "...in the complexities and uncertainties of daily life, global warming is far down on the list of things requiring attention" (Bord *et al.*, 1998:84). Poortinga and Pidgeon (2003) present the findings of a large-scale survey of public attitudes towards science, risk and forms of governance in relation to five risk issues that all raise prominent public policy questions, climate change being one of them. They put the five cases in context by comparing them to various personal and social issues. Climate change is found to be to some extent important and interesting, is generally seen as a bad thing and a high risk issue and is felt to be unacceptable and of high concern. However, it is generally less important than most other personal and social issues, the most important being personal (such as health, partner and family, personal safety) and social (such as population growth, world poverty and human rights). A survey of public attitudes to quality of life and to the environment by DEFRA (2002) also finds that while the majority of people think that climate change is happening, that humans directly cause it, and that it is an important issue, climate change is not as important as social issues more directly affecting individuals, and that they are not very personally concerned.

2.2.2 Action

Thompson & Rayner (1998) argue that climate change is perceived as part of a wider problem concerning humankind's disturbed relationship with nature; that humans should protect the environment for moral reasons¹⁰. Lorenzoni & Langford (2001b) report a clear concern for future generations and for the non-human world; that people should act as custodians of the Earth (see also Bulkeley, 2000). Despite such concerns, perceptions of who is responsible for dealing with climate change appear to lie outside the sphere of the individual; often blame and responsibility is associated with parties other than oneself. Participants in a study by Hinchliffe (1996) suggest that companies and multi nationals should be the ones to act. Lorenzoni & Langford (2001b) find that people tend to lay the blame of inaction on politicians. MORI (Norton and Leaman, 2004) report that most people in Britain feel that global warming should be tackled at a global level rather than at European, national and local levels; around half of those sampled felt that it is a waste of time trying to tackle global warming in Britain without international agreement.

Research into people's perceptions of climate change suggests a common sense of disempowerment where action on climate change is concerned. The literature highlights a shared perception that the problem is too large to be solved on an individual basis. Hinchliffe (1996) reports that respondents are unlikely to take personal action to reduce their energy use because of feelings that their influence was so minimal; participants expressed a sense of futility in taking individual action, articulating feelings of hopelessness (see also Blake, 1999; Bulkeley, 2000; Kempton, 1991, 1997; McDaniels *et al.*, 1996). Kaplan & Kaplan (1989) find that people hate to feel helpless and Kaplan (2000) goes on to state helplessness is the pivotal issue in terms of environmentally responsible behaviour and that feelings of powerlessness will influence people's propensity for behavioural action towards lifestyle change¹¹. Connell *et al.* (1999) report results which demonstrate this suggestion. They find, in a study of young people's environmental attitudes in Australia, that while there are feelings of environmental concern, these are mixed with cynicism toward the issues and action paralysis.

Roberts (1996) states that a belief that one can help solve environmental problems is the best predictor of 'ecologically conscious consumer behaviour' and distinct from a sense of environmental concern. Scott and Willits (1994) find that perceived self-efficacy influences one's propensity to actively care for the environment (see also Fransson and Garling, 1999). Blake (2001) and Eden (1993) supports this suggestion that people who believe that individual action can make a difference are more likely to act than those who do not. Ellen *et al.* (1991)

¹⁰ E.g. people being concerned about species extinctions (e.g. real life warnings) for religious reasons.

¹¹ This thesis does not examine people's behaviour in relation to their perceptions of climate change. It concerns the reasons for people's apparently low levels of issue salience and their senses of helplessness and reluctance to commit behaviourally, and the barriers that people perceive to engagement.

suggest that motivating people to take environmental action is to some extent a function of increasing their perception that individual actions do make a difference; if people do not believe that their actions contribute to climate change, they will have less motivation to take corrective actions. Considering the reasons why people may feel helpless or powerless to do anything to reduce the causes of climate change may therefore shed light on why people profess their concern yet are reluctant to change their behaviour.

2.2.3 Reasons for lack of personal concern and motivation to take action

“[An] apparent lack of public concern for the issue is attributed to their lack of knowledge of its risks, due to the complexity and global scale of the issue, the extent of publicized scientific uncertainty and confusion, and its irrelevance to their daily lives.” (Bulkeley, 2000:316)

There are a number of explanations for why the public generally do not perceive climate change to be of personal or local importance and why they do not feel inclined to take significant behavioural action on the issue. Climate change is difficult to comprehend: it is complex and characterised by substantial uncertainty, far removed and remote from direct experience and everyday concerns (e.g. Bord *et al.*, 1998). Lack of knowledge about the science of climate change, lack of understanding of the causes and consequences (including what individuals can do about it), perceived issue uncertainty and the abstract scale of the issue in time and space¹² give some explanation as to why the issue is not of great personal importance or a priority for individual action.

2.2.3.1 Lack of knowledge about the causes and consequences

“...the ways in which people think about environmental problems, their individual “understandings”, are not necessarily accurate or complete. Nevertheless, these cognitive processes are likely to influence both their willingness and ability to participate in solving the problem.” (Stamm *et al.*, 2000:220)

The literature suggests that people's perceptions of climate change are characterised by much confusion, and that citizens have fairly loose knowledge of its causes and the underlying science. For example, Kempton (1997) argues that people have important misconceptions and associated attitudes about the extent to which human activities can affect the climate, the degree to which it has already changed, the consequences, and what should be done about it. He argues

¹² Much research into people's concern about environmental issues and tendencies for pro-environmental behaviour has cited socio-demographic characteristics as being influential. Studies suggest that women, the more highly educated and young people are more concerned in general about environmental issues. Stern *et al.* (1993) and Schahn and Holzer (1990) find that gender has a significant effect, with women taking a more pro-environmental stance. Iversen & Rundmo (2002) also find that women express higher levels of concern about environmental issues than men, as do young and well-educated people (see also Fransson and Garling, 1999; Scott and Willits, 1994). Bulkeley (2000) argues that young people are more concerned about global environmental issues (see also van Liere and Dunlap 1980). Theodori and Luloff (2002) argue that young individuals, the more highly educated, people with higher incomes, and those with liberal political ideologies are more likely than their opposites to maintain positions on environmental issues and so on. This study does not examine any further the effect of demographic characteristics, political ideology, etc., on people's outlooks.

that while they are aware of climate change in a general sense, understanding of particular causes, possible consequences, and solutions is more limited (see also DEFRA, 2002; Stamm *et al.*, 2000; Stoll-Kleemann *et al.*, 2001). Common misconceptions and a lack of knowledge about the basic causes of climate change for example, influence people's perceptions of the salience issue and their self-efficacy.

Morgan (1995) states that climate change tends to be perceived under an umbrella of general environmental problems; that perceptions and concern about the issue tend to rest on general environmental orientations rather than on specific knowledge (see also Thompson and Rayner, 1998). Bord *et al.* (1998) argue that this inappropriate application of a 'general pollution model', people have a flawed understanding and make errors in assessing the causes of global warming. This leads many to believe that general pollution causes climate change and that good environmental practice or pollution controls will prevent it. Dunlap (1998) also gives ample evidence of misunderstanding regarding the causes of global warming. He finds that people in many different countries often confuse global warming with ozone depletion and air pollution, incorrectly rate 'aerosol sprays' as a major cause of global warming. Bostrom *et al.* (1994) also found that automobile use, heat and emissions from industrial processes, pollution in general, and aerosol spray cans are perceived as the main causes of global warming (see also Bord *et al.*, 1998; Kempton, 1991, 1997; Lorenzoni and Langford, 2001a; Morgan, 1995; Read *et al.*, 1994; Seacrest *et al.*, 2000). Other issues associated with climate change are nuclear power, the space programme and forest destruction (Bord *et al.*, 1998; Bostrom *et al.*, 1994; Kempton, 1991; Morgan, 1995; Read *et al.*, 1994).

The mismatch between people's general ideas about what causes climate change and reality has consequences for our efforts to solve the problem. If a 'general pollution' concept and impersonal model of the causes of climate change guides people, it would seem that large-scale pollution controls for example, are the solution to climate change, obscuring the roles of seemingly non-polluting personal human activities such as inefficient energy use (e.g. Kempton, 1997). The literature indicates that because of non-specific ideas about climate change and a lack of knowledge, people generally fail to link the issue with energy systems, including personal energy consumption (e.g. Harrington, 2001). Kempton (1991:183) concludes, "Few informants recognised the connection between energy consumption and global warming, and they typically regarded their personal fuel consumption as inelastic." This lack of recognition that global warming is a function of individual activities and energy use is also addressed by Bostrom *et al.* (1994), McDaniels *et al.* (1996), Read *et al.* (1994), and Seacrest *et al.* (2000). Ungar (2000) suggests the absence of the above connection is because there are no available

metaphors that provide a simple schematic for understanding climate change, that the issue does not have a clear-cut cause and effect relationship¹³.

'A person cannot be effective if he or she does not know what to do.' (Ellen *et al.*, 1991:114)

When causes are not well understood, it is clearly difficult for people to carry out effective solutions, even if they are willing (Kempton, 1997; Stamm *et al.*, 2000). If people have misconceptions about the causes and consequences of climate change, behaviours or actions that people are engaging in may be misguided and ineffective. Such misunderstandings can lead concerned citizens to waste their energies on ineffective actions whilst neglecting efforts that would help towards the problem (Bostrom *et al.*, 1994). For example, people may actively avoid using spray cans but do not consider changing their patterns of energy use (see also Bell, 1994; Seacrest *et al.*, 2000; Thompson and Rayner, 1998). Stoll-Kleemann *et al.* (2001) state that this also means that citizens are unlikely to readily relate to a possible mitigative policy option (e.g. carbon tax). This has implications for the acceptance of future mitigation policy measures, particularly those directed towards individual activities.

2.2.3.2 Scale of the issue – distance in time and space

"...we simply find it impossible to imagine the globally warmed future...while we accept the evidence for climate change intellectually, we reject it emotionally. We find ourselves unable to believe it really, truly exists." (Marshall and Lynas, 2003:20)

People think and act on the basis of extremely short time horizons compared to the time scales over which scientists project climate changes (Lorenzoni and Langford, 2001b). Jodha & Maunder (1991) characterise this in terms of the concept of 'immediacy'; the present to most people is more important than the long-term future, which is often overshadowed by more immediate considerations. Rebetez (1996) suggests that global change issues are too abstract to be related to personal experience because human perception of the long-term is limited. The perception of climate change as a distant issue in time and space therefore partly explains its lack of ascribed priority in terms of both salience and efficacy; the literature suggests that climate change is on the whole seen as a remote problem in time and space, and not one of personal concern (e.g. Lorenzoni and Langford, 2001b). Jaeger *et al.* (2000) report that consequences of climate change are perceived as more likely to be global and in the future than local and in the present. Local or regional impacts were not in the foreground of discussion amongst focus group participants. Climate change and other large-scale environmental issues seem to be distant problems that we believe mostly affects other people in other places and

¹³ In contrast, the ozone issue had a more obvious scientific grounding, less uncertainty and a clear preventive strategy involving achievable individual action. Links made between the issue and resulting health implications (skin cancer) held immediate everyday relevance.

consequentially, it is difficult to relate to personally (Gooch, 1996; Kempton, 1991; Rebetez, 1996; Stehr and Von Storch, 1995)¹⁴. Perceptions of climate change as being spatially and temporally remote have implications for the extent to which people connect this global issue to their everyday lives; crucial if personal engagement is to take place (Bulkeley, 2000). The spatial and temporal remoteness of the issue means that people do not relate it to their ways of life; lay concerns for the societal implications of climate change appear to be separate from the personal ones and people do not personally identify with the causes and consequences of climate change (e.g. Bord *et al.*, 1998; Hillman, 1998).

“The farther away in time and space people think a threat is, and the more difficult it is for them to visualize the threat, the less involved they are.” (Meijnders *et al.*, 2001:965)

Because the nature, seriousness and consequences of environmental problems such as climate change are uncertain and unfamiliar to people, the way they evaluate these issues is to a large extent dependent on risk perception (Slovic, 2000; Steg and Sievers, 2000). Risk perceptions and judgements may influence people's outlooks on climate change and their related behavioural actions. People take decisions on risk issues based on sensory experience, attitudes and expectations which incorporate personal circumstances, beliefs, stored knowledge, etc. Sjöberg (1998) proposes that perhaps the majority and the most important of risks have to do with abstract threats, about which we do not have sensory information or sensory memories (see also Sjöberg, 2000). Langford (2002) suggests that fundamental anxieties (fears of death, freedom and responsibility, isolation and meaninglessness, etc.) can be related theoretically to the ways people perceive risks such as climate change. Because people find it difficult to imagine climate change affecting them, there is very little coupling of a dread factor with personal relevance or threat; climate change is future orientated to the extent that it is not tied to concrete events capable of operating as a focus for concern or change (e.g. Peters and Slovic, 1996; Slovic, 2000b; Ungar, 2000)¹⁵.

“...with global climate change, the risks are uncertain, the costs and benefits distributed unequally, and the responsibility reaches from the scale of the individual right through to the centres of major industrial and political power (e.g., the United States).” (Langford, 2002:106)

Because of the long lag-time between the causes and the consequences of climate change, the climate will continue to change in our foreseeable future. The consequences of personal behavioural change have an indirect link with the global and future consequences of climate change. Our activities have no apparent short-term effect on the climate, so there is no immediate driver for reducing our energy consumption; taking action now will not result in

¹⁴ Bickerstaff & Walker (2001) find that people's environmental understanding is localised within the immediate physical, social and cultural landscape. However, climate change is not necessarily experienced or perceived as a local problem.

¹⁵ Ungar (2000) suggests that the issue of ozone depletion on the other hand became a personally intrusive problem, with everyday warnings, and adverts, etc., which were comprehensible and concrete.

obvious climatic changes within the lifetime of present generations. The costs of remedial actions are also close and immediate, whereas the benefits are far away in space and time – mitigative measures are not going to be rewarded in the short term. The climate change problem seems far off and may not become a pressing problem until there are closer and more immediate physical impacts which act as cues for action (Peterson *et al.*, 1997).

2.2.3.3 Perceived issue uncertainty

Climate change is an uncertain issue, partly because the causal processes in relation to the climate system are complex and cannot be accurately projected. While there is an overall consensus about the causes and consequences, a minority publicly argue that we do not need to take preventative action. As noted in chapter one, many advocate the need for more research before taking mitigative action, arguing that it is unclear whether one can justify incurring the costs of prevention (e.g. Lomborg, 2001). These competing claims and the lack of certainty in climate projections leave people wondering whether or not they should be concerned and whether they should do anything about climate change (e.g. Lorenzoni and Langford, 2001b).

2.3 Constructing outlooks on climate change

Irwin and Wynne (1996) discuss the role of ‘mediating institutions’, which currently convey information about scientific issues such as climate change to the general public. Such institutions can take a number of forms, e.g. the mass media, government information, environmental campaign groups, education, etc. These institutions act as major sources of awareness, and the way in which they mediate information has an important influence on people’s perceptions of climate change. The mass media has an important agenda-setting role and is the most major source of awareness and information about climate change. Its role as a driver of climate change perceptions is outlined below. Personal experiences and social interactions are also important influences on people’s outlooks on climate change. All of these sources directly or indirectly influence people’s perceptions of climate change; its salience, what they think should be done and their judgements about the extent of individual capacity and responsibility to act.

2.3.1 The mass media

The media play a crucial role in heightening people’s awareness of risks such as climate change, acting as a primary channel for knowledge and awareness (Stamm *et al.*, 2000). People have little direct or everyday contact with climate change, so depend on the media as a source of information about the science, politics and environmental aspects of the issue. Without the news media in particular, many risks, disasters and dangers known to science would only be known to those involved. For example, Gooch (1996) proposes that the salience of

‘unobtrusive’ issues such as climate change which the public cannot experience personally are more affected by the mass media than more local obtrusive issues which people can experience (see also Ader, 1995; Fortner *et al.*, 2000; Joffe, 1999; Stamm *et al.*, 2000; Trumbo and Shanahan, 2000). The ways in which the media represent climate change will therefore undoubtedly have an impact on public perceptions of the issue.

Media attention to particular environmental issues such as climate change provides resources that audiences can draw on and talk about (Burgess and Carvalho, 2004; Myers and Macnaghten, 1998). Kasemir *et al.* (2000a) find that climate change is increasingly present in citizens’ daily conversations. The amount and nature of media coverage devoted to climate change will influence the perceived salience of the issue in the public arena and its topicality (e.g. McComas *et al.*, 2001). Cycles of media attention have a powerful role in framing issues such as climate change and setting agendas within the public arena (Burgess and Carvalho, 2004; Gooch, 1996; Mazur, 1998; McCombs, 1999; Rowe *et al.*, 2000; Trumbo and Shanahan, 2000). In 1995, Ungar suggested that global warming had begun to receive only intermittent media attention, tending to be short lived and that the decline in the reporting of global warming occurred because of the inability of the topic to sustain the status of a dramatic crisis. More recently, and during the course of this research, the issue has been increasingly present in the media and its profile continues to rise as climate change is more often connected with erratic and extreme weather events for example. Climate change has been the subject of even more recent attention due to the release of the Hollywood blockbuster ‘The Day After Tomorrow’ (Allen, 2004; Leiserowitz, 2004; Weaver and Hillaire-Marcel, 2004)¹⁶.

Burgess and Carvalho (2004) state that the media play a number of cultural roles in modern life, including the *selective* provision of social knowledge, including knowledge of science. They argue that this selection is partly driven by economic, professional, political and technological demands on media professionals to produce stories that will define the day’s news. It is also influenced by the characteristics of climate change (e.g. time and spatial scale), many of which are not immediately compatible with conventional news values such as novelty, recency and factuality. Burgess and Carvalho suggest that the complex nature of climate change in particular leaves scope for media sources to shape agendas and discourses on the issue. For example, expert judgement is interpreted by the media in order to convey to people the nature of the risks that they face. During this process, scientific claims may be simplified, adapted or strengthened in order to be understood by the audience and to fit the media’s rhetorical purposes. While climate change is generally discussed in the media as a serious environmental

¹⁶ Weingart and Pansengrau (2003) present reflections on the role of film in the perception and representation of science. Kirby (2003) investigates the impact that fictional representations, created with the assistance of scientists have on the construction of scientific knowledge and the public’s understanding of scientific issues.

problem, its salience can be compromised by an emphasis on scientific uncertainty, controversy and the lack of political cohesion surrounding the issue (e.g. Zehr, 2000). Expert judgement is therefore often shrouded in doubt as the media compel lay people to witness the uncertainty that characterises experts' risk assessments, undermining the trust that can be placed with the 'experts' (Joffe, 1999). The media can therefore foster accurate views as well as misconceptions and confusions concerning the issue; there is considerable leeway for public confusion over the causes, consequences and potential mitigation options available (Bell, 1994; Lacey and Longman, 1993; Stamm *et al.*, 2000).

Burgess and Carvalho (2004) present a review of the way climate change has been represented in the UK broadsheet press, 1985-2003. They raise some important issues about the ways in which the media can frame public discourse on climate change, as well as describing the patterns of representation in terms of volume of press coverage. In early representations, a strong degree of confidence in the forecasts for global warming was found to be exhibited and scientific knowledge was depicted as consensual and reliable. These early depictions of climate change did not show any traits of catastrophism, and newspapers remained silent about responsibility for the problem, leaving unquestioned economic and social practices and the role of political institutions. The authors found at this early stage that scientists were the exclusive definers of the issue for the press. Between 1985 and 1990, the politics of risk associated with climate change gained ground and scope within the British press. Political agendas and actors began to shape understandings of the issue, reframing it to fit political and economic concerns; scientists lost their initial control of the definition of the problem and media discourse moved from the construction of an image of certainty to the use of uncertainty and mistrust in science. Burgess and Carvalho report that over recent years the media have begun to depict climate change as something happening here and now rather than being a distant possibility. Climate change has been reported in association with news of dramatic climate events, and more pressing media has been observed during these occurrences. Examples include the record-breaking rainfall and flooding of the year 2000 in Britain and the European heatwave of summer, 2003, which caused thousands of deaths.

The agency of top political figures and the ideological standpoints of different newspapers are two main factors which shape media discourse on climate change (Burgess and Carvalho, 2004). Burgess and Carvalho found that coverage of climate change has been particularly strongly linked to the political agenda on this issue; for example, to public pronouncements of Prime Ministers and other top governmental personalities. However, they note that the power of officials to influence media discourse on climate change does not mean that their points of view are simply conveyed or amplified by the media. They often become the object of contention – frequently the focus of media attention. Chapter three discusses the types of climate change

imagery employed by the media to bring climate change to the attention of the general public, and the importance of images as communicative tools.

2.3.2 Experiential and social contributions

Laypersons perceptions of climate change are not composed solely of rational facts. In addition to mediation by the media, personal experiences (of local environmental problems, for example) and interpersonal communication influence people's outlooks on the issue. For example, Stamm *et al.* (2000) find that both mass media and interpersonal communication appear to make a positive contribution to understanding, as well as to perpetuating some popular misconceptions. Rebetez (1996) argues that lay people react to climate change mainly on the basis of their own everyday experience. De Fleur and Ball-Rokeach (1982) argue that the media's role in the construction of meaning is a function of how readily available meaningful experiences are in people's everyday experience; that the more available these are the less the media dependency. Bickerstaff & Walker (2001) also emphasise the importance of trust in personal experience that overrides any kind of information-based evidence. Kempton (1991; 1997) finds that many people associate climate change with personal observations of warming, noting milder winters, unpredictability in the weather and more violent weather (see also Bostrom *et al.*, 1994). The association of particular weather events with climate change by the media may contribute to the development of these perceptual links.

Trust in sources of information may also have substantial impacts on public perceptions of environmental risks. Issues of trust relate to people's value structures, affecting their perceptions of climate change, e.g., trust in information, in the Government to respond to the issue and so on (e.g. Langford, 2002; Macnaghten and Jacobs, 1997; O'Connor *et al.*, 1999). Chapter three discusses in more depth the contribution of people's values and morals and the role of social interaction in determining people's perceptions of climate change (with particular reference to Social Representations Theory). It also considers the role of trust in sources of information – to some extent socially and culturally defined – and the effect that this has on people's reception of information and consequent perceptions of the climate change issue.

People's perceptions of climate change clearly draw on a whole host of stimuli. In a complex world, people need to make sense of this information and the situations that confront them. The social and environmental psychology literature suggests that people construct mental frames of reference in order to do this, incorporating incoming information into their existing understandings and frames of reference. Chapter three addresses the way in which people's perceptions and mental imagery of climate change are constructed. It takes Social Representations Theory and the mental models approach as examples, going on to consider the implications for communicating engaging messages about climate change.

2.4 The consequences for engagement

“People respond to hazards according to their perceptions of the risks they pose. What they perceive, why they perceive it that way, and how they will subsequently behave is a matter of great import...” (Peters and Slovic, 1996:1427)

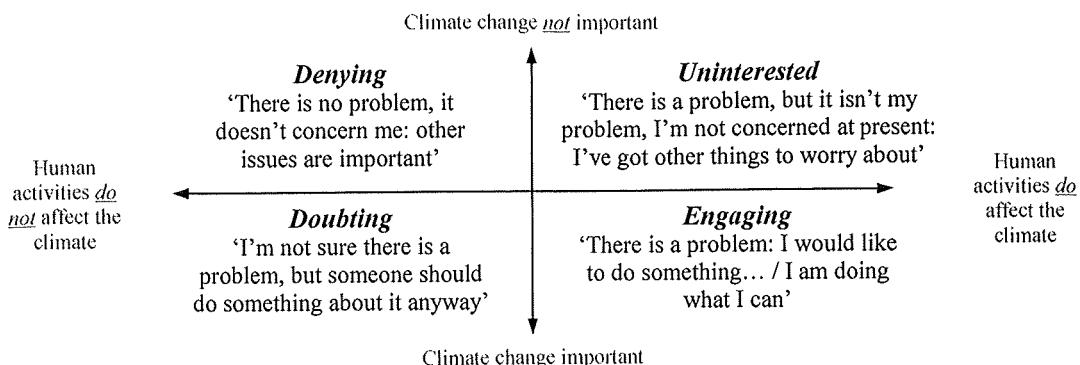
People’s varying perceptions of climate change yield a variety of perspectives about appropriate mitigation strategies, how urgently they should be carried out, who should be or is responsible for dealing with climate change and what should be done. Understanding people’s engagement with climate change is a complex task; even when people state that they feel concerned, understand the issue, and know what they could do about climate change, they do not necessarily behave accordingly. Despite an apparent awakening of public awareness about climate change, and the emergence of a widespread, general concern, the literature highlights many implications for acting on this concern.

2.4.1 Different levels of engagement

Stamm *et al.* (2000) propose that there are different levels of engagement with climate change, ranging from having some kind of basic exposure or awareness to having a sense of how best to solve it – and taking action. However, this is not a straightforward process. Moving from becoming aware of the problem to taking the required behavioural steps is a complex process and depends on a variety of factors, some of which act as barriers to full engagement (addressed in more detail shortly). Lorenzoni (2003) and Lorenzoni & Langford (2001a; 2001b) present an exploration of perceptions of climate change and degrees of engagement among citizens of Norwich (UK). The reported study distinguishes four different perspectives or ‘typologies’ with regard to the way people relate to climate change. These do not operate on the linear scale suggested by Stamm *et al.* The four types are termed: Deniers, Disinterested, Doubters and Engaged. Box 2.1 elaborates.

Lorenzoni & Langford state that the investigation of different perspectives “...can inform our understanding of the different ways in which people accommodate the issue in their thoughts and actions, justify their concern or lack of concern and subsequent behaviour.” (Lorenzoni and Langford, 2001a:19). The results reported demonstrate a range of views which can be applied in relation to the perceived importance of climate change (salience), the need for behavioural change and the role of individuals in reducing the causes and impacts of climate change (efficacy). Of those people whose views fell into the Denying, Uninterested and Doubting groups, most did not see any need to alter their behaviour; the Engagers, in contrast had already adopted lifestyle changes or were willing to do so. However, even amongst the ‘engagers’, it appears that little change is actually being made in behavioural terms to reduce greenhouse gas emissions (Lorenzoni and Langford, 2001a).

Box 2.1 Typologies to illustrate four perspectives on climate change



- **'Denying'** Belief that climate change is not important to their own lives or to society in general and humans do not affect the climate. These respondents were less likely to consider other environmental issues as important personally or to society. More inclined to link climate change to natural variability maintaining that proof would be required before they would undertake any behavioural changes. Climate change is everybody's problem but politicians have the obligation to make the first move as they have wider scope for action than individuals.
- **'Uninterested'** Humans are thought to affect the climate but climate change is not important. Also unlikely to attribute importance to other environmental issues. Point out that the degree of concern relates to how severely it affects one personally. Did not strongly link human activities with climate change. Blamed society in general and developed nations for current climate change and accuse politicians of not enabling individuals to alter their behaviour by changing the present system.
- **'Doubting'** Belief that humans do not affect the climate but that climate change is important personally and socially. Keen to make sense of the contrasting information available on climate change and questioned validity of climate projections in the light of scientific uncertainty. Felt that responsibility for climate change should lie with politicians and a neutral agency and that individuals would only act when directly affected.
- **'Engaging'** Humans do affect the climate, climate change is important personally and socially. Indicate that action is required even though there will be some inevitability. Felt to be very important to alter their personal behaviour, blaming industry and individuals for climate change. See individuals as having a role to lobby governments and industry to enact changes, reduce emissions.

(Based on Lorenzoni and Langford, 2001a; 2001b; Lorenzoni, 2003)

It has been generally assumed that people with strongly pro-environmental attitudes are more likely to hold and carry out their behavioural intentions (Ajzen, 2001; Poortinga, 2002; Scott and Willits, 1994). However, the literature makes clear that even people with strong environmental concerns do not necessarily translate this into behavioural action (Lorenzoni and Langford, 2001a; 2001b; Lorenzoni, 2003; Stoll-Kleemann *et al.*, 2001). For example, Lorenzoni (2003) reports that participants were generally willing to contemplate taking some action, but only up to the point where they felt that their lifestyles were threatened (the results indicate that participants felt that people in general were unlikely to alter their behaviour until affected by climate change). MORI also report an apparent willingness among the public to take action to reduce domestic energy use, but only to the extent that actions are easy (Norton and Leaman, 2004). MORI report that the challenge grows considerably in relation to reduced

car usage for example. Bord *et al.* (1998) find that a majority of the world's citizens will support national and international initiatives designed to cope with global warming. However, their findings suggest that such initiatives will be supported only on the condition that they do not demand significant alterations of lifestyle, levy unusual personal hardships or infringe people's interests. Many other studies also emphasise a limited willingness to make any sacrifice in order to deal with global warming; that while people express some willingness, it may be contingent and limited with narrow support for policies to restrict personal energy use or to enforce energy conservation practices for example (e.g. Jaeger *et al.*, 2000; Kaplan, 2000; Kasemir *et al.*, 2000a; Kempton, 1997)¹⁷.

Lorenzoni & Langford (2001b) found that participants were torn between a moral sense of needing to change their behaviour and what they could personally achieve; there being an apparent difference between feeling a moral obligation to do something about climate change and actually feeling willing or able to take substantive action. Various strategies and explanations were uncovered for how people assuaged a resulting sense of dissonance and anxiety. For example, "...difficulties of adapting their lifestyles, the unwillingness of 'others' in society to take action because of ignorance or lack of concern, the failure of institutions to provide leadership and effective legislation, and the greed of commercial enterprises." (Lorenzoni and Langford, 2001b:12). A pervasive theme was the perceived helplessness of individuals to instigate change, other than by expressing their views for or against options through the voting system or by protest. It was accepted that present trends and habits would persist until restrictions or incentives (financial) were put into effect. Lorenzoni (2003) highlights the difficulty involved in motivating people to change for long-term benefit when they currently feel helpless or not interested. This point motivates the research presented in this thesis, which explores the potential for climate change imagery to convey senses of salience and efficacy, and to stimulate feelings of motivation and engagement.

2.4.2 Barriers to engagement

Macnaghten and Jacobs (1997) propose that major reductions in our impact on the environment will require adjustments to individual lifestyles. They note that it is inconceivable that such changes could be introduced without public acceptance. However, the literature clearly indicates a number of barriers that people perceive to engaging personally with climate change and taking action. Many of these have arisen in this chapter so far. For example, the inherently remote nature of the issue; because of the time and space dimensions it is naturally difficult to comprehend climate change in terms of one's immediate circumstances. A lack of knowledge about the issue (what it is, what can be done about it) is also an important factor and these

¹⁷ Berk and Fovell (1999) look at people's perceptions of climate change and their willingness to pay (WTP) to prevent significant climate change, but this is not a focus of this thesis.

contribute to people's non-specific outlooks on climate change. Seacrest *et al.* (2000) confirm that misunderstanding the fundamental physical processes of climate change and perceptions of scientific uncertainty act as barriers to initiating a significant response to climate change. The following review considers these as explanations for the gap between a general concern and personal engagement with the issue (including behavioural action). It outlines some of the reasons why "nearly everyone professes to care about global warming while simultaneously continuing with set patterns of behaviour that make the problem worse." (Marshall and Lynas, 2003:18).

Seacrest *et al.* (2000) also pinpoint that a sense of helplessness is also a significant barrier to action as explained in section 2.2.2 of this chapter, e.g., helplessness as a result of feeling that there are no solutions and that the problem is rooted in moral decay, human indifference, and entrenched in consumerist lifestyles. This highlights the key role that a sense of efficacy may play in disposing people to take behavioural action and engage more personally with the climate change issue (also discussed in more detail in section 2.5.2). Oskamp (2000) states that people's resistance to major changes in their lifestyles have many other explanations including: inertia and the postponement of action until changes become irreversible; the danger that fear appeals will backfire and lead people to deny environmental threats; the belief that technological improvements can save the situation; and opposition to the necessary lifestyle changes because they are perceived as requiring sacrifice (see also Bord *et al.*, 1998; Lorenzoni and Langford, 2001a).

Not feeling willing or able to give up present lifestyles and comforts relates to a fear that costs of change will be borne individually. This outweighs the benefits to society of participating in pro-environmental behaviour – in effect a 'commons dilemma' (e.g. Rachlinski, 2000)¹⁸. Oskamp (2000) adds that major lifestyle changes are often resisted, because people pursue short-term individual benefit and ignore long-term consequences to their whole society (particularly likely when the long term consequences cannot easily be seen, such as the risk of climate change). Stoll-Kleemann *et al.* (ibid.) state that the tragedy-of-the-commons theme creates a strong sense of awaiting others action before individual sacrifices are perceived as worthwhile. Marshall and Lynas (2003:19) argue that the complex causality of climate change plays particularly strongly to the natural human tendency to diffuse responsibility; "The South blames the North, cyclists blame drivers, activists blame oil companies, and almost everyone blames George Bush."

¹⁸ Hardin's (1968) tragedy of the commons example refers to people's pattern of using community resources for their own individual and short-term benefit, ignoring the consequences to society over a longer time scale (the consequences of climate change are a long way off over time and space so this is a good example).

Kempton (1991) finds that people imagine doing something about climate change as involving ‘going back to colonial times’. Consumption is seen as an aspect of social well-being and an economic good; the prospect of using fewer resources suggests to many that people will have to cut back on life’s comforts and make do with less (Stoll-Kleemann *et al.*, 2001). People are hence more likely to support policies that socialize the cost of solutions and incentives rather than policies that seem to target the individual and which represent disincentives. ‘User-pay’ alternatives (e.g. economic disincentives) are more likely to attract opposition than collective policy measures because the costs are more direct. Urmetzer *et al.* (1999) state that no issue better highlights tensions between consumerism and the environment than the use of the private car; even though people may be aware of the environmental consequences of car use, most are unwilling to change their transportation behaviour. Kempton (1991) found that people are unlikely to respond to policies directing people to drive less; that they were more supportive of suggestions to increase car efficiency than a suggestion of an energy tax, which was seen as a punishment (see also Bord *et al.*, 1998; Urmetzer *et al.*, 1999).

The survey of public attitudes to quality of life and the environment by DEFRA (2002) states that many respondents felt unable to cut down on their energy use because they felt unable to use their cars any less, lacked the time or desire to cut down on their energy use or felt that the lack of available public transport was a factor, and that while many people were cutting down on energy-use, this was usually due to cost or other reasons (rather than for environmental ones). It reports little support for potential policy responses involving higher taxes or prices in comparison to polluter pays-type options (policies targeted at the individual motorist directly were also unpopular). Oskamp (2000:384) also finds that “...the idea of sacrificing personal advantages or comforts in order to advance the general welfare is apt to be unpopular” because people generally display reactance against changes they perceive as detrimental to them. People will be unlikely to support measures mandated by governments that are perceived to impose personal costs (McDaniels *et al.*, 1996). This means that such policy measures (necessary if we are to reduce our emissions by 60%) are likely to be resisted and major lifestyle changes will be unlikely on a voluntary basis. Few people readily take actions that demonstrate really sustainable lifestyles, despite their apparent environmental concern or engaged status as demonstrated by Lorenzoni (2003). Blake (1999) states that many of the actions that people do take are tokenistic and often unrelated to the particular concerns people express about the environment.

Much of the literature reports findings that people have faith in technological and regulatory advances to solve the problem of climate change. Blake (2001) states that those who place more faith in science and technology ‘to save us’ are less likely to see the need for personal action (see also Stoll-Kleemann *et al.*, 2001). People also cite other reasons for inaction, such

as feeling that they are the ‘wrong type of person’ to act, or that it is a problem for other people to deal with. This highlights tensions over the perceived relative responsibilities of different actors including individuals, business, Government, etc. (Blake, 1999). Action on climate change is also compounded by a lack of political will, often translated into a justification for not committing to climate change. Perceptions of how politicians are dealing with climate change influence what they think should be done about climate change, how important it is and how far they see themselves as having a responsibility. A perceived lack of inclination to change present behaviour in the light of the Government not being able to deliver its promises regarding climate change mitigation is important (e.g. Stoll-Kleemann *et al.*, 2001). Given the lack of commitment by the US, many barriers to change are based on the perception that there is a lack of political cohesion and action being taken both nationally and internationally by Government and industry. Bulkeley (2000) suggests that although morally sanctioned, actions taken by individuals to reduce energy use for environmental benefits were thought to be largely ineffective in a context of inertia from influential institutions (business, governments). Participants in a study by Hinchliffe *et al.* (1996) were adamant that some form of regulation was required.

The literature suggests that some of the justifications given for not taking any actions when professing to understand and care about climate change constitute strategies that people employ to assuage their anxiety about these feelings (e.g. Lorenzoni and Langford, 2001b). Stoll-Kleemann *et al.* (2001) report on how informed citizens judge their personal responsibility for climate change mitigation, stating that people erect a series of psychological barriers to justify why they should not act to mitigate change (Dunlap, 1998; Rachlinski, 2000). Stoll-Kleemann *et al.* state that essentially people may profess anxiety over climate change but be faced with internal resentment or even denial over what they cannot accept as a justifiable change in behaviour (e.g. using public transport instead of a car). The authors find that perceived unwillingness to abandon personal comforts and lifestyle consumption in the name of climate change mitigation is a particularly powerful zone for denial. The inconsistency represents a disjunction between a personal preference for a particular lifestyle or level of consumption and the perceived need to respond to climate change. The theory of cognitive dissonance refers to the “dissonance” or discomfort experienced when there is a mismatch or conflict between attitudes and behaviour (Festinger, 1957)¹⁹. Dissonance results from the lack of cognitive consistency and individuals generally seek to resolve, deny or displace it, finding justifications for their behaviour where it negatively affects the environment (Lorenzoni, 2003; Rachlinski,

¹⁹ Hayes (1994) explains that if an attitude (or cognition) that we hold is in direct conflict with another, and if the two are related somehow, then we will experience tensions. Either we change one of the cognitions or we add an extra one to explain the discrepancy. Streets and Glantz (2000) define this as a contradiction between perception of reality and reality itself, which may serve as an obstacle to perceiving the actual links found between the causes and consequences of climate change (see also McDaniels *et al.*, 1996).

2000; Stoll-Kleemann *et al.*, 2001). Stoll-Kleemann *et al.* (*ibid.*) state that people construct barriers of denial because they need to overcome the dissonance created when they realise the daunting consequences of changing their lifestyles (see also Lorenzoni and Langford, 2001b; McDaniels *et al.*, 1996). Denial, displacement of responsibility and dissonance act powerfully to maintain the gap between attitude and behaviour with regard to climate change and box 2.2 presents nine ways in which these may occur.

“Some processes can contribute to conciliating an individual’s inner demands with external signals, thus establishing a sense of harmony or consistency within the individual.” (Lorenzoni, 2003:48)

**Box 2.2 Denial and displacement mechanisms as justifications for feeling disengaged
(Stoll-Kleemann *et al.*, 2001)**

- Metaphor of displaced commitment (I do other things)
- Condemnation of the accuser (You have no right to challenge me)
- Denial of responsibility (I am not the main cause)
- Rejection of blame (I have done nothing wrong)
- Ignorance (I do not know the consequences of my actions)
- Powerlessness (I am only a tiny being in the order of things)
- Fabricated constraints (There are too many impediments)
- “After the flood” (What is the future doing for me?)
- Comfort (It is too difficult for me to change)

“Such mechanisms heightened the costs of shifting away from comfortable lifestyles, set blame on the inaction of others, including governments, and emphasised doubts regarding the immediacy of personal action when the effects of climate change seemed uncertain and far away.” (Stoll-Kleemann *et al.*, 2001:107).

The denial mechanisms outlined in box 2.2 help to assuage guilt, reinforce victim status, justify resentment and emphasise the negative feelings towards disliked behaviour (e.g. the disagreeable features of public transport). People look for such cues to avoid unease and justify continued behaviour in the face of a moral norm to the contrary. By employing such justifications, it becomes easier to do little, rather than more by way of change. Environmental concerns become justifiably outweighed by feelings such as laziness, reluctance to take any responsibility, or feeling ill informed about what to do, etc. Such denial strategies are not easily set aside unless people’s perceptions of gains and losses are significantly altered. Langford (2002) proposes similar strategies used to avoid responsibility, stating that we construct the world of appearances to serve our denial; an individual may blame others or those institutions with authority and so on. Joffe (1999) reports that when people are initially face with risks, their responses are, ‘not me’, ‘others are to blame’ (as the literature presented suggests in the

context of climate change). Joffe demonstrates that people tend to attain a sense of personal invulnerability to risk by externalising the threat. She argues that people control the anxiety evoked by danger by forming social representations (addressed in chapter three) which alleviate the worry by portraying ‘others’ rather than the self and the in-group, as the more deserving targets of danger. This approach may explain why people perceive that they may not be affected by climate change (it’s a far away issue, affects people in other countries), and that others are responsible for the dealing with the issue, rather than themselves.

“Individuals must accept responsibility for the future, but conditions, institutions and their own day-to-day responsibilities constrain their actions.” (Myers and Macnaghten, 1998:346)

External barriers are also cited as reasons for feeling unable to do anything about climate change, e.g. a lack of public transport infrastructure. Bulkeley (2000) questions the assumption that people’s behaviour would change if they were more educated and knowledgeable about climate change, stating that often institutional barriers have to be lifted to enable individuals to practically engage. Blake (1999) also suggests that while people might have the intention to change their behaviour, there are still practical social or institutional constraints preventing them from adopting pro-environmental action, regardless of their attitudes or intentions. These include lack of time, money and facilities. They extend to the design of our housing (detached houses, locations reliant on people having access to private transport) and fuel efficient cars not being competitive market options, etc. Kaplan (2000) adds that it is not only an appropriate infrastructure that may be lacking, but also the lack of sustainable choices (i.e. beneficial both personally and for the environment) and cultural support for these. Urmetzer *et al.* (1999) add that people’s reluctance to give up the private car for example is a ‘macro-social’ problem framed by a social structure which makes car use and other energy dependent activities central to our way of life; that much of our infrastructure and urban design is centred around the use of private transport (see also Bord *et al.*, 1998).

2.5 Exploring the attitude-behaviour gap

The research reported in this thesis is based on the themes of imagery, salience and efficacy and doesn’t examine people’s behavioural change. However, the theories of Reasoned Action and Planned Behaviour provide some insight into the way in which issue salience, personal efficacy and the various perceived barriers to engaging with climate change lead to an apparent lack of behavioural intention and action.

2.5.1 The Theory of Reasoned Action

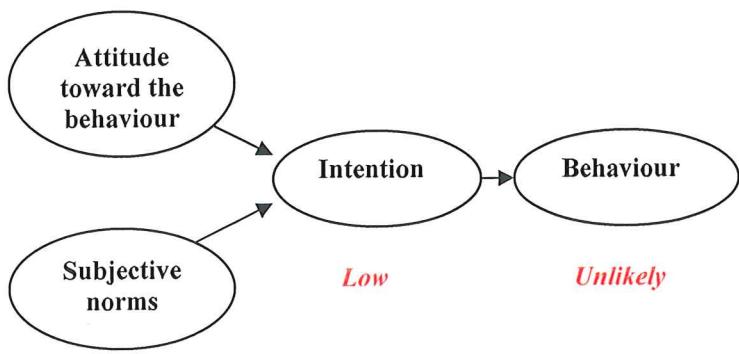
The Theory of Reasoned Action (TRA) postulates that the tendency to engage in a particular behaviour is determined by the person's intention to do so, and that their intention to perform (or not) a behaviour is the immediate determinant of that action (Ajzen and Fishbein, 1980). The model may be taken into account by this research because it offers a way in which people's perceptions of climate change salience and personal efficacy can be explored in relation to their behavioural intentions and actual behaviour. As demonstrated in figure 2.1, intention mediates the effect of attitudes plus other elements including subjective norms and values on behaviour, i.e. the model includes a person's appraisal of what they think others will expect them to do (social norms) and takes account of a person's beliefs and evaluations about the consequences of the behaviour (values) (Stainton-Rogers, 2003).

Figure 2.1 The Theory of Reasoned Action (adapted from Eiser, 1986)

Evaluate beliefs about consequences of the behaviour:

e.g. I am concerned about climate change and should take action. But no-one else is acting, I can't make much of a difference

Beliefs about how others would view one's performance of the behaviour and the motivation to comply with their views: e.g. some people care and do stuff, but most people don't do much and probably won't until they are affected



With respect to taking action on climate change, the literature suggests that features of people's attitudes to climate change, and subjective norms which lead to only negligible intention to act (even if they feel that the issue is important). The TRA does not clearly consider the notion of self-efficacy. This is a key theme of this research and a concept which appears in the literature to be a powerful reason why people might feel that while the issue is important, they do not act on their concern.

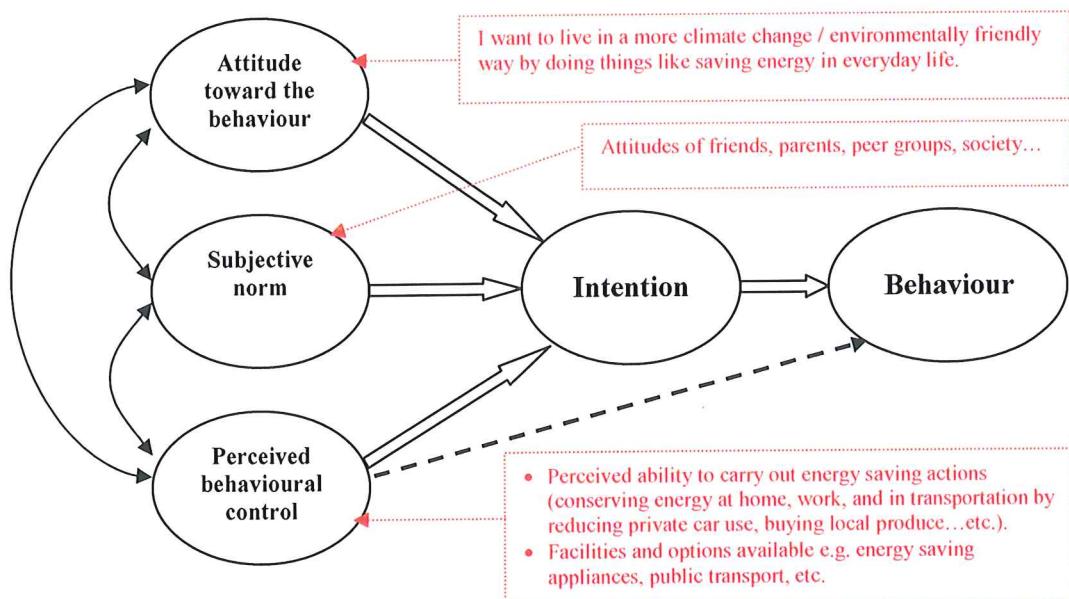
2.5.2 The Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) is an extension of the TRA and incorporates the concept of perceived behavioural control (PBC) as a predictor of intentions and behaviour. As well as attitudes toward behaviours and subjective norms, the TPB theoretically suggests that reasoned human agency is a key determinant of action (see also Blake, 1999). The TPB therefore treats intentions and what people do as the outcome of considering their own capacities as well as their attitudes toward the behaviour and the views and expectations of

important others²⁰. Figure 2.2 illustrates the TPB, which proposes that people act in accordance with both their intentions and perceptions of control over a behaviour (Ajzen, 1985; 2001). The bi-directional arrows demonstrate that the determinants of intention are not always independent of one another. The broken arrow demonstrates that people's judgments about their capabilities influence whether they actually carry out behaviours or not, over and above any intention (Potter, 1996).

"In comparison to people who perceive themselves as having little behavioural control, people with a high degree of perceived control form stronger intentions to engage in these types of behaviours and are more likely to carry out their intentions under appropriate circumstances." (Manstead and Hewstone, 1996: 56).

Figure 2.2 The Theory of Planned behaviour (based on Potter, 1996:132)



The TRA applies only to volitional behaviours, whereas the TPB takes account of "actions subject to interference by internal and external forces" (Bagozzi, 1992:180). The TPB acknowledges that intentions can be carried out only to the extent that people perceive that they have sufficient control over the behaviour in question. It refers to the perceived ease or difficulty of performing behaviours and takes into account perceived as well as actual control²¹ over a behaviour under consideration (e.g. energy saving, taking local holidays, changing mode of transport, buying renewable energy). The TPB is assumed to reflect anticipated impediments and obstacles, recognising that people are less likely to undertake actions where they perceive

²⁰ The relative importance of these influences in the prediction of intention varies across behaviours and situations (Armitage and Conner, 2001).

²¹ It recognises that many factors can intervene between the intention and the act or obstruct the intention-behaviour relationship, influencing the successful performance of an intended behaviour.

that they have little confidence of success (i.e. individuals are more disposed to engage in behaviours that are believed to be achievable). Examples of the application of the TPB include Schultz and Oskamp (1996), who investigate the role of effort as a moderator of the attitude-behaviour relationship for general environmental concern and recycling. They propose that the amount of effort required for a behaviour functions as an impediment to action (a behavioural barrier) and that overcoming greater barriers requires stronger attitudes. Their findings support the notion of PBC as an important variable in the attitude-behaviour relationship: the amount of effort required to perform a behaviour is one part of a person's perceptions about the ease or difficulty associated with performing that action. Tonglet *et al.* (2004) use the TPB as a cognitive framework to understand the factors which underpin recycling behaviour. They find that recycling attitudes are the major determinant of recycling behaviour and that these are influenced by having opportunities, facilities and knowledge to recycle, and by not being deterred by the issues of physically recycling (e.g. time, space and inconvenience). Tonglet *et al.* (*ibid.*) conclude that TPB is valuable because it enables the identification of factors which are likely to encourage or discourage intention and the performance of a behaviour. These relate to some of the barriers addressed earlier in this chapter.

The TPB represents one way in which issue salience and personal efficacy are incorporated in people's outlooks on climate change and their engagement with the issue from a behavioural perspective. It offers an explanation for the mismatch between an apparent concern for climate change and attitudes in favour of doing something about the issue (and other environmental issues of perceived importance), and a lack of actual intention and / or action. The PBC component in particular provides information about the potential constraints on action as perceived by the actor and is held to explain why intentions do not always predict behaviour (Armitage and Conner, 2001).²² The concept of PBC in the TPB can be likened to the concept of personal efficacy which is a theme of this research. This is also because perceived self-efficacy and PBC are both learned in various ways, including as a result of personal experiences, and can determine whether an individual attempts a given task, their persistence and ultimate success (Jackson, 2004). Some literature however, argues that the concepts of efficacy and PBC are not the same thing. For example, Armitage and Conner (1999) make a distinction between perceived controllability (whether people believe that they have volition control over performance of a behaviour) and self-efficacy (conceptualised as the degree of anticipated difficulty in performing a behaviour). Using measures developed on the basis of this distinction, they find that self-efficacy and PBC had distinct and independent effects on

²² Another example: Chan (1998) found in a study of intention to voluntarily use waste recycling receptacles in Hong Kong, that environmental attitudes were most important for the prediction of behavioural intentions, and that the influence of the social network is mainly symbolic in the case of recycling (a highly voluntary behaviour, with no immediate tangible consequence in terms of reward or public shaming on the other hand). Chan reports only a moderate correlation between behavioural intention and actual behaviour and suggests that Hong Kong people are only paying 'lip service' to environmentally responsible actions for various reasons.

intentions; that only perceived difficulty added significantly to the prediction of intentions and behaviour. Similarly, Hagger *et al.* (2001) found that self-efficacy and attitude were strong predictors of physical activity intention, but PBC and subjective norms were not (see also Ajzen, 2001).

“...a distinction can be drawn between perceived controllability and perceived difficulty of performing a behaviour (self-efficacy) and that the latter may be a more important antecedent of intentions and actions.” (Ajzen, 2001:48)

Armitage and Conner (2001) later report that self-efficacy and PBC are both useful predictors of intention and behaviour, and that there is little clear evidence as to which is preferable. However, they find that self-efficacy is more clearly defined and operationalised. This supports the application of the concept of efficacy as a theme of this research because it has an important influence on people's intentions to carry out a behaviour and to act (in this case, pro-environmental, energy-saving behaviours).

2.5.3 Barriers to action on climate change in relation to the Theory of Planned Behaviour

The literature concerning the TPB implies that a sense of efficacy or PBC has important consequences for whether intentions are developed, and whether they lead to behaviour. However, the preceding discussion of the barriers to action on climate change highlights that there are people who consider themselves engaged (e.g. Lorenzoni, 2003), yet who still do not take action (e.g. Stoll-Kleemann *et al.*, 2001).

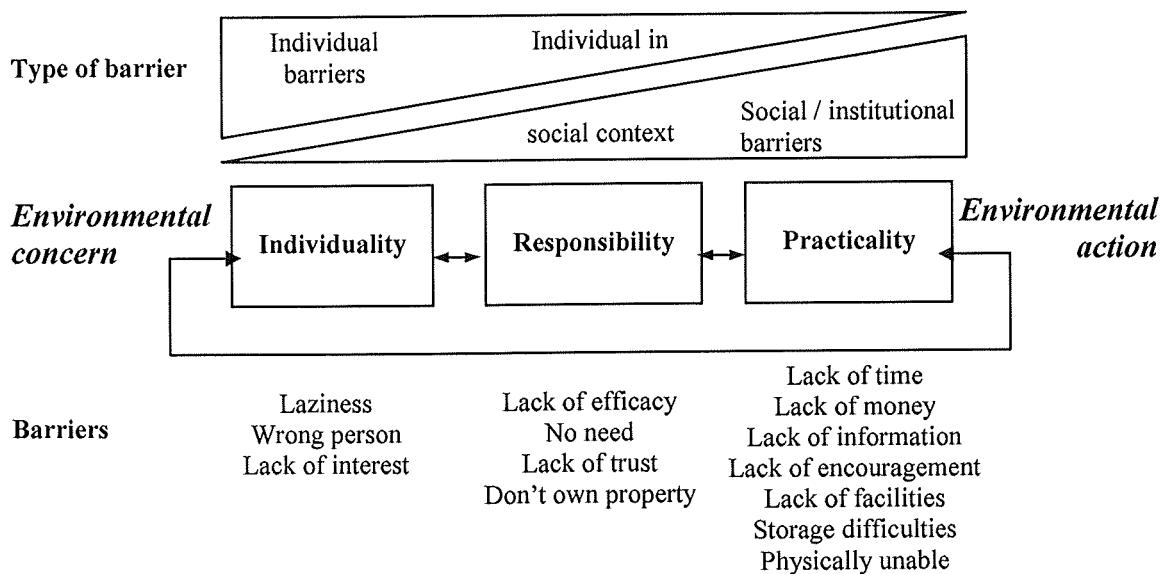
“Bandura (1977)...believed that self-efficacy should reflect a person's evaluation of their confidence in performing a given behaviour in the face of salience barriers and facilitating conditions.” (Hagger *et al.*, 2001:3)

Ajzen (1985) and Blake (1999) highlight that even amongst those people with strong positive attitudes toward behaviours, there are still practical, social and institutional (or 'external') constraints that may prevent people from adopting these actions. This is regardless of their attitudes or intentions, hence the broken arrow in figure 2.2 which identifies PBC as potentially obstructing the intention-behaviour relationship, as well as being an influence on intention. Hobson (2003) argues that the 'plethora' of barriers to action described in this chapter so far, account for the low uptake of public messages emphasising the link between the environment and action in the home. Ajzen (1985) proposes that obstructions to the intention-behaviour link include internal and external factors range from individual circumstances to public norms and structures. Internal factors incorporate: individual differences (e.g. perceptions of the extent to which they, as opposed to environmental factors, control events in their lives); information, skills and abilities (successful performance of an intended behaviour is contingent on the presence of required information, skills, and abilities); power of will; emotions and

compulsions. External factors include: time and opportunity; dependence on others (i.e. when performance of a behaviour depends on the actions of others, there exists the potential for incomplete control over behavioural goals).

Blake (1999) sheds light on the value-action gap by asking respondents to identify barriers and reasons that prevented them from carrying out particular environmental actions despite a general concern for the environment. Blake (1999:266) groups these into three categories of obstacles that exist “between the sphere of ‘concern’ and that of ‘action’: individuality; responsibility and practicality.” The responses confirm that both psychological and institutional factors affect individual action which in any one case will vary. They correspond with the intention-behaviour obstructions proposed by Ajzen (1985) and the barriers emerging from the literature described earlier in this chapter. Figure 2.3 demonstrates.

Figure 2.3 Barriers between environmental concern and action (Blake, 1999:267)



People's past behaviours and habits also play a part in their likelihood to carry out pro-environmental behaviours. Verplanken *et al.* (1997) argue that daily, repetitive and habitual behaviours are important and socially relevant. The concept of habit is not incorporated into the TRA or TPB or into Blake's model of the barriers between environmental concern and action which emphasise reasoning-based antecedents of behaviour. However, habitual behaviour may be less guided by such considerations because ordinary people are not capable of processing all the cognitive information required for so-called rational choices (Jackson, 2004). Jackson (*ibid.*) suggests that they cope with the cognitive demands of behavioural choice (particularly where it occurs on a routine basis) through a variety of ‘rules of thumb’ against which immediate and sometimes not even conscious decisions are made. Habitual behaviours may occur without thought, on the basis of decisions made quickly and automatically, and they may

have large scale impacts for society. Verplanken *et al.* (1997) argue that these ‘habits’ can predict future behaviour over and above measures of attitude, subjective norm and any effect mediated by intention. They specifically address the influence of habit on choice of travel mode (e.g. driving to the supermarket) and find that for instance, a person may have a strong general car habit, and thus even take the car for very short distances.

Ajzen (2001) reviews some of the literature which considers the role of habit and past behaviour, noting that intentions may indeed become largely irrelevant when a behaviour has been performed many times, i.e. when it has become habitual (see also Eiser, 1986; Eiser, 1994). The socio-cultural infrastructure may lead to the development of unquestioned habitual behaviours and social norms. Hobson (2003) suggests that much environmentally detrimental behaviour is implicit in the infrastructures and technologies of everyday lives. Hobson argues that both inconspicuous and conspicuous consumption behaviours such as transport use, are forms of social and cultural norms. They represent norms with underlying goals such as convenience, profit and safety, often counteracting environmental concerns (see also Vigar, 2000). Eden (1993) explains that such behaviours may be environmentally ‘bad’ but considered culturally ‘necessary’, e.g. driving cars²³. The latter are therefore perceived as being normal – validated and facilitated by the culture (and becoming habitual), despite recognition of their morally questionable aspects.

Habits may become entrenched, even when they are no longer particularly beneficial and a distinct cognitive effort is required to overcome habitual behaviours – even where new behaviours carry substantial benefits to the individual (Jackson, 2004). For example, using a bicycle instead of a car for short journeys is beneficial for one’s health and saves on the cost of petrol, but driving to the shop around the corner instead of walking or cycling may have become a habitual behaviour. Such habits are often reinforced by short-term rewards which can outweigh the long-term benefits of making a behavioural change (Jackson, 2004). Eden (1993) adds that pro-environmental behavioural choice is sometimes dependent on an individual’s perceptions of what constitutes sacrifice. Thus, ‘bad’ actions are not seen as ‘necessary’ but as desired luxuries and often bring about an inconsistency between attitudes and behaviour – an individual might want to be environmentally friendly but also be pulled in the direction of their desire to have luxuries (see section 2.4.2)²⁴. This can also be argued to happen in relation to habitual behaviours as discussed above, which might be acceptable in a personal or social

²³ See also Vigar (2000) who highlights the difficulties in implementing sustainable transport planning because of cultural demands and political difficulties.

²⁴ Also because the attitudes that individuals hold regarding the good of the environment and society may not correspond to the hierarchy of values which operates in their personal lives – other issues are more important and prioritised at the expense of acting pro-environmentally at every opportunity.

context as part of one's routine (e.g. driving a short distance to the shop), but are 'bad' in relation to climate change and the good of the environment.

Hobson (2003) notes that the resonance of the environment as a motivating public 'good' is also questioned because of its linkage to broader social debates which can be connected to the concept of subjective norm as an influence on behaviour. For example, debates about who individuals trust, who is responsible for making changes²⁵, public understandings of the science of climate change and the fall of the environment from the public agenda during the 1990's (e.g. Harrison *et al.*, 1996)²⁶, highlighted in the preceding review of the literature on public perceptions of climate change.

Because of the differences between individuals in terms of their attitudes toward environmental behaviours, subjective norms and perceptions of behavioural control, some people are more or less likely than others to have intention to act on their concerns, and to subsequently take action. None of the 'individual' and 'responsibility' barriers (or 'internal' obstructions in Azjen's terms) would prevent some people from acting to help the environment i.e. possibly the more 'engaged' individuals as identified by Lorenzoni (2003). In terms of the TPB, these people both hold attitudes as individuals and evaluations of particular actions which lead them to hold intentions to carry out specific pro-environmental actions. For example, Eden (1993) finds among individuals representing different levels of pro-environmental behaviour, that responsibility is related to a sense of moral obligation or duty to take action. Eden also found that responsibility depends upon a belief in efficacy, that individuals can have some impact through pro-environmental behaviour; responsibility is shown to be most significant where an individual believes in the efficacy of their pro-environmental behaviour (that responsibility embodies agency)²⁷. Eden proposes the concept of actionable responsibility, stating that efficacy relates to the perceived internal control an individual can maintain over the outcomes of his or her behaviour as suggested by the TPB. Eden finds that where strong internal control is perceived, the individual has a much stronger belief in his or her own efficacy (where efficacy is not perceived, responsibility is weakened because, without impact, individual acts are futile). However, Eden finds that among environmental activists, moral obligation to behave

²⁵ For example, the 'risk society' refers to the conditions of contemporary western society in which people have high levels of awareness of myriad risks, yet a lack of trust in the experts who might be relied upon for protection from them (Beck, 1986; Joffe, 2003).

²⁶ Chan (1998) applies the theory of planned behaviour to predict behavioural intention and actual action of voluntary use of waste recycling receptacles. In the establishment of subjective norms, Chan found that perception of mass media was a major source of influence or subjective norm. Chan suggests that further research of media content related to environmental issues will help in understanding who and what are communicating in the media, and how it has a potential impact on the public. This issue is addressed further in chapter three.

²⁷ Eden uses the role of environmental responsibility to address how perceptions of the self and the social contexts of specific acts are related to pro-environmental behaviour (both awareness of the consequences of behaviour influencing perceptions of responsibility, and whether the self is perceived to be the main agent of pro-environmental behaviour; responsibility ascribed to the self).

responsibly remains, despite the sometimes perceived futility of the impacts of behavioural action on a grand scale; i.e. that people can act on a moral imperative within a group context regardless of a sense of efficacy or PBC, for example. Efficacy is also reinforced by their group situation which underlines the need to acknowledge the setting of individual pro-environmental behaviour intention and action within social circumstances / contexts (or subjective norms as proposed in the TRA and TPB).

The TRA and TPB do not specifically deal with the influence of moral considerations, which, it might be argued, are important because people (such as the above) are capable of foregoing self-interest for the sake of broadly altruistic motives. Jackson (2004) argues that the TPB model is capable of incorporating moral or affective antecedents but only to the extent that these are modelled as attitudinal beliefs about, or evaluations of specific action outcomes. Jackson also points out that it has been argued, that the inclusion of moral values in individual behaviour via the concept of subjective norm is inadequate. Eiser (1986) reports a term representing *personal* normative beliefs was originally included in the model of TRA, i.e., a term representing what subjects thought they *should* do in a situation (as distinct from social norms which represent perceptions of what others would think about the performance of a behaviour). However, this was subsequently dropped on the grounds that it functioned simply as an alternative measure of behavioural intention. Manstead (2000) concludes that the specific inclusion of moral beliefs improves the predictive power of the theory in applications in which pro- or anti-social dimensions of behaviour are relevant (e.g. GM food consumption). In a study of climate change for example, one would also expect a consideration of moral beliefs to be important because they are associated with perceptions of issue salience and concern. Related intentions and behaviour are subject to a whole host of barriers (or the ‘plethora’ as suggested by Hobson, 2003) highlighted in the study of self-efficacy, which means that moral values do not always lead to behavioural action.

Many features of an individual’s situation and culture have effects on perceived efficacy and behavioural choice. The TPB and associated research presented and discussed in this chapter suggest that the value-action gap cannot be overcome on the basis of an information deficit model. While knowledge about what behavioural actions one should carry out in order to be more environmentally friendly is a requirement (because a lack of knowledge can act as an external or practical barrier)²⁸, the preceding discussion makes it clear that there are many more factors associated with social norms and individual psychology which hinder the development

²⁸ For example, Gardner and Stern (1996:80) suggest that lack of information can be a serious internal barrier to action because it is not always obvious to an individual how to act effectively on his or her attitudes. They state that this is particularly the case for environmental issues because the connections between behaviour and its environmental effects cannot be discerned from personal experience. See also, Kaiser *et al.*, (1999) in a study of environmental attitude and ecological behaviour based on the TPB.

of an intention to act, or which obstruct the intention-behaviour link even when a person has knowledge about what to do.

2.6 Conclusions

Engaging the public with climate change is important if movement towards decarbonised lifestyles and a more sustainable pattern of living is to occur. Mitigation policies are unlikely to succeed until there is a widely held feeling that climate change is a personally relevant and salient issue, and that individual contributions can make a difference to reducing the causes of climate change. The literature suggests however, that the issue is not as important as other priorities in life and that people feel generally unable to do anything about it. Many are reluctant to make lifestyle changes and engage in pro-environmental and energy saving behaviours, even when individuals perceive climate change to be a problem, advocate doing something about it and know that patterns of their activity are environmentally destructive. Making the transition to low-carbon lifestyles represents an enormous challenge. This hinders the translation of intention into action, as demonstrated by the discussion around the theories of Reasoned Action and Planned Behaviour. The many personal and external barriers that people feel they face to engaging with climate change have implications for the success of policy initiatives designed to reduce carbon emissions.

This chapter has presented a review of people's perceptions of climate change, the bases of these and the reasons for an apparent gap between the issue appearing to be somewhat salient yet not motivating personal action. It has outlined the wide range of barriers which are perceived as preventing people from feeling that they can take action and engage more fully with the issue. From this understanding we can progress to developing effective and meaningful communication packages which initiate a sense of personal salience and efficacy and encourage behavioural responses toward decarbonisation. Chapter three examines the role of visual imagery, both as constitutive of and as a means of influencing people's outlooks on climate change.

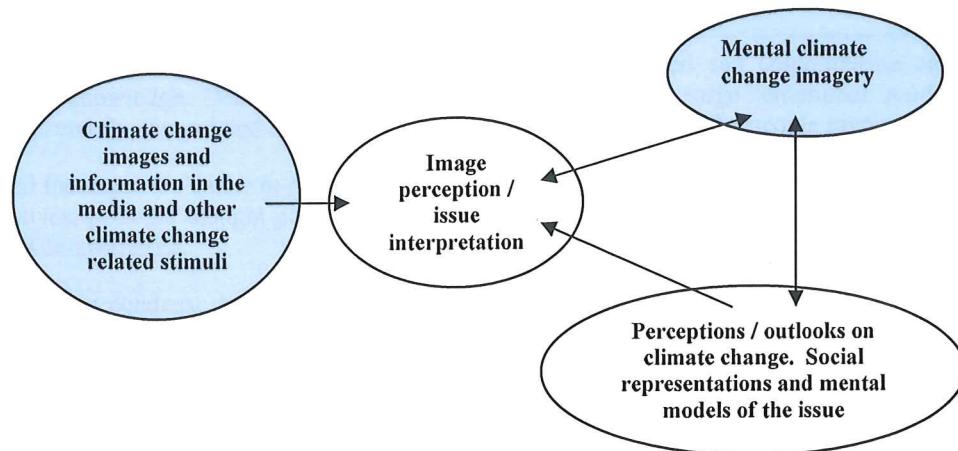
Chapter three – Imag(in)ing climate change

“...visual representation is acknowledged to be increasingly influential in shaping our views of the world. It thus concerns sociologists both as a topic of social analysis and in terms of its communicative potential.” (Chaplin, 1994:1)

3.1 Introduction

This research adopts a visual approach to exploring people’s senses of climate change salience and personal efficacy. Chapter three introduces use of images of climate change in communications about the issue. It also discusses the role of mental imagery in interpreting the meaning of these and in influencing subsequent perceptions of the issue. Mental imagery and people’s perceptions of climate change are related to their mental models and social representations circulating in society, as depicted in figure 3.1.

Figure 3.1 The roles of mental imagery and images of climate change in the research



The chapter begins with an introduction to the visual approach taken by this research into people’s outlooks on climate change. It outlines way in which environmental imagery is currently used in the public domain by the media, in education, by environmental campaigns and in advertising and marketing. The chapter then reviews the processes of image perception and role of mental imagery. It goes on to explain how people’s outlooks on climate change are constructed in relation to Social Representations Theory and the mental models approach. Chapters two and three are brought together in a discussion of how incoming visual information, in conjunction with other cues, are part of a dynamic and ongoing process enabling people to make sense of issues such as climate change. Finally, the potential for encouraging engagement with climate change using the visual communication of climate change in future is discussed.

3.2 A visual approach

More information comes to us through our eyes than through any of our other senses (Gombrich, 1982; Leibowitz, 1965; Wade and Swanston, 2001). Boholm (1998) argues that as a mode of communication, visual representation seems to be taking over more and more from the written word. Robins (1996) suggests that we are undergoing an 'image revolution' on an unprecedented scale. We are exposed to visual information about climate change on an increasingly regular basis via the media and our leisure and working environments. Deacon *et al.* (1999) note that many of the central forms of mass communication are saturated with images. For example, film, television, magazines, popular newspapers, advertising and the internet. As information technology develops, we also experience an increasing flow of images and pictures depicting virtual as well as authentic realities of environmental issues. Box 3.1 presents a number of reasons why a visual approach to investigating people's outlooks on climate change and communicating the issue is being taken.

Box 3.1 Incentives for taking a visual approach

- Visual representation can convey strong symbolic messages and can communicate emotive and intuitive knowledge. Visual images can stir emotions and can forge 'emotional bonds' between viewers and the viewed and can make people care about an issue and the people involved in it.
- Visual messages are easier to remember than textual based messages. They can provide the basis for narratives, personal thought processes and conversations, which also contribute to people's memory and issue-awareness.
- Pictures can condense complex information and communicate information that is perhaps new and hard to understand. The visual format enables a great deal of information to be conveyed because it overcomes hurdles of literacy and verbal skills; the understanding of a visual image arises from intuitive interpretation. Images have a strong capacity to represent risks that are remote from everyday experience as being subjectively relevant.
- Visual imagery is attention grabbing and eye-catching. For an example, it is harder for a reader to bypass an article if it contains a photograph (easier to skip text). People pay more attention to accompanying text when visuals are available.
- Visual expression offers opportunities to communicate ideas in an instant using many different media in a variety of contexts, e.g., awareness raising campaigns, participatory planning exercises, education, etc.
- Images can convey realistic information, enhancing the credibility of news reports for example.

"Contemporary science communication relies on visual representation to clarify data, illustrate concepts, and engage a public informed through an ever-increasing arsenal of computer graphics and new media tools." (Trumbo, 1999:241)

See Boholm (1998), Graber (1990), Seppanen and Valiverronen (2003) and Trumbo (1999; 2000) for elaboration on these points.

Graber (1990) states that visuals are very important information sources when they depict unknown situations for which audiences have no pre-existing mental imagery, and which would be difficult to imagine (for example, climate change). Seppanen and Valiverronen (2003) argue that photographs in particular have played an important role in changes in environmental awareness over recent decades. They argue that photographs are crucial elements in the production of meanings; that these and other visual images are important elements in the definition and popularisation of abstract scientific concepts (e.g. biodiversity). Cosgrove (1994) argues that the representations of the Earth in the Apollo space photographs for example, are significant in terms of their role as global spatial and environmental images and symbols. Farr (1993) also notes that the vision of the globe from space is convincing evidence that the Earth is an ecosystem and that it is easier for people these days to talk in global terms because they have the evidence before their eyes (see also Deacon *et al.*, 1999; Franklin *et al.*, 2000; Hager, 1995).

Bronnimann (2002) looks at how climate change has been visually communicated to the public. He notes that the motif of palm trees and glaciers has been used to signify climate change, and that presently, photographs of recent extreme weather events are used more often to illustrate the issue. Visual symbols for climate change in film and photographic visual communications are plentiful. Smokestacks, tidal waves, floods, withering crops, and famine victims are all images that have been used to express the notion of climate change and its impacts. The recent Hollywood blockbuster 'The Day After Tomorrow' (Emmerich, 2004) features dramatic and catastrophic visualisations of the northern hemisphere suddenly freezing as a result of the thermohaline collapse, massive tidal waves engulfing New York City etc. In communicating climate change other types of images have been used, including maps, graphs and diagrams (Seppanen and Valiverronen, 2003).

3.2.1 Environmental issues and imagery in the media, education and advertising

Environmental imagery is employed in a range of fields which concern the channelling of scientific and environmental information into the public domain. Irwin and Wynne (1996) discuss the role of 'mediating institutions' which currently convey this information to the general public. They can take a number of forms such as environmental groups, local industry, the mass media, organisers of science exhibitions, educational settings and the Government (e.g. Burgess and Carvalho, 2004). All of these employ visual imagery in their communications and offer the public opportunities to experience and understand scientific issues. As discussed in chapter two, they also have important agenda setting roles. Building on section 2.3.1, I present the mass media as a field in which images are used to bring environmental issues such as climate change into the public eye. Environmental NGO campaigns, education and advertising are further examples which I address briefly.

3.2.1.1 Mass media

Visual images used in the media play a role in shaping people's knowledge about environmental issues in conjunction with text, sound and music. Meanings in the popular media are created not through the use of images alone, but through the interplay between language and image. For example, news photographs appear alongside headlines and the television newsreader is seen against a visual backdrop anchoring or distilling the key theme of a story (Deacon *et al.*, 1999).

The visual media is a substantial source of information about climate change and other environmental issues, and is particularly important as a source of influence on people's perceptions of the issue because we are unable to experience it. Climate change is not an issue that can easily be 'seen', and experiences or sensations are not available to people to help them judge its seriousness or relevance. The television and print media illustrate events connected with climate change visually, making it possible to see events happen rather than having to rely on verbal descriptions (Graber, 1990). Joffe (2003) proposes that the mass media appear to form part of people's social existence, their experiential world, and that media images may operate in a similar manner to experience (acting as an experiential resource similar to their role as memories as suggested by Rosenstone, 2003). Rosenstone (2003) notes that images in film as well as the news media as mentioned above, are powerful because they function within us as memories and metaphors, as well as being important representations of science.

"...a greater salience of visually sensational or shocking images (as the saying cynically has it, 'if it bleeds it leads'), or at the very least to a greater emphasis on the inclusion of images that appear stunning in terms of their sheer visuality, rather than in view of any specific informational content they may possess." (Deacon *et al.*, 1999:223)

The visuals that are incorporated into television news features, for example, are to an extent the product of struggles for channels to attract significant shares of the audience (e.g. Burgess and Carvalho, 2004; Deacon *et al.*, 1999). Sheehy *et al.* (2002) report that the following factors are influential in capturing the public's attention: interestingness; incongruity (or unexpectedness); credibility; personal relevance; exaggeration; realism; sensationalism, and so on. Sensationalism is particularly employed by the media to 'sell' stories to the public (Ungar, 1992). For example, the newsworthiness of scientific information increases if identifiable events can be linked to a threat to human life (Weingart *et al.*, 2000). Because the livelihood of the media depends on their ability to attract audiences it often relies on compelling and dangerous issues to hold people's attention. In order to make these imminent dangers or risks newsworthy, levels of alarm are often magnified (Joffe, 1999). Deacon *et al.* (1999) explain that images that have high dramatic impact and are visually sensational or shocking, are preferred to those which adopt more sensitive perspectives because the former are judged to best

‘hook’ an audience. However, Graber (1990) warns that the pictures used on television news do not always necessarily supply the kind of factual information that scientists advocate.

Ungar (1992) suggests that the media also responds to real-world clues which bring the issue to our attention. These events trigger a significant response in and by society because they correspond to the time horizon and activities of everyday life (Stehr and Von Storch, 1995). For example, the global warming issue began to attract significant public attention during the summer of 1988 when a heat wave and drought created a social scare in the USA, and the matter made the media and public agenda (Bord *et al.*, 1998). Shanahan & Good (2000) demonstrate a relationship between local temperature and frequency of attention to climate issues, such that New York Times and Washington Post journalists are more likely to discuss climate during unusually warm periods. Erratic weather events and catastrophic natural disasters occurring in recent years have been increasingly linked to climate change by the mass media. These include events such as severe floods in Bangladesh, Mozambique and China, drought in Sudan and Afghanistan, mudslides in South America, the collapse of the Antarctic ice shelf, often in the dramatic and sensational visual styles mentioned above. Kasemir *et al.* (2000a) suggest that it is graphic images of such catastrophic events that are particularly successful in capturing the public imagination (see also Rowe *et al.*, 2000).

3.2.1.2 Environmental interest groups

Environmental interest groups expend considerable resources on motivating supporters and potential recruits to contribute to their causes. Visual appeals play an important role and appear in a variety of media: television and newspaper advertisements, t-shirts, shopping bags, leaflets, demonstrations, corporate reports, websites, etc. (Huddy and Gunnthorsdottir, 2000; Myers and Macnaghten, 1998). The imagery employed in environmental NGO campaigns and communications often carries great affective resonance (e.g. dying birds in oil-spills, dead trees as a result of acid rain, whale hunting in anti-whaling campaigns, protesters on Brent Spar, etc.). This is because it is thought that an emotional element leads people to pledge their support for a campaign. Seppanen and Valiverronen (2003) state that photographs are often used to provide proof of dramatic environmental changes, serving to arouse emotions and stimulate action. In a review of leaflets from organisations promoting sustainability, Myers and Macnaghten (1998) find pictures of smiling or worried looking children, the earth from space, rainforest deforestation, cartoons, the earth as an alarm clock (set to the 11th hour), etc. They argue that portraying a sense of crisis, or portraying environmental issues in apocalyptic terms, is a device of radical green groups to compete for attention with other media messages and political issues for example. It has also been used by all sorts of organisations including Government and business (see also Bator and Cialdini, 2000).

3.2.1.3 Education

When it comes to young people's concern about climate change, education appears to make a considerable difference (Hargreaves *et al.*, 2002) implying that visual communication in educational contexts presents prospects for engaging young people with climate change.

"We cannot afford to ignore the major ways in which learning is shaped by the vistas gleaned by the human eye and the cognitions, emotions, and memories that these vistas produce." (Graber, 1990:154)

Jewitt *et al.* (2001) argue that learning is realised through the interaction between visual, actional and linguistic communication (see also Ametller and Pinto, 2002). They state that learning as a purely linguistic process fails to capture the full range of learning possibilities in education – that the visual realisation of meaning is particularly important. This is because the image-evoking potential of material is directly implicated in the mechanisms responsible for learning and remembering (Richardson, 1999). Pinsky and Wipf (2000) argue that visual images in combination with verbal instruction significantly enhance recall of subject material for example, and, "Visual images quickly orient learners to the same concept, add interest, and increase the likelihood that the illuminated point will be remembered." (Pinsky and Wipf, 2000:805-6)²⁹.

Images are used in science education as representations of abstract, difficult and non-observable concepts to help students to learn about scientific concepts. For some topics, visualisations are particularly appropriate, for example in physics and chemistry where lots of information takes the form of images. The role of scientific images in the science education environment is examined further by Ametller and Pinto (2002), Pinto and Ametller (2002), Stylianidou *et al.* (2002) and Treagust *et al.* (2002). Edelson and Gordin (1998) argue that scientific visualisation technologies in education offer learners the ability to interact with data visually rather than numerically or symbolically.

3.2.1.4 Advertising

"The world of advertisements is peopled by fantastic images...Pictures pun, photographs fantasize, illustrations illuminate. In rich colors and textures, a panoply of visual messages entice, exhort and explain." (Scott, 1994:252)

Visual imagery is a core component in advertising (McQuarrie and Mick, 1999; Mitchell, 1986; Myers, 1994; Rossiter and Percy, 1980; Scott, 1994). McQuarrie and Mick (1999) state that

²⁹ Richardson (1999) finds that the process of constructing images gives rise to more effective memory performance; items rated as high imagery are better remembered than items rated as low imagery over a variety of tasks. Lutz and Lutz (1977) present a study of the effects of external imagery on learning. They find that participants shown an interactive image in a learning task have higher recall than those not presented with an interactive picture. They also state that the use of pictures in advertisements would seem justified by the evidence that visual memory is better than verbal memory (see also Edell and Staelin, 1983).

consumers are acutely sensitive to the visual element which is understood to be an essential, intricate, meaningful, and culturally embedded characteristic of contemporary marketing communication (Smith, 1991). Edell and Staelin (1983) find that the way a message is conveyed pictorially or verbally in an advertisement has a significant effect on the viewer's brand attitudes and purchase intentions (see also Shepard, 1990). The visual component has been found to be just as capable of increasing favourability of a consumer's product attitude as verbal content; it is often employed to persuade the consumer to purchase the product (Mitchell, 1986; Rossiter and Percy, 1980). This indicates that visual images may be used successfully in environmental communications to stimulate senses of climate change being a salient issue and that there are good reasons for acting on it.

In advertising, pictures are not intended to reflect reality and are used to persuade, question, create fictions, represent concepts and actions, present metaphors, etc. Scott (1994) states that advertising images are a sophisticated form of visual rhetoric³⁰. Through variations in the selection of viewpoint, style, context and interactions to other texts and systems, images become capable of highly sophisticated rhetorical tasks. Messages can be crafted in anticipation of the audience's probable response using shared knowledge of vocabularies, conventions and common experiences. Receivers of the message also use this shared body of cultural knowledge (or social representations as explained later) to read the message and formulate a response. Scott (1994) suggests that the visual information must be processed cognitively. She states that advertisements relying on pictures to promote a message, anticipate a viewer who knows certain pictorial conventions and who shares visual experiences with the makers. As in the case of environmental campaigning and fundraising, the impacts of advertisements are also driven by how well they trigger emotional responses: "...emotional involvement (affect) is an integral and immediate part of all response to advertising, as it is to other stimuli, and an essential feature of consumer decision-making." (Ambler *et al.*, 2000:19). Ambler and Burne (1999) suggest that this is partly because affect is associated with better remembering.

3.3 Images in mind

This study does not delve deeply into the psychological underpinnings of mental imagery. However, it presents a basic introduction because the elicitation of mental imagery and people's reactions to a range of climate change images are central to the methodology of this thesis. The potential success of climate change visualisations to convey senses of climate change salience and personal efficacy is dependent on what individuals make of the images they encounter. Their prior outlooks and mental images of climate change will influence their interpretations.

³⁰ "Rhetoric is an interpretive theory that frames a message as an interested party's attempt to influence an audience." (Scott, 1994:252)

Image perception is not a static event. It is an ongoing, cyclical process, which guides information processing and adaptation to new knowledge (Best, 1986). It forms part of the way in which people's outlooks on climate change are constructed and undergo constant alteration in response to the input of new stimuli. Held (1990) for example, argues that processes behind the eye and the meanings of artefacts in front of the eye co-determine each other; that the relationship between what is outside and what is inside is reciprocal.

3.3.1 What is mental imagery?

“image *n* 1 a mental picture of someone or something produced by the imagination or memory.” (Collins, 2000:398)

Mental imagery can be thought of as the mental recreation or representation of an experience or information in the absence of visual input (Bartolomeo, 2002; Finke, 1989; Ishai and Sagi, 1997; Kaski, 2002; Kosslyn, 1980; Richardson, 1999). This thesis employs the term ‘mental imagery’ as an expression of the images that come into people’s minds when they think about climate change. Mental images are not material, visible or tangible because they do not have dimensions. They only have a subjective, mental existence in memory, dreams and imagination (Dennett, 1981; Goodman, 1990). They are considered to represent in roughly the way that pictures do; that our mental images are like pictures in their mode of representation (see also Block, 1981; Kosslyn *et al.*, 1981). Kosslyn (1980; 1981) argues that mental images are quasi-pictorial representations which depict an object or scene and are accompanied by a subjective experience. Pylyshyn (1981) argues that mental images are formed according to meaning and interpretation by the viewer. They therefore meaningful, whereas material pictures may not be; an essential concept for the methodology of this thesis.

“Perception is a process of information reduction whereby a welter of sensations is reduced into a simpler and more organized form...[These are] stored and later assembled into images that are experienced as quasi-pictorial, spatial entities resembling those evoked during perception itself.” (Kosslyn, 1980:19).

The content of mental imagery is determined by the interpretative processes which generate it; its origin no doubt lies in visual experience (Kosslyn, 1981; Pylyshyn, 1981). While mental imagery is not exactly like viewing a picture, the experience is therefore one that preserves some aspects of real perception (Best, 1986). Rossiter and Percy (1980) state that external visual images are especially capable of stimulating visual imagery. This is because they present visual images in a mode that the viewer can internalise as a basis for their personal imagery. However, words and music can also produce visual imagery.

How mental images are generated is subject to debate. However, a generally accepted position is that mental images are not unanalysed representations, but reflect the way in which

information is organized in long-term memory (Denis, 1989; Finke, 1985; Kosslyn, 1980). Pictures in people's minds are retrieved or generated from memories and representations that underlie the experience of seeing. They occur in a spatial display and are processed by a "mind's eye" which acts as an interface with more abstract 'deep' memories and representations (e.g. broader conceptual constructions, mental models, attitudes, values, and beliefs). As Gregory (1990) states, visual perceptions and images are figments of imagination. We view and interpret stimuli, constructing mental representations in conjunction with our underlying conceptions, memory and imaginative processes. Mental imagery is therefore a medium of internal representation in which information about physical objects, events and scenes can be depicted and manipulated (Richardson, 1999).

There are debates over whether images exist as by-products of a psychological process or whether they are functional in cognition (Blackburn, 1996; Pylyshyn, 1981). Mental images can be thought to serve as repositories for information and are also involved in thought processes, highlighting their role in the construction of people's perceptions of climate change. They can play a role in describing, depicting, and representing objects, relationships or situations (Paivio, 1991; Schwartz, 1981). Kosslyn (1980) argues that mental imagery may therefore be an important engineering or functional feature of the mind, for example as a memory aid. For example, mental imagery can be used for fact retrieval if the fact is about, or involves a visible property of an object or situation that a person has seen (Kosslyn *et al.*, 1981). Denis (1989) also argues that mental imagery enables the human mind to store and process information from the perceptual environment. He adds that it can be a tool for the evocation of the past and can also orient people towards the future.

Our internal processes allow us to transform information by using mental images to simulate possible transformations in our worlds; they allow us to anticipate events that might occur in the future by acting as a representation of the outcome of an act or situation. Thus, Kosslyn (1980) argues, imagery is an aid to thinking about consequences of actions and serves a role in concept learning, reasoning, and in making unconscious thoughts and desires manifest in consciousness. It may act as an anticipatory simulation of possible outcomes, and play a role in the influence and regulation of behaviour: "At the crossroads of cognition and action, images enter into planning and management of individual behaviour. While fulfilling its role of representation, imagery is at the same time a guide for action and an instrument for the acquisition of skills used in action." (Denis, 1989:181). Mental images serve as instruments for the regulation and planning of behaviour; imagery can act as a cognitive instrument for guiding action. This thesis does not address people's climate change related behaviour explicitly. However, during the course of the research, participants were required to imagine themselves in an active role in order to discuss their sense of being able to do anything to reduce the causes of climate change.

Mental imagery can therefore be assumed to people's internal representations of their environments and their associated actions (Denis, 1989). However, there is no direct evidence that imagery itself is what produces behavioural effects (Kosslyn, 1980).

3.3.2 Differential meaning and interpretation

“...it would appear that humans don’t have general-purpose vision. What we see when confronted with a new scene depends as much on our goals and expectations as it does on the array of light that bombards our eyes.” (2002:11)

The effectiveness of visual images of climate change as stimuli for engagement clearly depends on how people interpret them and respond. Even once a person's attention is drawn to an image, there are therefore a number of individual influences on the message they finally receive. This means that pictures involve an audience in constructing for themselves a range of messages. A single image will not be interpreted in exactly the same way by different people, and explains why pictures are not simply windows on reality.

“A picture is not the thing itself. It is always open to multiple interpretations.” (Myers, 1994:139)

Image interpretation is a complex, individual and social process. The meaning of any image is made up of a combination of the social and personal connotations that have attached themselves to the subject(s) of the image and what it depicts. Visual perception occurs with the mediation of thought; seeing is an active behaviour, learned and part of our cognitive system rather than a passive and automatic process (Scott, 1994)³¹. Meaning is derived from the world via the creation of rich interpretations of sensory data which connects with stored knowledge, attitudes, values, etc. (Gregory, 1990). The interpretation of visual stimuli therefore involves underlying constructs, which are culturally and individually specific, in order to extract meaning. Liebowitz (1965) states that a person's interpretation of a visual stimulus is, in this fashion, subject to various transformations. During this process, the wants, needs, fears, and expectations of the observer modify and even distort what is finally perceived (see also Pyllyshyn, 1981).

Mason and Santi (1998) state that individuals construct personal knowledge systems on the basis of their experiences of the world, and that the learning or uptake of new information is greatly affected by these underlying constructs. A constructivist approach sees learning not

³¹ Liebowitz (1965) argues that to an extent we perceive what we want to perceive, or see what we want to see (and do not see what we do not want to see). Because of people's different underlying attitudes and conceptions, people selectively attend to stimuli (paying more attention to those that are meaningful). An ability to select from a variety of possible inputs is referred to as the process of attention or selective perception, which is partly determined by past experience, knowledge, attitudes, etc. This is because humans are not passive receivers of stimuli and do not perceive indiscriminately; they pay more attention to those stimuli that have become meaningful through past experiences for example.

only as enrichment of information, but also as a reconstruction of what is already known. As suggested in chapter two, people's outlooks on climate change are fluid and evolving in response to the information that they receive (e.g. Eiser, 1994). This includes visual input which in turn influences people's attitudes and interpretations of such stimuli and how personally meaningful these are. Humans do not passively receive new information, but actively fit it into their pre-existing concepts and 'cultural models', their underlying values and moral guidelines (Kempton, 1997). People therefore tend to adapt information until it fits into the relevant schema, making us more prepared to remember some things than others and to take away individual messages (e.g. Hayes, 1994).

The technical framing of an image (e.g. light, space, colour), its source, associations and feelings of trust in the provider of the image, etc. are other influences on people's interpretations. However, Deacon *et al.* (1999) note that to an extent, the possible meanings that can be constructed for visual images are loosely defined by the particular genre, narrative and discourse in which they are deployed. The meanings attributed to photographs employed in the media for example, are influenced by the changing social, economic, political and cultural contexts in which they are situated. The meaningfulness of an image therefore depends not only on individual experiences and mental constructs but also on cultural contexts, and on the social setting of an image.

There are potentially many different climate change image audiences, each being made up of a wide range of people. Each depends on an assortment of prior perceptions or mental models of climate change, pre-existing knowledge, personal circumstances, social background, lifestyle and behavioural dispositions, cultural orientation, opinions, attitudes, beliefs and values, etc. People's emotional reactions to the styles or content of the visual images that they are presented with also influence their reactions. These guide their interpretation of pictures, the messages they take away and whether they act on the basis of the visual communication they have received (e.g. Myers, 1994).

3.4 Constructing outlooks on climate change

As I have explained, people's perceptions of climate change and their mental imagery do not simply result as a consequence of rational information processing; much of their interpretation is guided by unconscious or emotional drivers. People's outlooks are fluid and evolving in response to the information and experiential cues that they receive as part of everyday life. Eiser (1994) argues that we experience a reality which is constantly open to dispute; attitudes about issues such as climate change are not fixed or consistent – our knowledge consists of what we have worked out through reasoning or experience, and of what we have inferred from others.

The following discussion presents an introduction to Social Representations Theory and the mental models approach as theoretical explanations for the processes by which different outlooks on climate change are constructed. The text highlights issues to be taken into account when communicating climate change – discussed in the final part of this chapter.

3.4.1 How do people's mental imagery of climate change and their perceptions of the issue come about?

The incoming stimuli we receive contribute to the construction of our perceptions, attitudes and behaviour. These are mediated by internal mental structures that make reference, for example, to our beliefs, values and worldviews³². These structures also influence what is consequently integrated into people's mental frames of reference and therefore their outlooks on climate change, as explained above (e.g. Maiteny, 2000).

Much literature also relates environmental concern to underlying values and moral guidelines in an attempt to explain people's concern about the environment. The scope of this thesis does not include an examination of the value-basis of people's climate change concerns and how these influence behaviour, beyond the consideration given in the discussion around the theories of Reasoned Action and Planned Behaviour. However, it does acknowledge that people's values and moral principles (alongside their worldviews, beliefs and attitudes), are important influences on the constructions of people's outlooks on climate change (e.g. Maiteny, 2000; Rachlinski, 2000). Stern & Dietz's (1994) value-basis theory for example, suggests that concerns about environmental issues are based on a person's more general set of values, in particular, the relative importance that a person places on themselves, other people, or plants and animals. They argue that clusters of environmental concern are the direct result of valuing self, valuing other people or valuing the biosphere (see also Dunlap *et al.*, 2000; Kortenkamp and Moore, 2001; Stern *et al.*, 1993; Stern *et al.*, 1995). Schultz (2000) also states that the type of concerns an individual develops are based on the degree to which they perceive a connection between themselves and other people or between themselves and the natural environment (see also Schultz and Zelezny, 1999; Schultz, 2001; Stern and Dietz, 1994). This suggests that some people may have more of a tendency, based on their moral and environmental values, to be personally concerned about climate change and live in greener, less wasteful and more sustainable ways than others. Kempton (1991; 1997) argues that concern for the environment can stem from several sets of values, for example, for religious reasons. Values are therefore important foundations for how various environmental issues are interpreted and whether they are acted upon (see Bord *et al.*, 2000; Lockwood, 1999).

³² Peters & Slovic (1996) suggest that worldviews are generalised attitudes toward the world and its social organisation – measures of people's attitudes toward political, economic, and social relations, acting as filters on information influencing how we perceive and act towards situations.

People's perceptions of the outside world incorporate both cognitive or rational, and emotional components. One's attitude toward an object or situation is, for example, an ensemble of cognition and affect, the affective dimension being the aspect of an attitude which is concerned with feelings and emotions directed toward the attitude object (Fabrigar and Petty, 1999; Harrington, 2001; Rundmo, 2002)³³: "Affect and worldviews appear to play similar roles as orienting mechanisms, helping people navigate in a complex, uncertain, and sometimes dangerous world" (Peters and Slovic, 1996:1427). As we shall see, the role of affect is particularly pertinent in the interpretation of images of climate change.

3.4.2 Social Representations Theory and the mental models approach

A consideration of Social Representations Theory (SRT) and the mental models approach illustrate some of the ways in which people's outlooks on climate change are constructed. They help to explain the diverse range of ways in which people perceive (and misconceive) climate change in relation to incoming information, e.g. from the media and social interactions. The approaches help to explain how cultural and social dimensions of climate change are embodied in both the communication of climate change issues and people's perceptions and interpretations of it. The two approaches highlight implications for the way in which climate change and other environmental risks are best communicated to the public, particularly when looking to correct misconceptions and motivate behavioural change.

3.4.2.1 Social Representations Theory

Social representations refer to the shared understandings and belief structures, through which people make sense of the social world. SRT stresses the importance of shared understandings, both as a medium for communication between people and a basis for social groups to share a social world (Stainton-Rogers, 2003). The term was adopted by Serge Moscovici in the 1960's as a bridge between the concepts of collective³⁴ and individual representations (Stainton-Rogers, 2003). The term refers to the manner in which values, ideas and practices are structured in and by ordinary communication, allowing people to both communicate and to order their world, the purpose being to make something unfamiliar, familiar (Manstead and Hewstone, 1996; Moscovici, 2000). Moscovici defines a social representation as:

"...a system of values, ideas and practices with a twofold function: first, to establish an order which will enable individuals to orientate themselves in their material and social world and to master it; and secondly to enable communications to take place among the members of a community by providing them with a code for social exchange and a code for naming and

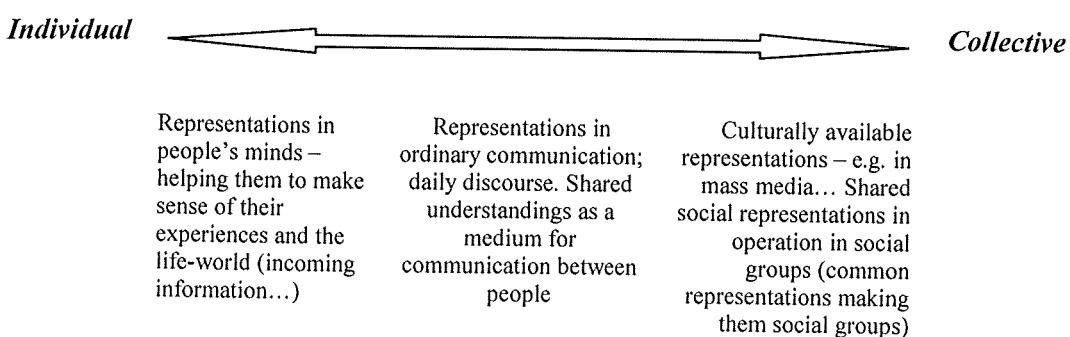
³³ Ajzen (2001) states that affect is a term used to denote general moods such as happiness and sadness, and specific emotions such as fear, anger and envy) and that attitudes towards some objects or issues may rely more on affect than cognition and vice versa.

³⁴ Emile Durkheim's concept of representations being shared between people and determining how they understand and make sense of the world (Stainton-Rogers, 2003).

classifying unambiguously the various aspects of their world and their individual and group history.” (1976:xiii)

Farr (1993) explains that a representation is of something and held by someone; a way of understanding. SRT explains the way in which texts and images for example, are seen through a lens of existing, often socially shared representations. Social representations are also a way of communicating what we know and relate the way we picture a thing to ourselves to the way we describe it to others. Hence, Joffe (2003) argues that social representations are part of culture as well as of individual cognition or information processing, as I have demonstrated in figure 3.2.

Figure 3.2 The emphasis of Social Representations Theory

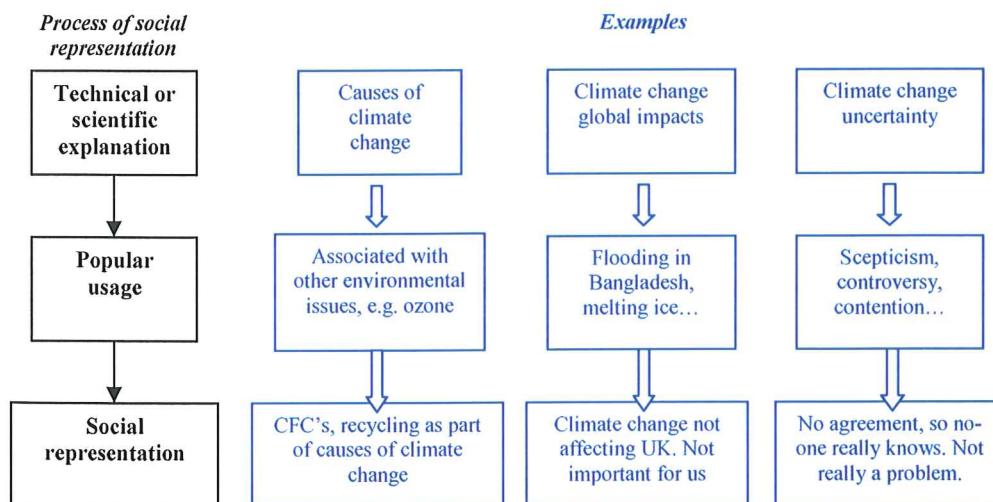


Social representations are made up of a mixture of concepts or ideas and images, both in people's minds and circulating in society where they are carried by conversations and media texts (Potter, 1996)³⁵. SRT particularly takes account of a person's social world in understanding their conceptualisations of risks rather than concentrating on intrapersonal processes, devoid of interaction with their cultural environment. SRT proposes that human thought is relational and that judgements and explanations are constructed in the dialogue that people have with each other (Joffe, 2003). Social meanings and representations can be made in conversational dialogue between people. The media, for example, provides a discursive resource through which to mobilise these deliberations, contributing to social learning and reinforcing existing ways of seeing the world among different social groups (Burgess and Carvalho, 2004). Bauer and Gaskell (1999) propose that social milieus or communication systems are the functional locus of representations, and that in these systems, representations are elaborated, circulated and received. Potter (1996) argues that hence, social representations are intrinsic to effective communication because as people interact through discussion, they build up shared pictures of the world to make sense of it.

³⁵ Bauer and Gaskell (1999) explain that there are four modes of social representation, all more or less linked to language (habitual behaviour, individual cognition, informal and formal communication). These may take the mediums of words, visual images or non-linguistic cues. The mass media is characterised by highly formalised communication, by contrast, everyday face to face conversation is informal.

SRT refers to both the process through which representations are elaborated and the structures of thought that emerge (Duveen, 2000). Breakwell (2001a) elaborates, stating that as a process, social representation is the whole package of activity in which individuals and groups engage to make meaningful changes in their physical and social environment. This includes communication and exchanges. As a product, social representation is a widely shared set of beliefs, a systematic framework for explaining events and evaluating them. Malim and Birch (1998) explain that via the process of social representation, information undergoes transformation. What starts out as being a specialist, or unfamiliar explanation of some phenomenon (e.g. climate change science) is given public attention (e.g. by the media) and by a process of simplification and perhaps distortion, becomes a ‘common sense’ and familiar explanation, i.e. the information becomes more accessible in the form of images, metaphors, concrete objects and habitual practices (see also Bauer and Gaskell, 1999; Stainton-Rogers, 2003). This is illustrated in figure 3.3.

Figure 3.3 Social representations of climate change (adapted from Malim and Birch, 1998)



Moscovici (2000) proposes two processes which act to familiarise the unfamiliar: anchoring and objectifying. Anchoring involves the naming and classifying of new ideas, objects, persons or experiences, setting them in a familiar context. Objectification solidifies and makes tangible the abstract new ideas, making them real and accessible (Bauer and Gaskell, 1999). The ideas, image and language shared within groups direct the way in which these are processed and become familiar (Joffe, 2003). Joffe (*ibid.*) suggests for example, that through objectification, unfamiliar ideas can be made familiar by being linked to familiar episodes and a person’s current experiential world (something which is easier to grasp). These processes of social representation act to modify pre-existing representations. The transformation of information is ongoing; representations shared by many enter into and influence the mind of each and are re-

thought and re-presented – what is perceived replaces what is conceived (Moscovici, 2000). The nature of this transformation of information offers an explanation for the variety of perceptions and misunderstandings that people have of climate change (outlined in chapter two). For example, why there tends to be a general association with the ozone issue, and why some people perceive that no-one knows very much about climate change and therefore do not see the point of taking personal action.

Joffe (2003) states that the mass media play a major role in transforming expert into lay knowledge. It has an important influence on public engagement with climate change and other environmental issues, because it is a significant mediator of the information output by scientific institutions to be circulated in society (as indicated earlier in this chapter and in chapter two). The media may be a first point of contact with an issue such as climate change, and the media do not simply replicate expert knowledge, but simplify and sensationalise it, setting up debates concerning responsibility and blame and framing risks in a manner quite different from scientific notions of the issue (Joffe, 2003). Therefore, Farr (1993) argues that representations of science held by lay people are likely to originate in the mass media of communication than in that of the scientific community (see also Joffe, 2003). Bauer and Gaskell (1999) emphasise the importance of the mass media in the circulation of knowledge and cultivation of symbolic environments. They state that as a mediator, the media enables and constrains the contents of informal communication (everyday face-to-face conversation). Through the media and personal interactions, existing representations circulating in a given culture are communicated between people and enter their explanations of new events and ideas, etc. The emerging social representations are hence, relatively consensual understandings of phenomena, particular to specific social networks.

3.4.1.2 Mental models

As outlined previously, individuals interpret and respond differently to the same information because incoming stimuli are filtered through people's pre-existing mental models (Dunlap, 1998; Stern *et al.*, 1995; Warren, 1995). Underlying misunderstandings can mean that new information is incorporated but leads to substantial confusions, as discussed in section 2.2.3. If people lack knowledge of climate change then they apply general concepts about the environment, observations about the weather and broad environmental values for example (Kempton, 1991, 1997). Read *et al.* (1994) state that because of their non-specific mental models of climate change, people's thoughts about climate change are situated within a general framework of environmental risks (see also, Kempton, 1991, 1997; Thompson and Rayner, 1998). Non-specific mental models of climate change are stated by Kempton (1997) to be a reason why the UK's 'Helping the earth begins at home' campaign failed to have much effect

on perceptions of climate change; most Britons appeared to be trying to understand climate change using the wrong models (see Hinchliffe, 1996 for more about this campaign).

Considerable research has been conducted in order to explore the mental models, which individuals use in their appreciation of hazards such as climate change (e.g. Morgan *et al.*, 2002). The approach argues that people have an intuitive understanding of risks and that they can be helped to appreciate these better and be placed in a position to make more informed decisions if they are given new information in a format consistent with their initial belief system (Breakwell, 2001). The mapping of the belief system about a hazard that is the target for risk communication is therefore crucial for communication to be designed so as to take account of the way in which systems of beliefs will respond.

Breakwell (2001) notes that the mental models approach seeks to identify for a particular hazard both accurate and inaccurate beliefs that are held by a target population, which are then used as a basis for developing risk communication material to correct misunderstandings. In terms of climate change, Kempton (1991) argues that there is a need to understand and target the gaps in people's climate change knowledge and to rectify misconceptions in pre-existing mental models³⁶. Breakwell (2001) suggests three basic principles for risk communication: firstly, that the audience needs to be offered a basic understanding of the exposure, effects and mitigation processes relevant to making decisions about the hazard; secondly, that the existing beliefs of the target audience are assumed to affect their reception and interpretation of new information; and thirdly, that new information must be presented in such a way that it is consistent with the levels of understanding of the audience.

"The object is to bridge the gap between lay and expert models of the risk by adding missing concepts, correcting mistakes, strengthening correct beliefs and minimizing peripheral ones." (Breakwell, 2001:341)

Morgan *et al.* (2002) outline a five step method designed to create and test risk communications. They suggest that one should start by creating an expert model followed by mental model interviews with people in order to elicit their beliefs about a hazard, expressed in their own terms. Structured interviews follow, administered with a larger group sampled from the intended audience after which, risk communication can be drafted based on the models and interview results. This determines which incorrect beliefs most need correcting and which knowledge gaps need filling. The communication should be evaluated (tested and refined) with individuals selected from the target population and repeated until the communication is understood as intended. Cox *et al.* (2003) used this approach in a study of chemical risk

³⁶ Kempton suggests that it is necessary to connect climate change to energy consumption; develop a concrete concept of what energy efficiency is; convey a realization that small changes in mean global temperature could have huge effects; and to instil recognition of the sensitivity of the living world to climatic conditions.

protection. The juxtaposition of expert and user understandings, via ‘influence diagrams’ to represent beliefs held by chemical experts and ‘user models’ was developed from open-ended interview data with workplace users of the chemicals. It enabled the identification of knowledge gaps and misunderstandings about chemical safety beliefs and workplace behaviour. The process highlighted areas of appropriate user knowledge, user misconceptions, and gaps in user knowledge in relation to the expert model and these provided the basis for designing subsequent risk communications. The authors found that by designing safety information to be relevant to the workplace context of the users, employees and employers may gain improved knowledge about chemical hazards in the workplace (such that better chemical risk management, self-protection and informed decision making are encouraged). The authors state that their use of an ‘expanded’ mental models approach in order to develop user-centred risk communications captured the considerable complexity and contextual richness in user representations and understandings. They conclude that these go beyond the level of individual cognition and include wider considerations (in this case, for example, the work practices that affect understanding of chemical workplace safety and behaviour).

Breakwell (2001) underpins this suggestion by Cox *et al.* (2003) by arguing that mental models of hazards are themselves social constructions; that they serve identifiable social purposes for the subculture in which they are elaborated and that they are generally shared by members of that subculture. For example, Breakwell (2001) offers some insight into how SRT can be used to account for the genesis and maintenance of a mental model of a hazard. She proposes that Social Representations Theory can provide a basis for explaining how an individual may acquire a mental model of a hazard. It is applicable because it helps to explain what happens when people are faced with having to make sense of novel ideas or data (perhaps under conditions of uncertainty or where claims are contested – particularly relevant for considering the communication of an issue such as climate change). The processes of anchoring and objectification as outlined above, may account for the structure often evident in lay people’s mental models of hazards.

However, there will be some individual variation in access to and use of a mental model of a hazard. SRT would suggest that the mental model of any hazard will be determined by the inclinations of each individual and their particular forms of anchoring and objectification – but emphasises that a mental model is not purely idiosyncratic (Breakwell, 2001). This is because the processes of anchoring and objectification are not individual processes, but ones that involve social interaction and the establishment of shared meaning through communication among people³⁷. This means that if mental models of hazards or issues such as climate change are

³⁷ Joffe (1999) also explores the subjective experience of risk, and connects this to broader social factors, demonstrating how social forces become sedimented in inner experiences.

generated through processes of social representation, they will be shared by members of groups or subcultures. Whilst members of a subculture would not be expected by SRT to hold identical mental models of climate change, these would share certain core elements comprised of a social representation (Breakwell, 2001). For example Cox *et al.* (2003) found that the respective mental models elicited from the expert and workplace perspectives contained shared aspects within each group, with marked differences (e.g. knowledge gaps) arising between the two. In terms of climate change therefore, scientists might be expected to share similar mental models based on their scientific knowledge and professional interaction. As noted in chapter two, these models are very different from those held by members of the public (e.g. Bostrom *et al.*, 1994; Kempton, 1997) within which common representations or mental models of climate change also exist – with some individual variation depending on personal experience etc. With relevance to both cases, Morgan *et al.*, (2002) note that mental models incorporate a variety of personal concerns and demands of daily living in association with a particular risk or hazard.

3.5 Environmental communication for public engagement?

Some members of the public are uninformed about climate change and hence, the consequences of their individual and collective actions. Others are informed, but construct many barriers to feeling a personal sense of agency and responsibility. Raising awareness and providing information is clearly only a small part of the communication challenge and not necessarily the key to engagement (e.g. as Burgess *et al.*, 1998 state in the context of communicating more effectively with citizens about environmental citizenship). Blake (1999) suggests that this is because becoming more informed may even exacerbate feelings of helplessness because one might reasonably conclude that there is little that individuals can do to help correct such a major problem (see also Bord *et al.*, 2000; O'Connor *et al.*, 1999). If individuals are to be engaged in thought processes and commitment to the possible outcomes of climate change and the mitigative options available, information needs to be tailored to address different outlooks, mental models and social representations of the issue.

3.5.1 Contributions from the Social Representations Theory and mental models approach

Both SRT and the mental models approach highlight the necessity to take into account people's conceptions (models / representations) of climate change if communications and advice are to be understood and effective.

SRT acts as an appropriate way of illustrating issues which arise when one attempts to mediate between the scientific and lay perceptions of scientific issues such as climate change. It brings to our attention the complex, social processes that are crucial to the making sense of media communications about climate change. In the context of health, Farr (1993) notes that

important health measures may falter because authorities (under the advice of scientists) fail to take into account people's representations of health and illness. Farr argues that because people act on the basis of their social representations, messages which do not take these into account will not be effective. This point also applies to the communication of, and policy measures designed to address, environmental issues such as climate change, i.e. in order to effectively communicate messages about climate change, the communicator needs to understand both the science and the 'common sense' interpretations – that is, have an understanding of the social representations of climate change. Bell (1994) for example, finds a considerable mismatch between media reporting of scientific information and the public's understanding of that information and states that this mismatch is socially and politically disabling because it misleads people away from dealing with the issue of fossil fuel consumption.

Mental models of hazards such as climate change will be substantially a product of sub-cultural dynamics that are modified by individual identity motivations and concerns. This suggests that risk communications should be founded on a clear understanding of the shared representations of a hazard held by the target group as well as people's personal concerns (Breakwell, 2001). Myers and Macnaghten (1998) also conclude that the generalised appeals and rhetoric of crisis used by policy organisations to communicate about environmental sustainability to the public tends to distance them from the immediacy and dailiness of the public's own experiences of and talk about the environment; that respective rhetorics of environmental organisations and everyday talk are seriously out of joint. They state that because of this distance, the rhetoric does little to encourage participation and practical action; that the vast amount of communication on issues of sustainability appears to have had little effect on most people's ways of life. Myers and Macnaghten argue that approaches to communicating sustainability have thus far failed to take into account the ways in which people interpret information in terms of their 'commonplaces' as mentioned earlier in the chapter, and the ways in which they define rhetorical situations in terms of their daily lives and immediate worlds; people's interpretation of information depends on how they link them to their everyday lives and their relations to organisations and to others (as SRT would suggest).

Myers and Macnaghten (1998) note the need for moves towards including everyday talk, relationships and motivations within the rhetoric of sustainability (messages about climate change as part of this). This means redefining models of communication used by policy makers and others communicating environmental issues to the public. There is a growing body of literature, which argues that people are not 'empty vessels' which simply need to be filled with information (e.g. Irwin, 1995; Irwin and Wynne, 1996; Morgan *et al.*, 2002; Wynne, 1996). Irwin and Wynne (1996) discuss an apparent assumption of 'public ignorance' in matters of science and technology, which suggests that public controversy over technical issues is created

by inadequate public understandings rather than by the operation of science itself (see also, Irwin, 1995). The assumption goes hand in hand with a top-down and dissemination-oriented model; that the problem is one of the public understanding of science.

Irwin and Wynne (1996) and Irwin (1995) advocate that this notion of a ‘deficit’ model of public understanding should be dispelled (see also Sturgis and Allum, 2004). They argue for consideration of people’s needs and interpretations, and the way in which personal understandings of the world and previous experiences fit together with scientific information. Irwin and Wynne note that the way in which people make sense of new information is a complex process, highlighting a rich pattern of social relations and personal understandings involved in the understanding of science, rather than simply a state of ignorance; that the ‘facts’ certainty cannot stand apart from wider social, economic, and moral questions. Breakwell (2001) also specifically argues for a more differentiated approach to risk communication that takes systematic account of the personal and sub-cultural concerns of the target audience. Risk communication interventions require more than a simple information-deficit approach aimed at the individual. Breakwell proposes that communications should involve acknowledgement of the motivational and social dynamics which underpin people’s mental models.

Joffe (2003) also questions the deficit model of risk communication, arguing that it obscures the symbolic, meaning making and emotive realms of human experience. Joffe states that since the 1950’s, there has been increasing realisation that lay people bring aspects of an ‘already known’ to their understanding of media content and that social representation theory may help to develop the media-mind link. Joffe argues that people do not mechanically process information. Rather than being passive perceivers of ideas from experts and the mass media, lay people actively forge representations in line with their concerns and are guided by affective processes and social influences (see also Slovic, 2000b). These are driven by identity motivations, emotions, anxiety and trust, and the demands of daily living rather than by ‘cold’ information-handling processes and they may play pivotal roles in the way in which people apprehend risks such as climate change (Breakwell, 2001; Joffe, 2003).

“The rhetoric of sustainability is central to the future participation of publics in sustainability initiatives; it is not just a vehicle or a dressing for it...rhetoric has tended to remain disembodied, tied to a global overview. Participation requires effective institutions and mechanisms, but it also requires and effective and common language. That language will ultimately be found in the way people talk, not in policy documents.” (Myers and Macnaghten, 1998:352).

Irwin and Wynne (1996) highlight the issues of trust in and credibility of scientific expertise (see also Wynne, 1996). Wynne (1996) argues that trust and credibility are major contextual factors influencing the uptake and understanding of scientific messages, and hence, public

perceptions of risks (see also Irwin, 1995). Myers and Macnaghten (1998) also argue that public distrust of institutions affects responses to information. Wynne (1996) emphasises the need to recognise that the trustworthiness and credibility of the social institutions concerned with providing scientific knowledge are basic to people's definition of risks or uptake of knowledge. Wynne argues that thus, 'understanding' science is therefore a function of experience, judgement and understanding of scientific institutions as much as the cognitive content of information. He concludes that the problems in public understanding of science cannot be divorced from issues of the social purposes of knowledge and what counts as 'sound' knowledge in different contexts. Morgan *et al.* note, in support of Irwin and Wynne (1996), that risk communications also require authoritative and trustworthy sources in order to be effective (for example, so that people know what to believe and are not confused by perceptions of the information coming from vested interests).

Joffe (1999) argues for a need for a theory of the fluid interaction between lay and expert responses to risks, because the dynamic is neither top down, nor bottom up. The process for risk communication suggested by Morgan *et al.* (2002) in relation to a mental models approach acknowledges this, arguing that risk communication should be derived from both expert and lay models. They state that ultimately, effective communication should focus on relevant issues that recipients most need to understand and that the communication should be understandable. The question we are left with however, is can mediating institutions (e.g. environmental groups, the mass media, education, government) move away from the conventional 'deficit' model of science-public relations to offer new and perhaps more effective patterns of knowledge? (Burgess and Carvalho, 2004)

"Communication is about speaking AND listening in order to get a truer understanding of the public's needs, interests, and concerns." (Rogers, 2000:557)

The process of stimulating engagement with issues such as climate change using visual communications is highly complex and a difficult task (e.g. Bator and Cialdini, 2000). It involves not only image or information exposure, but also attention and understanding, storage and retrieval of the information, and the interpretation of a meaningful message. Consideration of the target group and carefully selecting the images and contexts of communication are crucial if senses of salience and efficacy are to be conveyed. Rogers (2000) states that, currently, understanding the audience that receives information about scientific issues remains a weak link in the communication process. Bator and Cialdini (2000) emphasise the need to investigate a target audience, their attitudes and behaviours in relation to an issue, and the potential barriers

they might have to accepting a message, for the development of pro-environmental announcements designed to encourage certain behaviours³⁸.

3.5.2 Communicating environmental information - image characteristics and opportunities for the visual communication of climate change

This research investigates the potential for visual images to be used as a means to communicate climate change issues and to stimulate willingness to engage with the issue (to drive personal feelings of salience and efficacy). Images may be used in many contexts, and both the visuals employed and the contexts themselves need to be thoughtfully selected according to the interests of the target audience(s). The discussion of social representations and mental models in relation to communicating environmental issues suggests that efforts must aim to connect with issues that are of relevance to people's lives (e.g. see Myers and Macnaghten, 1998). Gooch (1996) proposes that the climate change images currently presented by the media are easily understood but do not always correspond with people's personal knowledge and environments. The OST and the Wellcome Trust (2001) note that while stimulating and informing an inclusive debate involves the dissemination of scientific information, it also requires the identification of 'hooks' that connect with people's everyday lives and concerns so their attention is attracted and information retained. Communications must be made as relevant as possible to the audience so that they specifically address the attitudinal predispositions of the target (Davis, 1995).

Emsley (2001) notes that good hooks for scientific information should be linked to sex, money and health (strategies used in product advertising, for example); that in general local and personal connections are useful areas to emphasise. Bator and Cialdini (2000) assert that personally involving messages increase thoughtful consideration of a message and strengthen resulting attitude change (see also Meijnders *et al.*, 2001). When a message is personally relevant, or when it comes across as being personally useful, people's level of processing is more thorough and a persuasive message is more likely to result in attitude change. Burgess *et al.* (1998) propose that the reception of environmental communications and their 'effectiveness' in delivering change in people's attitudes and values, is highly contingent on many factors, not least the local social and cultural contexts in which people live. Myers and Macnaghten (1998) suggest that it is important to move towards including everyday talk, relationships and motivations within the rhetoric of sustainability (climate change is considered to be a part of this). The imagery used to communicate climate change issues to the public must therefore be personally relevant at a local community level: "People are only interested in what is relevant to them in their daily lives, which is why we have to go to them with a simple message that they

³⁸ In this case, not behaviour, but senses of salience and efficacy as constituents of engagement and possibly precursors to action.

know will benefit them" (Sue Nelson, ENCAMS quoted in Gibson, 2001:32). Myers and Macnaghten (1998) state that communication sympathetic to people's daily routine and local concerns is also more likely to lead to action, because personally applicable and involving climate change images are more likely to stimulate feelings of efficacy than global and crisis orientated ones. Providing personalising visual hooks alongside practical information may be most likely to engage people behaviourally with the issue of climate change because when people do not have the motivation, ability or cues to think about an issue any persuasive message is unlikely to inspire change in attitude or behaviour (*ibid.*). This would essentially mean using the visual depictions of climate change to make the issue personally relevant and to convey a sense of individual agency or self-efficacy.

"...generalised appeals and the rhetoric of crisis tend to distance policy organisations from the immediacy and dailyness of the public's own experiences of and talk about the environment. Because of this distance, the rhetoric does little to encourage participation and practical action." (Myers and Macnaghten, 1998:333)

Rebetez (1996) considers that whatever the technique used to communicate, climatic data should be replaced by meaningful representations and argues for novel approaches to climate information aimed at the public. While graphs and maps, for example, are well suited information communication formats for scientific (or 'expert') audiences, Kasemir *et al.* (2000a) suggest that additional visual aids may be important for other audiences. Participants in a study by Kasemir *et al.* stated repeatedly that pictures would make it easier for them to grasp model and scenario outputs depicting climate change.

The characteristics of an image, for example its representation of reality, its medium of presentation, and its affective nature as well as the informative or reported content, influence the ways in which it will be perceived and interpreted. For example, people's perception of realism in an image affects its resonance. Deacon *et al.* (1999) state that the importance of realism in an image cannot be under-estimated; that it is the dominant form of representation in contemporary visual media. Denis (1989) argues that the 'realism' of images is an important factor of their functional efficiency, since images often provide subjects with 'models' of a reality which is not directly accessible (as they do in the case of climate change). Photographs in particular, may depict a piece of factual evidence to show that something has happened. Boholm (1998) develops the discussion on realism, noting that a news item accompanied by photographs tends to be understood as more truthful or objective than one without. Such stories are perceived as being more trustworthy and authentic because in contrast to other visual images such as paintings or drawings, photographs serve to verify the event that is depicted. Gruber (1990) reports on respondents who felt that visuals in television news allowed them to form more complete and accurate impressions of people and events, and that visuals helped to clarify or corroborate a story. For example, making it easier to assess the scope of a disaster. Boholm

(1998) adds that by showing instances of catastrophic events, intangible risks issues are given concrete form and content.

“The potential of visual images to communicate emotive and intuitive knowledge, imbuing it with veracity and permitting projection of identification, makes them an effective medium for social constructions of messages about risks.” (Boholm, 1998:127).

Visual images used in the media and elsewhere can cause emotional or affective³⁹ feelings to be aroused in us when we view them (Oring, 1999). Such reactions are often intended by the users of images in information which circulates in the public domain. This was noted earlier in the context of the media, which employs dramatic and often emotive climate change imagery because it is newsworthy and intended to sell papers. Such visuals are often employed by the media, in advertising and by the designers of environmental campaign material to attract attention, thereby acting as hooks for features, news stories, advertisements, etc. Trumbo and Shanahan (2000) propose that making issues meaningful essentially involves thinking about how to portray issues in the most vivid, dramatic and affecting manner possible. Emsley (2001) states that this is partly because rational argument alone will not carry a message to the general public; that it has to travel on the back of emotion because unless it has a component that registers feelings such as fear for oneself or sympathy for others, it is quickly forgotten. Nisbett and Ross (1980) suggest that such information is likely to draw and hold our attention and likely to stimulate the imagination so that information appeals to us emotionally and is hence more influential than other types (see also Bator and Cialdini, 2000; Meijnders *et al.*, 2001). Bator and Cialdini (2000) note that vivid information also stands out in memory, a necessary feature for encouraging unfamiliar behaviours to be undertaken (e.g. when a visual message about individual empowerment and acting on climate change needs to be recalled). In terms of issue salience, Ungar (1995) suggests that the public appears to be moved by events that involve concrete, graphic and serious real-world outcomes. Ajzen (2001) adds that whether cognitive or affective in nature, negative information tends to have a greater impact on a person’s overall evaluation than comparably positive information. Emsley (2001) stresses that only bad news is good news as far as the popular press is concerned (because bad news hooks readers).

Graber (1990) suggests that unlike pictures of people, scenes depicting objects or landscapes do not readily elicit rich inferences and emotions. Gruber notes that ‘people pictures’ are resonant because people draw many inferences from pictures of other human beings, e.g. mental states such as sadness, pain, happiness; states of physical well-being; wealth or poverty, etc. (see also Boholm, 1998, who argues that a dramatic episode can be captured in a photograph, and the

³⁹ Blackburn (1996:9) terms an affective quality as being “...the feature of an experience which renders it pleasurable or desirable, or the reverse, or which gives it a distinctive emotional tone.” See chapter two for more on the definition affect.

viewer, relying on non-verbal cultural cues can infer from it emotions and attitudes). Graber identifies an emphasis of close-ups of people in the American television news, adding that 'people pictures' are best for involving the viewer emotionally. Such pictures hook and hold an audience because viewers respond emotionally to seeing people like themselves (sometimes suffering) in pictures on screen. Images can hence serve as a vehicle for vicarious experience, inviting the viewer to project their own interpretation therefore giving rise to a subjective identification with the object of the image (Boholm, 1998; Joffe, 1999; 2003). This quality of visual communication is important in the context of climate change – an issue which is not generally felt to be experienced. Seppanen and Valiverronen (2003) note that affective identifications with situations or people depicted visually may also have a decisive impact on the meanings unfolding from a story (even on whether the story is read in the first place).

Meijnders *et al.* (2001) suggest that inducing fear of CO₂ risks leads to systematic processing of information about energy conservation as a risk-reducing strategy and results in more favourable attitudes toward energy conservation. However, while visual messages can be powerful, they can also be ambiguous or ineffective if their interpretation depends on how people link them to their everyday lives and behaviour. Myers and Macnaghten (1998) for example, note that crisis on a global scale might be motivating, but does not sit comfortably with the suggestion to take action as part of ones daily routine. They warn that emphasis on fear and crisis may have implications for communicating sustainability messages. This is because the use of fearful and crisis orientated information and images make suggested actions, such as walking instead of using the car, recycling, etc., seem disproportionate to the apocalyptic events to be averted (a barrier noted in chapter two). Wilson (2000) also finds that the media presents dramatic, eye-catching and entertaining stories about climate change, that attract audiences but do little to enlighten them further about the issue (see also Oskamp, 2000). Wilson states that much coverage of climate change is sensational, technical or too abstract for the general public, and does not help people to make a connection between their everyday actions and long-term global climate changes; that it has created not only public confusion but also a perception of impotency to properly respond to climate change. Oskamp (2000) adds that people do not like to think about fearful topics such as global warming, and that they are likely to repress or deny such information. This implies that behavioural or even favourable attitudes toward doing something about climate change would be an unlikely outcome. These arguments question the previously presented literature which advocates the use of emotive and dramatic imagery (often involved in the reporting of bad news and fearful situations) in communications directed toward the public domain. They also raise implications for the outcomes of the use of dramatic and emotive imagery in climate change campaigns designed to encourage behavioural change.

Dramatic images of climate change also have the potential to be ambiguous for audiences with little awareness of the issue and how it relates to them. To some extent, the successful communication of an engaging message using images demands a degree of familiarity with the issue. In particular, images that involve complex conceptions (such as the link between climate change and individual, daily behaviour) benefit from the accompaniment of other communicative media (e.g. captions can define meaning). To be understood, Boholm (1998) argues that photographs, in particular, need to be accompanied by clues to allow the unfolding of a story so that the frozen instant of evidence becomes intelligible and the ambiguity of the picture is resolved (see also Becker, 1998, for discussion of image ambiguity and context).

Davis (1995) proposes that the challenge for communication in terms of environmentally responsible behaviour is to identify methods that motivate individuals to *act* on their environmental concerns. Davis (1995) examines the effects of environmental message framing and finds that it can significantly influence how a problem is perceived, and how alternative decisions and behavioural options are evaluated. Davis finds that communications discussing losses to the current generation give rise to the most positive responses and highest levels of intent to participate in environmentally-responsible behaviours (compared with messages framed according to recommended activities and gains and losses to future generations). Davis states that messages emphasising personal losses or negative impacts associated with inaction are generally more persuasive than those emphasising gains. On the other hand, Bator and Cialdini (2000) state that messages that promote specific goals will have the most persistent effects, and that communication should tell members of the public what they should do, how and the ways in which this behaviour will be beneficial (see also Oskamp, 2000).

Rossiter and Percy (1980) also advocate pairing stimuli with favourable emotional consequences (in terms of a product being advertised). They state that consequent positive feelings enhance one's attitude towards a product; this concept can be applied to a climate change communication strategy. Kaplan (2000) questions whether appeals to sacrifice or behave counter to one's self-interest are a realistic approach to motivating behaviour; they advocate strategies that do not require people to make choices that run counter to their self-interest, but that are not only good for the environment but also personally desirable (see also Maiteny, 2000). Wicks (1995) notes that individuals avoid discrepant messages and selectively retain those consistent with their beliefs (selectively forgetting those which contradict their knowledge or views on a topic) in order to avoid dissonance and achieve consistency. This suggests that positive communications relating to the importance and potential for individuals to make a difference to climate change would be most useful. Oskamp (2000) adds that the motive of self-interest is powerful and so appeals could be centred on trying to create a healthier world, for example (see also Young, 2000). Myers and Macnaghten propose an approach to

communicating sustainability information that is multidimensional and sets off a web of interactions (rather than being one way from source to receiver). This highlights the previously mentioned necessity for visual messages to become part of people's thought processes if they are to engage with the issue of climate change.

The discussions here and in chapter two highlight that people's concern for climate change does not easily translate into behaviours such as energy conservation, and that their perceptions of climate change must be taken into account when communicating messages about the issue⁴⁰. McDaniels *et al.* (ibid.) suggest that communication efforts should attempt to improve understanding of cause-effect links in people's mental models, for example (see also Kempton, 1991; Meijnders *et al.*, 2001). A wide range of communication messages, designs and media can be employed to help reshape the 'mental models' that individuals hold for global change processes (McDaniels *et al.*, 1996). However, many aspects of environmental issues are hard to capture by means of photography or by a single image, and complex environmental problems such as climate change can be particularly hard to portray. Some literature suggests that some kind of interactivity is a key. Lutz and Lutz (1977), for example, found that participants receiving interactive imagery remembered more brand names in a study than a non-interactive imagery group. Different methods provide alternative ways of communicating climate change issues; how it will affect our lives and how we might choose to respond. For example, projections of the future in various forms can offer us a vision of the possibilities we might be able to expect and how we can influence them (e.g. Berkhout *et al.*, 2001; Lorenzoni *et al.*, 2000a; Lorenzoni *et al.*, 2000b; Lorenzoni, 2003). Stoll-Kleemann *et al.* (2001) also conclude that there are various powerful tools now available to help citizens visualise the consequences of their misplaced actions⁴¹.

⁴⁰ Lofstedt (1995) suggests, in terms of public awareness campaigns concerning climate change, that the failure in rectifying misunderstanding of climate change before policies and awareness campaigns are launched often decrees their lack of success. The 'Helping the earth begins at home' campaign was undertaken by the DoE in 1990-94 using newspaper and TV adverts to raise public awareness of the causes and consequences of global warming so as to encourage domestic energy efficiency (it was designed to help the government meet its target of stabilizing CO₂ emissions by 2000 at 1990 levels). However, Lofstedt (ibid.) notes that it did not increase people's awareness nor increase their willingness to save energy because of the failure to base the communication on people's perceptions of global warming. It was hoped that scare tactics used in the ads would lead people to save energy; public confusion about the issue for example, was not addressed.

⁴¹ Realistic computer and virtual reality simulations, for example, could play a role as a climate change communication tool. Computer visualisations have the potential to project what future environmental and social climate change conditions might look like, depending on various emissions pathways, in order to help people think about our options for different climate futures (e.g. Kingston *et al.*, 2000; Wherrett, 1999; Wollensak, 2002).

3.5.3 Ethical considerations

“...the creation and dissemination of science visualisation makes it more important than ever to ask questions about what and how these fascinating images of science communicate.” (Trumbo, 2000:380)

Ethical and practical issues relate to the visual communication of climate change because a person's response to an image is not simply a rational one, but has an emotional component. Pictures do not evoke clear and rational responses, and so images will trigger different emotional and intuitive responses in people (Cronin, 1998; Myers, 1994)⁴². Visualisations have the power to alter interpretations of complex concepts and to arouse positive and negative emotions (Daniel and Meitner, 2001; Meijnders *et al.*, 2001). The traditional use of 'negative' imagery or fear-appeals in the communication of environmental issues needs to be managed carefully. This is because anxiety responses to sustained emotional visual appeals can simply end up triggering defensive responses rather than meaningful messages, e.g. leaving the audience desensitised or eventually with a sense of 'issue fatigue'. Meijnders *et al.* (2001) suggest that frightening images are likely to make people avoid information or not process it. Conversely, sensationalism can cause fear and anxiety which may be groundless and counter-productive (Boholm, 1998). There is clearly a fine balance involved in communicating meaningful messages about climate change using images; it is important that the messages communicated are motivating rather than de-motivating.

“The social reality which film or television may appear to reveal is never innocent of the procedures that have produced it.” (Deacon *et al.*, 1999:198)

Visual representation is not a value-free activity and therefore subjectivity is inherent not only in the interpretation but also in the creation and selection of visual images that might be used in climate change communication exercises (e.g. Ervin, 2001). Sheppard (2001) notes that the preparers of digital visualisations in particular, conjure up and select the imagery in the first place. This emphasises the potential for visual communication to be biased or to put across a particular point of view because the creators and selectors of climate change imagery carry their own interpretations, meanings and assumptions and these are communicated in the imagery used: “As texts suggest an attitude, a point of view, and a form of address, so can pictures. And as words play with meanings and associations, so can pictures.” (Myers, 1994:144).

Photographs can also convey a whole range of meanings to different people, and such images are never neutral representations of reality (Seppanen and Valiverronen, 2003; Winston, 1998). Historically, photographs were taken to be objective extensions of human vision (Deacon *et al.*, 1999). However, contemporary pictorial representation - for example, photographic images, film or video news clips – are carefully constructed, and photographers have certain aesthetic

⁴² Robins (1996) proposes that whatever the course of visual rationalisation, images connect with pre-rational forces such as desires and fantasies and our basic anxieties and fears.

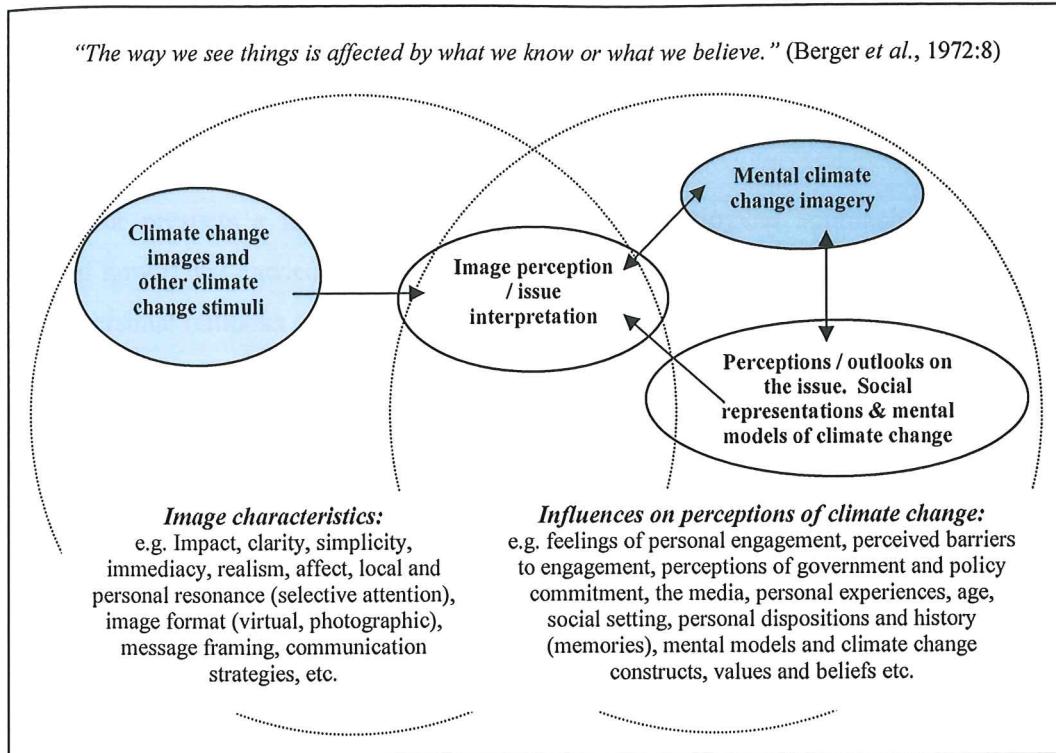
standards or goals that they wish to meet, as well as events to document. The process of translating issues into meaningful stories involve decisions about the story line, actors, and themes, which take into account the shared social realities of storyteller and audience (Trumbo and Shanahan, 2000). By presenting people with an image of any kind, we are pre-empting their visualisation because, by communicating about climate change using visual images, we cannot help but frame the issue for the viewer. Sheppard (2001) talks of computer landscape visualisation for example as constituting a 'crystal ball' capable of showing us views into the future and discusses the risks of the potentially unstructured use of these visualisations as a popular public communication tool.

In the context of risk communication, Slovic *et al.* (1981) argue that subtle differences in how risks are presented can have marked effects on perceptions and actions. This suggests that those responsible for information programmes have considerable ability to manipulate perceptions. Macfarlane *et al.* (forthcoming) remind us that the techniques of landscape visualisation, for example, remain highly expert-oriented, meaning that technical experts will always remain at the core of the visualisation process and this raises matters about the intersection of values, communication and audience understanding. In the context of science education, the reading of images cannot be considered as trivial, straightforward or transparent; scientific images are not always received without some difficulty. A lack of knowledge or familiarity with the visual language for example, may hinder the interpretation of a scientific image (Ametller and Pinto, 2002; Pinto and Ametller, 2002; Stylianidou *et al.*, 2002; Treagust *et al.*, 2002).

3.6 Conclusions

This chapter highlights the role of visual imagery and the influence of mediating institutions, particularly the mass media, on people's perceptions of environmental issues. It emphasises that an individual's interpretation and message uptake will be affected by their various pre-dispositions, social representations and mental models, as well as the way in which visual information about climate change is represented and the agendas of those responsible for this communication. The way a visual image of climate change is framed and where it comes from, will affect the way it is received and interpreted, as will individual and social psychological processes. People's interpretations of images and the messages they take away from communications about environmental issues are both individually and socially driven. Visual input interacts dynamically with underlying individual and social constructs thereby influencing people's subsequent mental imagery, interpretations of future visual stimuli and outlooks on the climate change issue. This relationship is expressed in figure 3.4 which elaborates on figure 3.1, in light of the discussion presented.

Figure 3.4 The interaction between images, imagery and perceptions of climate change



A bottom-up approach to understanding how people interpret and visualise climate change is necessary in order to develop the way in which the issue is visually communicated. I have argued that communicating with the public about climate change should not simply be a case of providing information about behavioural change. It is important to understand the way in which people perceive and relate to climate change if communications can be designed to convey senses of salience and efficacy, and if behavioural engagement with the issue is to result.

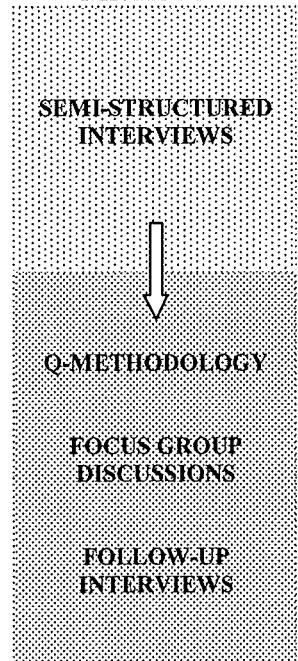
Chapter Four – Methodology

4.1 Introduction

Chapter four presents a rationale for the chosen methodological approach, design and an account of how it was carried out. A qualitative methodology is most appropriate for capturing people's personal outlooks on climate change in terms of the themes of the research. Central to this study is its exploratory nature, which lends itself well to an iterative, multi-method design. The research design has developed as the research process has progressed and the research questions have become more refined. This approach has intentionally left the study open to changing events, new ideas and an accumulation of understanding by myself and by the participants involved throughout the course of the research.

The chapter begins with an outline of the epistemological foundations of the research. It then presents an argument for pursuing a mixed but largely qualitative approach to the methodology and a justification for adopting flexible and open style. The three methods used in the research are outlined – semi-structured interviews, Q-methodology and focus group discussions, followed by details of how they were carried out and the data analysed (brief follow-up, reflective interviews were carried out in order to consolidate the study). Table 4.1 summarises the research questions and methods used, which were guided by the principal objective of the research. My approach acknowledges that there are important issues of reliability and validity associated with understanding people's outlooks on climate change and a consideration of these concludes this chapter.

Table 4.1 Relationship between research questions and methods

RESEARCH QUESTIONS	RESEARCH METHODS
<ul style="list-style-type: none"> • How do people relate to climate change in terms of salience, efficacy and imagery? ○ How important is climate change, in the context of other concerns? (Salience); ○ How far do people see themselves being able to do anything about reducing the causes of climate change? (Efficacy); ○ What imagery comes into people's minds when they talk and think about climate change? ○ In what ways, if at all, do these themes connect to extend people's commitment to responding to the causes and outcomes of climate change? • Can images of climate change move people to feel engaged (both feelings of salience and efficacy) with climate change? ○ Can images bring about both senses of salience and efficacy, engaging people over the long term with the causes and consequences of climate change? ○ What else would have to be done for people to feel senses of salience and efficacy with regard to the causes and consequences of climate change? 	 <p>SEMI-STRUCTURED INTERVIEWS</p> <p>Q-METHODOLOGY</p> <p>FOCUS GROUP DISCUSSIONS</p> <p>FOLLOW-UP INTERVIEWS</p>

4.2 Methodological foundations

4.2.1 The background to my methodology

“Questions of method are secondary to questions of paradigm, which we define as the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways.” (Guba and Lincoln, 1994:105)

A paradigm acts as a basic set of beliefs which guides the act of research; the researcher therefore interprets a world as it appears through this lens. The methodology that one adopts is located within this framework and the methods are consequently tied to ones vision of how social reality should be studied (Bryman, 2001; Denzin and Lincoln, 2000). A philosophical guideline or paradigm binds this research process, underpinning its exploratory style, the underlying objective, research questions and the qualitative, multi-method research design. The following discussion outlines my approach in more detail, explaining the perspective I have chosen to take, which informs my methodological design and analysis of results.

Denzin & Lincoln (2000) discuss four major paradigms: the positivist and postpositivist, constructivist-interpretive, critical and feminist-poststructural. Comprehensive reviews of all of these paradigms are given by many authors including Guba and Lincoln (1998). The positivist

and postpositivist paradigms provide the backdrop against which these other paradigms and perspectives operate. Positivist approaches characterise the ‘received view’ of science and are aligned with a realist ontology (assuming an objective external reality upon which inquiry can converge) and objectivist epistemology (assuming that the investigator can determine “how things really are”) (Guba and Lincoln, 1998). They are characterised by experimental, quantitative methodologies based on hypothesis testing and generalisable results. In recent years this conventional paradigm has been challenged as pressures for scientific research to provide context and insight into human behaviour have arisen. The consequently emerging paradigms embrace a more qualitative approach to social research associated with much greater ambiguity and flexibility.

The rationale behind this research is grounded in the constructivist-interpretive school of thought. This research is concerned with exploring people’s outlooks on climate change in terms of issue salience, personal efficacy and climate change imagery. I assume that people’s outlooks are not complete or fixed and so the research therefore necessitates a flexible and adaptive approach. This is underpinned by a constructivist-interpretive paradigm which implies that the social world is interpreted, understood, experienced or produced (Mason, 1996). The approach denotes an alternative to the positivist orthodoxy, asserting that social phenomena and their meanings are continually being accomplished by social actors; that the mind is active rather than passive in the construction of knowledge (Bryman, 2001; Lincoln and Guba, 2000; Schwandt, 2000). Realities are apprehendable in the form of multiple, intangible mental constructions which are socially and experientially based, and which may change as their constructors become more informed (Guba and Lincoln, 1998). People do not simply discover knowledge or hold static views; they construct these by inventing concepts or models to make sense of their experiences and social interactions which are modified in light of new stimuli. Interpretation of these is connected with the need of human beings to make sense of their experience; individuals seek an understanding of the world in which they live, developing subjective meanings which are in a constant state of revision (Creswell, 2003; Mason, 1996; Stevenson, 2000)⁴³. For example, chapter two presented the argument that people’s perceptions of climate change are outputs of their mental models and attitudes, which are reactive to new information and experiences. Chapter three discussed mental imagery as being constructed and undergoing constant change as people react to new information and life experiences.

A constructivist-interpretive paradigm focuses on meaning and understanding; it considers that “...a strategy is required that respects the differences between people and the objects of the

⁴³ Shared understandings or cultural perspectives act as a responsive point of reference (Bryman, 2001; Schwandt, 2000). The cultural construction which acts as a backdrop to this study is constantly changing due to political progress, media activity, business response to climate change, etc.

natural sciences and therefore requires the social scientist to grasp the subjective meaning of social action" (Bryman, 2001:13; see also Schwandt, 2000). Constructivism is associated with a hermeneutic methodology which concerns the theory and method of the interpretation of human action, or the practice of interpretation. It suggests that social constructions can be elicited and refined only through interaction between and among investigator and respondents; it sees knowledge as created in interaction among investigator and respondents, and this is demonstrated in this thesis (Bryman, 2001; Guba and Lincoln, 1998; Lincoln and Guba, 2000; Schwandt, 2000; Stevenson, 2000). Guba and Lincoln (1998:207) state, "The investigator and the object of investigation are assumed to be interactively linked so that the "findings" are literally created as the investigation proceeds"⁴⁴.

4.2.2 My methodological approach

A qualitative approach offers the means by which people's outlooks on climate change can be explored. Exploring people's outlooks on climate change in the contexts of their imagery, salience and efficacy demands a research strategy that is sensitive to the nuances of their perceptions and feelings about the issue; an approach which recognises the variable and personal nature of social constructions such as climate change. This can be offered by a qualitative methodology which is particularly suitable in research looking to capture meaning, process and context (Bryman, 2001; Luttrell, 2001). The constructivist-interpretive paradigm is associated with qualitative methods; research of this kind tends to look for the complexity of views rather than narrowing meanings into a few ideas, the goal being to rely as much as possible on the participants' views of the situation being studied (Creswell, 2003).

"...qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them." (Denzin and Lincoln, 2000:3)

Qualitative research is loosely defined by "...methods of data generation which are flexible and sensitive to the social context in which data are produced" (Mason, 1996:4). Qualitative methods can be used particularly to explore areas of research in order to gain novel understanding; a goal of this research which aims to explore people's perceptions of climate change in the contexts of issue salience, personal efficacy and climate change imagery. Box 4.1 summarises some broad methodological preferences as suggested by Silverman (2001) which complement the underlying research paradigm. They are subsequently discussed in terms of this research.

⁴⁴ This perspective is taken by Habermas (1990) who denotes that the process of interpretation is inevitably tied to the horizons or value judgements of the interpreter. This issue is addressed later in the chapter, as part of a discussion of research validity.

Box 4.1 Methodological preferences

- *A preference for qualitative data* – understood as the analysis of words and images rather than numbers.
- *A preference for naturally occurring data* – e.g. unstructured vs. structured interviews.
- *A preference for meanings rather than behaviour* – attempting to document the world from the point of view of the people studied.
- *A rejection of natural science as a model* – for the study of social phenomena.
- *A preference for inductive research and hypothesis-generating rather than hypothesis testing*

Based on Silverman (2001)

A qualitative approach was deemed more appropriate than a quantitative strategy because of the exploratory nature of the research, which aims to carry out an in-depth study of the feelings and thoughts of a small number of participants. Qualitative methods offer the potential for the details of their outlooks on climate change in terms of the themes of the research to be learnt about, whereas quantitative ones would not. Burgess *et al.* (1988a), for example, consider in the context of exploring environmental values that quantitative analyses are not suitable media for discovering feelings and meanings regarding the environment. Conventional quantitative methods (e.g. a large scale survey) would not enable the in-depth details of participants' feelings, thought processes, emotions and imagery to be elicited. Q-methodology constitutes one part of the multi-method approach. It involves a quantitative component and is an experimental method, but as discussed in due course, it combines strengths of both qualitative and quantitative research traditions. This research identifies patterns which are generalisable across the sample and to some extent to the wider population, however, it does not generalise the findings in the same way, and with the same rigour as quantitative approaches (e.g. using tests of statistical significance).

This research is neither specifically hypothesis-generating nor hypothesis testing, but the exploratory approach taken lends itself more comfortably to the former. The research began with a statement of the issue I was seeking to address and an overall objective as presented in chapter one, from which the methods evolved. This emergent research process rather than the investigation and product of a single research problem is endorsed as a methodological strategy by authors including Glaser and Strauss (1967) and Strauss and Corbin (1990). In this study, the themes of the research – imagery, salience and efficacy – enabled me to formulate broad research questions which drove the methodological exploration of my objective. These themes guided the research questions, the design of each methodological stage and structured the on-going analysis. Beginning with a clear objective and loose research questions, I have moved

throughout the course of the research towards more refined questions and a clearly defined methodology. This emergent process has drawn not only on the objective and themes of the research, but over time on participants' own outlooks on climate change. This is because the data has been gathered systematically and analysed throughout the research process beginning with the semi-structured interviews. At each stage of method design, data collection and analysis, I consulted the data generated by the previous research stages in order to move forwards. The unstructured design of the methodology of this thesis is characteristic of a hermeneutic approach which suggests a vision that research is always incomplete and uncertain, responding to new questions and problems in the quest for sense (Stevenson, 2000).

"Research may be conceived of as a circular process, one that involves a lot of going back and forth and around before finally reaching ones goal." (Strauss and Corbin, 1990:30)

The flexibility and openness often associated with qualitative methodologies involve learning to sustain a fair amount of ambiguity because the phenomena studied using qualitative methods are often complex with intricate meanings (Strauss and Corbin, 1990). This ambiguity however, has enabled me to be methodologically creative and responsive to the participants and the data collected. Van den Hoonaard (1997), for example, suggests that insight and meaning are more likely to occur when there is this initial ambiguity.

4.2.3 Multi-method approach

This study takes a multi-method approach because no single method could be expected to fulfil the demands of my research. A multi-method strategy meant alternating between action and reflection as suggested above, and converging towards a coherent understanding of people's outlooks on climate change in relation to salience, efficacy and imagery. The findings are consequently grounded by the overall objective and themes of this research. The methods used were not pre-determined but it was a definite intention to undertake more than one stage of practical research using more than one method to explore the outlooks on climate change of a consistent group of participants. The three main research stages of research were put into practice over a 12 month period, each informed by the results of the previous stage and followed later by the brief reflective interviews.

Fielding and Fielding (1986) advise that movement should be from uncontrolled to controlled methods, from natural to less natural forms of interaction; this helps us to conceptualise and thus to define and be systematic, and is the pattern that I have pursued. I began with a series of semi-structured interviews which were designed around the themes of the research and intended to allow participants the space to construct and articulate their own interpretations of climate change. In a qualitative research project of this nature, semi-structured interviews were deemed the most appropriate method to employ for initial data collection. Their main purpose was to

generate ideas about people's outlooks on climate change in terms of salience and efficacy and climate change imagery. Fern (1982) notes that interviews generated more ideas than did focus groups. Gaskell (2000) notes that qualitative interviews may play vital roles in combination with other methods, and offer an in-depth understanding which may provide valuable contextual information. In this study, the semi-structured interviews lay the foundations for the rest of the research and driven by this data, a responsive process of analysis and method design continued.

The second phase of research employed Q-methodology which enabled me to investigate participants' senses of issue salience and their feelings of efficacy directly in reaction to a set of climate change images. The premise behind Q-methodology is qualitative but it involves a quantitative constituent; while Q-method quantifies people's responses, the analysis of its output is interpretative. It is concerned with exploring people's subjective viewpoints using a quantitative form of analysis. It complements my methodological requirements and intentions as described above and proves itself to be a rigorous mix of qualitative and quantitative methods. Q-methodology is often used in conjunction with semi-structured interviews and focus groups (Barry and Proops, 2000). In this study, the method is used to bridge the interviews and focus groups, complementing both. Much research comments on Q-methodology as being an advantageous method to use in combination with other qualitative (and quantitative) analyses. Robbins and Krueger (2000) state that a truly hermeneutic approach involves the researcher returning to the 'researched', sharing the results and evaluating the analysis of Q-methodology in a study together. The researcher's interpretation of the output is thus brought into a dialogue allowing participants to freely communicate about their worlds in relation to the Q-study. For this reason, focus group discussions were employed two weeks subsequent to Q-methodology. Their main feature was to consolidate and explore the earlier data in terms of participants' feelings of engagement with climate change. Fontana and Frey (1998) note that focus group discussions can be employed usefully in conjunction with other data collection techniques; they can be used to interpret the results of other methods and for triangulation purposes (Bernard, 2000; Oates, 2000). They are the most controlled of the methods I have used. Essentially all of the methods are situations deliberately constructed for the purpose of gathering interpretative data (Oates, 2000).

Following the three stages of empirical research, it was felt that a further stage should be added in order to generate feedback from participants about their experience of being involved in the research. Follow-up interviews were undertaken with 13 of the 18 participants who had contributed to the entire research process ten months after the focus group discussions (explained further in chapter eight). The methodological process is presented in figure 4.1.

Figure 4.1 The methodological process

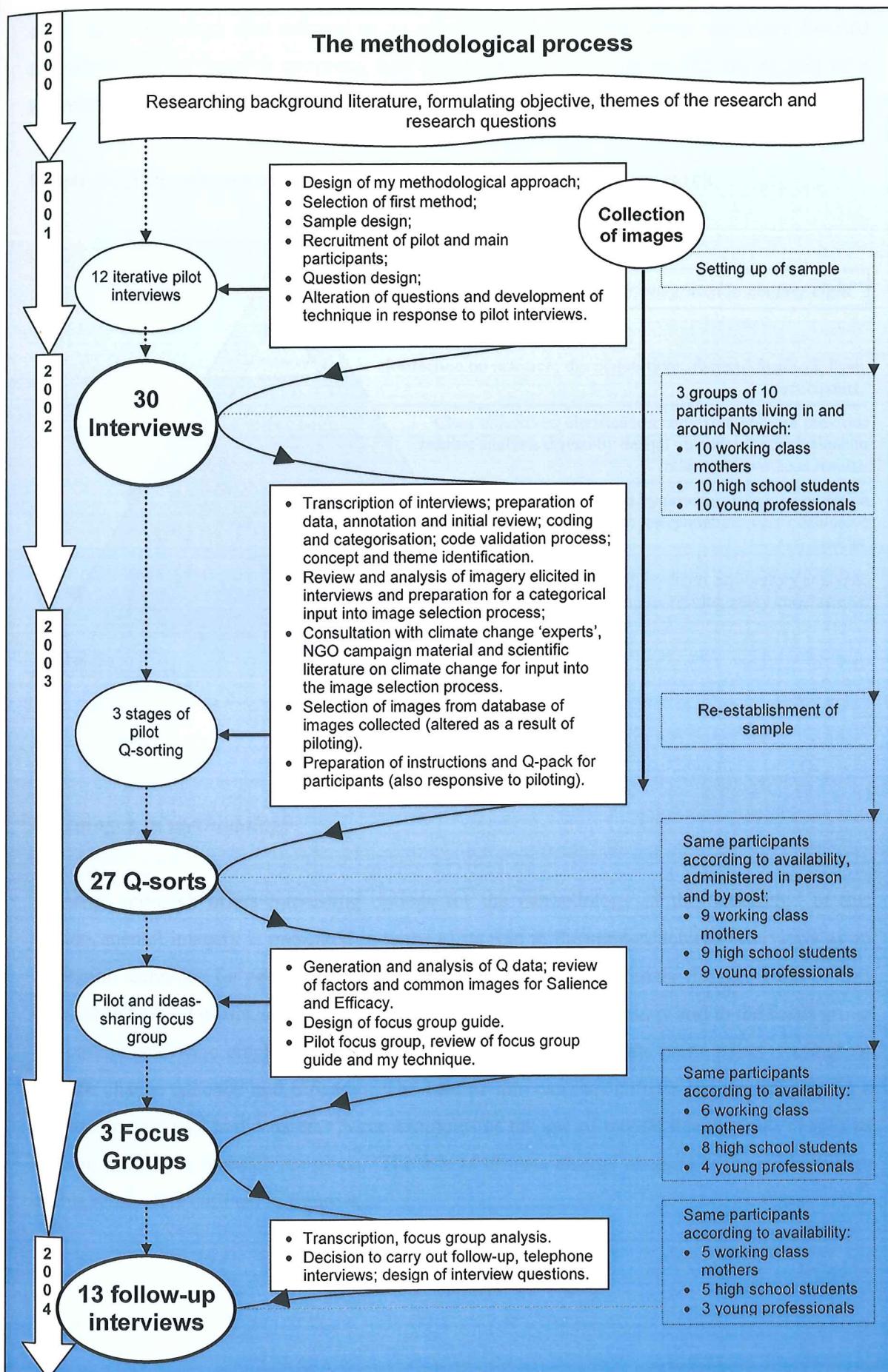
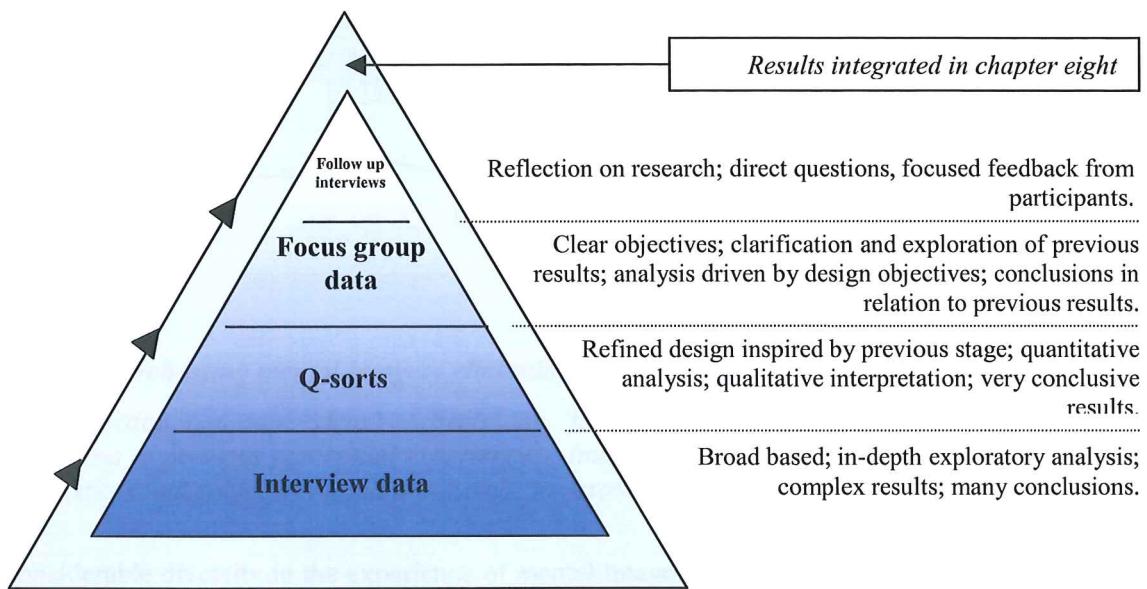


Figure 4.2 illustrates the bottom-up nature of my methodological approach in terms of the methods used and nature of the results. The study began with the broad base of the interview data. Q-methodology was selected as an appropriate method for further and more focused exploration of the research questions, and so on. Each stage built on the last as part of a sequential and more focused process as the research progressed.

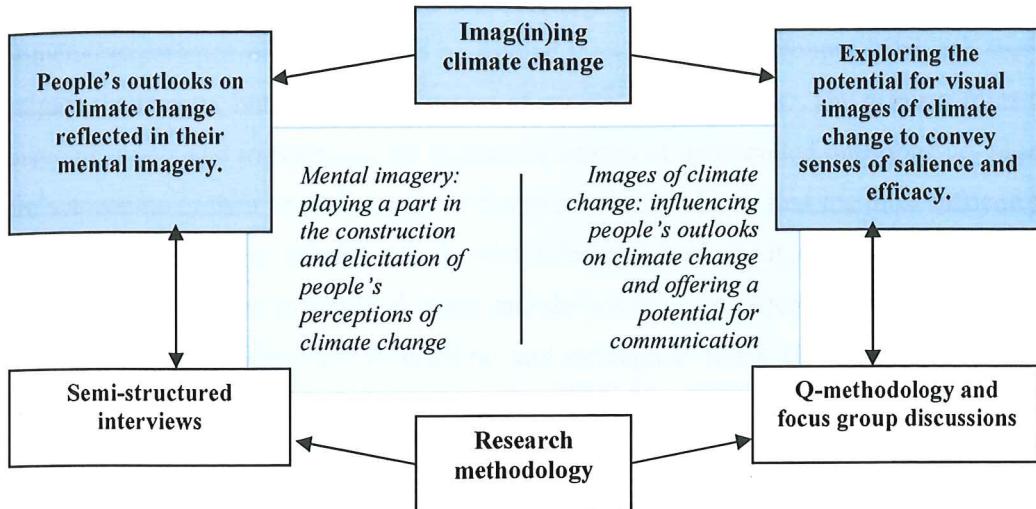
Figure 4.2 The bottom-up methodological approach taken in this research



4.3 Images in methodology

A visual approach offers interesting options for the methodology of this research. In this section, mental imagery is presented in terms of its role in the semi-structured interviews as an elicitation technique for people's thoughts about, and imagery of, climate change. Built on this baseline data, a set of images was put together for use by Q-methodology and in the focus group discussions and were employed as a visual tool to further investigate participants' feelings of climate change salience and efficacy. The role of this external climate change imagery as a methodological tool is discussed. Some examples of the use of mental imagery and images as tools in qualitative research are given. The role of climate change imagery in the methodology of this research is outlined in figure 4.3.

Figure 4.3 The role of climate change imagery in the research methodology



4.3.1 Research using mental imagery elicitation

“Introspection can tap ‘ideas’, ‘affects’ or ‘feelings’, but above all images, i.e., mental evocations of previous perceptual experiences. Images are not only easy to access but are also experiences that subjects can put into words, for example, in verbal reports.” (Denis, 1989:16)

Considerable diversity in the experience of mental imagery is present among the general public because image content varies from person to person (Fodor, 1981). In terms of climate change, people's spontaneous mental imagery is influenced by their knowledge and understanding of the issue, by messages they associate with climate change delivered via the media and other people, and by other experiences and other associations they make with the issue. The mental imagery that different people articulate therefore depends on their life history and experiences, symbolic events, attitudes and all sorts of other psychological variations as discussed in chapter three.

Aside from the nature or content of people's spontaneous mental imagery, Richardson (1999) suggests that there are individual differences in the extent to which people tend to experience vivid images. Finke (1989) suggests that some people are able to form clear and vivid images at will, whilst others might have little if any imagery ability. People also vary in the ease and the speed with which they evoke imagery⁴⁵. Paivio (1991) argues that different people habitually use different forms of thinking broadly based upon either imagery or verbal processes, some tending to be more visual (mainly relying on visual imagery in remembering) and others more vocal (relying mainly on language).

⁴⁵ Women tend to report more vivid imagery than men (Paivio, 1991), but this was not tested in this research.

Because mental imagery is essentially a private and subjective experience, we cannot directly observe other people's mental images (Finke, 1989; Richardson, 1999), however, we can ask them to describe sensations, thoughts and feelings. Richardson (*ibid.*) states that as a phenomenal experience, imagery has to be studied through verbal accounts. One can therefore investigate the images, but only in the context of people's descriptions. The primary route is via linguistic channels and imagery can be elicited by means of open-ended questions i.e. based on people's accounts of their mental imagery. Schwartz (1981) claims that the most difficult thing about imagery research is knowing exactly what is being talked about, because although images cannot be located or seen in physical space and do not have an objective existence, our usual ways of describing imagery are in physical and perceptual terms (Kosslyn, 1980; Shepard, 1990). Finke (1989) states that you cannot rely on what people tell you about their images because subjective reports are often inaccurate and unreliable, and this is partly because mental images are very elusive and are not necessarily consistent; they may appear one moment and fade the next or change according to a person's situation, cognitive activity or other incoming stimuli. They can wane and be altered or even distorted when one's interpretations change (in the way memories can). One limitation to note, therefore, is that while the process of change in mental imagery is constant, elicited images can only provide a static representation of a person's mental imagery. Accounts given by participants are considered to shed light on the nature of their climate change imagery and their outlooks on the issue, rather than giving a definitive impression. This is because even when we are trying to interpret visual data from introspection, we may be insensitive to many aspects of our imagery partly because much of it remains in the unconscious (see also Goodman, 1990). However, Denis (1989:34) highlights the potential range of imagery accessible by the conscious mind:

"Even when classifications are restricted to conscious forms of imagery...the range of imagery activities and the functions they serve is still enormous."

There are examples of research that has used imagery elicitation to explore people's perceptions and feelings about the future and other environmental issues. Peters and Slovic (1996), for example, used a telephone survey where participants' mental imagery and thoughts were elicited by verbal free-association to the concept of a nuclear waste repository. They suggested that relatively simple image-elicitation techniques can reveal mental imagery and affective feelings, and provide a powerful framework for predicting both intended and actual behaviour; that images about an issue and the emotional significance attached to them are related to an individual's worldview. Fleer (2002) asked Australian school children aged 5-12 years to draw or write about their visions of the future, in particular what their environment would look like when they were grandparents. The children were subsequently interviewed in groups about their understandings using the drawings and written material. Alerby (2000) also employed the use of drawings by children and young people (combined with oral comments) to understand

their thinking about the environment, and Barraza (1999) analysed drawings by English and Mexican school children to evaluate their environmental perceptions, major expectations and concerns for the future.

4.3.2 Research using images as a tool

Chapter three discussed the subjective nature of image interpretation and the significance of individual differences. This applies to the second and third methodological stages which involve the use of climate change images to investigate people's feelings of salience and efficacy and the potential to stimulate these further.

Stoll-Kleemann *et al.* (2001) used the creation of collages as pictorial representations of possible outcomes of climate and energy futures. Groups in the study were asked to think about how the region in which they lived might look 30 years into the future depending on different levels of energy use. They then presented the collages to each other and the conversations were taped so that it was possible to understand better the various interpretations of the collages. Kasemir *et al.* (2000a) employed visual expressions of citizen's association with energy use and its relation to climate change. They find that there is a gap between the complexity and uncertainty involved in climate change research and the graphic images of catastrophic events which actually capture the public imagination. Appleton and Lovett (forthcoming) state that visual communication is an increasingly common part of environmental decision-making and much other environmental research also employs visual imagery. Many examples lie within the realm of landscape visualisation, where visual communication is used in public participation exercises and decision-making processes for landscape change for example. Clay and Daniel (2000) state that a major component of an encounter with the natural environment is visual or scenic quality, making visual assessment a key tool for participatory planning exercises and landscape quality assessments (see also, Al-Kodmany, 1999). Research in the field also concentrates on the potential for visualisation technology to act as a tool for landscape planning, design, and preference studies (examples include Bell, 2001; Daniel and Meitner, 2001; Gimblett *et al.*, 2001; Hands and Brown, 2002; Lange, 1994; Misgav, 2000; Orland, 1994; Pullar and Tidey, 2001; Purcell *et al.*, 2001).

4.4 Sample and setting

This study explores people's outlooks on climate change and is based on the premise that people are explicitly not homogenous (e.g. Thompson and Rayner, 1998). A small sample was deemed appropriate for the nature of the study. The individual and in-depth approach takes into account variations in people's perceptions and values, as well as identifying broad patterns; generalisation is not an objective.

Set in the community of Norwich, UK, the study employed a sample of 30 participants. This sample was made up of three broad groups: ten high school students (aged 16-17 years), ten young mothers from an area of Norwich recognised as having some socio-economic disadvantage (referred to as working class mothers throughout this thesis), and ten middle-class young professionals. I felt that it was important to avoid selecting a wholly middle class sample and to present a range of ages and life stages within the sample (e.g. Mason, 1996). In deciding on both the methods and the sample that I should employ in order to explore my objective, I had to take into account a number of practical considerations. These included time and financial constraints, finding participants who would be prepared to take part in the whole research process and finding participants who were local.

Purposive sampling involves making choices about cases or settings according to some initial pre-specified criteria, deliberately selecting particular settings, persons or events for the important information they can provide that cannot be obtained from other choices (Patton, 2002; Pidgeon and Henwood, 2004). It "...allows us to choose a case because it illustrates some feature or process in which we are interested" (Silverman, 2001:250). The sample was identified as a result of piloting the interviews with a range of people, consulting colleagues and referring to the climate change perceptions literature. Because of practical constraints, only a small number of groups could be selected. I chose people from different lifestyle and social backgrounds and settings in order to generate diversity in the points of view expressed. Schlinger (1969) states that structured samples such as the one in this study may be used in order to make certain that relevant sub-classes of respondents are sufficiently represented (even though the incidence of those sub-classes in the population may be relatively small). A further justification for the choice of the sample groups was that each was thought to have different interests in the future, or orientation. In the case of nuclear power for example, Drottz-Sjöberg & Sjöberg (1991) found that the future was the most important value dimension. Climate change is framed as a future issue and certainly, human activities carried out in the present will be reflected by climate changes many years into the future. A rationale for my choice of sample groups is given in table 4.2. Participants were constant throughout the research, however the number of individuals participating at each stage declined as the study progressed (see figure 4.1). Table 4.3 gives an account of how the participants in each group were recruited and how the three stages of fieldwork were organised.

Table 4.2 Rationale for the choice of sample groups

Group	Rationale
High-school students	<ul style="list-style-type: none"> Formative opinions on many issues; cognitive and moral development. Possibly strong orientation to the immediate future, e.g. at a stage in their lives where decisions about what to do next are prominent⁴⁶.
Young mothers	<ul style="list-style-type: none"> All participants have young children, the assumption being that outlook on life would be highly influenced by their children's future well-being. This group represent an area of Norwich that suffers from some economic disadvantage and social problems⁴⁷.
Young professionals	<ul style="list-style-type: none"> Future orientation in some cases is having children, in others careers, etc. This group were largely representative of a middle class population; generally high consuming and highly mobile.

Table 4.3 Participant recruitment and details of the arrangement of fieldwork

Sample group	Participant recruitment	Arrangement of fieldwork stages
High-school students	The selected school has a link with UEA and other professional contacts who had recommended approaching it. A geography teacher at the school was interested in the study, and keen for the students to participate in outside activities. On my behalf he arranged some initial interviews.	Interviews took place on school premises. Participants were recruited by 'snowballing' via initial interviewees and by visiting the school library during breaks over the period of two days. Contact details were provided by each participant; all stated that they would be willing to take part in further research. The following year, contacts were re-established by telephone and arrangements made for completing the Q-sorts by post. At this time, availability for attending a subsequent focus group was also established. The group were now in the second year of their A levels and the arrangements had to take revision and exams into account. The venue for the focus group was arranged via the same member of staff and again, took place on school premises.
Young mothers	Contact with a community development officer in Norwich City Council was established. She identified an area of Norwich where she thought she would be able to recruit participants on my behalf. She obtained contact details for a group of mothers who met regularly for a toddlers group and who were interested in participating.	By joining the group every week for 6 weeks at the local community centre I interviewed 10 mothers who were happy to participate further at a later date. Interviews were conducted each week in a room adjacent to the hall where the group met, so that others could care for the children while their mothers were being interviewed. Contact details were obtained for each participant. The following year, contacts were re-established over the phone and arrangements made for completing the Q-sorts (the mothers were happier for me to run through the task with them, either in their homes or at the community centre during the mothers and toddlers group than completing it by post). During this period participants' availability for attending a focus group was established; the focus group arrangements had to take into account childcare, etc. It was decided that the group should be held during an evening at the community centre, a familiar venue.
Young Professionals	Recruitment was dependent on snowballing via existing contacts, colleagues and friends outside the university. Those approached during the recruitment process seemed a little less willing to participate than individuals in the other two sample groups.	Over a period of two months, a sample was recruited which represented a mixture of ages (23-36 years) and professions (lawyer, teachers, journalist, scientist, trainer, administrator, physiotherapist, social worker, salesperson). Participants were interviewed in a variety of convenient locations, e.g., their homes and workplaces. Contact details were obtained for each participant; all stated that they would probably be willing to participate further, but some mentioned that they might not want or be able to nearer the time. Contacts were re-established over the phone and by email, and arrangements made for completing the Q-sort by post. Participants' availability for attending a focus group was also established. Some were unable or unwilling to give up an evening to attend. The focus group was organised and held at a local sports centre with meeting facilities.

⁴⁶ Drott-Sjöberg & Sjöberg (1991:2010) state why they chose to study an 'adolescent' group: "We assumed the existence of different values and beliefs established early in the socialization processes and present already in adolescence. We thus expected the students to have formed opinions about issues related to nuclear power, although their actual knowledge would not differ drastically, and predicted that the expressed opinions would be in accordance with the general interest orientation..."

⁴⁷ Sjöberg (2000b) argues that there is usually a bias in risk perception work involving too many respondents with an above average level of education. This area tends to have a low educational level in comparison with other areas of Norwich, confirmed in discussion with my contact from Norwich City Council.

4.5 Semi-structured interviews

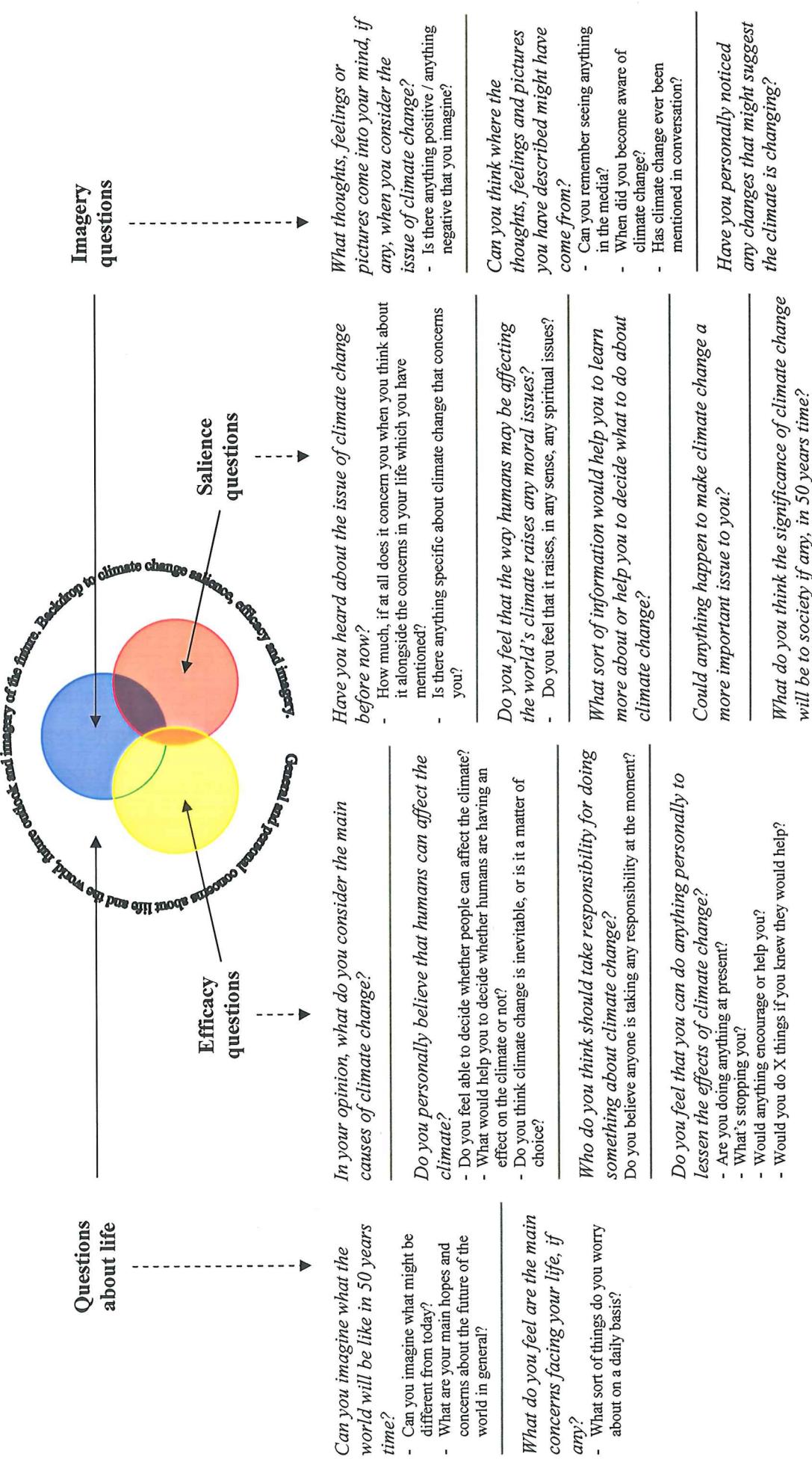
The semi-structured interviews aimed to explore participants' outlooks on climate change in terms of salience, efficacy and imagery: the images that came to mind when talking and thinking about climate change, its importance and how able they felt as individuals to do anything about climate change. Semi-structured interviews are of great value in the pursuit of understanding people's motives and interpretations and in gaining insight into their world views (Flick, 2002; Luttrell, 2001). Because of their open-ended nature, they provide a way of generating data about people's perceptions, opinions and visual interpretations of their relationship with climate change. The technique is linked to the expectation that the interviewee's viewpoints are more likely to be expressed in a relatively openly designed interview situation than in a questionnaire survey or tightly structured interview (Flick, 1998; Satterfield, 2001). Open-ended questioning gives a foundation on which an interviewee can base their response, whilst still allowing them to talk freely and to discursively consider their own agendas. Survey techniques, for example, would have restricted the ways in which people felt able to raise issues or openly discuss their concerns (Hinchliffe, 1996) and would have limited participants' opportunities for visual expression of their outlooks on climate change.

It is important for semi-structured interviews to be well planned in order to be effective. The following considerations were crucial to the integrity of the design of this component of my methodology: the choice of participants; devising and testing an interview schedule; carrying out the interviews; the nature of the data: how the data can be analysed and presented; and researcher effects. These are addressed in the following discussion.

4.5.1 Question design

The interview questions and their range were formulated around the three guiding themes: the importance that people attribute to climate change personally (salience); how able they feel to do anything about it (efficacy); their imagery of climate change; and in the context of their wider concerns in life and their beliefs or feelings about the future (people's feelings about climate change are considered to be enveloped within this wider frame of reference). In semi-structured interviews, the questions act as a guide to support the narrative string developed by the interviewee and act as a basis for avoiding stagnating or unproductive conversation. An interview guide was therefore designed to offer a logical sequence of questioning and particular wording, or phrasing of questions. Flick (1998:78) states that the range of questions "...aims at securing that all aspects and topics relevant to the research question are mentioned during the interview". Appendix 1 presents the interview guide used with participants. Figure 4.4 relates these questions to the themes of the research. A review of the content of the questioning guide is presented in box 4.2.

Figure 4.4 Design of the interview questions in relation to the themes of the research



Box 4.2 Summary of the interview questions

The initial questions are general and based on finding out what people imagine the future to be like, what their main concerns are for the future of the world, what are the main concerns facing their own lives and how climate change compares to these in importance. Questions are then introduced to elicit the imagery that people have in their minds about climate change. This is followed by some questions on their opinions about the causes of climate change; whether they've noticed any local changes which might suggest climate change is happening; whether they consider that there is a moral or spiritual dimension to climate change; who, if anyone, they think should take responsibility for it; what they think they could do personally to lessen the effects of climate change and whether they are doing anything at present; an enquiry into the sort of information people think would help them to learn more and finally what they think the significance of climate change will be in future.

The interview guide was designed and refined as a result of a piloting process. This led to a logical question order with clear zones of conversation surrounding each theme. The questioning guide was structured whilst being open enough to allow respondents freedom to respond with their own meanings, thoughts and feelings in a conversational style. It incorporates a mixture of open and more direct questions. Open questions allowed participants to comment on issues in their own words and were particularly appropriate for eliciting interviewees' climate change imagery, while more direct questions were useful to prompt them further or focus their responses (e.g. Flick, 1998; Gaskell, 2000). Lorenzoni found that people have a complex stock of knowledge about climate change and so these types of questions (as well as this method) were very appropriate (see also Lorenzoni and Langford, 2001a; 2003). Flick (1998) adds that people will have immediate assumptions or thoughts about issues which they can express spontaneously in response to an open question. While interviewees were given the chance to introduce new topics, focus was maintained using prompts and moving on to other questions when considered appropriate. Using relatively open questions accompanied by prompts to encourage people to elaborate on their ideas or trains of thought was a beneficial approach. Morgan (1995) states that by doing this, interviewers can ask follow up questions without introducing new ideas in order to get more of a sense of what people know and believe about a particular issue. Prompts were included in the interview guide and used in the interviews to draw interviewees back from tangents, or to trigger more thoughts. Flick (1998) notes that specific prompting also deepens the understanding on the part of the interviewer by mirroring, summarizing and feeding back what has been said by questions of comprehension and clarification (see also Bernard, 2000; Rubin and Rubin, 1995). With specific relevance to interviewing people on the topic of climate change, Morgan (1995:17) states, "When asked to tell what they know about climate change, most people run out of steam relatively quickly...If

interviewers have been well trained, they can ask follow-up questions without introducing any new ideas of their own.” (see also Bostrom *et al.*, 1994).

The same interview guide was used in all the interviews. Bulkeley (2000) argues however that different groups have different types of vocabulary and associate different meaning with the words used; a potential problem associated with using the same questions across groups (see also Rubin and Rubin, 1995). Measures taken to deal with this issue involved the careful planning and piloting of the interview guide to develop a relaxed approach. The guide was intended to be flexible rather than rigid, allowing variation in the order of the questions depending on the flow of conversation, their re-wording as appropriate to the participant and the use of prompts when necessary in-situ⁴⁸. Semi-structured interviews can provide the intuitive freedom to adapt the questions to a particular situation (May, 1993). The piloting process led me to feel confident and relaxed in my approach and the semi-structured design did allow flexibility for tailoring each interview to the interviewee.

4.5.2 Piloting and carrying out the interviews

Silverman (1999) recommends thorough pre-testing as one of four means of achieving reliability in an interview schedule. There were three reasons for conducting a pilot study: to design, refine and test out the questions (style, range, wording, etc., as noted above); to develop and practice my interviewing technique. The pilot sample of 12 respondents was intended to reflect a range of ages, backgrounds and professions, interests, level of education, etc. This helped me to decide on the appropriate sample groups as outlined earlier.

The pilot study was carried out over the course of a few months while background research was ongoing. Rubin and Rubin (1995) advocate that design takes place gradually, that it is an iterative process and that the final design emerges slowly. Repeated testing, critical reflection and consultation with colleagues ensured that the interview questions adequately addressed the themes of the research, objective and research questions. Kempton (1991) illustrates the importance of piloting in the field, stating that when discussing interview plans with colleagues, he was successfully able to convey his intentions. However, Kempton found that the terminology used was not successful in the interviews. Piloting was crucial in this study for a similar reason, highlighting areas of difficulty that had not arisen in the consultation process. It gave me the following opportunities: to prepare for misunderstandings and cases of non-response; to try and test a series of prompts and to practice re-phrasing the questions; to practice and reflect on my interviewing style, adaptability and listening skills; to become familiar with the questions and develop a relaxed approach to interviewing (consequently I was able to cover

⁴⁸ Rubin and Rubin (1995) note that qualitative interviews are flexible and iterative, that they are not locked in stone.

the material in a relaxed and conversational way, intuitively deciding when to introduce questions and prompts). A relatively informal style is one element that characterises a qualitative interview (Bernard, 2000; Gaskell, 2000; Mason, 1996). It was important to develop a relaxed rapport in the interviews so that participants felt at ease and able to express their true thoughts and feelings without feeling constrained or judged. The location of the interviews (see table 4.2) was an important aspect to consider. In most cases this was beyond my control, however all locations were familiar to participants⁴⁹.

Each interview was designed to last between 25 and 40 minutes. Piloting led to a reliable average of half an hour and interviewees were given prior notice about approximately how much time their interview would take. The interviews were tape recorded with consent from participants. The tape recording of semi-structured interviews has been established for a long time (Flick, 1998). This enabled me to concentrate on carrying out the interview without taking notes, and to make full transcripts for analytical purposes and the presence of a small tape recorder in the interviews did not appear to distract participants. Low-energy light bulbs were given to participants to thank them for their participation. Following each interview, notes were taken to record any problems or indications that interviewees were uncomfortable in the interview situation, how I felt about the interview, how I felt I related to the person and how they appeared to relate to me. This was a useful self-reflection and learning exercise. Flick (1998) advocates that at the end of an interview, the interviewer should note his/her impressions: the communication; the interviewee as a person; of himself or herself and his or her behaviour in the situation; external influences; situational influences, etc. Context information was thus documented and was helpful for later interpretation of the transcripts and comparison with other interviews.

4.5.3 Data management and analysis

Each interview was transcribed verbatim into a permanent text based format. This helped me to familiarise myself with the data and stimulate my thoughts about the themes arising from it. The generation of an accurate and permanent record of each interview helped me to avoid making unwarranted assumptions about the data. An excerpt of one of these transcriptions is presented in appendix 2. A parallel process of noting personal thoughts, reflections and links with the literature was carried out.

“...it is not merely the method that promises to deliver on some set of local or context-grounded truths, it is also the processes of interpretation.” (Lincoln and Guba, 2000:178)

⁴⁹ Elwood and Martin (2000) note that the location of interviews is an important decision and can have implications, e.g. meaning in relation to the interviewees.

Qualitative research generates a huge volume of text-based information. The data interpretation and analysis can be extremely overwhelming and there is no best system for analysis (Fontana and Frey, 1998; Janesick, 2000). A systematic analytic strategy was taken in order to interpret the large amount of interview data whilst still retaining closeness with it. Procedures outlined by Strauss and Corbin (1990) provided me with an approach to managing and analysing such a lot of data in an exploratory way. A process of coding and categorisation of the data, identifying emerging patterns whilst still remaining in touch with the individuality and detail within these was undertaken. The exploration and management of the text was carried out with the aid of Atlas.Ti, a qualitative data analysis software package⁵⁰. The analytical approach taken is suited to a process-based and inductive methodology. Chapter five presents a more detailed discussion of how the interview data analysis was carried out, followed by the results of this first stage of the empirical research. The semi-structured interview data constitutes the first part of a systematic and bottom-up methodological process, acting as the inspiration for the design and development of the subsequent phases of research (as demonstrated in figure 4.2).

4.6 *Q-methodology*

The original intent of Q-methodology (hereafter “Q”) is exploratory and interpretative. It usually employs a small sample of subjects and is complemented with follow-up interaction with participants to draw out underlying attitudes and values behind the viewpoints revealed (Fairweather and Swaffield, 2001). This small scale, but in-depth study explores the interaction between climate change imagery, and people’s feelings of salience and efficacy for which there is little previous literature on which to build concepts. Q provides a unique way of exploring people’s outlooks on climate change, identifying common responses amongst participants to climate change images in terms of salience and efficacy.

“Q-technique is a way of classifying respondents on the basis of their attitudes toward stimuli.” (Schlinger, 1969: 53)

Q is a technique for eliciting, evaluating and comparing human subjectivity, offering the means to identify shared attitude structures, views and perspectives among individuals regarding a certain problem (Brown, 1980; McKeown and Thomas, 1988; Robbins and Krueger, 2000;

⁵⁰ Coffey & Atkinson (1996) propose that the use of computers is a key feature of contemporary qualitative data analysis (see also Tesch, 1990). It does not offer any analytical aid in the sense that the software cannot think on behalf of the researcher but it does help to organise and analyse large and complex data sets (Gaskell, 2000). Coffey *et al.* (1996) question whether programs like Atlas.ti enable uncritical thinking by users. Charmaz (2000) adds that these packages appear more suited for objectivist grounded theory than constructivist approaches because they may foster an illusion that interpretive work can be reduced to a set of procedures, and infers that gaining a holistic sense of the body of data is not possible using a computer as an aid for data management and analysis. I argue that this is an issue of mindset and of the way in which a researcher approaches their data including their ability to maintain a multidimensional view.

Stephenson, 1953; Stone and Green, 1971)⁵¹. Most Q studies are exploratory and qualitative in their nature. In Q, people's responses are not being measured against predetermined concepts or criterion as in other statistical methods. Its focus is on uncovering participants' perspectives instead of measuring them in relation to an operational definition or variable (Kitzinger, 1999). Because Q does not use concepts or measures that have been pre-specified or that require large numbers of participants to produce valid results, Q typically employs small numbers: McKeown & Thomas (1988:45) state that the main concern of Q "...is not with how many people believe such-and-such, but with why and how they believe what they do". Q is a suitable methodology for any kind of research where the identification of homogeneous response segments add meaningfulness (Kitzinger, 1999). While people's attitudes, experiences and discourses are individual and subjective, there may also be some degree of communality or sharing of discourses and therefore similar patterns of response or social discourses. Q's concern is with what views individuals hold and to what extent the members of a particular group share these discourses, and therefore generalisations occur but these do not extend beyond the participants involved in a Q study (Barry and Proops, 2000; Kitzinger, 1999; Valenta and Wigger, 1997). It has the capacity to reveal underlying agendas or unrecognised social discourses by outlining areas of consensus which may reflect previously unrecognised shared attitudes (Addams, 2000)⁵². These are identified by Q using the statistical technique of factor analysis to determine the range of discourses by seeking patterns of subjective response among individuals, thereby eliciting a variety of accounts around a particular theme or issue. Q therefore combines the openness of qualitative methods with the statistical rigour of quantitative analysis, spanning the divide between qualitative and quantitative approaches to attitudinal research (Addams, 2000; Barry and Proops, 2000). Addams & Proops (2000) argue that Q is particularly suited to studying socially contested environmental issues (such as climate change) because it can provide insights into the ways in which these are conceptualised. Its use as part of this research is also a result of the possibility Q offers for working with visual stimuli as well as with written ones. It gives scope for exploring outlooks on climate change, solely in a visual medium; for exploring feelings of issue salience and personal efficacy directly in relation to images of climate change.

4.6.1 Design of the Q-sorts

The instrumental basis of Q is the Q-sort technique whereby a subject models his or her point of view by rank-ordering a Q-sample of stimuli defined by a guide for sorting the Q-items (Brown, 1980, 1996; McKeown and Thomas, 1988). Participants in this Q study are asked to sort a set

⁵¹ Stephenson (1953) regards subjectivity as the internal frame of reference one calls upon to make sense of the world. In the context of Q, it is a person's communication of his or her point of view on any matter of personal or social importance, anchored by their internal frame of reference (McKeown and Thomas, 1988).

⁵² Addams (2000) uses the term discourse to mean a way of seeing and talking about something; a set of views and attitudes on a particular topic. Discourses represent the way an individual relates to, and forms conceptions of certain aspects of the world and these may vary over time (Barry and Proops, 2000).

of images according to two conditions of instruction, one for salience, one for efficacy. Each gives them a parameter against which to rank the images: one for salience, one for efficacy (the same Q-sample was used for both sorts)⁵³.

Respondents sort stimuli (the Q-sample) into a fixed distribution (appendix 4b) according to the specific instructions. Q-studies generally use this kind of forced-choice Q-sort, which requires participants to sort items into fixed rank positions (Sexton *et al.*, 1998). Stimuli placed at the extreme ends of the distribution represent the strongest positive and negative reactions to the condition of instruction and the items placed in the middle represent more neutral reactions. This encourages participants to compare the relative importance of the Q-stimuli to a greater extent than they would if there was no guide; the pattern forces people to differentiate between the stimuli, prioritize and make choices that reveal their viewpoints vis-à-vis a topic under consideration (Barry and Proops, 2000; Brown, 2002). Dryzek and Berejikian (1993) explain that a contextual understanding is achieved in Q because the ranked stimuli are not taken in isolation, but are placed in the context of all others as participants are making comparisons between them and ranking them relative to one another (see also Brown, 1980). A viewpoint emerges as a result of participants expressing their strongest views in relation to a topic (Kitzinger, 1999). The sorting operation is wholly subjective, representing each individual's point of view and the meaning of each stimulus is subject to individual interpretation; the same stimulus in a Q-sample may mean different things to different people depending on the context in which it is interpreted (Addams, 2000; Barry and Proops, 2000; Kitzinger, 1999). The interpretation of these viewpoints is aided by participants' associated comments and in follow up discussions (Kitzinger, 1999).

In Q, the sample is a set of stimulus items that is presented to each participant for rank ordering. The nature of the stimuli constituting the Q-sample is constrained only by the domain of subjectivity in which the researcher is interested (McKeown and Thomas, 1988; Schlinger, 1969). Q studies typically employ the use of statements for the sorting exercise however in this case, pictures are used. Fairweather and Swaffield (2000; 2001) state that Q-sorting with photographs is appropriate and works well for research that emphasises experiential and socio-cultural aspects of environmental perception. A minority of Q studies have used images as their sample. Fairweather and Swaffield (2001) conducted a study using photographs to identify

⁵³ Generally Q-studies report only one sort however, in this research I am concerned with how the images relate to both participants' feelings of salience and efficacy. Therefore, in this study there are two conditions of instruction constituting a double Q-sort (e.g. Stone and Green, 1971). A number of issues have to be considered with reference to the double Q sort, e.g. the time it takes; participant concentration and fatigue; the impact of recall. Stone & Green (1971) find that participants complete a second sort with a minimum of difficulty and in less time than the first, since they were more familiar with the instructions and more able to concentrate on content and less on the process of sorting. There may also be some recall effect; the participant being influenced in his ranking of an item on the second sort because of where they recall placing it in the first. These issues were taken into account and tested during the pilot study.

broad dimensions of the physical landscape, focussing on understanding visitors' landscape experience in Kaikoura, New Zealand. They found that the use of pictures could encompass a wide variety of landscape settings and had the ability to focus on subjects in ways that allow sensitivity to individual responses. They found that the use of photographs was unproblematic as subjects found it easy to assess images in response to the condition of instruction. Other studies include Swaffield and Fairweather (1996), Palmer (1997), Amedeo *et al.* (1989) and McCoy and Evans (2002).

A major portion of the time spent carrying out Q-methodology is devoted to designing the Q-sample, and this is a challenging part of the design process (Donner, 2001; McKeown and Thomas, 1988; Sexton *et al.*, 1998; Valenta and Wigger, 1997). The aim of the Q-sample is to present the widest range of possibilities or situations to subjects (Fairweather and Swaffield, 2000, 2001; Swaffield and Fairweather, 1996). The items constituting the Q-sample is selected from, and should be representative of, the entire range of discussion on a topic, or the 'flow of communicability', sometimes called the concourse (Brown, 1999). A well-rounded sample should therefore provide a fair and comprehensive representation of all that is being said about the topic (Brown, 1991; Sexton *et al.*, 1998). The concourse can be generated in a number of ways, e.g. interviews with participants which ground the stimuli in concrete existence (Brown, 1991, 1996; Sexton *et al.*, 1998). Other sources can also be used, and a concourse may be generated intuitively depending on the nature of the study (Schlinger, 1969)⁵⁴. In this research, the Q-sort sample is defined by a categorisation derived from the following four sources:

- Image categories grounded in the interview data from the first phase of research;
- A review of the climate change literature, projections and scenarios for the future;
- Consultation with climate change and public perception experts;
- A review of NGO campaign imagery.

The image sample has been composed systematically, ensuring that all relevant components of the climate change issue are represented. The process is robust and the final categorisation (and hence the sample) is as comprehensive and visually representative of the climate change issue as possible. 32 images were used in this study based on the categorisation of the concourse on climate change (Q-samples typically use between 30 and 50 items in order to be comprehensive yet manageable). They are attached in appendix 3. The image selection process is explained in more detail in chapter six. Sexton *et al.* (1998) recommend that various content validation approaches be used to verify the representativeness of the Q-sample items (e.g. knowledgeable individuals). Basing the image sample on expert advice, a literature review and pilot study in

⁵⁴ A study of public opinion for example would necessitate interviewing suitable representatives about the issue in question (Brown, 1991).

addition to the baseline data helped to ensure content validity; and that the Q-sample is unbiased and varied in order to allow different viewpoints to be expressed in the Q-sort (Fairweather and Swaffield, 2000; Valenta and Wigger, 1997). The sample was also taken back to the consulted experts for review and was put through an iterative piloting process.

4.6.2 Piloting and carrying out the Q-sort

A pilot sample of 10 members of the public was employed through informal recruitment of friends and various contacts outside academia and subsequent snowballing. Participants in the main study were engaged in the research process and would be completing the Q-sort against the backdrop of their interviews whereas pilot participants were not. Therefore it was not necessary to recruit pilot participants relating to the groups included in the main sample. The pilot study was carried out for logistical and structural, rather than theoretical reasons:

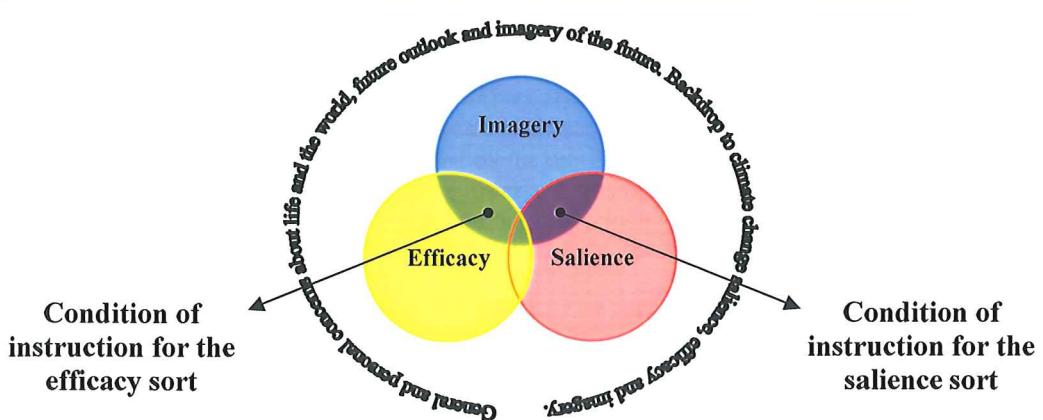
- To decide on the image sample (explained further in chapter six);
- To make sure that the images would be manageable (number and size);
- To design an easy to follow set of instructions;
- To time the task.

An iterative process was employed for the piloting of the Q-sort, which was initially conducted with four participants. Changes were made to the instructions, the number and size of the images, and the image selection before the study was piloted again with a further four pilot participants. Finally, the Q-sort was piloted with two people to make final adjustments. At each stage, a Q-method pack⁵⁵ was given to participants including a briefing sheet to explain the point of the exercise, that their comments would be very much appreciated and that there were no right or wrong answers. The pilot participants were specifically asked to make comments on: each image in the set and what they thought it was showing; the size and number of the images (e.g. whether they were manageable); the range of scenes shown in the pictures; their interpretation of the instructions and how they might be improved (whether they were understandable and straightforward, if there was anything they did not understand or thought could be explained better); whether they understood the sorting instructions; the format of the instructions; and how long the task took. The size and number of pictures had been varied in the pilot Qsorts; the most manageable being 32 images, slightly smaller than a postcard. The exercise took between 30 and 45 minutes.

⁵⁵ Q-sorting materials: An instruction booklet; two response sheets corresponding to the Q-sort pattern to be filled in by the participants after they had sorted the images; markers (-3 to +3) to help them set out the image sorts; two comments booklets (one for each sort); and one set of postcard sized pictures. Participants found it helpful that the materials particular to each sort were different colours.

A main focus of the piloting for the instruction document was the wording of the specific criteria or ‘conditions of instruction’ given to participants for sorting the images. The instructions used are presented in figure 4.5 which demonstrates their relevance to the themes of the research (see also the instruction booklet given to participants, attached in appendix 4a). Following the piloting of various options and consultation with colleagues, the specific criteria given to participants for sorting the pictures were determined. It was important to make the two instructions distinct so that participants would arrange the Q-sorts differently.

Figure 4.5 Q-sort conditions of instruction



- These pictures make me feel that nothing I do will make any difference to climate change
- I am unsure or undecided about these pictures, or they seem unimportant to me
- These pictures make me feel that I can do something about climate change personally
- These pictures make me feel that climate change is not important
- I am unsure or undecided about these pictures, or they seem unimportant to me
- These pictures make me feel that climate change is important

The Q-sorting procedure is outlined in box 4.3. The format of the full Q-sort instructions was informed by consultation with experienced colleagues and guidelines suggested by McKeown and Thomas (see also 1988). A booklet was designed and piloted with different coloured pages according to which of the two Q-sorts the participants were completing (the text of the instructions is attached in appendix 4a). The images used in the study were randomly assigned numbers so that participants were able to note their arrangements on the response sheets corresponding to the sorting pattern (appendix 4b) and were professionally printed on thin card. The pictures were mixed up before being given to participants for sorting along with a cover letter and the other Q-sorting materials. The comments booklets were provided for participants to explain their sorting of the images. This helped me to understand the reasons why participants sorted the images in particular ways and therefore inform the description of the

factors output from the analysis. The majority of participants found the instructions easy to follow but many noted that they felt restricted by having to place the pictures exactly into the pattern provided (a characteristic of the forced-distribution design outlined earlier but not a problem in terms of the Q-output). Participants generally found the second sort easier because the images were more familiar and therefore easier to manage and sort.

Box 4.3 The Q-sorting procedure

Participants are asked to:

- Find a table top or space on the floor where they can lay out the Q-sort.
- Review the items and become familiar with them.
- Sort the items into three piles according to whether they feel generally positive, negative, or neutral/ambivalent/uncertain about each item in terms of the condition of instruction (this gives participants more time to familiarise themselves with the sample, think about their responses and subsequently place the pictures into the Q-sort more easily).
- Sort these into the Q-sort pattern (as guided by the markers provided and the pattern illustrated on the response sheet). They can be told that the order of items below the markers is not important⁵⁶. They are asked to rank the images from the extremes, into the middle position until all of the images have been placed in the Q-sort, and make changes until they are happy that the arrangement of the pictures in relation to each other best represents their feelings.
- Record their Q-sort by writing the numbers of the items onto the response sheet corresponding to the arrangement of their Q-sort.
- Make comments about the items in the booklet provided. Their comments can include any problems they had deciding where to put an item, any difficulties understanding any of the items, and why they feel strongly about some and more neutrally about others. It can be stated that their opinions and comments are very useful for helping the researcher to understand why they have sorted the items in a particular way.

In my study, participants are then guided through the second sort using the same process.

Of the 28 participants who were successfully re-contacted (see table 4.3) and agreed to complete the Q-sort, one person failed to do so. Participants were given the option of completing the Q-sorts in person or by post. In two thirds of the cases, the Q-sorts were administered to participants by post (the high school students and the young professionals all agreed to this on the telephone). At their request, the Q-sorts were carried out in person with the working class mothers at participants' homes or at the mothers and toddlers group. Many expressed concern that they might do it wrong or that they might not be able to find the time to complete the task by post. Colleagues had also found that participants in 'working class' groups were less likely to complete Q-sorts and return them by post than other groups, supporting the decision to administer the Q-sorts in person to ensure a full response rate⁵⁷. This also enabled me to explain the instructions verbally; it was clear that they would have been put off by the Q-package

⁵⁶ This is because the stimuli are scored according to the column in which they are placed, not their order.

⁵⁷ Often the participants would ask me questions about the images, for example, "What does this show?" I would respond by stating that they should sort it according to whatever they thought it was showing. If they really did not know, they were told that they could put it somewhere in the middle of the sort. I made notes of these queries and at the end of each sort I also noted their reasons for placing the pictures in certain places (particularly the extreme ones).

otherwise. Their comments on the task were delivered verbally and I noted these onto the comments sheets during the sorting. Participants were offered twenty pounds for their involvement in both the Q-sort and focus group and more low-energy light bulbs. It was hoped that the financial incentive would encourage them to attend the focus groups.

4.6.3 Analysis and interpretation of the Q data

Following the sorting and recording of results, Q collates and correlates individual responses, extracting a set of factors which explain different attitudes or the range of discourses that exist in and among a group of people regarding an issue. In this study, analysis was carried out using PQMethod, a DOS based computer programme. Interpretation of the factors output by Q is subsequently necessary to identify the viewpoints or attitudes projected by the factors; Q makes no attempt to explain them. It simply elucidates them and shows which individuals are particularly associated with each factor (Barry and Proops, 2000). Factor interpretation is aided by reviewing the comments that participants provide about their interpretation and sorting of the stimuli. Their comments provide insight into the basis for the distinctions between the factors and for identifying the viewpoints that they express. By describing or interpreting the factor arrays, Kitzinger (1999) suggests that the researcher is telling a story about the choices made by the participants whose sorts load, or correspond significantly with each factor. Interpretation of the factors is the most subjective (and the qualitative) part of the Q process and so reference to participants' comments is crucial in order to avoid the insertion of the researcher's own biases or meanings being inadvertently imposed on research participants and their Q-sorts (Kitzinger, 1999). The analysis and interpretation of the Q-sorts in this study in relation to the points above are discussed in chapter six. The perspectives revealed by the Q-factors generated areas of consensus and debate and these were the basis for the focus group discussions.

4.7 Focus group discussions

Both interview and focus group contexts provide rich data sources created through allowing people to discursively raise their own agendas. Focus group discussions are unique in qualitative research because of their group nature, offering a perspective on a research topic not available through individual interviews or other methods (Fontana and Frey, 1998; Gaskell, 2000; Kitzinger, 1994; Krueger, 1998c; Oates, 2000). Their interactive nature elicits different information to that drawn out by other methods, because participants react and respond to each other, presenting and constructing their views in relation to a particular topic⁵⁸. The method is based on the premise that people do not operate in a social vacuum and so it offers an opportunity to explore a topic in a social context offering a rich response to the issue of climate

⁵⁸ The term 'focus' group has come about because the method involves a collective activity or debate over a focussed topic (Kitzinger, 1994).

change (e.g. Burgess *et al.*, 1988a, 1988b; Flick, 1998; Myers and Macnaghten, 1998). The method is evolutionary in the sense that participants develop their opinions and thoughts during the course of the discussions: "...focus groups encourage interaction among the respondents and allow people to change their opinions after discussion with others." (Krueger, 1998c:6). They influence and learn from each other, opinions can change and new insights emerge during discussion. The interactive characteristic of this methodology may consequently play a role in deepening participants' understanding of the issues surrounding climate change as they draw on different information and express it during the discussions (e.g. sharing their experiences of climate change and interpretations of the images).

In this study, the focus group discussions offered an opportunity to explore further, participants' thoughts and feelings about climate change in relation to imagery. Taking the Q-results back to participants gave them the chance to respond to the results. Using the Q-results as a driver for discussion helped me to understand more about why participants sorted the images in certain ways, aiding the interpretation of the Q-results⁵⁹. The focus group discussions gave me the opportunity to find out more about the ways in which participants were interpreting the images and the associations they were bringing to the pictures, and their feelings of salience and efficacy in relation to these. The discussions also made it possible to explore issues of motivation and engagement in response to the climate change images. The objectives of the focus group discussions in this study are presented in box 4.4. The key to using focus groups successfully is to ensure that they are consistent with the objectives and purpose of research (see Oates, 2000). The points below are based on the objective of this research and the design of the focus group discussions is directly related to these.

Box 4.4 Objectives of the focus group discussions

- To obtain feedback about participants' experiences of the Q-sorting procedure; comments on the method and demonstration of anything that may affect the interpretation of the results.
- To elicit further feedback from participants concerning their interpretation of the images; their explanations of the results of the two Q-sorts independently and comparatively.
- To generate further discussion of whether and how the images could be motivating and bring about both feelings of salience and efficacy in conjunction; initiating a wider discussion about what participants think would ultimately make them feel 'engaged'.
- To summarise the participants' experience of their involvement in the research; how they feel that their attitudes, opinions and feelings about climate change may have changed or developed as a result of their participation in the study.

⁵⁹ Instead of via follow up interviews as suggested is good practice in Q-methodology by Fairweather and Swaffield (2001).

4.7.1 Design of the focus group discussions

The focus group guide used in this study to structure all three focus group discussions is presented in appendix 5. The discussion presented here considers the principles and main methodological considerations behind the design of the question guide and plan for the focus group discussions, the details are presented in chapter seven. Figure 4.6 illustrates how the questions relate to the themes guiding the research. The design of the focus group questions was orientated around the objectives presented in box 4.4, which were translated into design requirements and from there into key questions and associated prompts (see chapter seven)⁶⁰. The wording of the questions was piloted with a group of colleagues in order to make sure that they would be clear and understood as far as possible by the participants in each focus group. Numerous revisions were made in order to reach a satisfactory set of questions.

The discussions were moderately structured so as to focus on the research questions but also open enough to allow participants the freedom for discussion around the images without too much constraint. Two principal considerations were involved in the design of the questions: simplicity, which relates to the conversational and straightforward manner that questions should ideally adopt; and sequencing, which refers to a pattern of questioning which is logical and which gives the space to address key points as well as allowing time to ‘warm-up’ and ‘warm-down’. These aspects are important because they influence the dynamics of focus group discussions and have a bearing on the analysis.

The role of the moderator in delivering the questions is also an important aspect. Krueger (1998a) notes that establishing a ‘climate for communication’ or a rapport amongst the group based on trust and confidence are part of this (see also Burgess *et al.*, 1988a; Gaskell, 2000). Set questions can add to the confidence of the facilitator, ensure consistency across groups and guide analysis (see chapter seven for more elaboration on these points). The questioning guide had to bear in mind the time allotted for the discussions. Some of the questions were designed to take longer than others, as discussed in chapter seven and indicated in the guide (appendix 5). The groups were scheduled to last for ninety minutes with a thirty minute window for further discussion if necessary. Krueger (1998a) states that two hours is a physical and psychological time limit for people.

⁶⁰ Krueger (1998a) encourages one to maintain ‘conceptual clarity’ so that the questions are designed to be as clear as possible.

Figure 4.6 Design of the focus group questions in relation to the themes of the research

Part one: Ice-breaker and Q-sort feedback

- Were there any aspects that you found difficult and what were they?; How long did it take you? **Prompts:** *What did you think was good about it? Did you enjoy it? Did you understand the instructions?*

Part 2b: EFFICACY Q-factors and image interpretation

- These are the images that seemed to make people feel most able to do something personally about climate change...How do you feel about these?
 - Why do they make you feel able to do something about climate change? What is it about these images that makes you feel that way?
 - These are the images that seemed to make people feel most unable to do anything personally about climate change...Why do they make you feel unable to do anything about climate change? What is it about these images that make you feel that way?
 - What distinguishes the 'able' images from the 'unable' images?

Prompts: *What characteristics or associations in the images make you feel able or unable to do anything personally about climate change and why? What do you focus on when you look at these pictures? What do you think these images are trying to say?*

- Would these images benefit from captions to make you feel more able to do something about climate change and if so what might they be?

Part 2a: SALIENCE Q-factors and image interpretation

- These are the images that came out most strongly as making climate change seem an important issue...What do you think? Why do you think they make climate change seem 'important'? These ones also featured..Why do you think that these make climate change seem important?
 - Are there any images that make you feel that you can make a really meaningful difference? These are the images that came out most strongly as making climate change seem unimportant...Why do you think this is the case?
 - What distinguishes the important from the unimportant images?

Prompts: *What characteristics or associations in the images make climate change seem important / unimportant? What do you focus on when you look at these pictures? People pictures? Global images? Local images? What do you think these images are trying to say?*

- Do you think that captions would make a difference to how important the images make climate change seem? Can you think of any captions for any of these images that would make climate change seem more important?

Part 3: Engaging images, wider motivations

- Do you find any that any of these images make you feel motivated, in other words that climate change is both important and that you feel personally able to do something about it? If so, why? If not, why not? How do these more motivating images compare with the ones that separately made climate change seem important and made you feel able to do something about it?

Prompts: *which ones make you want to do something about climate change as well as making it seem important?*

• Elimination game: Do you think you can find a group of about five of these pictures that together make you feel motivated? Begin by taking away the most un-motivating images a few at a time and mention why you think they are un-motivating? Why do you think these ones [chosen pictures] make you feel motivated? What is it about seeing these pictures together that makes you feel motivated?

- Are there any pictures or types of pictures that are not included here and should be? Are there any other images that you think might be more motivating than the ones in this set?
 - Is motivation really possible with a picture? What do you think would ultimately make you feel that climate change is important and that you can do something about it?

Prompts: *Do these pictures or any others that you can think of really make you feel motivated? What other things do you think would make you feel more committed? E.g. if the Government really took a stand on climate change etc.*

Part 4: Wrap-up and assessment of participation

- Wrapping up: I am very interested to know if you feel that you feelings and opinions about climate change might have changed as a result of helping me with my research. Think back to the interviews last year if you can; I wonder if your feelings are at all different? If so, how?

Prompts: *Are you more aware of the issue of climate change? Have you found yourself talking about it with others at any point? Have you noticed any environmental changes that you now associate with climate change, but might not have done before? Has any aspect of your day-to-day routine altered as a result of taking part in this research e.g. have you made changes at home in the way you use energy etc. because of your thoughts about climate change?*

Participants' feelings were likely to change throughout their involvement in the research, not just during the focus group discussions. I decided to seek feedback which would encompass an evaluation of participants' participation as a whole, rather than of their experiences and thoughts about the content of the focus groups alone. The nature and reason for using the focus groups in this study do not demand specific reflection. If this were a study examining the role of participation in environmental decision making for example, then it would be important to seek feedback about the group process in particular. However, it is more important in this case to have an evaluation of how participants felt after having participated in the whole study – their experience of all the methods and their feelings as a result, rather than just one of them.

4.7.2 Piloting and carrying out the focus group discussions

The focus group discussions were reliant on participants having been involved in the first two phases of research. It was therefore not considered necessary to arrange a pilot focus group with members of the public; the questions were taken to colleagues for comment and review (other postgraduate students, researchers with focus group experience and undergraduates new to social environmental science) (see Krueger, 1998a). The questions were subsequently presented to a group of undergraduate environmental sciences students in a focus group format which generated comments on the content and gave me a chance to practice the delivery of the questions, refreshing my moderating skills. The pilot focus group aimed to:

- Run through and time the proposed focus group guide.
- Obtain practical feedback about the proposed guide.
- Think up some games and tasks to incorporate into the main groups.
- Test out the recording equipment.
- Talk about some of the methodological issues of using images as a research tool.

The original structure of the sample groups was maintained for the discussions because no significant clustering of orientation was apparent in the results of the interviews and Q-sorts. Many authors (e.g. Bernard, 2000; Krueger, 1998c; Morgan, 1998; Oates, 2000) advocate the need for homogeneity, or compatible participants in focus groups, as "Generating a productive discussion requires a good group dynamic, and that depends on the compatibility of participants." (Morgan, 1998:59). Keeping the original groups together satisfied this. Kitzinger (1994) adds that it is useful to work with pre-existing groups because they provide a social context within which ideas are formed and decisions made. When participants perceive each other as fundamentally similar they are also more likely to feel comfortable whereas in mixed groups, more time would be spent building trust and establishing a comfortable environment.

Focus group studies usually depend on small numbers of purposively sampled participants⁶¹. It is recommended that groups of six to ten participants usually strike a balance between having enough people to generate a discussion and not having so many people that some feel crowded out (Bernard, 2000; Gaskell, 2000; Morgan, 1998; Oates, 2000). It was important to encourage attendance by the participants of the study because it was not possible to 'over-recruit'. The measures taken to ensure a good turnout took account of potential obstacles to participation and are outlined in box 4.5. Arrangements had been discussed in advance with participants to facilitate co-ordination of the discussions.

Box 4.5 Measures taken to maximise focus group attendance

- Participants were told on the telephone during initial conversations about their participation that they would be offered £20 (and low-energy light bulbs) as thanks for their participation in both the image sorting and the group discussion.
- Groups were scheduled for days when most participants would be available and at convenient times. Venues were carefully considered and were selected according to convenience and familiarity.
- Participants were sent letters to confirm the arrangements and what they could expect on the day: where the group would be held; how to get there; how long it would take and what it would be about (the sorting task they had all completed); that refreshments would be provided; that the discussion would be informal and relaxed (with other mothers from the toddler group; other students; other young professionals); that their contribution to my research was important and greatly appreciated.
- The letter was followed up with a reminder phone-call one or two days before the group.

Table 4.4 presents a summary of participation. The variable attendance had effects on the group dynamics of each focus group. The young professionals group was the smallest. Small numbers may give each participant a greater opportunity to talk, however they can also place a greater burden on each person to carry the conversation (e.g. Bernard, 2000). On the other hand, large groups such as the high school students group may provide less opportunity for each person to talk. Group size is not the sole determinant of the group dynamics and were not found to pose problems in this study; much depends on the participants in any particular group and how outspoken or quiet they might be (Kitzinger, 1994; Morgan, 1998). Retrospective feelings about the group dynamics in this study are presented in chapter seven. In all groups, relatively more interested or engaged participants attended (those with high senses of salience and efficacy relative to the sample as a whole as suggested by the results of their prior participation). The three discussions were carried out during a period of one week, however not more than one in a single day which would have been draining, affecting my facilitation (see Krueger, 1998c).

⁶¹ i.e. Where the researcher samples the participants based on the purpose of the study, see section 4.4.

Table 4.4 Summary of focus group participation

Group	Location	Specific steps taken to maximise attendance	No. of participants ⁶²	Reasons for non-attendance
High school students	School classroom	Held before A level exams during school hours but after classes had finished for revision. Confirmation letters and reminder phone calls.	8	Forgot (1)
Young parents	Meeting room in local community centre (venue for mothers and toddlers group)	Held during an evening when childcare was easier to organise. Local, familiar venue. Confirmation letters and reminder phone calls.	6	Unable or unwilling to attend (McCarthy <i>et al.</i>)
Young professionals	Meeting room in local sports centre with conference facilities	Local venue, evening. Confirmation letters and reminder phone calls.	4	Unable or unwilling to attend (McCarthy <i>et al.</i>) Forgot (McCarthy <i>et al.</i>)

I prepared each venue beforehand so that each group was arranged in a circle, preferably around a table big enough to allow participants to work with the images (otherwise images were laid out on the floor in the middle of the circle)⁶³. A boundary microphone was placed in the middle of the table attached to a tape recorder at my side (e.g. Burgess *et al.*, 1988a; Oates, 2000). Each group was recorded (with participants' permission) in order to make the analysis more accurate and systematic and to avoid having to take notes during the groups which would have been off-putting for the participants and for me. Box 4.6 presents a summary of the structure of the focus groups. At the beginning of each discussion, I explained that there were certain questions that I wanted to ask and this may mean that I have to move the discussion on at some points. As necessary, interruptions were made but generally the time allotted for each question was enough for discussion (without participants seeming to get fatigued or bored with talking about that particular point). My experience with the interviews, consultation with colleagues and the pilot focus group helped me to anticipate tangents and potential sticking points. I also thought beforehand about strategies to involve quieter participants and to move the discussion away from more active participants. I thought about the types of prompts I could use to encourage discussion and the variations in language that I could employ to subtly repeat questions and elicit more discussion. The focus groups were to an extent an iterative and a reflexive process. Although there were only three groups, it was possible to learn from difficulties and from my experience as moderator as the groups progressed⁶⁴.

⁶² Of those who had successfully completed the Q-sort.

⁶³ The same images were used, as those sorted previously by participants. Each was professionally printed A4 size, and laminated for use in the groups.

⁶⁴ Employing an assistant moderator is recommended (Bernard, 2000; Krueger, 1998c) however this was not possible due to funding restrictions. An unsuccessful attempt was made to recruit some volunteer undergraduates interested in pursuing social science methodologies for their dissertations.

Box 4.6 Summary of the structure of the focus groups

- The groups began with a welcome and introduction followed by a brief feedback discussion on the Q-sort exercise to get the groups warmed up. All participants had completed the same exercise and so had this in common. This was useful for me methodologically (feedback on their experience of the method) and for the group as an icebreaker.
- A task was introduced to elicit discussion about the images that made climate change seem important or unimportant (or neither) and why. Participants were prompted to consider the characteristics of, and differences between these images. Participants were also asked to consider whether and what types of captions might be useful in addition to the images to make climate change more important.
- The next task was designed to elicit discussion about why certain images made people feel able or unable to do anything about climate change (or neither), followed by a discussion about which of the images seemed to be most motivating.
- The groups then played an elimination game based on the complete set of images in order to arrive at a set of pictures that were thought to encapsulate a sense of importance, efficacy and motivation. This exercise initiated a need to argue about which images should be excluded from the sample and pushed the groups towards a consensus.
- The set arrived at by participants was then compared to the ones they initially found made climate change seem important and the ones that generally made them feel able to do something about it.
- They were asked what else they thought would really make them feel that climate change was important and that they could do something about it.
- The session was closed with a brief wrapping up. This is an essential part of the focus group discussion format (Krueger and Casey, 2000). The wrap-up included a review of whether people's feelings had changed as a result of participating in my research and how.
- Finally I thanked participants for their involvement, gave them twenty pounds each and provided an opportunity for informal discussion and requests for more information about climate change.

Morgan (1998) notes that in moderately structured focus groups such as the ones in this study, the moderator largely controls the group dynamic because the goal is to keep the group focussed on the topic in question. However, issues of group dynamics were taken account of before, during and after the focus groups. For example, did some people appear to be influencing others or are there particularly dominant characters? Are others consistently quiet (silence does not imply a lack of opinion; sometimes what is not said can be important)? The groups were organised and discussions facilitated so as to even out problematic elements of the group dynamics. After the groups, notes were taken to record my feelings about persistent characteristics and my thoughts are addressed in chapter seven. I did not feel that in any case there were aspects of any group dynamic which were problematic. In all groups, participants seemed to be comfortable talking to each other and the dynamic was relaxed. This was possibly because the working class mothers and the high school students already knew each other and the groups were held in venues where the participants were used to meeting one another. The young professionals did not know each other; their group dynamic was not so relaxed. This was also the smallest group (see table 4.4). Morgan (1998) states that whether participants are

strangers or acquaintances affects the moderator's task in managing a group. For example, working with strangers may involve more effort in involving participants in the discussion as they may feel reluctant to discuss their views with those they do not know. These are all potential issues affecting the outcome of my focus groups and the apparent impacts of these are reflected on further in chapter seven.

4.7.3 Considerations for analysis

Each focus group recording was listened to and transcribed before the following discussion in order to offer practical and analytical reflection on the adequacy of my facilitation and the group dynamics. Transcriptions were supplemented by notes made immediately following each group and analytical memos were made. Atlas.ti aided the management and analysis of the data.

Krueger (1998c) notes that focusing the analysis is important in order to 'survive the deluge' of material. The design of the methodology means that the focus group stage is naturally the most focused of the three methods. This carries over to the analysis which is clearly structured, being based on, and reflective of the results of previous methods. The purpose of carrying out the focus groups drives the analysis, which is therefore focussed and framed by the objectives; the analysis directly relates to the questions asked in the groups and the reasons for asking them (see Kitzinger, 1994; Krueger, 1998c; Krueger and Casey, 2000). In this way the nature, depth of elaboration and intensity of analysis can be determined⁶⁵. The analytical strategy is explained in more detail in chapter seven.

Krueger (1998c) recommends that a systematic step involved in the analysis of focus group data is participant verification, i.e. ensuring that the researcher has adequately understood the intent of participants. This can be done by asking the participants to summarize their thoughts at the end of the group, or respond to a summary report at a later date. In this study, the focus groups themselves were fulfilling some verification role, in that they were employed to qualify the results of the Q-sort and explore these further in a wider context. Therefore, feedback about participants' experience of the whole research process was invited. This was followed up 10 months later with some brief follow-up interviews. These were designed to offer reflection on participants' experience of their involvement in the research; how they felt that their feelings about climate change in terms of salience and efficacy may have changed as a result of their participation. More details about this stage of the methodology are given in chapter eight.

⁶⁵ Burgess et al. (1988a:322) note that focus group material is easier to handle when a 'top-down' approach to interpretation is taken i.e. when the conversations are studied for the light they shed on particular theoretical or practical issues.

4.8 Research validity

In qualitative research we do not seek to find an objective 'truth' so we must find other ways of achieving validity and reliability⁶⁶. Validity to a large extent depends on the rigour of the researcher; the judgement of validity and reliability is therefore a real challenge⁶⁷. Denzin and Lincoln (2000) advocate transparency in research, and acknowledgement of the role that ones values have in the process (see also Flick, 1998). Throughout this thesis I have tried to make transparent the methodological and analytical choices and decisions that I have made and to be reflexive. The following discussion presents a consideration of the factors thought to affect the validity and reliability of this research, accompanied by measures taken to maximise these. Some have been addressed throughout this chapter, e.g. pilot studies and consultation to verify aspects of my methodological design and analysis.

"There is no such thing as value-free enquiry, and in qualitative research this premise is presented with clarity. Such clarity permits the value commitments of researchers to be transparent." (Denzin and Lincoln, 2000:367)

Taken into account during the research process are a number of criteria suggested by Silverman (2001) for evaluating research. Asking myself the questions presented in box 4.7 has forced me to question the quality of my methodology; its design, data collection and analysis, and to ensure that I have taken steps to make this a valid and reliable piece of research.

Box 4.7 Criteria for evaluating research

- Are the methods of research appropriate to the nature of the question being asked?
- Is the connection to an existing body of knowledge or theory clear?
- Are there clear accounts of the criteria used for the selection of cases for study, and of the data collection and analysis?
- Does the sensitivity of the methods match the needs of the research question?
- Was the data collection and record-keeping systematic?
- Is reference made to accepted procedures for analysis?
- How systematic is the analysis?
- Is there adequate discussion of how themes, concepts and categories were derived from the data?
- Is there adequate discussion of the evidence for and against the researcher's arguments?
- Is a clear distinction made between the data and its interpretation?

Based on Silverman (2001:222)

⁶⁶ Validity concerns the integrity of the conclusions generated from a piece of research; reliability is concerned with the question of whether the results are repeatable (Bryman, 2001).

⁶⁷ The traditional criteria for judging quantitative research are reliability, validity, empirical content, consistency and generalisability. However, if these criteria are applied to qualitative methods, the benefits of their use can be undermined and the researcher could be accused of being unrepresentative, etc. (Luttrell, 2001).

The structure of the research itself plays a crucial role in ensuring validity and reliability. The evolving structure and systematic procedures of data collection, handling and analysis have allowed the objective and research questions to be explored interactively by returning to the sample participants in the same groups at each point. While the methods have played distinct roles, the combination of techniques has enabled rich insights to be developed into the ways in which images of climate change are interpreted. This is because the different methods of investigation have given rise to different sets of data which constitute multiple explanations of participants' outlooks on climate change. In qualitative research such as this there is often a mutual interdependence of the single parts of the research process (Flick, 1998; Janesick, 2000).

"Knowing a single landmark only locates one somewhere along a line in a direction from the landmark, whereas with two landmarks one can take bearings on both and locate oneself at their intersection." (Fielding and Fielding, 1986:23)

The adoption of a multi-method approach (or methodological pluralism) can add to research validity. Fielding and Fielding (1986), for example, state that multi-method work obliges a greater empirical and conceptual accountability on the part of the researcher and is useful in 'quality control'. The approach adds an element of 'triangulation' to this research. Triangulation is defined as the combination of methodologies in the study of a single phenomenon, a technique whereby evidence can be corroborated and supplemented (Fielding and Fielding, 1986; Luttrell, 2001; Silverman, 2001)⁶⁸. If diverse kinds of data support the same conclusion, confidence in it is increased. The use of triangulation strategies can drive 'convergent validity' and permit generalisation, pursuing an awareness of the total significance of the findings (Fielding and Fielding, 1986). It helps to ground the knowledge obtained with qualitative methods, systematically extending and completing the possibilities of knowledge production; it enables further accounts to be generated in relation to the data already gathered (Flick, 1998). Silverman (2001) states that triangulation involves taking findings back to the subjects being studied and that by doing so, one can be more confident of their validity. This has been undertaken by working with the same participants throughout, most explicitly in the focus groups where participants were invited to respond to and explain the results of the Qsorts.

Returning to the same sample of respondents at each stage of the research and using different methods has elicited their thoughts and opinions from these different perspectives, building on the underlying data. External measures or standards do not enter the analysis and so large numbers of participants were not needed; the validity of this study is not dependent on the size of the sample (Brown, 1996; Krueger, 1998c). Patton (1990 quoted in Krueger, 1998c:72) states that the validity, meaningfulness, and insights generated from qualitative inquiry have

⁶⁸ The usual emphasis is on combining methods but triangulation can also refer to the combination of kinds of data and data sources or subjects (Fielding and Fielding, 1986; Flick, 1998).

more to do with the information-richness of the cases selected and the observational or analytical capabilities of the researcher than with sample size (see also Flick, 1998).

A critical point in multi-method research is how to integrate the sources of data because the value is in achieving integration rather than using several approaches alongside one another. Each stage of research builds on the last, and chapter eight integrates the results further. Facts do not simply emerge from qualitative research, and the data does not speak for itself. It is impregnated with assumptions (see Finlay, 2002; Silverman, 2001). Throughout the methodological process, the researcher attributes their own framing and confers their own meaning on the data.

“...when the social scientist adopts an interpretative stance, he or she is not simply laying bare how members of a social group interpret the world around them. The social scientist will almost certainly be aiming to place their interpretations that have been elicited into a social scientific frame.” (Bryman, 2001:15)

One's values are integrated into the research process at any or all of a number of points: the choice of research area; formulation of research questions; choice of method; the formulation of research design and data collection techniques; implementation of data collection; analysis of data; interpretation of data; conclusions (Bryman, 2001). I acknowledge that my account of this research is a construction; it presents a specific version of the social world in the context of the research topic which is not definitive. The analysis and results presented in the following chapters have emerged from my interaction with the data, the participants and the methodological process itself. Denzin and Lincoln (1998; see also Sjöberg, 2000b) state for example, that an interview is a conversation involving the art of asking questions and listening; it is not a neutral tool and thus the interview produces a situated understanding grounded in the interaction between interviewer and interviewee. This concept applies to all the methods I have used; the questions I have posed and the images I have chosen to use. This thesis reflects how I have approached and thought about the data, as well as the thoughts that the participants have expressed about climate change; it presents my exploration of participants' outlooks on climate change which has involved interpreting their interpretations (see Charmaz, 2000). In all sorts of ways, my values have shaped the course and outcomes of this research from selecting the topic of study to the presentation of the final conclusions. There is therefore a necessity for qualitative researchers to remain reflexive – to take stock of their actions and their role in the research (Mason, 1996). The multi-method approach that I have taken has involved a process of self-reflection, seeking to understand my influence on this research at each stage and how I have engaged with each element of it.

Finding out what people think about climate change is easier said than done and indeed, exploring people's attitudes is notoriously difficult (e.g. Morgan, 1995). This is a consideration for the validity of my research because of the issue of interpretation. Box 4.8 outlines a number of problems suggested by Barry and Proops (2000) which concern the methodology and interpretation of research exploring people's attitudes, in this case about climate change.

Box 4.8 Problems facing the exploration of people's outlooks on climate change

- *Clarity of attitudes*: people do not find it easy to specify their attitudes. Putting these into clear and precise words is even more difficult (see also Eiser, 1994; Satterfield, 2001). Representing the full range or extent of participants' outlooks on climate change cannot be expected.
- *Consistency of attitudes*: People's attitudes may be internally contradictory. Their outlooks on climate change are expected to change and develop throughout the research process and not be fixed in time. The results of each stage can only be expected to represent a person's thoughts at the moment of their participation and can not necessarily be representative of a coherent view (e.g. Eiser, 1994).
- *Statistical significance of attitudes*: Qualitative data on attitudes is often not amenable to statistical methods. Q-method is a mixed-method offering some statistical rigour however the interpretation of its output is of a qualitative nature.
- *Minimizing investigator influence on attitudes*: the attitudes revealed in a study may be partly imposed by the investigator. My interpretation of the data is subject to my own frames of reference. Also, by asking specific questions and presenting particular images of climate change, responses are framed in the interest of this research project (specifically, the themes of the research).

Based on Barry and Proops (2000)

Challenges in this kind of research include whether to trust what is said (Krueger, 1998c) and how to deal with a 'deference' effect whereby people talk about what they think you want to know (Bernard, 2000). Fransson and Garling (1999) discuss the difference between verbal and actual commitment; what a person states he is willing to do to protect the environment and what a person actually does. I found that such issues were often dealt with intuitively as well as via the practical measures taken to override them; setting people at their ease for example, and being intuitive about what was being said and the avenues that should be explored further were important ways of dealing with this. It is not easy to measure attitudes, because they are not directly observable, nor is there a clear relationship between attitudes and what happens in real life⁶⁹. A purely exploratory approach is taken to this research, which does not incorporate a behavioural dimension because, as explained in chapter two, the links between attitudes and behaviour are very difficult to pin down. A totally different research strategy would have been necessary in order to study participants' behavioural commitments to climate change as opposed to their feelings of salience and efficacy with regard to the issue.

⁶⁹ Looking for behavioural indicators on the basis of people's expressed attitudes highlights inherent difficulty in translating motivational and intention based research into the likelihood of people actually engaging in behaviour – what people state is not necessarily how they will behave (e.g. Stoll-Kleemann *et al.*, 2001).

Each method has involved different considerations in terms of the validity and reliability of the research. In the context of interviewing for example, Silverman (2001) argues for the need to preserve and understand the reality of the interview account. Interviews constitute a static representation of a person's opinions and beliefs during and after which people's thoughts and feelings are prone to conflict or change. People can also demonstrate conflicting sentiments which may then change over time. Kempton (1997) suggests that a problem with asking people about climate change in particular is that most of them have not thought about the issue at any length and thus cannot give meaningful responses. Their thoughts are likely to develop during the course of an interview (and in this case, the research process) as a person considers it further. Interview responses are therefore taken to be displays of perspectives, rather than true accounts of reality. Even when questions are designed to be open-ended, they are not without influence. In semi-structured interviewing and focus groups, there is a danger of forcing data through preconceived questions for example, and framing the participants' narratives. By asking questions people are going to start using the information to make their own inferences.

"Pretty soon, we won't know whether the answers we are getting are telling us about a person's mental model before we started quizzing him or her, or a new mental model that the person is building because of all the information we are supplying in our questions." (Morgan, 1995:17)

Silverman's (2001) proposals for increasing interview reliability have been taken account of and are summarised in box 4.9 with my responses in square brackets. The points confirm that the impact of the researcher is important not only in the design and practice of qualitative interviewing but also in analysis, which in this research, dictates the design of subsequent research stages. Because it is not possible to completely eliminate subjective influence, I have to put much effort into validating my analytical process as described in chapter five.

Box 4.9 Strategies for increasing interview reliability

- *Thorough pre-testing of interview schedules and training of interviewers* [extensive piloting undertaken to arrive at a logical and appropriately worded interview guide, enabling flexibility during interviewing and responsiveness to participants]
- *As much use of fixed-choice answers as possible* [not deemed to be appropriate to this type of study, where open ended questions were used]
- *Tape-recording all face-to-face indicators and carefully transcribing these tapes for reliable analysis* [an accurate record of the data enabling evaluation of my influences on the interviewee's responses]
- *Reliability checks on the coding of answers to open-ended questions* [code and category validation exercise carried out].

The use of images in this research highlights questions of validity and reliability. This is why the rigorous and systematic image selection procedure was employed during the Q-method stage

of this research (see Fairweather and Swaffield, 2000; Valenta and Wigger, 1997). Despite a careful and representative image selection process, images are still subject to each individual's interpretations no matter how obvious they might seem from an expert point of view. The ambiguity or meaningfulness of an image is affected by each individual's views and experiences for example. Some may have widespread resonance, e.g. because they are familiar because of being widely used in the media. However, people are still likely to bring their own associations making it important to obtain participants' comments following the Q-sorts to explain why they had sorted the images in certain ways. Based on the Q-sort alone it is also difficult to know how persistently resonant the images are⁷⁰ and what it is about certain kinds of image that make them resonant in the contexts of salience and efficacy. For example, images are rich in detail, yet only some of the detail may be resonant and it is helpful to understand the nature of these. Working with images using Q-method to elicit people's feelings about the importance of climate change and their senses of self efficacy will not actually tell us anything about people's true behavioural intentions and I was interested to gain an insight into these. Also, we cannot be sure whether it is the image itself or a person's perception of the situations depicted in the images that push them to feel that climate change is important or compelled to act. All these points, as introduced in chapter three, clarify the necessity to follow the Q-sorts up with the focus groups in order to verify my interpretations of the results.

Being the third in a succession of methods examining the same topic and employing the same participants raises some validity considerations for the focus groups. Aspects contributing to the verifiability or validity of the results of the focus group discussions in this study are: my facilitation and analytical note-taking about group dynamics, etc.; recording each focus group, transcribing the tapes and coding each transcript; writing memos and reports to summarise each discussion and each person's contribution, and reflecting on these to present an overall report of the results. In this research, the bottom-up approach naturally led to a focused design at this stage of the study. An issue that one might take with the focus group stage of my research is that it is focused on a narrow set of predetermined issues. Krueger (1998c) warns that familiarity with the topic and anticipation of the viewpoints surrounding it can limit ones thinking and therefore affect the outcome of the research. Some may see the structured approach as bringing about an inability to learn about issues that are not included within these (Morgan, 1998). These were taken into account in the focus group analysis as explained in chapter seven. Were focus groups to be used more conventionally as a scene-setting method (e.g. in market research), then they would require a more open design in order to generate a wider representation of participants' outlooks on climate change. However, in this research, the

⁷⁰ For example, five or ten minutes after a participant has completed the exercise, perhaps stating that some of the images would make them feel that they could do something about climate change, something may happen to distract them, dissipating all intentions to act.

discussions were intended to respond to previous findings, which proposed various viewpoints on the issue, and elaborate on these, i.e., the focus groups were employed for reflective purposes as well as for exploration. Familiarity with the topic and images used in the focus group discussions therefore enabled further interpretations to be made of the previous results about the ways in which imagery was mediating participants' senses of issue salience and personal efficacy. There are some inherent difficulties in focus group research which cannot completely be ruled out. Thoughts being held back or exaggerated, subtle pressure to conform or agree, inhibition or fears about discussing feelings with others and concerns about how the information might be used are examples addressed in this chapter and in chapter seven.

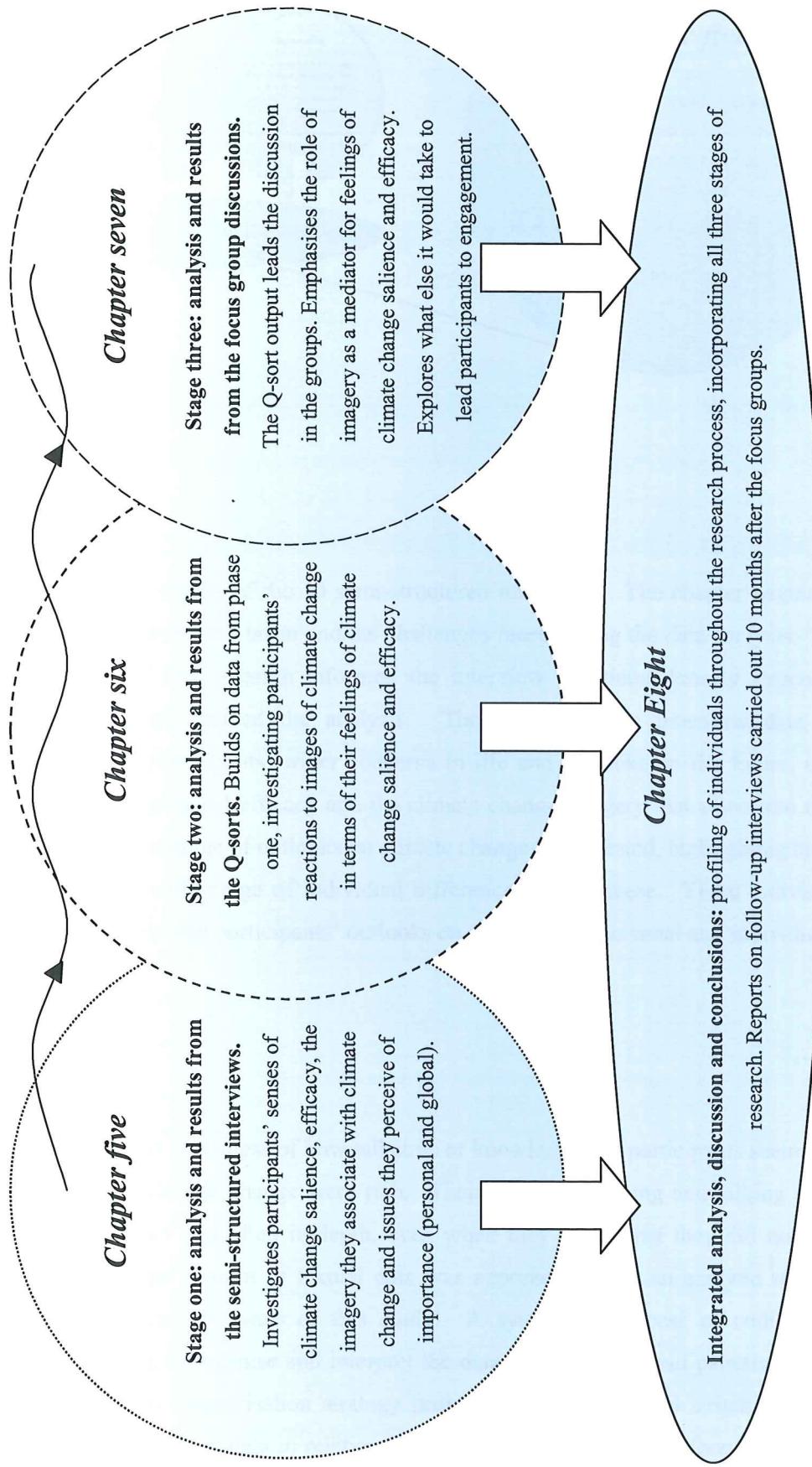
4.9 Conclusions

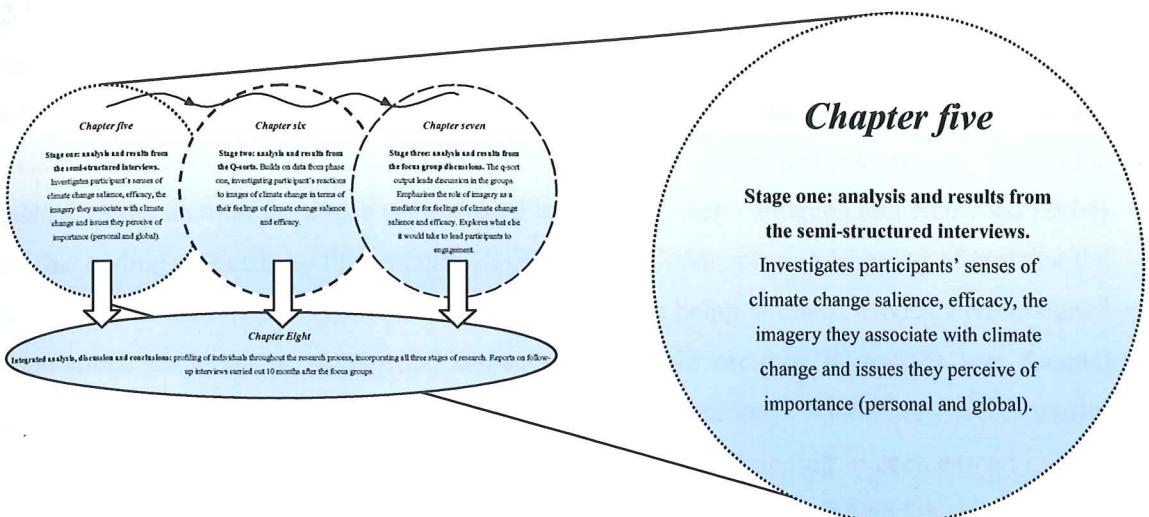
My methodological frame of reference has been explained in this chapter, which has addressed its foundations and presented a rationale for the chosen methods and how they were carried out. Flick (1998) notes that the essence of good qualitative research design to an extent depends on the use of research procedures that are simultaneously open-ended and rigorous, and that do justice to the complexity of the social setting being studied (see also Mason, 1996). This has driven me to make decisions, carry out my methods and analyse my data on the basis of a sound research strategy and sensitivity to the changing contexts and situations in which the fieldwork has been undertaken. My study is rooted in its objective and the themes of the research and has been allowed to take its course as determined by each stage of research.

Chapter four has been brought to a close with a discussion of issues of validity in my research. There is no such thing as value-free research design. The researcher must describe and explain his or her social, philosophical, and physical location in the study, by clearly describing the precise role of the researcher in the study (Janesick, 2000). As orchestrator and facilitator of this study, I have tried to clarify my intentions and assumptions and the efforts made to ensure the integrity of this study. I have tried to present a strong and transparent methodology and demonstrate that the very process of designing and carrying this out has forced me to question my personal assumptions and methodological choices.

The results of this study are presented in chapters five, six and seven. These sequentially present the results of the three phases of empirical research, each part of an unfolding process. Chapter eight presents the data from a broader perspective, integrating the results and bringing together the three methods and the major outcomes of the research in light of each other. It also presents the results of the follow-up interviews. The relationship between the following chapters and stages of research is presented in Figure 4.7.

Figure 4.7 The structure of the results and analysis chapters in this thesis





5.1 Introduction

Chapter five presents the results of the 30 semi-structured interviews. The chapter begins by explaining the analytical approach taken and the challenges faced during the data analysis. The objective and themes of this research informed the interview questions, loosely structured participants' responses and guided the analysis. The results of the interview data are summarised in terms of participants' wider concerns in life and outlooks on the future, their senses of issue salience, personal efficacy and the climate change imagery that came into their minds. The tendency for a range of outlooks on climate change is suggested, highlighting broad trends in the data but a wide range of individual differences within these. Three individual example cases demonstrate that participants' outlooks on the issue are personal and individually consistent.

5.2 Data analysis

The data demonstrates that regardless of how talkative or knowledgeable participants seemed to be, their conceptions of climate change were rich. Their ways of thinking and talking about climate change were broad and often in-depth, even when they stated that they did not care about the issue. The huge amount of textual data was approached with an analytic strategy sensitive to the exploratory demands of this study. A systematic process of coding and categorisation enabled me to organise and interpret the data, identifying broad patterns arising from it. The coding and categorisation strategy provided a coherence and structure to the management and analysis of the data in relation to the research themes and without restricting the emergence of valuable concepts or representation of participants' outlooks on climate change.

5.2.1 The coding and categorisation of the interview data

A sample-wide code set was generated from the interview data, organised broadly in terms of the themes of the research. Coding reduced the large amount of material, enabling me to sort it in relation to the research themes on which the interview questions had been based. Within the guidance of the themes, the codes were shaped by the data itself. Pidgeon and Henwood (2004) state that coding proceeds by the tentative development of concepts and labelling of text that the researcher considers of potential relevance to the problem being studied. Codes were assigned to quotations made up of statements, sentences, or whole sections of text as was deemed appropriate (e.g. whilst maintaining the context of the quotation). Quotations were usually assigned a number of codes which reflected the various concepts arising in each extract of text. The coding was made as descriptive as possible. It was a time consuming and iterative process that involved reading and re-reading the transcripts, revising and adding codes until a saturation point was reached and the data no longer generated new codes. A detailed examination of the codes led to the categorical organisation of the data. The data had been coded by theme and the categories were intended to draw out the broad patterns arising from the data within each of these themes. This process of analytical refinement drove patterns to emerge from the data, shaping my analysis and interpretation of the data (e.g. see Charmaz, 2000; Strauss and Corbin, 1990). The categories were identified and altered on reflection and over time.

The codes, sub and main categories vary in their nature. They represent not only the wide range of thoughts, feelings and imagery expressed by participants, but also details of the setting or context⁷¹ of their articulated perspectives (e.g. Creswell, 2003). The codes were treated as being equally important when being allocated to sub-categories, and sub-categories to main categories; there was no weighting taken account of, e.g. how many quotations were subsumed within each code. This was because the study is exploratory and qualitative rather than intending to be representative of the wider population.

5.2.2 Analytical challenges

Strauss & Corbin (1990) emphasise the need to question the data and one's interpretations of it because of the danger of imposing ones own values and assumptions on the data during the coding and categorising. Memo-writing was therefore carried out during the analysis, e.g. for including hunches and insights, recording explanations for changes made to the categorisations, etc. (e.g. Pidgeon and Henwood, 2004). The practice enabled me to attach my feelings and interpretations of respondents inferred beliefs or meanings to relevant codes and quotations, enabling my judgements to remain separate and making my assumptions and intuitions clear. Memo-writing also helped me to retain focus and stay in touch with my data because it acted as

⁷¹ For example, whether they are talking about an image of climate change that they imagine in terms of the future, or if they are reflecting on a past experience that they associate with climate change.

a way of linking the raw data to the wider patterns that were becoming apparent and my ideas about subsequent approaches to data collection for example. As well as using memos to record my conscious assumptions and thoughts, a validation procedure was set up in order to maintain transparency in the coding and categorisation process. This is explained in more detail in box 5.1. This process of peer review helped to verify my coding and categorisation, highlighting areas where assumptions had unintentionally been incorporated. This type of exercise is advocated by Pidgeon & Henwood (*ibid.*).

Box 5.1 The code and categorisation validation process

10 quotations were arbitrarily selected and their associated codes and categories output by Atlas.ti⁷². This material was presented to the reviewers, each quotation set within a larger extract from its transcript to give context. The six volunteer reviewers were also presented with a briefing of the study including the main themes, objective, research questions and an outline of my methodological approach. It was important to set the scene for the reader so that they were able to make constructively critical comments, e.g. about the suitability and openness of the allocated code and category names. They were asked to consider the following:

- Codes that may have been missed and should be added.
- Obvious assumptions or subjectivities that may have been imposed in the assigning of codes or categories.
- Anything with reference to the relationship between the quotation and the code that needed to be clarified in any way (e.g. by further coding or adjusting the code name).
- Any thoughts about further 'groups' or 'categories' into which the codes should be subsumed within the larger themes of imagery, salience and efficacy?

The main issues arising in the feedback were, firstly, that some codes did not seem to explicitly relate to the text (they were not as descriptive as intended). There therefore appeared to be some uncertainty as to how I had arrived at the codes and what assumptions I had made. Secondly, some of the coding and categorisation seemed to be rather general. Reviewers felt that some of the codes should have been more detailed and/or incorporated into more categories. These and further specific comments led me to reassess and adjust the codes and categories, and think about my interpretations of the data more carefully.

A representative categorisation was eventually reached at a point where minimal changes were being made. The reviewing and re-categorising process could foreseeably continue and further changes be made because of the large amount of data collected and its complex nature. The categorisation may then be slightly different; however, the same patterns would arise. I believe that in any case, the complexity would endure and the data would remain resistant to being neatly bound into categories. For this reason the categorisation should be thought of as a systematic summary of the whole data set rather than a concrete expression of the outcomes of the interviews.

The presentation of the results highlights the complexity of the interview data and demonstrates the tangled web of links between the codes, categories and research themes, e.g. some of the

⁷² It was felt that validating ten example quotations would be sufficient. Any more (for example asking the volunteers to code a complete transcript) would have taken up too much time.

codes apply to more than one category. Appendix 6 gives an idea of the diversity of codes within some sub-categorisations. The reader is given examples of the detailed coding in relation to the categories and sub-categories with accompanying quotations throughout this chapter. Because the majority of quotations were linked to many codes, they also sometimes apply to more than one category. Therefore, aspects arising in the data cannot all be neatly categorised however the best attempt possible was made. The data is full of overlaps and connections; it has been presented in the contexts of each theme, but the reader should bear in mind that there are threads running all the way through.

5.3 Results

The overall categorisation of the data is presented in table 5.1. As demonstrated in figure 4.4, the interviews took account of participants' wider concerns in life, their thoughts about the future and so on (using questions not relating to climate change). Therefore the data categorisation is fourfold: general and personal concerns, general future outlooks and imagery; issue salience; personal efficacy; climate change imagery. The categories presented in table 5.1 present an overall summary of the huge amount of interview data collected. Each is broken down into sub-categories in order to offer a more descriptive and illustrative representation of their content. The categorical breakdown is presented in appendix 7 which consists of four tables, one for each of the themes. They list the main categories, each accompanied by their constituent sub-categories and a short description based on the codes. This gives a more specific account of the categorical content and a greater insight into the data.

What follows is a description of the outcomes of the interviews, presented in four parts by theme: the characteristics of participants' general and personal outlook on life and the future, issue salience, personal efficacy and climate change imagery. Each is essentially an explanation of the main patterns arising from the data in the context of the categories identified⁷³. This is followed by a mapping of all thirty individuals according to their discussed personal climate change salience and efficacy. Three individual cases are presented in detail, each representing a different individual's outlook on life and on climate change. They offer an opportunity to view the patterns arising from the data and the research themes in an integrated and more personally specific way than the first part of this chapter. Set against the analysis of the data as a whole, each case offers a contrasting perspective on the all-embracing first part of this chapter.

⁷³ The quotes have been edited for presentation in this chapter. Transcripts were made verbatim (appendix 2) and these take account of hesitations and pauses, and other characteristics of what Brown (1999) terms transitive thought; in interviews people think on their feet and do plan their responses so these quite often reflect pauses for thought, and different and emerging thoughts as the discussion proceeds.

Table 5.1 Main categories arising from the interview data

General and personal concerns, future outlooks and imagery	Issue salience	Personal efficacy	Climate change imagery
<ul style="list-style-type: none"> <i>Overall future outlook on life</i> <i>Hopes and concerns for the world (present and future)</i> <i>Priorities in life / personal / daily concerns</i> <i>General imagery – salient issues, hopes and concerns</i> <i>Imagery of the future</i> 	<ul style="list-style-type: none"> <i>Awareness of climate change</i> <ul style="list-style-type: none"> <i>Climate change is / is not happening</i> <i>Cannot relate to climate change</i> <i>Climate change is negative / worries me</i> <i>Personal experiences and personal effects of climate change</i> <i>Not important / not concerned / do not think about it</i> <i>Not important because...</i> <i>Important / concerned / think about it</i> <i>Important because...</i> <i>Importance of climate change in the future</i> <i>Moral, religious, ethical, spiritual issues</i> <i>Responsibility and blame</i> <i>Lack of knowledge / uncertainty / confusion</i> <i>Important causes and what should be done</i> <i>What would make climate change more important</i> <i>Sources of information and influence</i> 	<ul style="list-style-type: none"> <i>Feasible / willing to do something</i> <ul style="list-style-type: none"> <i>I can't make a difference</i> <i>Believers</i> <i>Personal actions</i> <i>I think something should be done</i> <i>Should be done</i> <i>Causes of climate change – natural, human, personal and other</i> <i>Who's responsibility</i> <i>What would increase personal efficacy?</i> <i>Confusions and uncertainties about climate change</i> <i>Sources of imagery</i> <i>Negativity about climate change</i> <i>Positive</i> 	<ul style="list-style-type: none"> <i>Causes of climate change</i> <i>Solutions to climate change</i> <i>General impacts of climate change</i> <i>Personal impacts of climate change</i> <i>Wider social impacts</i> <i>Happening / not happening</i>

5.3.1 General and personal concerns, future outlook on life, imagery of the future

Some of the interview questions were designed to elicit participants' thoughts about how they imagined the future, their hopes and concerns for the world and personally (in a general sense, without reference to climate change). At times, participants also talked spontaneously about important issues in life in relation to climate change. Appendix 7a presents a categorical summary of this segment of the data.

Participants' outlooks on the future tended to be negative, uncertain and rather bleak, with a fairly short time horizon; an outlook on life which did not take the long-term future into account. Some participants noted that they had not really thought about the future. Many, who did not tend to, or had not imagined the future found themselves trying not to think about it because they felt negative about it. Overall, participants found it hard to imagine what life might be like in 50 years time.

"I've never really thought about it, no. The way it's going, terrible, terrible. I don't know. I've never really thought about this sort of thing. Hopefully it'll be much the same really. I don't know, you're asking the wrong person. I haven't got a clue."
(Sarah, working class mother)

"In 50 years. I have to say it's the sort of thing I don't ever stop and think about. I don't know. I just don't have the faintest idea. I suppose I just don't devote any energy to those sorts of hypothetical questions. I probably just focus on what I am doing at the moment."
(Simon, young professional)

"It just seems all kind of out of control. The whole world does. I mean, if you think about it too much, it's rather scary. How's it all going to end up? I don't know if I'll want to be around. And I mean, some people now are talking about how they don't really know if they want to have children, because they don't want to bring their kids up into a world where there's all this trouble."
(Tanja, young professional)

"I don't know, you try not to think about these things don't you. They're a bit too - well, even about poor people and stuff as well. It's just going to get worse really."
(Helen, high school student)

Much of what participants talked about when they thought about the future was of an extreme and global nature, beyond the timescale of a lifetime. The questions also lead participants to imagine and talk about more personal future and timescales. The working class mothers tended to spontaneously imagine and talk about the future in more local or personal terms than the high school students and young professionals who made more reference to global scale concerns and future imagery. Images of the future broadly spanned social and environmental issues, e.g. imagining the way people will live in the future, what technological development will bring, images of environmental degradation. Some participants stated that having children makes one more likely to think about the future rather than having a very short-term outlook. Some participants considered that there will be little change to the world in the future.

"I think there are still going to be a lot of the same problems. You know, people are going to be starving and in the same places. And the richer nations are going to carry on being the richer nations and there's not really much change for those kinds of people." (Paul, young professional)

"Everything will be technology. I mean, I don't think humans will do much at all. I think we'll be basically, you know, computers will take over. I don't think we'll even have to go outside the house to do our shopping. I reckon it'll be a very sad place. I don't reckon there'll be much communication between people like there is now. I don't think you're going to see lots of greenery, I think that's going to be all demolished basically, because people need housing. They're doing it now at Threescore [local housing development]." (Mary, working class mother)

"I think in reference to people, that it won't be as nice. And I think in reference to sort of like, the environment and stuff, I just imagine it as being pretty dark. Because you are always seeing in films and stuff that it is all really dark, and dull, and not really very nice." (Angela, high school student)

"I think I'm more aware of the future since I've had children. Less so before I had the children. I think before I had them I [pauses] you know that when you go that's it, you're gone, but if you've got children you're more aware. And you think more long term." (Ann, working class mother)

Participants expressed a broad range of hopes and concerns for the future of the world. They referred to global social issues such as war and peace, terrorism, famine and world health issues such as AIDS, population problems, consumerism, and people's attitudes to one another, etc. They also had environmental concerns and hopes for the future, mentioning for example, rubbish and waste issues, urban development, and pollution, etc. Participants' more personal hopes and concerns for the future were diverse, overlapping with what they stated were their priorities in life including, children, crime and security, social issues such as drugs (a local problem for the working class mothers in particular), money and finances, education currently and in the future (for the high school students), jobs and careers (for the young professionals in particular), personal happiness and relationships, and health. A more detailed outline of participants' personal hopes and concerns and their major priorities in life is given in appendix 8a which presents the category 'Priorities in life / personal concerns', its constituent sub-categories, codes and example quotations.

"I don't worry so much about pollution as sort of, the nuclear threat to the world. I worry about that. Because one day, someone is bound to go too far." (Emily, high school student)

"It's a lack of action really on the police on crime and stuff in the area. I met this bus driver the other day who'd had no end of problems, the bus getting stoned and all that sort of thing. It's down to the police and that. What's it going to take for someone to actually to get killed?" (Theresa, working class mother)

"Priority number one is obviously getting food on the table, and for me, that's the main thing. You know, getting money so that we have an income is priority." (Paul, young professional)

5.3.2 Issue salience

The outcome of the interviews in terms of climate change salience is presented here. Appendix 7b lists the major salience categories, short descriptions of these and their constituent sub-categories. The most striking outcome is that participants tend to consider the issue important in a 'general' sense but climate change is not seen as such an important and concerning issue when considered on a personal level. Many participants stated that they do not feel that climate change is personally important, but that perhaps it should be.

"It does concern me. I mean, they say the sea's getting bigger and like, in so many years time, parts of our country won't even be here. Stuff like that concern me. And the rainforest, and that sort of thing, but not dramatically. I don't sit back and think, oh my god, what am I going to do about it, but it does go through my mind. More generally, not like, all the time. Just when I hear about it." (Vicky, working class mother)

"I mean I don't, it doesn't really. I don't really think about it that much. It's not the sort of thing I think about very much at all. It doesn't really bother me much. It probably should, but it doesn't." (Yolander, high school student)

"I mean, how does that affect my life? It doesn't. If they were talking about climate change or something like that which is important it would kind of go into your brain a bit more. But when it's not in front of you...So I do think about it but not as much as I probably should." (Emma, young professional)

Climate change was not considered personally salient for various reasons. Appendix 8b presents the sub-categories, codes and some illustrative quotations for the category 'Not important / do not think about it because...' It outlines that reasons for not finding climate change personally important were: lack of awareness and understanding about climate change (e.g. never heard anything about it, do not know what it is); not a priority or an appealing issue (e.g. in comparison to personal and daily priorities in life); feeling unable to do anything (e.g. feel helpless so try not to think about it); lack of interest by others (e.g. by other individuals as well as other countries such as the USA); lack of personal relevance (e.g. including not being affected by climate change; climate change being a future issue beyond the length of our lifetimes); and a perception that there is no need to be concerned or to do anything about climate change (e.g. climate change is not happening). Many participants plainly stated that they could not relate to climate change which is why it seemed unimportant. These people felt that climate change was distant and remote and saw it as a future rather than a present problem, not considering themselves or others as being affected.

"I'd worry about it more if I saw it on the news and read articles and things. It's not something I think about every day or the first thing I think about when I wake up in the mornings and things. I don't think there's as much coverage as there should be." (Kathryn, high school)

"The closest it's come is all the recent flooding that we have had here. But even that hasn't touched us here in Norwich. So the immediate effect on my life is nil. And you kind of see it on TV and it's very removed from you, and you see it happening to other people." (Ailsa, young professional)

"I've got like a negative attitude but I think because it doesn't really affect me personally I find it hard to really relate to it." (Theresa, working class mother)

A perception of being personally and locally affected in the present is linked to having a sense of personal climate change salience. Participants' feelings of climate change salience were influenced by their perceptions of its 'locality'. Participants who perceived it to be happening, considered themselves to have experienced climate changes and saw it as affecting their vicinity in the present (and imagine this happening in the future) attributed importance to the issue. It was more important to these people relative to those who did not see themselves or their locality being affected by climate change in any way or at any time. The young professionals' climate change salience was largely dependent on whether and/or how it was perceived to affect their lives at present. The working class mothers tended to characterise the importance of climate change in terms of how they thought it might affect their own and the lives of their children both now and in the future. The majority of participants stated that the issue would become more important if it were to have adverse personal effects.

"[Does climate change figure amongst your daily concerns?] I wouldn't say every day. When you have huge drastic changes like the weather has been these last two days, then you do sort of take stock of it. I think as well, the fact that they sort of say that climate affects crops and things. That obviously again affects your finances because when food gets more scarce then it gets more expensive." (Karen, working class mother)

"If someone said to me, right we're out of petrol, you're going to have to walk everywhere from now on then, I think that's probably my main concern. How it's all going to affect you. Unless it directly affected me then I don't think it would push me enough. It's human nature." (Lee, high school student)

"It doesn't concern me very much at all. Because those sort of global issues haven't yet coincided with my own personal issues. If in 50 years time I'm still around, and if what's happening in the global environment is impacting on me directly so that I can't, I don't know, so that I can't go out without wearing a mask over my face or without getting sunburn or whatever, then, then I'll start to pay attention. I suppose that is how most people see it." (Simon, young professional)

The complexity of climate change salience is illustrated by the suggestion in the data that reasons for participants' feelings that climate change was not important, were given by others as reasons for feeling that it was. Presenting the data as a whole makes it difficult to offer a clear distinction, however the following examples illustrate this point.

- I can see climate change happening so feel that it's important vs. cannot see it happening so it's not important.

"It does concern me when you see like, when you can see it happening. 'Cause just like, the winters the last few years have been really mild. Like Easter was really hot. And then you get a day like a couple of weeks ago and it was over 30 and then the next day it was cold. You see it changing." (Kerry, working class mother)

"It doesn't actually affect your daily life or make any difference to you. And you feel like there is nothing you can do to change it. It's all about being able to see physical evidence." (Tanja, young professional)

- I can make a difference, so think about climate change vs. I cannot do anything about climate change so it's not important.

"[Do you feel personally concerned about climate change?] Yeah, I am influenced by things like not using the car as much, walking if we can, buying a fuel-efficient car. I tend to think about things that I know I can make a difference to. If it's something that I can't make a difference to then I don't really think about it." (Mark, young professional)

"A lot of people can't do anything about anything that is going to happen, so what's the point of reading about it." (Angela, high school student)

- It's important because it's a future issue (e.g. for future generations, my children) vs. because it's a future issue rather than a present one, it's not important, I do not care about it.

"It's not as important as the day-to-day, you just have to get by don't you. It's when you stop and think about the climate and all that lot, that's when you worry. Is there going to be anything here for when they get older? I mean are they going to be able to play outside?" (Sara, working class mother)

"It does concern me, but I'm not sure how much that would affect me in like, my life time, but more kind of in future generations. It's difficult when it's going to affect future generations and not us." (Kathryn, high school student)

The reasons for climate change being important, unimportant and aspects that may make the issue more important to participants clearly overlap. Some participants felt, for example, that climate change was important because they perceived it as affecting them and their locality; others felt that climate change was not important because it was not affecting them (a more distant issue). The majority of participants felt that climate change would become more important if something happened, if it began to affect them, or affected them further. Other examples of these all encompassing factors include: Government and international commitment to climate change; the profile of climate change in the media, education and business; levels of uncertainty, confusion and the consistency of the message; awareness of climate change; belief that climate change is or is not happening and perceived ability to relate to the issue; perceiving the issue as being negative or worrying. A lack of knowledge played a role and was articulated in a variety of contexts, e.g. some participants felt that climate change would become more

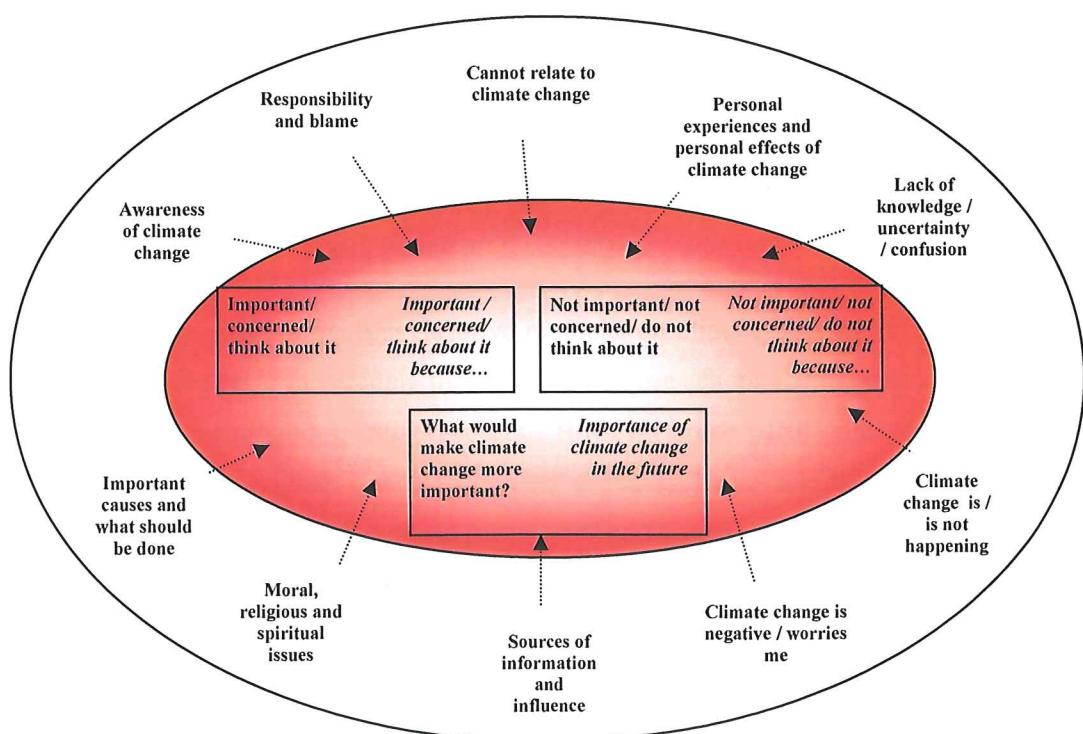
important if they knew how it would affect their locality, if there was a more coherent message (this point applies mainly to the young professionals and to some of the high school students), or if they simply knew more – or anything – about it (mainly the working class mothers). Some stated that ultimately, climate change would *only* become more important if it had direct impacts, e.g. if it flooded their house or if it changed their lifestyles in any way (having to mow the lawn more often was given as an example).

"I think if America flippin' well got real, putting it politely. I'm absolutely disgusted with them. They just seem so disinterested. I mean, they are just this huge nation and other countries are suffering as a result of their selfishness. So I would definitely like to see America get on the band wagon." (Karen, working class mother)

"[Is there anything else that you think could make climate change more important?] Yeah definitely, if something happened. Particularly in Norfolk, that would worry me. It would really affect us. It would me anyway." (Tanja, young professional)

The categories summarising participants' feelings of climate change salience interact and overlap in the interview data. Figure 5.1 illustrates that the explanations for the various facets of participants' senses of salience make up a 'pool' of influences. These are independently definable in the data but do not appear to work in isolation. Each appears to have had a bearing on participants' feelings of issue salience in conjunction with others, and the nature of this interplay is personal to the individual (as demonstrated at the end of this chapter).

Figure 5.1 Interconnectedness of main salience categories



Moral, spiritual and/or religious expressions in terms of climate change salience reflected feelings such as: the world will be worse in the future unless people have more respect for it; people are treating the world badly and leaving an unfavourable legacy for our children and future generations; people are currently doing harm but should not be. Participants had different takes on these issues, as to whether they were seen in spiritual, religious or moral terms but often they made similar points no matter which aspect they adopted. Participants also mentioned: America not doing anything (because of money); people's freedom of choice to do as they wish and live the lifestyles they wish; the nature of society being wasteful and greedy; that people do not look after the world because the consequences are not affecting them; not being able to go backwards and live like cavemen so we might as well continue; the culture people grow up in being environmentally destructive and wasteful; the need to try and bring up your children to care; Christians having to be concerned about the environment but people come first; our local activities affecting someone in another country and so on. Some participants had no moral, spiritual or religious feelings in relation to climate change.

"Christians believe that God's given us the earth and we have to look after it. So I suppose if we don't really look after it then whatever put us together is not going to be very happy with us. You've got to look after it. And also, it's not just for us but for people and generations after us. It's a bit selfish for us to do all this for the people who will come along, you know, in centuries or later on. They aren't going to be very happy with their world." (Helen, high school student)

"Humans are the worse enemy. They just don't help themselves. The way they look at it, moral issues, they look at it as it's not affecting me so why should I bother. Get out of my face, it ain't affecting me. And if you ask most people that's the way they look at it. They don't care, they don't think about how it's going to affect their children, they don't think that further ahead. But morally that's what it is. People cannot be bothered with anything but themselves. And that's what's wrong with the world in the whole of today." (Mary, working class mother)

"What we do here affects someone on the other side of the world. The way we process our foods, how we emit whatever waste we emit. I think we should be more obligated into accounting for the dumping of our excess waste. You don't see it happen. It's out of sight, out of mind." (Paul, young professional)

Participants had positive as well as negative outlooks on climate change. They generally felt negatively, in some cases mentioning that this was because school and the media put it across in such a way, not mentioning positive aspects. However some participants did make positive references, e.g. better English weather and nicer summers, being able to grow different crops, seeing others taking action. Often these participants additionally stated, for example, that while it might be all right for us, people in other countries will suffer.

"I don't really know anything positive about it. That's probably media influence again. Because they're just telling you about the bad things. But I don't really see anything good coming out of it." (Giovanni, high school student)

"The only positive thing is that we are getting slightly better weather. You know, the weather is warmer. I mean, we went to Cornwall for a week, and we only had one day of rain in a whole week. You don't actually have to travel abroad now to get the sunshine. It gets very sunny now and you can not travel abroad, and have good weather in Cornwall." (Theresa, working class mother)

"I guess it must have benefits. There is going to be some balance. While you can see it cause some destruction, I guess it must in turn provide beneficial environments for other things. I don't know, all you ever hear is disaster stories and warnings like these ominous predictions of doom. So you never really hear anything positive." (Yvette, young professional)

Some participants had very little perceived knowledge about climate change but still considered it to be an important issue to some extent. Others felt that the issue was not important to them because they were not aware of it; they felt unable to make a decision about the importance of climate change, personally or generally because they did not feel that they had any / enough knowledge or awareness. Some participants felt that they did not want to know about climate change and would rather not think about it because it made them feel frightened, scared or depressed. Some talked about being confused about the causes of climate change and what it is. Many believed that climate change was the same thing as the ozone issue (particularly the working class mothers but also other participants). Confusion as a result of conflicting information, scepticism, uncertainty as to whether anyone knows what's really happening or will happen, and trust in the sources of information were pertinent influences on climate change salience among participants (interacting with their confusion and sometimes scepticism). A sceptical approach was particularly noticeable amongst the young professionals and least so amongst the working class mothers who were more concerned about having a lack of knowledge about the issue.

"You have just made me realise how little I know about it really. About climate change and its effects. I mean, I don't actually know anything really, to be honest. Which is a bit scary. You can kind of see that there is just going to be some kind of limit on what the earth can take. I don't know what will happen, but it's scary." (Tanja, young professional)

"One documentary says well, this is scientific proof that this and this is going to happen, but then you watch another one and they say something completely different. So I have sort of come to the conclusion that no one actually knows what is going to happen. So I just don't really pay any attention to it. It would be good if they came up with some information, that wasn't straight away contradicted. If someone says this then generally someone else comes back the next day and says the opposite. I mean you don't know what to believe. So it would be nice to actually get some information that would, without a doubt be true." (Giovanni, high school student)

"You hear conflicting reports about it, because the scientists predict that we, probably East Anglia might be under water, in however long. So again, you are influenced a bit by what you hear, and what you know, or might know. Because basically no-one knows." (Karen, working class mother)

Sources of information about climate change were associated with issue salience, including communication with others (e.g. family, friends and colleagues), the media, school, personal experiences, the government, personal beliefs and scientific research. The credibility participants assigned to the information they had about climate change and the extent to which it appeared to be at the forefront or the back of their minds were influential of their senses of salience. Perceiving climate change was an important issue amongst friends or family and in one's own experience, feeling that there was a lot of media coverage, and trusting the information they had come across were associated with having a sense of issue salience. Conversely, perceiving that one had no personal experience of the issue, that the media were not serious about it or feeling sceptical about the reliability of scientific research were associated with the opposite kinds of feelings. The influences on participants' senses of salience were particular to the individual, e.g. some participants talked predominantly about their experiences of climate changes; others felt influenced by older relatives who talked about the changes they had seen over time; others were reliant on information from the media alone, being sceptical about the reporting of various scientific research outcomes contradicting one another, etc. On the whole, participants felt that climate change was not a topical issue and was not a subject likely to come up in conversation.

"The older generation can remember what the winters were like, what the summers were like ages ago. We have a friend who's in his 80's and he's noticed huge changes in the way the climate is changing. I mean, he said it was never ever this erratic. To hear somebody say that who was around years and years ago, that makes you think. It's quite worrying." (Karen, working class mother)

"A lot to do with the television. And you obviously cover it when you do different lessons at school. Mostly the news and some people just kind of mention things like that if they are really concerned about it. But as I said, you'll see something and think about it for a day, and then you'll forget about it." (Lee, high school student)

"Media coverage in the papers, discussing it with friends and actually visually seeing it I guess as well. And thinking back to when I was a kid and it snowed. It was just snow, you know. But now you seem to get a coverage and then it turns to sludge and then it's gone really. I think life experience and media, really." (Emma, young professional)

On the basis of the interview data, salience also appears to be linked to what participants perceived as being the causes of climate change and what they thought should be done about it (and by whom). A minority of participants stated that climate change is natural and that therefore people do not have a responsibility to do anything about it and need not consider it important. Others felt that climate change was important and that we should be investing more heavily in renewables, etc. Whether those deemed responsible were taking climate change seriously or not was of significance to participants and their senses of climate change salience. Some talked about feeling a personal responsibility but generally they spoke in terms of the

Government, companies and other countries taking responsibility and particularly of the role of the U.S. (e.g. not important because America is not taking the issue seriously). Perceptions of responsibility and blame were linked to moral considerations, e.g. feeling that things cannot continue the way they are now and that people must change; climate change is important because it will affect future generations, it is our responsibility to deal with it now.

"[Do you think anyone is taking responsibility at the moment?] I don't think so, no. I think they are all kind of a bit, well most of them haven't really thought about it that much. Some of the countries haven't really thought about it. Or when they do, they probably all blame each other for it anyway and the people probably blame it on other people. Because they are the ones that are doing it. I mean, they are still driving their cars." (Yolander, high school student)

"I think that we aren't looking after it now. So things like global warming and everything like the Kyoto agreement, I mean, that's a big concern. If big countries aren't going to agree with the rest of the world on how best to conserve energy and things like that then..." (Kate, young professional)

"Unless we start saying, this is happening, this is our problem, not the next generations. Unless we hold our hands up and say yeah, it's our fault, unless we stop having as many cars on the road." (Mary, working class mother)

The interview data suggests that knowledge is not an indicator of issue salience. The preceding discussion highlights that when considering what might be, one runs into a highly complex structure of beliefs, feelings and experiences which all work together to define a person's personal sense of climate change salience. Issue salience is explained by a number of interconnected factors which contribute to feeling unable to relate to climate change because it seems so distant, hence the general feeling that while climate change might be generally important, it is not personally so. Perceiving climate change as happening and seeing its impacts locally, having a sense that one is personally affected by climate change (being able to relate to it), that it is happening, and that people right down to an individual level have a responsibility to do something about it are the clearest drivers of personal issue salience.

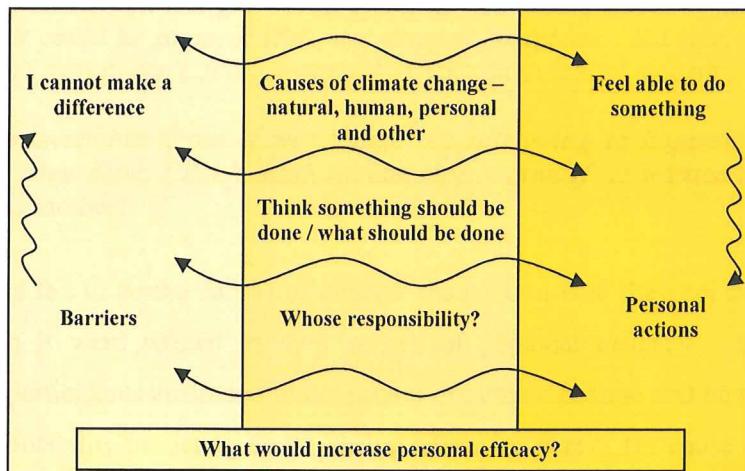
"If something drastic has happened then that makes things more important. But until it happens then people don't even think about it. It's got to be around you to make you think." (Sam, working class mother)

5.3.3 Personal efficacy

“When a woman decided to walk along the beach and help a starfish go back into the water, some other person goes up to her and says, “Why are you throwing that starfish back in the sea, you know it’s not going to make any difference to the whole starfish population?” This woman replies, “To that starfish it makes a difference, and to every starfish it will make a big difference.” So it’s kind of like saying it like that. You know, one individual actually doing something about it will make some difference, even if no one else bothers. So I still think it’s worth it.” (Jonny, high school student)

Appendix 7c presents the main categories, short descriptions of these and their constituent sub-categories for the efficacy theme. Figure 5.2 presents the main categories arising from the data and illustrates that the efficacy data are more straightforward the outcomes of the interviews in terms of salience. Perceived causes of climate change, what should be done about it and whose responsibility it is to act contribute to participants’ senses of personal efficacy.

Figure 5.2 Efficacy categorisation



Participants demonstrated a range in the extent to which they felt able to do anything personally to reduce the causes of climate change. Generally, participants felt that there were small things that they could do but that ultimately, one individual was unlikely to be able to make a difference.

“...obviously, from a personal point of view you can walk, use the car less and things like that, and recycle stuff...But on a more sort of wider scale then, I don’t think that the individual has got enough power to do a lot.” (Kerry, working class mum)

“...you can remember to only fill up the kettle so much before you turn it on. But it’s easier just to switch it on. People feel like they can’t do anything. And to be honest, it’s not going to really have a massive effect anyway. It’s still going to burn carbon unless like, the power stations change.” (Angela, high school student)

In the interviews, many participants made statements to the effect that something should be done about climate change: changes must be made before it's too late; people must change their ways sooner rather than later; people should think more long-term and protect nature; climate change will continue unless people take action, and so on. Many felt uncertain as to what should or could be done about climate change, some noting that people need to be made more aware of what to do and what their choices are. Others talked about possible solutions to climate change on personal and wider scales. Energy was seen as a target sector, particularly the introduction of more renewable sources and better public transport. Some participants saw technology as a key, feeling that in the future there will be more options and some feel that a fix will be found when climate change gets really bad. Most talked about the necessity for other environmental actions as well, e.g. recycling, saving trees, banning CFC's, etc. A minority suggested that people simply cannot do anything about climate change at all, or that anything we do will make very little difference.

"If what we are doing to cause it isn't kept lower and we keep doing it and probably do it more then I think it'll get worse. If we do something about it within the near future then it could be stopped. Well, not stopped completely, but like, slowed down. But if we don't then it won't. It'll get worse." (Vicky, high school student)

"I think it's inevitable. Even if we change it's still going to happen. Because the damage has been done. I don't think we can stop it even if we wanted to." (Theresa, working class mother)

What participants felt to be the causes of climate change and who they considered responsible for dealing with it were related to their senses of personal efficacy. This includes the remoteness that participants attributed to the causes of climate change and how far from oneself they placed responsibility for acting on it. Seeing oneself as part of the cause of climate change was associated with a greater sense of personal efficacy than considering climate change as being caused naturally, or due to industrial sources for example. In most cases, participants stated that they thought something must or should be done about climate change but did not explicitly see themselves as playing a part. They were most likely to feel that changes could be made at higher levels, not imagining a role for the individual. Participants' perceptions of the causes of climate change varied. There was a lot of uncertainty expressed, and association with the ozone issue in all sample groups. Many participants were confused and felt that they lacked knowledge about the causes of climate change and what people should and could do about it.

"[Who do you think should take responsibility for doing something about climate change?] I think industrials and the big power magnets that are behind all the industries. They ought to be more aware of disposing of their wastes...and it's just big places like America because they tried to get Bush involved, and he just didn't want to know did he." (Anne, working class mother)

"I'm not sure if CFC's affect global warming, but I can not use CFC's and other things that cause global warming." (Lee, high school student)

"[In your opinion, what do you consider to be the main causes of climate change?] I have no idea. It's definitely something to do with ozone and CFC's but I definitely wouldn't be able to explain it to you. I think definitely something that you would do would affect it, but I don't know how that would work. You just hear that something is bad because it does this, but nobody tells you how. I don't know what you do about it." (Claire, young professional)

Some participants felt more able than others to do anything personally about climate change. Overall, participants talked about their feelings of being able to do something about climate change in both personal and general terms. There was a tendency to err towards a more general level discussion of people's role in doing something about climate change, e.g. referring to people in general being able to act, statements to the effect that people in general could do more and talking about the ways in which people could do something about climate change. The interviews also pressed participants to think in terms of their own lives⁷⁴.

"Individuals as themselves, they can play a part as well as government. I really think, I mean, sure they won't be able to do it alone, but if they try, then they at least will be able to make a difference, in reducing the global warming effect. If that person wants to take showers instead of baths then they can, or if they just don't use so much energy as much as they normally do, then they can do that as well. Maybe it won't make a difference right away, but at least it will make the difference at some point." (Jonny, high school student)

Participants talked about a variety of actions that they were taking and that they felt they could take, e.g. saving energy by turning lights off and walking or cycling instead of driving. Sometimes participants' motivations for acting and feeling able to do something overlapped with acting for a wider environmental benefit, or were driven by motivations for their own health and fitness, etc. Participants had different perspectives on what acting on climate change entailed. The working class mothers, for example, were more likely to interpret actions as being generally positive and easy to incorporate into everyday life. The majority of the other participants were more sceptical about whether it would be worth making the effort and saw acting on climate change as representing a compromise to their lifestyles. Many stated that they were taking small actions and were usually keen to point out the things that they were doing. On the whole, however, many were unconvinced as to whether these actions made a difference to climate change and felt that the actions they were taking were largely token efforts; they often

⁷⁴ This was an issue for all themes: participants tended to lapse into talking about climate change generally, even when questioned in a specifically personal sense. Participants often referred to 'they' or 'people' when asked about the personal importance of climate change or what they could do about it; a noticeable tendency in all sample groups but particularly amongst the working class mothers who talked about 'them' doing things or 'they' not having done anything (by interpretation participants often seem to be referring to the Government). It is also possible that they were presenting a personal view about climate change based on what they perceived as being a public view.

did not see it as being possible to do more for various reasons, e.g. because of a lack of US commitment (my actions will not make a difference unless America commits), not knowing what to do or because of a whole host of further factors. Some participants felt completely unable to do anything, or that there was no need to take any action on climate change. All participants, no matter what their level of efficacy or extent of action, perceived many external obstacles to their personal ability to reduce the causes of climate change. These barriers to climate change efficacy are addressed further in due course.

"You can do what you can at home I think, can't you. I try to cycle if I can when I go to work, rather than take the car. Not just for the environment but for health too. Things like that. Just basic, everyday things I think. And my car is unleaded...I think I won't really change until someone change it. I suppose it's got to be up to the leaders of the countries isn't it. Because they are the ones who are supposed to be in charge at the end of the day, and who change things." (Sara, working class mother)

"You have people who do really tiny things like aerosol cans and they try and get ones that are ozone friendly. But that's not enough is it. That's it. And I'm going to shout at the government about the public transport. They are trying to promote that but it's pants really." (Lee, high school)

"Yeah, just kind of at a really local level. And obviously, while I think that everybody should be trying to do something, and for me it's caught up with much broader environmental issues. You know, like recycling and so on. So I do think that everybody can be doing something on that level. But if you're going to take it on an individual basis I don't think that I'm going to have terribly much effect. But that's not to say that I shouldn't do it. It's definitely worth doing from the point of view of the broader environmental reason." (Kate, young professional)

Some participants stated that they knew that there were things that they could do, but were not taking any actions (sometimes expressing feelings of guilt about this). They gave all sorts of explanations and justifications for not feeling that these measures would really make a difference to climate change and for not carrying them out. These include the examples given in the previous paragraph, as well as: inconvenience and other lifestyle issues; feeling restricted by a lack of facilities or other external obstacles; feeling uncertain as to whether one's actions will make a difference and therefore not bothering; explaining that they are contributing in other ways towards doing something about climate change or the environment, etc.

"We have a train station right near our house, but it doesn't come often enough, or at useful times to be able to use it very often. And because we are quite far out, it costs so much as well. So it's, cheaper, and quicker and easier to use our car. That sounds really bad because I am supposed to be really environmental, but I have to." (Erica, high school student)

"They say that not using the car do help but I still use the car 'cause it's easier for me. So I do know in a way that I should like, walk. But practically like, I live out Eastern where there's no shops and I'd have to walk a mile down the road to get to the shop, and a mile back. And it's about three miles from there where all my family is, so I

wouldn't be able to give up using my car...I would still use the car everyday because there's no bus." (Sam, working class mother)

"[Do you feel personally able to do anything about climate change?] I probably could but then it doesn't fit in with my life. It's inconvenient, which is awful really. The fact that you know, here's me complaining about it but if it's inconvenient then I don't do it really." (Emma, young professional)

A number of explanatory barriers for feeling unable to do anything to reduce the causes of climate change have already arisen in the quotes and commentary above. Reasons for not really feeling able to make an individual difference and taking only small or no actions rather than making more significant lifestyle changes are diverse and also include: not wanting to, or cannot be bothered personally; people generally not wanting to or not being bothered; not being affected by climate change; having lifestyle restrictions, for example being too busy or having other priorities in life; feeling that climate change is other people's responsibility 'not mine'; perceiving a lack of government commitment and international disagreement; not feeling prepared to change unless everyone else does; not knowing what to do or if it'll make a difference; perceiving that cost is a barrier to making changes and seeing a lack of alternatives (e.g. many participants stated that there are things they could do but that they felt unable to do anything because the options or facilities simply are not there; unreliable public transport and lack of consumer choice are examples). These barriers are each underpinned by a range of further explanations which come together to make participants feel generally unable, helpless, powerless or unwilling as individuals to do anything to reduce the causes of climate change. The barriers to personal efficacy are often the same, or linked to the barriers to issue salience, e.g. not being affected by climate change. The remoteness of the issue is certainly influential of participants' feelings of personal efficacy, e.g. it is a future issue, and so it's difficult to see how ones actions may make a difference, or whether it's worth acting. The reader can see that the barriers to salience and efficacy operate on all sorts of different levels spanning, for example, being too busy to do anything about climate change to feeling unable to do anything until there is international action on the issue. The interview data demonstrate that all participants have a deeply rooted feeling of being unable to make a significant difference to change at an individual level because of some major barriers such as the lack of U.S. commitment.

"One individual isn't going to make a difference. Somebody's got to do something to change it. I don't know how they're going to do it because there's just too many people. People's attitudes are that some do care a lot. And some just don't, they aren't bothered. They're just not bothered to do anything about it. I think a lot of people just have to manage nowadays. They have to just get by. If you're watching the pennies, that's where you use the best route. You don't use the more environmental route, you use the cheapest route don't you. Which is a bit selfish really isn't it, but it's about pros and cons." (Sara, working class mother)

"There's people who are choosing not to harm the environment and stuff but it's harder to do so without the government's help because of you know, transport. There needs

to be better public transport because you just can't get around without cars these days if you live in Norfolk." (Erica, high school student)

"This is a threat that is 50, 100, 200 years away possibly. We could all be dead anyway, and it'll be completely different by then. So if you take action now I mean, it might be helpful, and you're going to have a few people out there who believe strongly about this, and who are going to make a big difference. But the majority of people aren't going to be bothered about it, until it's clear and immediate. I suppose I don't really know that what I am doing isn't a waste of time. Either way, I suppose if I knew that this is what you have to do, this is what everybody has to do, and this will make things ok or better or whatever then you'd probably do it. Or you might do it. But of course it's a long way off before it gets worse." (Jim, young professional)

The factors affecting participants' feelings of being able to do something about climate change overlap what they thought would make them feel more able to do something about climate change. Appendix 8c presents the detail of this category 'What would increase personal efficacy?' Broadly speaking, participants felt that they would feel more able to do something about climate change if: the Government took more action; there was global commitment; there was more in the media, more information and education on the subject; there was certainty that making the effort would make a difference and if it was popular to do so; there were more options and facilities or if people were given no choice. Participants across the sample felt that if they were told exactly what they could do and if actions were easy to carry out, they would feel more able to do something about climate change. A feeling that people in general need to be told what they can do and need to know how their activities affect climate change if they were to do anything about it came across. The vast majority of participants talked about the ultimate need for change to come from above, stating that policy changes, laws and regulations are the only way to make people take action (and that these should also apply to industry, etc.). The interviews gave a strong sense that there needs to be more international action, information dissemination and education, etc. Some participants felt that they would (only) be driven to act if they were affected by climate change or if they could see it happening (but did not necessarily state that this would make them feel able to make a difference). On the basis of this data it is impossible to tell if people's feelings of efficacy and their likelihood to take action would increase given the above changes.

"The one thing that would make me do it would be if there was a kerbside collection. It's the same for most people. You know, if I just had to put it outside my door, then I would do it. It's just that walk, you know. It's lazy. But then again, I get home from work at eight o'clock, I eat something at nine o'clock and then suddenly it's dark. So it's just modern life really." (Simon, young professional)

"I think it is down to the Government and then down to the people. I think that people think, like I do that if they can't be bothered then why should I, because one person is not going to make any difference and that's the whole thing. If every single one person thought hey, I might as well push for this and then there would be a difference." (Giovanni, high school student)

"I think we all need to be taught. You know, re-educated. You know, if people just think oh, that doesn't affect me then...you know. But really, yeah it does affect everybody, and everybody's children. And everybody needs to be re-educated." (Theresa, working class mother)

The significance that participants imagined climate change having in 50 years time was dependent on the impacts that might occur and on what might be being done about it by that point. Participants on the whole considered that climate change *would* become more important to them in the future because the impacts would be more apparent and people would have to be dealing with it. They felt that if more efforts were being made in terms of renewable power, etc., then the issue would also be more important.

"[In 50 years time, what do you think the significance of climate change will be, to our society?] I think people will be a lot more worried about it. I think more people will know about it and there will be more ideas, and more ways to prevent it. People will be a lot more careful and people probably will use energy-saving, well, they won't use so much energy at home, they'll use more public transport I think. I think it will have had a much bigger impact on society by then." (Emily, high school student)

"I think it will be a lot more prevalent in people's minds. Because I really think that things will be happening that they are forced to take notice of by then. So I think that as ignorant as people are today, they will be that much more informed, by that time. I really believe that it will be quite different." (Yvette, young professional)

"I suppose it depends on how much it changes. You know, if things are done to change it, to slow it down. Well things are being done but it's not enough, obviously. And whether at the end of the day, whatever people do it's not going to change it. I suppose if it does change that much then you have to do something about it." (Kerry, working class mother)

The interviews demonstrated that few participants felt able to do anything personally about climate change; even those who stated that they felt able to do small things to help came up against a number of perceived barriers to taking more substantial action. They also expressed various positive reasons for carrying out energy saving actions, e.g. feeling that it's worth making efforts for the greater environmental good. However they still had generally low senses of personal climate change efficacy for a whole host of reasons which appeared to culminate in a general feeling of individual powerlessness and helplessness to do anything to reduce the causes of climate change. Sometimes participants' explanations for not feeling able to do anything reflected barriers perceived as external or beyond one's control (e.g. lack of facilities). Others had a more person-centred origin, for example, feeling that doing something was in some way a hindrance to the way they lived their lives (e.g. costs too much, is inconvenient, takes too much time, cannot be bothered and so on). In any case, participants had a vast range of explanations, justifications or reasons for their feelings about how able they felt to reduce the causes of climate change which are linked to the reasons for feeling only a negligible sense of issue salience, e.g. the feeling that climate change is a distant issue (not affecting me, future

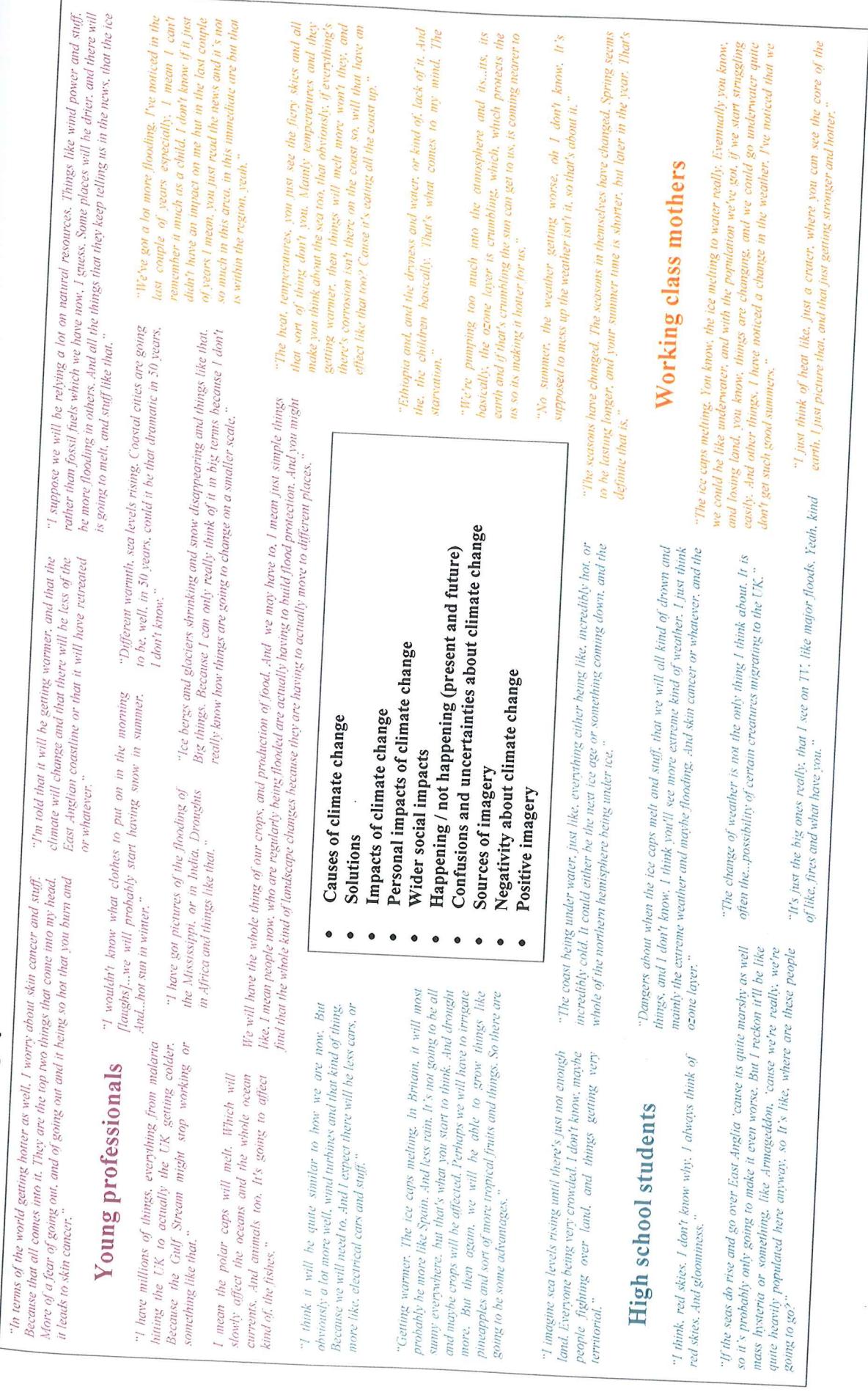
issue, happens in other places, cannot see it happening). It is not possible to separate the features of participants' feelings of efficacy from what characterises their feelings of salience or the images that come to mind. The explanations given for participants' senses of personal efficacy are diverse and specific to the individual (as they were for issue salience). These overlaps and the individual specificity of participants' outlooks on climate change are addressed further in the latter part of this chapter.

5.3.4 Climate change Imagery

Participants' climate change imagery reflected imaginations of major climate change impacts, causes, solutions, possible personal impacts and wider social consequences, climate change happening now and in the future, confusions and uncertainties, negativity about climate change, positive imagery and sources of imagery (e.g. media, personal experiences). These are elaborated on in Appendix 7d which gives a summary of each category, a brief description and its constituent sub-categorisations. Figure 5.3 gives a one page summary of the wide range of imagery described by participants in all groups. The main categories are listed, surrounded by a broad range of examples from all three sample groups.

The most extensive category of imagery summarises the main impacts of climate change as imagined and described by participants. It considers: where participants imagine impacts of climate change to be occurring (local to global); changing weather; changing seasons; sea level rise; flooding; coastal change; deserts, drought and heat; agricultural effects and landscape change; impacts on animals and nature; and human health. Participants also demonstrated more personal climate change imagery as well as global images in mind, e.g. imagery of climate changes within the context of one's lifetime, locality or family and examples of personal experiences associated with climate change. They talked about what they imagined the effects to be on their children in the future, how climate change might affect their homes, the way they live, where they go on holiday, where food comes from and so on. Participants talked about the impacts they imagined climate change might have on the local environment (local flooding, weather, hosepipe bans, insurance, public transport, etc.). The impacts participants associated with climate change span small, local changes that participants had experienced (e.g. flowers in the garden blooming earlier) to big global examples (e.g. stating that they imagine 'big things' or for example talking about changes in the atmosphere, major floods in developing countries and so on). The range of scale applies across many of the categories within the imagery theme, and throughout the discussion on salience and efficacy different levels of association or relationships with climate change have become apparent from the very personal to the future, abstract and global.

Figure 5.3 Climate change imagery



"I think of the future. I think of things I've read about like ice bergs, and glaciers shrinking and snow disappearing and things like that. Big things. Because I can only really think of it in big terms because I don't really know how things are going to change on a smaller scale, or how it will affect people." (Kate, young professional)

"He's three next week, and every birthday it's rained. But the day he was born. That was absolutely glorious. I noticed that with my daughter as well. I mean, with her, she was born in June, and it was boiling. It weren't boiling this June. And we haven't had, well, we've had a few odd days and that's it. And we haven't had anything. I mean, we very often get a nice September, but now it tends to go on longer. And you notice it because of the plants in the garden. You are wanting to take them up, ready to put your winter stuff in, but they are still good." (Margaret, working class mother)

"We'll get species coming over that are dangerous like...And I mean with this foot and mouth thing, if we didn't kill the disease, maybe the weather would have done 100 years ago, because the winters were colder. If it does get warmer, we're going to be struggling for water. And there will be malaria or something and we may not be able to cure it. Or, I don't know, other diseases." (Helen, high school student)

Participants referred to their imaginations of the wider social consequences of climate change; possible social changes and the impacts that climate change will have in the future, on the way we live for example. Many talked about imagining: economic change (e.g. need for growth but also restriction, tourism, unemployment as a result of climate changes); food and resource issues (e.g. food shortages, different food production, resources running out); population and housing problems the world over (e.g. overcrowding, population migration); inequality and human suffering (e.g. death and starvation, divide between rich and poor, inequality in the distribution of impacts across countries); and the effects of climate change on social relationships (e.g. riots over the introduction of measures to control climate change, mass hysteria at the loss of land).

"I think that there will be an awful lot more people without any food, and a lot more poor people, and a lot more starving people. Because I think it will get, because climate change is getting worse." (Erica, high school student)

"If the climate get warmer, there isn't going to be nothing here is there. Everything will change then. We'll just have to find another way of living. And can they do that? You don't know do you. I mean you learn about the ice age, when you're at school and like the dinosaurs being extinct and all that lot but you don't know that nothing similar isn't going to happen." (Sara, working class mother)

"Central Africa, and around the equator will be a lot worse off. We're going to create a whole series of other problems. People wanting to move out of there and going to places that are nicer." (Jim, young professional)

Participants imagined many causes and solutions to the problem, as well as climate change impacts. Causes were seen as being both human and natural. Human cause imagery included descriptions of humans damaging the world, upsetting a fine balance and causing destruction for example. More directly participants associated climate change with imagery of energy

consumption, gases and emissions as a result of personal transport, industry, burning fossil fuels, pollution, etc. They also described elements of our lifestyles, development and cultures as causes of climate change, such as living in a consumer culture and other human related activities associated with causing climate change, for example, deforestation and the hole in the ozone layer. Imagery of natural causes included past glaciations and ice ages, ocean currents, and animals causing climate change (e.g. cows producing methane). Solutions to climate change, or 'mitigative' imagery was elicited too (more so by the young professionals and high school students than the working class mothers). A breakdown of this category and its constituent sub-categories, codes and some example quotations is presented in Appendix 8d. It incorporates energy (e.g. ways of saving energy, alternatives, renewables), transport (e.g. electric cars, public transport), technology and science (e.g. finding technological fixes, scientists and research), political efforts (e.g. international summits, petrol taxation) and others (e.g. having cleaner air, more environmentally friendly products, saving trees, not using CFC's, etc.). Very little mitigation imagery was elicited in interviews with the working class mothers. This may be linked to levels of knowledge about climate change which might also explain why the working class mothers articulated a lot more imaginative imagery and that based on perceived personal experiences rather than other sources.

"I guess a lot of it is natural because the earth changes itself, naturally. I remember reading about the British Isles, many thousands, possibly millions of years ago. And in the area that is now Cornwall and Devon it was actually all desert. And over the course of the years, it's become what it is now. And then in a million years time, it would naturally be different. It's been suggested that there might be a cold switch." (Yvette, young professional)

"Chimneys with the smoke coming out of them, where they have like six chimneys in a row. Like with thick smoke coming out of them and you can see everything is like, is going to melt and it's just not very nice. And like, with all the exhausts and all that, in London, in like the big smoke and stuff. That's all like, part of it." (Vicky, high school student)

Most participants talked about their imaginations of climate change in negative terms and some did not imagine there being any positive outcomes at all. Many specifically talked about feeling fearful, depressed, scared or distressed at the thought and hoping that it would not happen. Some expressed apocalyptic visions of the end of the world (e.g. it'll be like Armageddon, chaos, craters, doom, we will not be able cope, it'll run away with us), whereas others talked about it in a more generally negative sense (extinctions, it'll be negative if it has local effects, human health problems). Some participants had positive thoughts in relation to: weather and seasons (e.g. better English weather, better summers, warmer winters and less cold deaths, local holidays would be good and so on); agriculture and food (e.g. could grow more exotic food and other different crops); and Energy (e.g. wind turbines are nice to look like, renewables are a

good thing, saving energy saves money). Participants also imagined other people's efforts to deal with climate change and felt that these were positive.

"I just can imagine that it's going to be too little too late really. Because we're only kind of just thinking about it now. If the seas do rise and go over East Anglia, 'cause it's quite marshy as well so it's probably only going to make it even worse. I reckon it'll be like mass hysteria or something, like Armageddon. I think it's going to be bad, definitely." (Helen, high school student)

"I don't know, it's all quite scary. I don't know, because things aren't exactly great at the moment. So I don't really want things to stay the same. But I don't think they'll get better." (Tanja, young professional)

"I recall these pictures of wind turbines, these massive wind turbines. I saw some article where they did an artists impression of what it would look like on that big island in Scotland where they are going to put them. I thought that was really cool. I don't object to it personally, I think they look great." (Erica, high school student)

"We are getting some really nice weather now. I mean, last year, during May, that was warm and we had that mini heat wave. You don't actually have to travel abroad now to get the sunshine. It gets very sunny now and you can not travel abroad, and have good weather in Cornwall." (Theresa, working class mother)

Participants had different visions of whether climate change was happening or not and to what extent. For example, some talked about perceived personal experiences of climate change happening now and being able to clearly imagine it continuing in the future. Some talked about it purely in future terms, e.g. climate change building up and suddenly hitting us. As established throughout the discussion on climate change salience and efficacy, the issue was seen as a very distant issue for many participants for whom it 'does not seem real', or for whom the consequences are abstract, distant and 'out of sight, out of mind'.

"We've got a lot more flooding. I've noticed in the last couple of years especially, I mean I can't remember it much as a child. I don't know if it just didn't have an impact on me but in the last couple of years I mean, you just read the news. It's not so much in this area, in this immediate area but that is within the region. And that had a bit of an impact." (Vicky, working class mother)

"You'll read about Venice flooding more often because of global warming. And it's interesting but it doesn't really affect me. If Norwich turns into Venice then obviously I'll notice so I think there's that remoteness about it for a lot of people. And you hear about the sort of ice flows melting, or whatever and it's just, they're such a distance." (Simon, young professional)

Some participants were unsure where their imaginations of climate change might have come from. Others associated their climate change imagery with a range of sources including: the media (e.g. TV documentaries, news features, radio programmes, newspaper pictures, features about national flooding); talking to others (e.g. conversations with relatives who've noticed changes); perceived personal experiences (e.g. noticing seasonal changes, more extreme

weather); school, education and scientific information (e.g. diagrams at school, statistics); and other sources (e.g. religious beliefs and imagery from reading the bible). Imagery elicited from the high school students and young professionals was more directly sourced, and was particularly linked with what they remembered being taught at school and/or what they had seen in the news media. The working class mothers were more reliant on their imaginations. It was apparent that those who had little knowledge, lots of uncertainty or seemed confused about climate change tended to describe relatively weird and wonderful imaginations of climate change, often related to the ozone issue or to pollution and other environmental issues. Others included general descriptions about wondering what the future might be like if climate change happens/continues, what life might be like in the context of having absolutely no idea.

“Just things like the earth just crumbling. A white mist and it’s all coming down. That’s how I’ve always presumed the ozone layer is like. That it just keeps crumbling and that’s what you’ve got around earth and then it’s all crumbling. That and all hot, very hot, that type of thing definitely. Yeah, the heat and I think that’s the major worry, because if the ozone layer crumbles the heat will eventually, we won’t be able to take it.” (Mary, working class mother)

“In Revelations it talks about how there will be flooding and all this kind of stuff which is pretty scary. And that at the end of the day there will be all this kind of stuff happening. And you look at it and you can actually, I mean it does kind of link in with some things that could happen, like what they are predicting in the future.” (Tanja, young professional)

“Mostly from school. And learning about it in Geography. Being told what a terrible thing it is. And things on the news on the tele. Scientists saying we’ve only got so many years because sea levels are rising.” (Emily, high school student)

During the interviews, participants demonstrated a great deal of variability in the ease with which they were able to visualise climate change and in the vividness of their reports of the imagery they experienced. For some, images of climate change were easily elicited, whereas for others it was more difficult, and some participants were unable to imagine very much at all (in some cases, different terminology, more time or more discussion for example, aided the elicitation of imagery). Some participants found it difficult to imagine climate change perhaps because they did not think it was going to happen, and participants often found it hard to imagine climate change if they felt that they did not know anything about it. Some participants found it easy to think in visual terms, finding themselves able to articulate masses of imagery regardless of their level of knowledge about climate change. Individual differences in terms of participants’ ability or tendency to visualise were not being tested but it is striking how much some participants seemed to be able to imagine in comparison to others.

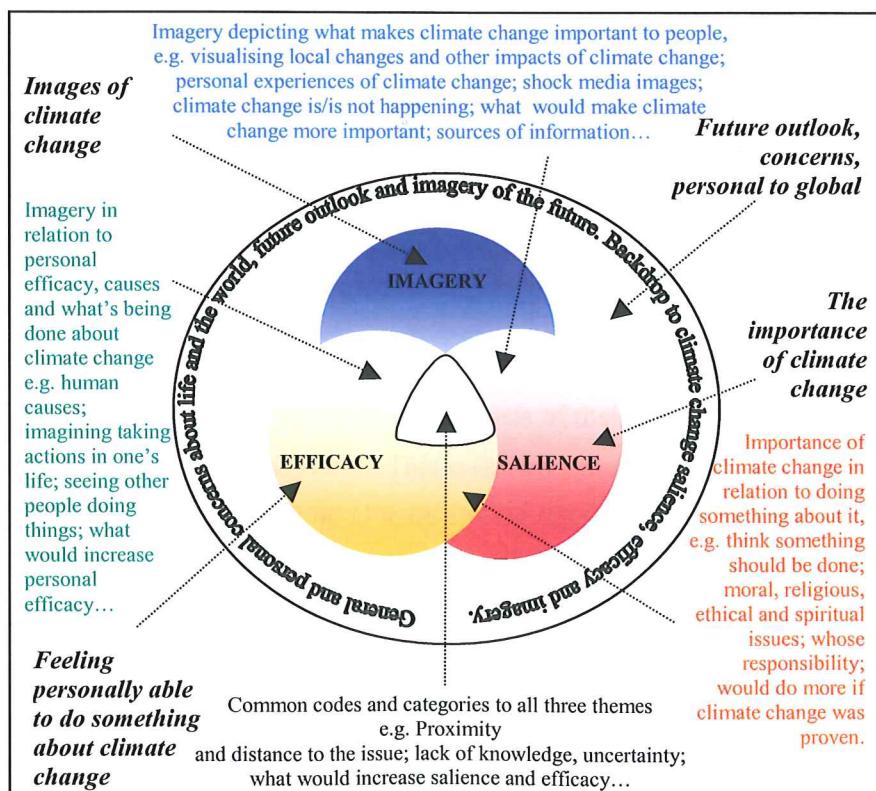
“I don’t know enough about it to imagine it really. That’s probably all I would say about it because I don’t have enough information. I haven’t read enough information,

or been given enough information or found enough information or whatever, to really know what I can imagine it to be like really." (Emma, young professional)

“They are just something in my imagination. I think they’re most probably from TV, most probably saw something from TV. But it’s just like, you think of what heaven is like, don’t you. I think heaven is like, all happy, you know, no-one’s sick, no-one’s sad, no-one’s anything, so it’s most probably that. I’ve got a very good imagination.”

Participants' imaginations of climate change spanned massive spatial and time scales and were driven by different outlooks on life as well as opinions about climate change. They were also guided by different sources of information and perceptions of personal experience. Factors arising in the discussion of participants' general and personal concerns in life and their outlooks on the future, climate change salience and climate change efficacy were all related to descriptions of climate change imagery demonstrating overlap between the themes of the research. For example, spontaneous climate change imagery was linked to participants' wider concerns about health and money: the possible health effects that climate change might bring, or barriers to taking action because of the cost. Participants who found the future hard to imagine also found climate change difficult to imagine and consider in personal terms. They were more likely to feel that climate change was not salient because it was something concerning the future which they did not feel connected to. They struggled to see how their current actions or potential efforts to mitigate climate change have much of a role in causing it. Figure 5.4 illustrates some examples of the kinds of overlaps that are present in the data.

Figure 5.4 Overlap between themes



5.4 Individual profiling

The coding and categorisation led to a comprehensive summary of the interview data as a whole. This section recognises the individuality of participants' outlooks on climate change. During the interviews and the analysis of the data these very individual takes on climate change became apparent. Each person articulated personally consistent outlooks on climate change with unique representations of salience, efficacy and imagery. These are lost when viewing the data set as a whole. This section therefore presents a further investigation into the characteristics of participants' outlooks on climate change and how the themes of the research interact with one another by illustrating how they are characterised at a more individual level. Three contrasting individual cases (one from each sample group) are presented to demonstrate personal outlooks on climate change in the contexts of salience, efficacy and imagery, set against the backdrop of participants' wider concerns in life.

Following the analysis carried out in part one, a participant profile was put together to give an overview of each person's point of view, in relation to the themes of the research and on the basis of their interviews. Seidman (1998) advocates the use of such profiles, arguing that they help to share what is learned from interviews by linking the individual's interview experience to the social context within which he or she operates, and displaying the coherence in what the participant has expressed. Each profile divides participants' responses into the themes of the research and a section addressing their general feelings about future, personal and wider concerns. Within each of these sections, the main points made by participants throughout their interviews are summarised and some example quotations given. This process constitutes a systematic way of examining and organising the data, highlighting the characteristics of each theme at a more personal rather than sample-wide level. A one page summary for each individual was prepared to summarise their outlooks. An example of a complete profile is attached in appendix 9.

5.4.1 Mapping participants

Following the creation of the individual profiles and summaries, the 30 individual cases were mapped onto a salience-efficacy framework on the basis of their personal levels of salience and efficacy as indicated during the interviews. This is demonstrated in figure 5.5. The 'map' gives an indication of participants' stances on climate change based on their feelings of salience and efficacy. It is not a definitive framework of climate change salience and efficacy or an indication of any relationship between the two because the interviews did not seek to measure these explicitly. Constant reference to the individual interview profiles and summaries prepared for each participant made the process more accountable and the positioning of participants was reviewed and altered until an appropriate mapping was reached. Some examples of the

considerations taken into account are presented in box 5.2 which illustrates how judgements about the mapping of participants were made.

Box 5.2 Considerations arising during the salience-efficacy mapping of participants

In both cases the predominant measure is my judgement of a person's personal levels of salience and efficacy. The following factors and indicators are examples of the kinds of points accounting for my judgements and accounting for the ways in which I have distinguished participants' positions relative to one another.

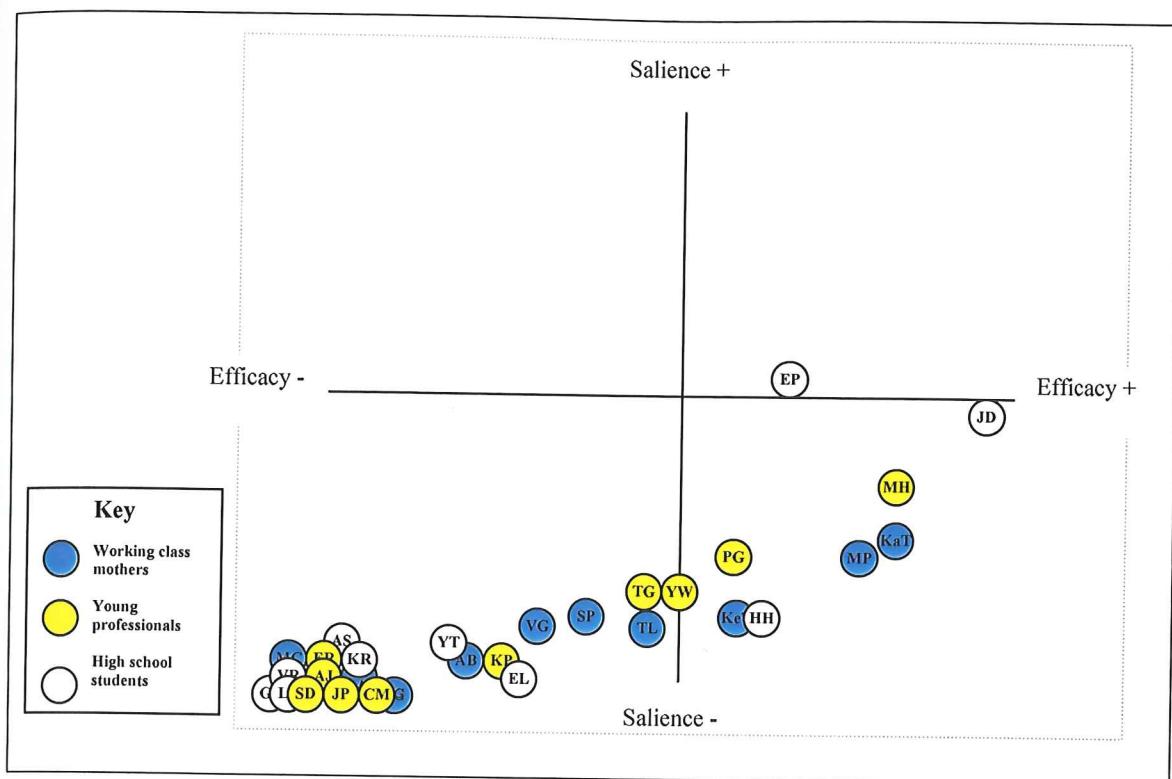
Salience:

- A participant who talked at length about climate change being important in a general sense would be placed in a marginally higher salience position than those who specifically state that it is not important. A participant demonstrating concern about climate changes in the UK or locally would be placed more highly on the scale than a person not mentioning these but talking about global impacts.
- A participant talking about climate changes happening in the local or national area as one of their concerns about climate change would be placed more highly on the scale than a participant talking about climate change happening in other places and not really affecting him / her for example.
- Most of the working class mothers saw climate change as part of the same issue as the hole in the ozone layer and related the causes. Confusion about the causes or lack of knowledge about climate change does not have a direct bearing on people's senses of salience (this applies to efficacy too). Participants may have very little knowledge about climate change yet still feel that it is important or that they can do something about it. However, a stated perception of not knowing very much about it and therefore feeling unable to do anything through not knowing would make a difference.

Efficacy:

- Participants' perceptions of the causes of climate change, how they see themselves as a contribution and whether they interpret themselves as having a personal responsibility for doing something about it were considerations for the efficacy mapping. Those who felt that climate change was largely natural were more likely to feel unable to do anything about climate change because they did not think it will make a difference and are placed at the lower end of the efficacy spectrum. Those who stated that they feel able to do something about climate change but talk about it being naturally caused for example would be placed marginally further along the scale but not as high up as someone stating that they feel able and that climate change is caused by humans, or even by individual activities.
- Some participants stated plainly that they felt unable to do anything about climate change, were unwilling to change and were not carrying out any actions. Other people's feelings of efficacy were harder to interpret from the interviews, e.g. stating that they feel able to do things but that they do not see individuals as having a real responsibility to do something about climate change.
- Willingness or unwillingness are not taken as indicators of efficacy. However, a participant who felt unable to do anything about climate change because they do not know what to do, but who expressed willingness to do anything that they know about (and states that they are doing things that they know about) would be placed slightly higher than a participant stating that they would not do anything even if they knew what to do, e.g. some participants feel able to do something about climate change but are unwilling to make changes (stating for example that they feel able but do not want to do things because they do not have enough time, other people are not changing, etc.).
- Stated behaviour is also not taken as an indicator. A participant could theoretically have a high sense of efficacy without actually carrying out any climate change behaviours (e.g. if they did not know what to do). However, the vast majority of participants who demonstrated a sense of efficacy were keen to point out a number of actions that they were taking.

Figure 5.5 Mapping of participants on a salience–efficacy framework



The majority of participants fall into two of the four sections of the framework (this is not to say that members of the wider population would not be spread differently). The framework demonstrates that there is no distinctive clustering by sample group on the basis of salience and efficacy. The map confirms the suggestion made earlier that the overall feeling of personal climate change salience is low (whilst participants might still consider it an issue of general importance). Participants' senses of efficacy are spread across a wider range. Nearly half the participants in the sample constitute a strong cluster characterised by feelings of having little personal climate change efficacy and low issue salience. The other participants are more spread out towards having a greater sense of climate change efficacy and marginally greater issue salience. The working class mothers are most evenly distributed across the range. The young professionals and high school students are slightly more polarised in terms of both salience and efficacy but these are loose distinctions.

Despite a carefully designed interview schedule and a very systematic approach to analysis, it is extremely difficult to give an absolute mapping on the basis of salience and efficacy. This is because of the subjectivity involved in interpretation of the interview material. The interviews represent an evolving viewpoint and required a somewhat intuitive approach to mapping, guided by a thorough knowledge of the details of the data. Thinking about the interviews in relation to each other aided distinctions to be made on the basis of salience and efficacy (participants are

positioned relative to each others personal ‘level’ of climate change salience and efficacy). Other obstacles were also encountered during the mapping of participants. The complexity of the data and lack of ‘separation’ or transparency of the themes in participants’ discussions of climate change was such an example. Participants’ outlooks on the issue do not neatly ascribe to the themes of the research even with interview questions designed to guide them in such directions. Similarly, even when participants are situated in the same ‘box’ in the above framework, the characteristics of their climate change salience and efficacy may be quite different. As noted earlier, participants also seemed to easily lapse in to addressing climate change on a more general than personal level and there was not always a clear distinction, e.g. when they talked about how ‘people’ feel about climate change it sometimes seemed that this was an illustration of their own feelings but this was not always clear.

5.4.2 Incorporating imagery

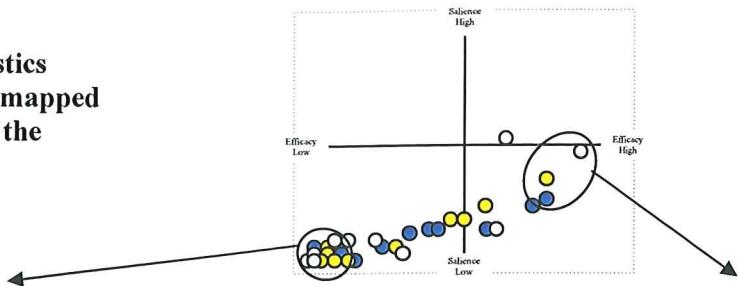
On the basis of figure 5.5 it was possible to explore potential links between climate change imagery and participants’ senses of climate change salience and efficacy. Participants’ climate change imagery is diverse and complex with many different characteristics, however, identifiable differences in participants’ climate change imagery may be apparent depending on where participants were located on the framework. Apparent differences would raise questions for the subsequent stages of data collection. Six participants were selected as polar examples for an exploration of their imagery. Figure 5.6 presents a summary of the climate change imagery elicited from these six participants during their interviews. In *italics* are a brief description of the characteristics of their salience and efficacy for reference.

Those participants who demonstrated relatively greater senses of issue salience and personal efficacy relative to others also seemed to be able to spontaneously elicit more climate change imagery. Explanations for this include having more knowledge about the causes, consequences and potential solutions to climate change, believing it to be happening and perceiving changes locally. Based on the summaries given in figure 5.6, imagery connected with perceived personal experience, potential personal effects and one’s locality seems to be a feature more connected with the participants who have greater degrees of salience and efficacy. Their imagery of the future and of climate change tends to be more personal (as well as global) in nature, their climate change imagery demonstrating a local or experiential bias. Their interpretations of climate change seem to be very dependent on the changes they have perceived as happening. Participants with negligible senses of salience and efficacy were somewhat more likely to demonstrate very global perspectives on the future and on climate change, reflected in their imagery. Climate change was more likely to be talked about in remote and abstract terms and these participants did not tend to discuss local or personal imagery based on perceived personal experiences. Those who imagined causes of climate change being completely

associated with human activity (particularly at personal, local or individual levels), demonstrated a greater degree of efficacy than participants who imagined natural causes and consequently saw less of a role for personal action to make a difference to climate change.

The differences and similarities that may link participants' imagery and their senses of salience and efficacy are tentative. The exploration presented gives an idea of the possible range and complexity of linkages between participants' senses of salience and efficacy and their climate change imagery. It is difficult to offer any further observations of any conclusivity because the sample is small and there is not a great range of feeling in the contexts of salience and efficacy. Most importantly, each participant has very diverse imagery and the differences and similarities between participants are difficult to pin down. A further exploration of this is the remit of phases two and three of the research.

Figure 5.6
Imagery and S-E characteristics associated with participants mapped towards the extreme ends of the framework



Lower salience, lower efficacy

Lee, high school student

Cannot imagine the climate changing much in 50 years; Imagines problems with petrol availability, transport coming to a standstill - oil running out; Major images of floods and fires; Finds changes difficult to imagine in UK context. Cannot really imagine CC; Does not imagine anything positive but thinks it cannot all be bad; Most imagery from television (mainly news and documentaries) and school; Has not really noticed many changes to suggest CC is happening apart from the examples on television.

Low efficacy mainly because others are not doing anything. Laziness also a significant barrier. Would have to be directly affected or lifestyle compromised before CC became more important or before he made any changes i.e. not important because it's not affecting him. More taken by the bigger picture of CC than by any local significance. Concerned about immediate issues, personal relationships, school.

Sam, working class mother

Associates with ozone layer, hole in ozone layer getting bigger; Heat, imagines it getting hotter, icebergs melting, flooding and loss of land; More built up making it even hotter; Getting worse more quickly in the future; Crater leading to the core of the earth; Pollution; Penguins in a TV advert; Positive – hotter, nicer weather and tourism bringing in money; Has noticed the weather getting hotter; Has noticed a river flooding every year nearby.

Salience is low because she does not know anything about CC and it has not come to her attention. Outlook on the future in CC terms is negative. Does not feel she can do much unless it's made easy. Feels that the Government should take responsibility and lead people. Knowledge may not make much difference to salience, perhaps a little bit to efficacy. Children's future, money and social class very important personal issues.

Simon, young professional

Imagines CC involving retreat of the East Anglian coastline and some warming; Finds CC difficult to visualise; Imagery is connected with the stories he has written as a local journalist about the East Anglian coast; Has not really noticed changes that he connects with CC; Flooding abroad, e.g. Venice.

Has not really thought about the future or CC. Very present and personal focus on life; lifestyle, money and career are important. Aware of CC but has not really crossed his mind, of no personal importance as it has not coincided with any personally important issues - would be more important if it did. Does not really know cause, thinks it's largely natural but that people have an effect. Would find it hard to do things and is reluctant to - Government should pass laws. Money, career and lifestyle are important.

Higher salience, higher efficacy

Jonny, high school student

Ice caps melting. Rise in sea level; Coastal erosion, loss of coastal space, population problems; Will get hotter especially in summer, winters not so cold - fall in cold extremes. Could be positive that people do not get too cold in the winter, easier to live; Temperate regions might reach extremes and high temp's; Subtropical animals migrating to the UK, other creatures able to live here. Decrease in polar animal populations such as polar bears and penguins; Disease epidemics; Change of weather - increased rainfall, more sun, snow and hail. Has noticed unpredictable weather - storms at funny times or temperatures higher than normal but nothing else; In 50 years there will be noticeable changes, e.g. rise in sea level and drop in arctic wildlife populations; wind and solar power, renewables.

Considers CC an important issue generally and personally. Makes time to think about issues like CC and acts on it. Feels able to do something even if it is just a small change, regardless of everyone else. Feels that people do not know what to do and need to be made more aware. CC would become more important if people were seeing noticeable changes. Concerned about school, job, university.

Karen, working class mother

Colder weather in summer (personal exp). Cannot gauge the seasons like when she was young, they used to be more definite. Older people remember what seasons used to be like, have noticed change; Winters mild in some places, more extreme in others. Not such extreme winters and summers. More erratic seasons. Cannot get over illnesses because the winters are not cold enough to kill off the bugs; Things in the news, seen things on television; Associates with ozone issue; Drought, dried up riverbeds, bush fires; Floods and it being wet everywhere, East Anglia underwater. Norwich might not be affected but Great Yarmouth will not exist; Has noticed big changes. York floods - saw it happening, shocked. Horrible for people whose houses got flooded; Lots of snow in Scotland; Positive – hot summer, but otherwise nothing; Oil fields on fire during the Gulf War and contribution to CC; Chernobyl and radiation, worries about skin cancer increasing; Ice sheets melting; Coastal erosion, building houses in silly places.

CC is not of great personal importance but she feels a strong sense of environmental responsibility overall and is doing a lot, feels able to do her bit for climate change. Environment generally of importance to her, also family and money.

Mark, young professional

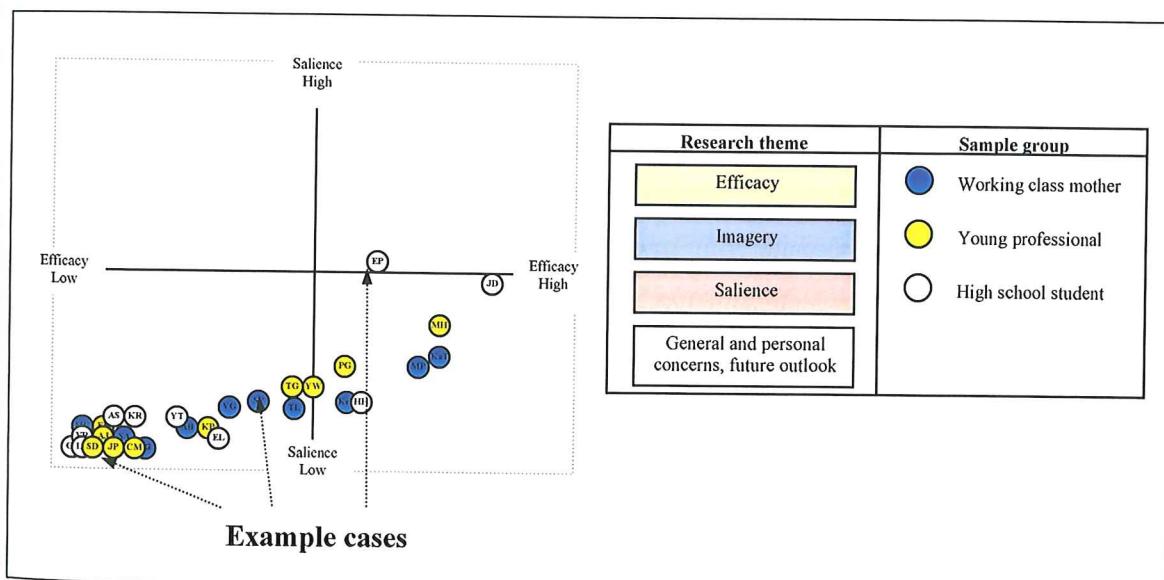
Seasonal changes in UK and SA, hotter summers in SA; Weather patterns are changing, different in SA; Concerned about skin cancer, notices he burns more easily and more quickly in SA these days. Multicoloured picture of the ozone layer; Green cars, environmentally friendly products; News images of people suffering; Flooding, drought in other countries; Warmer (so people say), winters are not so cold (so people say).

Feels able to do things that he knows make a difference. Generally does a lot and is aware of CC in his everyday activities. States that personally it is still not very important. Imagery is a mixture of personal experiences, what people say and the news media. Would do more if there was a stronger consensus. Media coverage would also make the matter more important. Finds climate change is quite an intangible subject and it's difficult to relate to energy use. Future concerns very focussed on his children and future generations.

5.4.3 Individual cases

More light is shed on the potential relationships between the themes based on an exploration of the individual cases, three of which are presented here. They are selected on the basis that they demonstrate some contrast in opinion and reflect the variety and depth of the data. One case is taken from each sample group and from different positions across the framework presented in figure 5.5. The cases selected are identified in figure 5.7 alongside a key relevant for the one page summaries of the interview profiles. Each individual summary illustrates a participant's placement on the framework, alongside the main points made in their interviews and example quotes (by theme). The summaries are presented in the coming pages and offer the reader a more detailed idea of how the interview data fits together. Each summary is preceded by a short account of each person's position and highlights the differences between them. The results presented in this chapter suffice by way of explanation so there is no discussion presented following the outline of each individual case. The personal outlooks on climate change presented are simply given as three contrasting outlooks, bringing the overall patterns in the data as presented above to life.

Figure 5.7 The individuals profiled in this chapter and key for interpretation



Simon, young professional (SD)

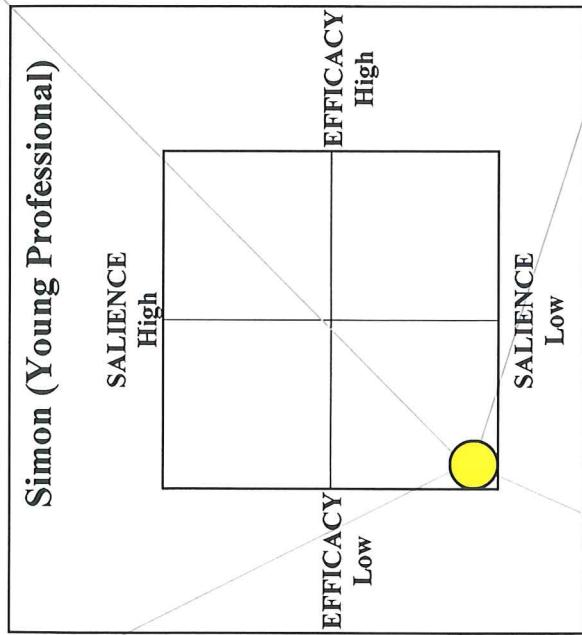
Simon's summary (figure 5.8) demonstrates the immediate nature of his outlook on life and his personal focus reflected by his difficulty in imagining climate change. His imagery is mainly local and associated with stories he has covered as a local journalist; also referred to when he talks in terms of climate change salience and efficacy. Climate change is not important personally because it is not affecting him and until it does, it will not become important. He finds it hard to imagine how his actions have an impact on the climate and is reluctant to make personal environmental efforts. He feels that the Government has a primary responsibility.

Simon is very concerned with his present situation and states that he has not really thought about the future or climate change. Rather, he focuses on the present and on personal issues. His main concerns and issues of importance in life are doing well in his career, being healthy, earning money and having a happy personal life. Environmental issues are not a consideration. He is aware of climate change but it has not really crossed his mind and is of no personal importance. This is because it has not coincided with any personally important issues. If it did, climate change would become more important but until then it is not. He does not really know the causes of climate change, but thinks it's largely natural. He feels that people do have an effect, e.g. car exhausts. However he finds it difficult to imagine how personal actions can have a planetary effect. He feels that it's hard to do things about climate change, feels unable to and is reluctant to. This is partly laziness but also because he feels he does not have time in his busy, modern life. He feels that he needs to be encouraged, that it needs to be made easier, and that Government should pass laws and take responsibility, making people more aware. He would be more willing to use public transport for example, if it was reasonably priced and clean. He finds climate change very difficult to imagine but through his work as a journalist thinks of East Anglia going under water and coastal erosion. He does not feel that he has noticed any changes attributable to climate change. He does not really know how significant it will be in the future, perhaps not at all if it has had no impacts.

Efficacy

- Considers consumer lifestyles and industry to be main causes, also mentions car exhausts but states he doesn't really know.
- Feels that climate change is largely due to nature and that it is fairly inevitable but that maybe we could slow it down / make it less harmful.
- Finds it hard to imagine his own actions affecting the global climate.
- Doesn't really feel able to do anything about climate change. Reluctant to take personal actions because of laziness and having a busy life. He needs encouraging to do more and wouldn't take actions that would cost more. It needs to be easier.
- Feels that Government should pass laws and take responsibility for climate change, and increase public awareness so people understand.
- Would be prepared to use public transport if it was reliable, cleaner and more reasonably priced.

Figure 5.8 Individual summary



Imagery

- Getting warmer.
- Imagines climate change involving retreat of the East Anglian coastline, coastal erosion.
- Finds climate change difficult to visualise.
- Imagery is connected with the stories he has written as a local journalist about the East Anglian coast.
- Hasn't really noticed changes that he connects with climate change
- Flooding abroad, e.g. Venice.
- Energy resources depleting. Wind, solar and nuclear in the future.

Salience

- States that climate change hasn't really crossed his mind and he isn't really interested. Doesn't know how significant it might be in the future.
- Sceptical about climate change science because of an apparent lack of consensus. Would be more important to him if it was more definite.
- Not concerned personally because it doesn't coincide with personally important issues and doesn't affect him directly. Feels that climate change would become more important if it affected his everyday life e.g. if he had to mow the grass more often or if Norwich 'turned into Venice'. Otherwise it remains too remote (for most people). Would be convinced by seeing physical evidence, feels that most people feel the same.
- First became aware in relation to the ozone issue. Feels that he doesn't know very much about climate change. Most awareness comes via his work as a local journalist and from the wider media – news, radio. Knowledge also of local research at UEA via his wife and job.
- Not a topic that's mentioned amongst friends.
- Feels that climate change is negative (because that's what people are told).

General and personal concerns, future outlook

- Hasn't really thought about the future, focuses on the present and at a personal level.
- Imagines technology moving on and the way that energy is produced being different.
- Hopes that UK economy will do well in the future. No great fears for the future. Imagines American dominance and wars.
- Hopes for a better personal lifestyle. Concerned about career, happy personal life, personal wealth, health but not environmental issues.

- "In 50 years, I have to say it's the sort of thing I don't ever stop and think about. I don't know. I just don't have the faintest idea. I suppose I just don't devote any energy to those sorts of hypothetical questions. I probably just focus on what I am doing at the moment."
- "It's only once you are a parent that you start thinking about the future of the world. I don't really think about it. I think about the future of me. Me and my wife I suppose. I suppose that I don't think globally really." "Hopefully I'll be better off, in a bigger house, with a nicer car. But that's purely selfish."
- "I don't, I suppose, environmental issues don't really come into it. I mean, because they don't directly affect me, now."

Sara, working class mother (SP)

The summary (figure 5.9) demonstrates that Sara considers climate change to be an important issue, and that there are everyday things she can do about it. However, she does not find it a very important issue personally. She does not have time to stop and think about it because there are other more important things in life to deal with. For example, her children and money which seem to be very important issues in her life. When she thinks of the future, it is in the context of her children's lives. She does not feel she knows much about climate change, however she has noticed changes in the weather and seasons that she associates with climate change. She feels that people need to be made more aware, particularly about what they can do.

Sara's dominant concerns are about her children's lives and money. She talks about both the future and climate change in terms of these things and also imagines a more hi-tech future. She has heard of global warming, and feels more aware of it having had children. She thinks it's an issue of importance to everyone but is not concerned on a daily basis unless she stops and thinks about it. However, she generally has more important things to think about and deal with (such as her children, getting by). She does not feel that she or other people know enough about climate change, and that people need to be made more aware. She feels negative about it and wonders whether she really wants to know. Climate change would become more important if she could no longer go outside but by that point it would be too late. She has noticed local changes, that the weather has become warmer and wetter, and states that she notices things every day and thinks that the seasons have already changed a lot in a short space of time. She imagines the weather being different in future. Traffic makes her think about climate change, she feels that it's caused by humans but that people will not stop until it gets too bad. She wonders if her children will be able to play outside in future and worries about skin cancer. Sara imagines sea level rise, the ice caps melting and coastal erosion but states that this does not affect her. She does not feel that she knows enough about what to do about climate change and that people need basic information about how to change in everyday life. She knows about some small things she can do and carries these out. Sara feels that it is everybody's responsibility to do something about climate change but that it has to be started by Government and globally. She feels that getting people to change will be a problem because people have busy lives and have to put themselves and their children first. She feels that it costs more to do something about climate change and this is holding her back, as money is tight enough in the first place. She also feels that with a family it is too difficult to use public transport and it's also expensive – at the end of the day "things boil down to money, not what's good for the environment."

General and personal concerns, future outlook

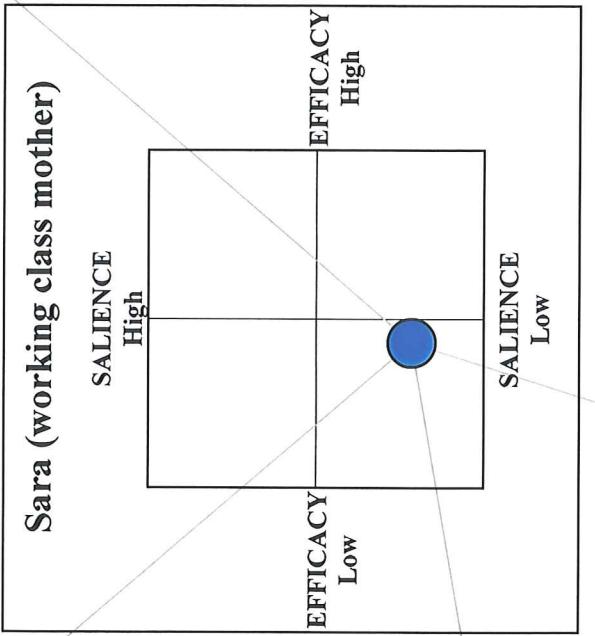
- Wonders if there will be a world in the future.
- Wonders what her children's lives will be like.
- Work and travel will be different and technology will move on in some areas.
- Things getting more hi-tech. Wants to get a computer and keep up with the children.
- Concerned about money and children's safety.

- "Well I wonder, are my kids going to be having families and think the same thing, or is it going to be a different total lifestyle and a different way of living. You just don't know, do you."
- "Work, travelling to and from and the way we work. Some things will always stay the same but other things will be more hi-tech."
- "I hope it's all going to be all right, and I hope that my kids is gonna have the same things as I want, and a bit better maybe."
- "Money, I worry about money. Safety is another thing. I don't let my kids out. I know a lot of others do. My eldest is eight and I still don't let her out. Their lives are so precious and it's just not worth taking the chance sometimes."

- Hasn't heard of climate change, has heard of global warming. Connects with the ozone issue. Became aware of climate change after having children. Generally feels people are more aware after having children.
- Important to everyone because if it gets warmer everything will change, we'll have to live differently. Not concerned on a daily basis, only when she stops and thinks about it. Doesn't really stop and think. Other more important things to deal with. People have other things in life to worry about. Have to get by.
- People don't know enough; don't know the extent of it. Doesn't know whether people are being told the truth, or what's going on. No-one has straight answers. Not sure she wants to know what will happen, frightening if you know too much.
- Doesn't think of climate change positively. Mainly knows about climate change from TV – news and films. Learns from her children who do it at school.
- Notices changes every day. Can see the effect of the sun by getting burnt easily which is concerning.
- Not mentioned in conversation unless something comes up on the TV – in which case its general and speculating about the future and the warming.
- Other people and animals on the earth don't have a say.
- Need to make people more aware, get them to listen. Children should be taught so that they are aware, and bring it home. Information on the TV should be interesting, not frightening.
- Importance in future depends if climate change carries on. Would become more important if she could no longer go outside, but by then it'd be too late.

- "I think it's important to everyone at the end of the day. Because if the climate gets warmer, there isn't going to be nothing here is there. Everything will change then. We'll just have to find another way of living."
- "It's not as important as the day-to-day. You just have to get by don't you. It's when you stop and think about that, the climate and all that lot, that's when you worry. Is there going to be anything here for when they get older?"
- "I think that if you couldn't go outside then that would change everyone's life, wouldn't it? If you couldn't walk out with just your normal clothes on, without protection. That would change everyone's attitude, but it would be too late then."
- "I don't think that until you stop and think then you don't, I don't know enough about it."

Figure 5.9 Individual summary



Imagery

- Imagines the world getting too hot. Heat, rising temperatures, fiery skies, earth burning up, ice melting into the sea. Coastal erosion.
- Imagines the weather being different everyday in the future, storms and hail. Thinks of variable weather, rain one minute, drought the next. Weather seems to be wetter. Different summers and winters – not so cold in winter. Seasons have changed very quickly. Positive outcome is that it wouldn't be so cold.
- Wonders if climate will stay the same or get worse and if anything will be left. Will be very different in future if climate changes and we could become extinct.
- Wonders if children will be able to play outside in the future. Worries about skin cancer, burning.
- Notices the traffic – makes her think about climate change.
- Most imagery from television, not newspapers. Films have made her think about it and what she can do. Has noticed some changes.

- "The heat, temperature. You just see the fiery skies and all that sort of thing don't you. Mainly temperatures, and they make you think about the sea too. Obviously, if everything's getting warmer, then things will melt more won't they, and there's corrosion isn't there, on the coast. 'Cause it's eating all the coast up. But that don't really affect you unless you're living there, and you lose your places where you live."
- "The different winters and the different summers that you have. And how they can change. That's the weather seems to change. We used to have a really cold winter and quite a warm summer. But that's all mixing now. It isn't as cold. At least it doesn't seem as cold unless you get snow. That changes so quick. I think that's the difference from when I was little to now. It's the winter and the summer, the temperatures and how it can rain so much, and then be really hot and dry. And then you can get hail stones and storms."

Efficacy

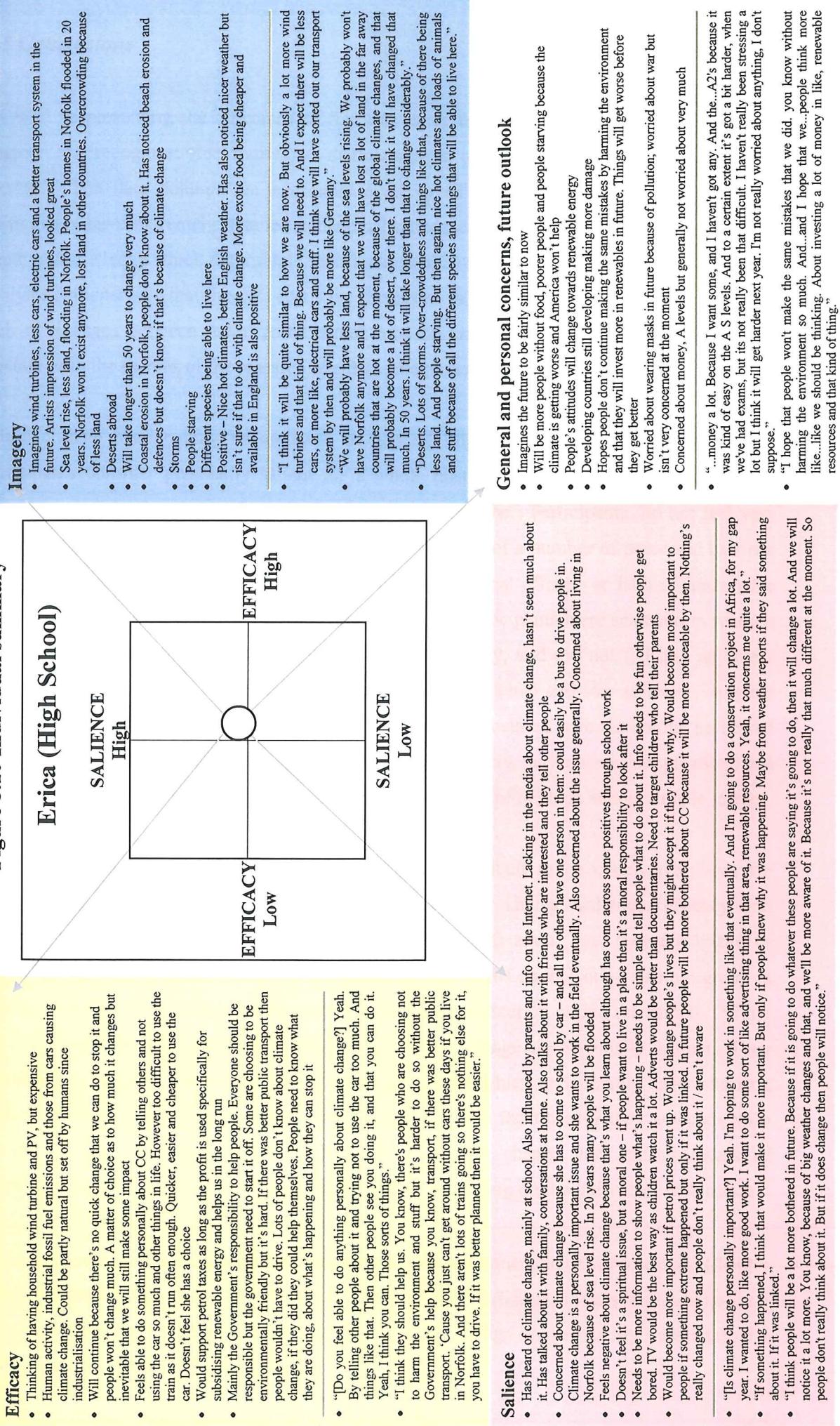
- Wonders whether like the switch to unleaded petrol will be brought in to deal with climate change.
- Doesn't know enough about what to do. People need to be more aware of what they are doing. Doesn't know what effect appliances at home have on the environment.
- Need basic information about how to change in everyday life.
- Feels able to do things at home, everyday basic things. Cycles, walks rather than using car but this is also for health reasons.
- Everyone's responsibility but has to start somewhere. One person can't make a difference. Won't change much until there is change from above. Need global effort but countries don't seem to be getting together. Leaders of the countries have responsibility, they are in charge.
- Getting everyone to change is a problem. Busy life, not enough time for the children, have to put yourself first. Would do more if she had more money and time to think about it. Comes down to money really. When you've got kids you just have to get by, especially with a mortgage. Costs money to change, everything boils down to money. Need to be able to replace appliances with energy ones when they go wrong at an affordable price. Some people care and others aren't bothered or have other worries; they just have to get by. Can't be bothered to use public transport with a family. Easier and cheaper to go in the car. Take the cheaper option because things boil down to money not what's good for the environment.
- People are causing climate change, it's not natural, so she's told. Would hear if there was another cause. Fumes from traffic and home heating are causes of climate change – that what's she's been told and all she knows. People will never stop affecting the climate until it gets too bad. Things can't carry on.
- "Fumes and that. And that goes from traffic to heating. I think heating your house up and that sort of thing. That's what we've been told. Basically, that's all we know."
- "[Do you feel that you can do anything personally?] You can do what you can at home I mean, I try to cycle if I can, when I go to work, rather than take the car. Not just for the environment, but for health too. But yeah, things like that. Just basic, everyday things I think. And my car is unleaded. But apart from that I think I won't really change until someone change it."
- "I don't really know enough. I don't think we know enough to know what to do. I think we are ignorant really. I don't know enough about how to change it. And how to stop it. I don't think we do know enough. Not enough to change it anyway, and it's getting everyone to do it."
- "You've got to put yourselves first. And then I suppose everything else comes later doesn't it. I mean, it's a busy life now. I don't think we have enough time for the children."

Erica, high school student (EP)

The following review with reference to figure 5.10 demonstrates that Erica feels a greater sense of both salience and efficacy relative to the other participants. She imagines climate change in positive and negative lights. She has lots of imagery associated with renewable energy as well as the impacts of climate change. Most is local in its nature although she does have some visualisations of impacts abroad. She feels that people need to be made more aware, and that it is mainly the Government's responsibility to do something about climate change by helping people. She does not have any dominant concerns in life beyond the environment.

Erica does not imagine much change in the future, however she imagines more people being poor and starving, and American dominance. She feels that people's attitudes to energy will change although developing countries need to continue their development. She hopes that people will think more about the environment in future and that it will probably have to get worse before it gets better and that people have a moral responsibility to look after the environment. She is concerned about money and her school work but has no major life issues. Erica is very aware of climate change and considers it a personally salient issue. She has learnt about it at school, on the internet and in discussions with her parents. She feels that it could be a positive as well as a negative issue. There needs to be more information about climate change that also tells people what they can do and thinks that if changes are made (e.g. petrol taxes) then people will accept them more easily if they understand why. She does not feel that anything could really make climate change any more important to her because it already is, but thinks that it would become more important to others if something happened that was clearly linked to climate change. She feels that when people start noticing change they will care more but at the moment it is not very noticeable. She feels that climate change is predominantly caused by humans and that it will continue (people will not change much). She feels able to do something about climate change by not using the car too much, saving energy and telling others about it. Erica's family are interested in having a wind turbine and solar cells but cannot because of cost and planning restrictions. She is concerned that she has to travel to school by car. She feels restricted in terms of transport because there are no alternative travel options from where she lives so has to use the car. Again she feels that people need to know more about what they can do. Imagery is based on what she's learnt about at school and talking to parents, she has not seen much on the media. She frequently talks favourably about renewable energy. She thinks of climate change in local terms most of the time (she has noticed coastal erosion, flooding) but mentions deserts and people starving. She thinks positively (mostly in UK context, more negative in a global context) as well as negatively and talks about having noticed nicer weather, different species being able to live in the UK, growing more exotic food, etc.

Figure 5.10 Individual summary



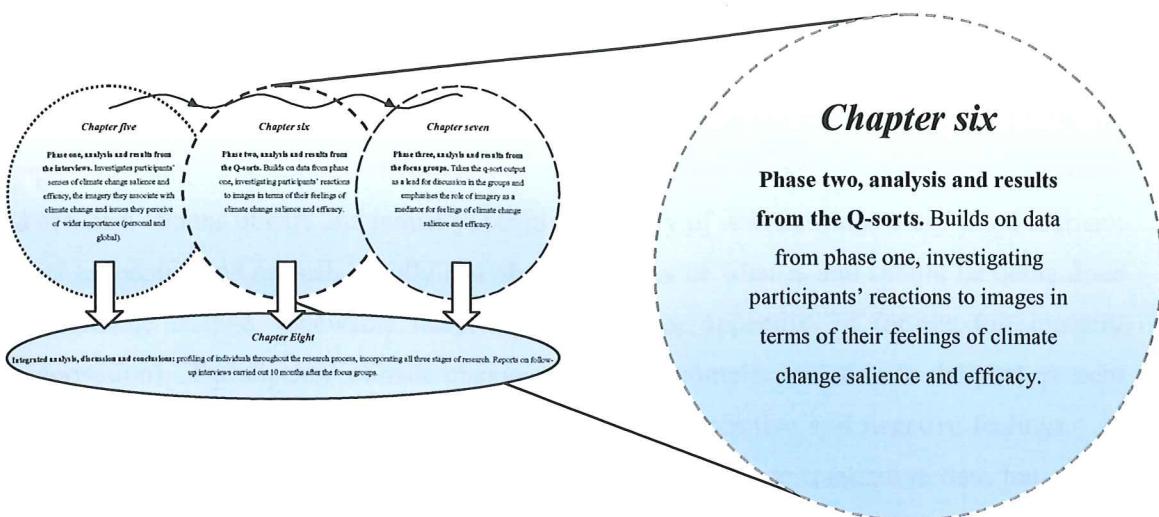
5.5 Conclusions

As well as presenting the outcomes of the interviews from an overarching perspective, this chapter has recognised the individual distinctiveness of participants' outlooks on climate change. The data contains an enormous diversity of views and positions on the issue; participants have extremely detailed conceptualisations of climate change, regardless of their depth of knowledge which incorporate their feelings about a whole host of other concerns. The analysis demonstrates that the data spans the themes of the research and that there is a complex web of linkages between them; participants' conceptions of climate change do not coincide directly with the themes of the research, the data categorisation or the sample groups.

While climate change may be an issue of general importance but is not something that participants consider personally salient for a whole host of reasons including the perceived remoteness of climate change from one's everyday experience. Participants did not feel very personally able to do anything about climate change because of a number of perceived barriers, for example, a lack of Government action validating personal efforts, or lack of knowledge about what one can do. On the basis of their interviews, participants were scattered in relation to their feelings of both climate change salience and efficacy, and did not fall into any clear typology beyond a cluster characterising feelings of low salience and low efficacy. A great assortment of imagery is apparent in the data, apparently associated with the media, perceived personal experiences of climate changes, interaction with others, participants' imaginations and educational sources (the latter largely because of the inclusion of the high school sample group).

When taking an overall perspective on the data, it is difficult to be conclusive about the relationships between participants' feelings about climate change salience, efficacy and imagery; it is not possible to generate definitive conclusions about how they are linked or distinctive in relation to sample group or clustering within the framework. Sample group is certainly not a defining factor despite some social class stratification within the sample. While there are broad patterns, participants' outlooks on climate change are personally distinct. They are related to people's life experiences and priorities in life which undoubtedly have a bearing on their feelings of issue salience and personal efficacy, and the imagery they associate with climate change. Connections are made between climate change and various issues of importance and concern in life, but to different extents depending on the individual in question.

The results presented in this chapter set the scene for the subsequent stages of research. Chapter six presents the results of the Q-sorts which explored how participants' senses of salience and efficacy are reflected in their reactions to a set of climate change images (partly selected on the basis of the data presented in this chapter).



Chapter six

Phase two, analysis and results

from the Q-sorts. Builds on data from phase one, investigating participants' reactions to images in terms of their feelings of climate change salience and efficacy.

6.1 Introduction

Chapter six presents the results of the second stage of empirical research. It reports on the exploration of participants' senses of climate change salience and efficacy in relation to a set of climate change images using Q-methodology.

The chapter begins with an explanation of the image selection process, a crucial component of Q-methodology, which is partly informed by the data presented in chapter five. The results of the two image sorts are presented in the second part of this chapter.

6.2 Image selection and design of instructions

As explained in chapter four, the aim of the Q-sample is to produce a representation of the full discourse on the subject (Brown, 1999; Fairweather and Swaffield, 2001). A systematic selection procedure generated a representative categorisation of the discourse on climate change. Four main strands constituted this strategy: the interview data, expert consultation, a review of climate change scientific literature and campaign material from two environmental NGO's. Each led to a classification of climate change imagery and these were integrated in order to give an overall categorisation which provided a framework on which the image sample could be based. The input from the four strands meant that the sample captured the full range of climate change imagery, and reflected that circulated in the public domain, as well as climate change images recognised by the scientific community. The categorisation has ensured that I avoid under- or over-sampling particular aspects of climate change and inadvertently introducing bias.

6.2.1 Image classification derived from the interview data

The descriptive categories summarising the climate change causes, impacts and potential solutions imagined by participants constitute one strand guiding the choice of images for the Q-sample, including descriptions of flooding and sea level rise; changing weather, temperatures and seasons; visions of cars and industry; positive imagery of warm summers and more tourism; effects on people and animals locally and abroad; visions of what is and should be being done about climate change, renewable technologies, etc. (see appendix 7d for the full imagery categorisation). Participants' climate change imagery is complex, relating to the past, present and future; to local, national and global levels and to both positive and negative feelings. As explained in chapter five, it is difficult to force categorisation on qualitative data but this is necessary as part of a systematic image selection procedure. A content focused categorisation based on the codes and sub-categories subsumed by the descriptive imagery categories of the interview data was generated for input into the image sampling process. The codes and (sub)categories were examined and distilled into a revised classification, presented in table 6.1.

Table 6.1 Image classification based on descriptive interview data

Causes (human):	Impacts:	Solutions:
Human causes: Energy consumption, gases, emissions, air pollution (personal transport, e.g. cars, also aeroplanes, etc.; industrial emissions)	Changing seasons (more moderate, warmer winters, hotter summers, local tourism, water supply, colder weather, temperature extremes, flowers out earlier, less snow)	Saving energy, the way people use energy
Energy production (Power stations)	Agricultural and landscape (food supply, irrigation and water, different crops, changing landscape, food shortages)	Improved technology
	Temperature change (temperature rise, getting warmer, might get colder, too hot, UK like the Mediterranean, more extreme temperatures)	Political efforts (national and international governments)
	Sea level rise (ice caps melting, effects on polar bears and penguins, Antarctica shrinking, loss of land, sea defences)	Better transport (public transport, hydrogen cars)
	Coastal change (local, national, abroad, coastal erosion, sea defences, losing homes, inundation)	Renewables
	Deserts and drought (famine, people suffering/dying, no water, desertification, developing countries, burning, forest fires)	Sea defences
	Effects on lifestyles / personal impacts (health effects, lifestyle change, economic effects, housing, local flooding, drought, coastal change, etc.)	
	Flooding (local, national, other countries, flooded houses, people swimming)	
	Changing weather (more extreme, freak weather, tropical weather, windy, storms, better, worse, more rain, less rain)	
	Impacts on animals and nature (extinctions and suffering, changing animals and migration, new diseases and pests)	
Bear in mind the different types of imagery as suggested by participants (e.g. global / national / local / personal; positive as well as negative; experiential, photographic, diagrams, graphs, art, cartoons, digitally generated images, film; present / past / future...)		

6.2.2 Image classification based on climate change science

A review of the scientific literature was undertaken, the publications representing the global to local range of climate change imagery. They were: IPCC Third Assessment Report (IPCC, 2001a-d); UKCIP02 Report on climate change in the UK (Hulme *et al.*, 2002); Europe ACACIA project report (Parry, 2000); and REGIS: Regional Climate Change Impact and Response Studies in East Anglia and North West England (Holman *et al.*, 2002). A summary of the categorisation input into the image selection process as a result of this review is presented in appendix 10a.

6.2.3 Image classification based on expert consultation

A process of expert consultation was undertaken with seven people. They were researching various aspects of climate change, representing both natural and social science disciplines and one was involved in communicating about climate change for one of the research groups. Each person was given a brief introduction to my research and was interviewed openly based on the following three broad questions:

- What sorts of climate change related images do you think appeal to people (catch their attention, have some resonance)?
- What categories or types of image do you think are representative of climate change, whilst still being scientifically plausible?
- What types of images do you think would most effectively be used in communication with the public in order to stimulate firstly a feeling that climate change is important, and secondly that they can do something about it?

The consultation led to a categorisation presented in appendix 10b. Those consulted suggested that involving a variety of qualities amongst the images used, as well as the topic of their content would be important, e.g. images should vary between being dramatic, realistic, comical, graphical, etc. Some of those consulted felt that images should be easy to relate to and imaginable in ‘real life’ in order to carry resonance. For this reason there was argument for the inclusion of local images as well as for pictures with people in to give the images an element of scale and ‘relatability’. They also noted that images should represent secondary impacts of climate change as well as major primary, positive and negative images, expressions of gradual change, references to the future and climate change politics. The suggestions offered also relate to the presentation medium, their scientific plausibility and so on. The full range of points made are also summarised in appendix 10b. As well as informing the image selection criteria, those consulted were involved in reviewing the selection of images prior to and during the pilot study, so that the final selection would be sound.

6.2.4 Image classification based on a review of environmental NGO campaign material

Campaign material in print and on the websites of environmental NGO's (both in terms of the pictures and words⁷⁵) was reviewed because it is designed for the purpose of public circulation, representing the kinds of climate change image being used in the public domain⁷⁶. Attempts were made to speak with designers of the campaigns at Friends of the Earth and Greenpeace but this was unsuccessful. The results of the NGO imagery review are presented in appendix 10c.

Based on the image classifications derived from the four areas of input into the image selection process, a comprehensive summary was put together and is presented in appendix 10d. It gives the overall classifications and some constituent detail for each and is the basis upon which the images used in this research were selected. A summary is presented in table 6.2.

Table 6.2 Overall image classification

Causes	Consequences / Impacts	Adaptation & mitigation
GHG emissions from power production and industry	Temperature increase Drought	Transport Energy use
GHG emissions from transport and energy use	Changing weather and seasons Flooding Sea level rise Agriculture and landscape Coastal Health and human suffering Effects on flora and fauna Lifestyle, leisure, tourism	Other technical fixes Political situation Renewable energy / energy alternatives

Because of the distant and abstract qualities of climate change, it is not an issue that can be easily seen let alone represented in an image. For example, some aspects of climate change are difficult to express in an image because they are experienced or because they are of a political nature, for example scientific uncertainty or the stance of the United States. Effort was made to make sure that climate change was represented as both a positive and negative issue because the interviews yielded positive aspects of climate change, as did both discussions with the experts and the scientific literature review. On balance, all four strands framed climate change more negatively and this comes across in the sample. Because the discourse on climate change appears to be largely negative, it was also difficult to find positive images, however they were sought and included in relation to the sample classification, e.g. the beach, café, field of

⁷⁵ The Chambers English Dictionary defines 'imagery' as "words that suggest images, used to make a piece of writing more vivid"

⁷⁶ A media review of climate change imagery was beyond the scope of this study.

sunflowers. It is difficult to be definitive however, because positive connotations are dependent on individual opinions, e.g. wind turbines.

The 32 images used in the study (appendix 3) were taken from a database of hundreds, compiled during the course of the research (as illustrated in figure 4.1). Given such a large database of potentially useable images, it was difficult to reach a final sample of 32 (a number manageable for sorting e.g. Fairweather and Swaffield, 2000). The selected sample was revised over time until it was considered representative of the classification and therefore of the discourse surrounding the climate change issue⁷⁷. This involved taking the sample back to the experts consulted for review, and some further changes were made to the sample. Following the consultation, the pilot study took place which highlighted some images which were the subject of confusion or ambiguity, e.g. repeatedly found to be unclear and often misinterpreted or confused with other environmental issues. These practical points and issues of misinterpretation warranted image exclusions or substitutions. At each stage of the pilot study, the sample was revised and then subject to the following phase (as explained in chapter four). Despite the painstaking image selection process, the Q-sample cannot represent all possibilities; questions may well be raised about the process of selecting some items while excluding others (McKeown and Thomas, 1988). Were the selection process to be repeated, a different sample of images may well be chosen. However, if based on the same selection process it should be equally representative of the issue.

The participants sorted the images twice according to two instructions: one for salience, one for efficacy. These are presented in figure 4.5 which distinguishes them and demonstrates how they are related to the research themes. It was difficult to decide exactly how to frame the instructions. Appendix 11 gives the other piloted options (the key terminology is constant so only the 'positive' options are presented). The variations given came about because I was interested in many dimensions of participants' salience and efficacy, which was why the different options for the sorting criteria arose⁷⁸. Following piloting and reflection it was thought that the simplest instructions, most crucial to the objectives of my research should be used. This would help to avoid confusion in their interpretation.

⁷⁷ The categories need not be represented by separate pictures as long as each category was represented twice within the selection. It was initially thought that two images would be selected to represent each category; however it was very difficult to pinpoint an image that would represent a single category alone.

⁷⁸ For example, I was interested in people's feelings of willingness and motivation to do something about climate change in relation to efficacy because the notion of feeling able to do something about climate change does not indicate a person's desire to take action (similarly, wanting to do something is not necessarily a reflection of feeling empowered). I was also interested in what it was about an image that might move people towards doing something about climate change, making them feel that they must do something as well as having feelings of agency, incorporating some sense of a moral obligation that some participants demonstrated in the interviews, etc. There was an opportunity to address these in the focus groups.

6.3 Analysis

Following the Q-sorting by participants, data was input into a computer programme called PQMETHOD. The analysis involves the sequential application of the following three sets of statistical procedures: correlation, factor analysis, and the computation of factor scores (McKeown and Thomas, 1988). The Q-sorts are correlated with each other using centroid factor analysis to provide a subject matrix⁷⁹ which is used by factor analysis to extract and rotate factors which reflect groups of participants who have sorted the images in a similar way (Fairweather and Swaffield, 2001; McKeown and Thomas, 1988; Schlinger, 1969; Swaffield and Fairweather, 1996). The factors indicate Q-sorts which correspond to some degree and therefore participants who have ranked the images in much the same way. We may think of the factors as the main dimensions of the data contained in the correlation coefficients and these represent different points of view, attitudes or sets of preferences (Addams, 2000; Brown, 1980; Swaffield and Fairweather, 1996). The rotated factors are correlated with the individual Q-sorts revealing the degree to which each individual subscribes to each. Individual loadings on each factor indicate the degree of association between an individual's Q-sort and each factor or viewpoint (Addams, 2000; Barry and Proops, 2000; Fairweather and Swaffield, 2001; McKeown and Thomas, 1988; Schlinger, 1969)⁸⁰. The factors are therefore characterised by individuals who load significantly on them because the loading individuals are thought to share similar perspectives, in this case about the relative significance of the images in relation to the perceived importance of climate change or participants' feelings of self efficacy.

PQMETHOD automatically extracts eight factors for each sort, each of which explains different amounts of variance in the data. The researcher has to decide which of these factors are significant as some may result largely from chance and should be discarded (Schlinger, 1969). There are various criteria that can be used to identify those that should be retained and these are predominantly statistical but can also be theoretical (McKeown and Thomas, 1988)⁸¹. Brown (1980) suggests that un-rotated factors should be retained if they have eigenvalues exceeding the value of 1.00 and if they have at least two significant loadings for example (whereas others, for example Sexton *et al.* (1998) suggest that factors should be defined by at least *four or five*

⁷⁹ In Q-methodology, the variables are the participants, so the output shows patterns of relationships among participants in terms of factors (Brown, 1980; Schlinger, 1969; Swaffield and Fairweather, 1996).

⁸⁰ These loadings can be identified automatically by the PQMETHOD programme or manually by working out the significance value and flagging the significant loadings as was done in this study. To determine whether a factor loading is significant or not a calculation was done, partly based on the calculation of the standard error. For this study (where n is the number of images in the Q-sample), the standard error of a factor loading is $1/\sqrt{n} = 0.18$. At the 0.01 probability level a loading has to be at least $0.18 \times 2.58 = 0.46$. Factor loadings may range from +1.00 to -1.00. The higher a participant's loading on a factor, the more representative he or she is of that factor dimension (either positively or negatively). In this study, a loading $\pm .46$ or greater was considered significant and indicative of a meaningful relationship between the participant and the factor.

⁸¹ Caution should be exercised when statistical criteria are used because they may overlook a factor that holds theoretical interest but that may be unimportant in terms of the proportion of the variance explained.

participants). Schlinger (1969) points out that the criteria generally used for selecting the factors should act as no more than rough guidelines and that the researcher will use empirical judgement to select criteria that will allow for the most meaningful and useful interpretation of the data. The above criteria and a visual inspection of a scree plot of the factors against their eigenvalues were applied to the data in this study, indicating that both sorts had one dominant factor that should definitely be retained (see appendix 12a). For each, the second factor was also accepted because it fulfilled the above criteria. In both cases, the second factor had between eleven and nineteen significantly loading participants and eigenvalues greater than 1.00. The meaningful factors are rotated so that the relationship of the factors to the individual Q-sorts is clearer. In order to define the factors further and make them as distinct as possible, only loadings that were 'pure', that is, for which there was a significant loading on only one of the two factors, were used (Addams, 2000; Fairweather and Swaffield, 2001). Appendices 12b and 12c list the loading participants for the salience and efficacy factors respectively, highlighting the split cases (loading significantly on both retained factors in the Q-sorts) and the overall percentage of variance explained by each factor. Despite the removal of split cases before the factor rotation, the factors for the respective Q-sorts are similar. This means that the views of the participants demonstrated by the two factors in each case coincide and there are hence some clear tendencies amongst the participants toward similar image arrangements.

Once the factors are identified they can be explored to determine the viewpoints that they characterise. One can attempt to explain each according to the comparative positioning of the items for each factor by inspecting the factor scores (Addams, 2000). Each image is given a rank score corresponding to the distribution into which participants sorted the images (-3 to +3). The factor arrays help to interpret the meanings of the factors because they act as model Q-sorts (the scores correspond to the Q-sort pattern used by participants to sort the images)⁸². The items can be examined to see where they are located in the factors, and this aids the interpretation of the nature of the viewpoints expressed. Appendix 12d presents the factor arrays for all factors extracted from the Q-sorts. It is particularly useful to identify the items ranked at the extremes (+3, +2 and -2, -3). They offer the best indication of the type of viewpoint represented by each factor because they are the items that participants loading on the factors in question feel most strongly about (positively or negatively in the contexts of salience and efficacy) and represent the most differentiation in the viewpoints expressed. Those images falling into the middle of the factor arrays (+1, 0, -1) do not elicit such strong reactions from participants and are not so resonant either positively or negatively. The factor scores for some of the images are very different when compared across factors, aiding interpretation. Other items have similar scores across all factors and point to areas of consensus or agreement.

⁸² Based on the scores, the Q-sort can therefore be reconstructed to demonstrate the 'ideal type' or prototypical Q-sort indicating the views of each factor. Appendix 13 illustrates the image array for salience factor one.

The viewpoints expressed by each factor can be explored further by referring to the comments supplied by participants. These are the primary source of information about the patterns underlying each factor extracted from the data, and hence the interpretation of the viewpoints they express. It is particularly helpful to refer to the comments provided by participants who load highly on each factor. These participants are most representative of each factor; highly loading participants would have provided similar Q-sorts to those modelled by the factors. In this study, some individuals load significantly on more than one factor and therefore seem to be rather split between the two. Their comments are not at the forefront of factor interpretation but of course are still taken into account.

6.4 Results

The results of the Q-sorts are presented firstly with regard to the factors extracted from the salience Q-sort and secondly the efficacy Q-sort. The interpretation and presentation of the factors is aided by the written and spoken comments provided by participants, some of which are given as illustrative quotations. Factor one in each case is the most dominant viewpoint extracted from the data.

6.4.1 Salience

Table 6.3 presents the images ranked as making climate change seem most important and most unimportant for both factor one and factor two (those in bold type denote pictures appearing at the extreme ends of both factors). In the following discussion of the results, an interpretation of each factor is presented and then the two are compared.

Table 6.3 Strongly ranked images for salience factors one and two

Salience factor one		Salience factor two
HIGH Starving children, famine Dried up lake with dead fish Flood in Bangladesh Graph showing temperature rise Flooded house Melting ice	 +3	HIGH Industrial smoke stacks Starving children, famine Wind turbines Dried up lake with dead fish Petrol station Power station
LOW Rainy high street Aeroplane George Bush Sunflower field UK Tram Café	 -3	LOW Tram Rainy high street Irrigation Sunflower field UK Beach Café

6.4.1.1 Salience – factor one

Salience factor one is visually represented as a Q-sort arrangement in appendix 13. The six images ranked in factor one as making climate change seem most important were fairly dramatic and generally global in their nature, showing the adverse effects on people and animals both locally and in a more global sense. These images were likely to be the ones most capable of making climate change seem important to the participants loading particularly highly on this factor (see appendix 12b). The following discussion presents an outline of why the most strongly ranked images conveyed a sense of climate change salience based on the comments supplied by participants during their completion of the Q-sorts.

Starving children, famine: Participants referred to this image as an emotive and upsetting one that shows how lack of rain as a result of climate change catastrophically affects human and animal populations and causes suffering (famine, starvation, death, malnutrition). Some saw this as the most disastrous outcome of climate change as drought affects food supplies, a desperate situation needing involvement. Participants' stated that this picture made them realise the dangerous nature of climate change and the effects which some had not previously realised. Some made the point that the picture demonstrates an unjust situation because the developed world have contributed the most to climate change causing drought and death in the third world (the least fortunate suffering from climate change). They felt that this was a call for action to prevent climate change impacts happening in the future.

"I thought this one showed the importance of climate change the best, in a sort of shock tactic way, because it shows how it can affect people." (Erica, high school student)

"The significance of this showing the importance of climate change is the fact it is having catastrophic consequences in developing countries. It is unjust and tells me something needs to be achieved if we are going to prevent this happening and reoccurring for generations to come. I find this picture very emotive." (Helen, high school student)

Dried up lake with dead fish: Participants noted that this was not a nice picture; a very dramatic one showing a result of climate changes. Some stated that it had become more of a common sight. A voiced concern was that drought may affect food supply as fish populations decline due to drought or higher temperatures.

"A dramatic picture of dead fish and deep dry cracks." (Tanja, young professional)

"This is sad as it shows the results of overheating. Would have less impact without the fish." (Kathryn, high school student)

Flood in Bangladesh: Participants felt that this picture showed how climate change is affecting the earth and causing severe flooding. Some stated that it brought home the extent of climate change and its effects because it shows that people's lives are being affected now as a result.

They felt that this picture was sad and upsetting and a call to take climate change seriously. Some stated that this image has an impact and made them feel that climate change was important because it shows human suffering.

“This reflects first how the climate is affecting the earth on a drastic scale.” (Karen, working class mother)

“This really struck home the extent of climate change and its effects.” (Lee, high school student)

Graph showing temperature rise: Dramatic, surprising, worrying and scary were words used by participants to describe this image. It made climate change seem very important because it shows the extent of climate change. Some stated that it was scary because it is dramatic and because it shows actual data, which made the prospect of climate change all the more worrying. The image made the issue more scientific for some, which was also scary because of the trends shown over previous years and projected into the future. Some participants felt that it was proof that things are getting hotter; that seeing actual data ‘brings it home’.

“This very clearly shows that global warming is not just a natural process, but that it must be affected by something.” (Ailsa, young professional)

“This has a lot of impact as it shows actual quantitative data as ‘proof’. It’s very worrying.” (Kathryn, high school student)

Flooded house: This image made climate change seem important to participants because it had immediate effect for some, sparking thoughts of ‘It could happen to me’ or ‘I hope that never happens to me!’ Participants stated that it made climate change salient because there had been noticeable and more frequent local flooding locally and they noted that ‘one hears about it a lot more these days’ and ‘you see pictures like this a lot’, so ‘this image hits home’. Some noticed that the house looks as if it could be local and that the image showed the impact climate change could have on people here. It was stated by one participant loading on this factor that local pictures make you think about climate change in more depth; that it’s not easy to switch off because this reminds people that climate change could happen, literally on their doorstep whereas disaster images and shocking pictures on the television are more easily forgotten about.

“This one is important because it shows a flooded house and has an immediate effect. It could happen to me like this and because we’ve had a lot of this in the local area it really hits home.” (Vicky, working class mother)

“A picture I can connect with myself – a home flooded! Makes it real to me.” (Tanja, young professional)

Melting ice: Participants made little comment about this image beyond stating numerous times that what is depicted is obviously to do with climate change, causing sea level rise and flooding problems.

“This shows that the changing climate affects sea levels. I think melting ice caps seem important as it’s always emphasised at school.” (Kathryn, high school student)

The images with scores of +1 in this factor also conveyed some climate change salience to leading participants: refugees, polar bear, forest fire, stormy coast, house falling off a cliff and biting mosquito. In reaction to these pictures, participants made reference to the suffering of people and animals once more as making climate change salient. Participants emphasised that it is worrying to see the effects of climate change on people and animals and mentioned the possible extinction of species and loss of habitats (polar bear and forest fire). They felt that the picture of the stormy sea shows how climate change is causing storms, rising sea levels and coastal erosion and noted that it shows how climate change is affecting people’s lives and having destructive and violent effects. The picture of the house falling off the cliff made climate change seem salient because of concerns about local coastal erosion. The mosquito was resonant because participants found it alarming to think of malaria and other health impacts affecting the UK.

The images that made climate change seem unimportant generally illustrate scenes that are not very dramatic or negative, and that tend to be more positive and ambiguous relative to other images in the sample. They signify that this is the case for participants because of three main reasons. Firstly, participants were not sure what relevance the pictures had to climate change. Secondly, the pictures were considered to show positive outcomes or made participants think that climate change was not something to be concerned about; that it might be a good thing. Thirdly, participants felt in reaction, that climate changes might not be very great, e.g. if it rains more; we’re used to it anyway, it has always rained. The picture of George Bush was a slight anomaly as explained in due course.

Café: Participants noted that this was a positive picture; it’s nice to be outside enjoying the warm weather, and some hoped that this would become more possible. They saw this as a scene of a nice day indicating that there will be no problems if this is what climate change brings. The picture did not provoke concern amongst participants; they stated that it did not make the problem seem at all important because it does not have any negative connotations. Some did not know what relevance this picture had and therefore it made climate change seem unimportant.

“I would like to be there!” (Emma, young professional)

"This picture didn't really make me feel climate change was important because it makes me feel like it looks like a lovely day and if that is what climate change is doing then there are some advantages. It doesn't show bad effects so isn't important." (Erica, high school student)

Tram: The picture 'does not motivate' and some stated that trams might not 'catch on'. Also, some participants stated that they did not know what the picture had to do with climate change.

"Wasn't sure how trams fitted in to a climate change theme." (Claire, young professional)

Sunflowers: Many stated that this was a nice picture and that it did not seem as if there was anything to lose from climate change. Participants noted that there was no potential hazard in the picture and that it shows some advantages. Some stated that they did not think it was at all significant in terms of climate change and so made the issue seem unimportant.

"Didn't really worry me, as I didn't see the consequences of climate change and couldn't see what there was to lose." (Lee, high school student)

George Bush: Some participants were not sure how this picture was relevant to the issue and mentioned that this picture did not make climate change seem important because does not show the effects of climate change. Others felt that it made climate change seem unimportant because George Bush himself does not consider climate change important; therefore why should anyone else?

"He is the leader of the USA, the most influential and powerful country in the world. If they are not worried on a global level, why should I, living in a remote town in Norfolk?" (Helen, high school student)

"This man has given no thought to the future generations through his actions." (Karen, working class mother)

Aeroplane: Some participants were not sure what this picture had to do with climate change. Others felt that it did not make climate change seem important because pollution is not clearly visible. As an image this did not make climate change seem worrying. Others stated that they associated the image with fun times because it shows people going on holiday.

"Plane doesn't make me worry about climate change, even though it's a contributing factor – the photo itself doesn't make me worry or react." (Tanja, young professional)

"It does affect it but I don't really know how." (Theresa, working class mother)

Rainy high street: Participants felt that this was a typical picture, a common sight and that it did not make climate change seem important. Most participants felt that it did not make climate change seem like too much of a problem as we are used to such conditions; it is normal British

weather; 'It has and always will rain' and, 'it does not make climate change seem important because we've always got it.'

"This picture made me think that maybe climate changes won't be too much of a problem." (Emily, high school student)

"If climate change means a bit more rain, then so what – we're used to it in this country." (Tanja, young professional)

Ranked -1 were the cyclist, beach, women at standpipe, petrol station, house with solar panels and irrigation. These were ranked towards making climate change seem unimportant for a variety of reasons, predominantly uncertainty as to what the pictures had to do with climate change and feeling that some things were happening and would continue regardless of climate change (people on beaches, people driving cars, irrigation).

Salience factor one was loaded onto by nearly twice as many high school students as young professionals and working class mothers. However, their loadings are often split meaning that no group is clearly defining of the factor (see appendix 12b). The viewpoint projected by this factor is one which considers human and animal suffering, and current impacts of climate change, to be of great concern. It is these aspects in an image which particularly convey a sense of climate change salience. Participants loading on factor one stated that these kinds of pictures had the most impact because they aroused emotive feelings of empathy and sympathy. Images showing other kinds of climate change impacts happening currently initiated feelings of climate change salience because the consequences were portrayed seriously, proving that climate change is already having adverse effects. Images promoting the positive sides of climate change, those not showing the negative impacts or those that were not deemed relevant made the issue seem unimportant to highly loading participants. As suggested in chapter three, these images did not convey feelings of salience because they are not dramatic or powerful and did not offer participants any kind of 'hook'.

6.4.1.2 Salience - factor two

The reasons for participants' rankings of the images are again discussed in relation to the comments given by participants. Descriptions are not repeated if the images fall into both factors unless the reasons given by participants loading highly on this factor are different.

The six images ranked as most positively making participants feel that climate change is important represent a mixture of depictions: dramatic climate change impacts as well as the causes and what can be done about it. The impact images made participants loading on this factor feel that the issue was important because they show the effects of climate change, because these kinds of images are becoming more common and because they show human suffering

which is upsetting. Comments signify that climate change was resonant when participants were able to see the causes of climate change. These made them feel that something must be done about climate change; they were able to see in some of the images that there are ways of dealing with climate change and these instilled some feelings of salience.

Industrial smoke stacks: Participants loading onto salience factor two felt that this image made climate change seem important because it shows a cause. They commented that there should be changes made to stop this kind of pollution and contribution to climate change.

“This is important because it’s a cause of climate change.” (Anne, working class mother)

“This is important because something needs to be done about using energy.” (Sara, working class mother)

Starving children, famine: (see previous explanation)

“It’s scary to see young people suffering so badly due to lack of food and amenities caused by climate change.” (Yvette, young professional)

Wind turbines: This image made climate change seem important to participants because it shows ‘the way forward’. They felt that this picture made climate change seem like an important issue ‘for the right reasons’. Some commented that wind energy should be the main source of our power.

“Clean green – and integrated into the environment.” (Mark, young professional)

“This picture made me think about the importance of climate change in relation to how we can use the change and combat it at the same time.” (Erica, high school student)

Dried up lake with dead fish: (see previous explanation)

“This shows a result, the sort of drought that might happen. It shows how the climate is affecting the earth and is becoming a common sight.” (Sara, working class mother)

Petrol station: Participants felt that this picture made climate change seem important because it shows what is making climate change happen and the results of ‘our lazy culture’. Some stated that there are too many cars, that petrol companies are only interested in profit. They commented that this as a worrying sight and that people have not adequately researched alternatives to cars or their fuel.

“The sad results of our lazy culture: I bet all the motorists don’t realise the effects of their laziness on the environment.” (Yvette, young professional)

“This shows what’s making climate change happen.” (Margaret, working class mother)

Power station: This image made climate change seem important because it represented a major cause. Many participants commented that they did not want to see this kind of scene in comparison to wind turbines, and that power generation should be changed towards renewables.

“I put this in the category of climate change being important because it clearly shows how industry and power production (which we all use) is contributing and we need to find an alternative solution to fossil fuels.” (Helen, high school student)

The images which scored +1 in salience factor two include further mitigative images and a mixture of pictures displaying global and local level impacts of climate change. These are: low energy light bulb, flood in Bangladesh, house with solar panels, house falling off a cliff, flooded house and the graph showing temperature rise. The associated comments illustrated various reasons why these pictures made climate change seem important to participants: fitting a low energy light bulb because it emphasised that something needs to be done about climate change and that something can be done by everyone; the picture of the house with solar panels for similar reasons; the picture of the flood in Bangladesh because it is an upsetting picture showing the effects of climate change on people and their suffering (similar reasons to those in factor one); the pictures of the house falling off a cliff, the flooded house and the graph also initiated feelings that climate change is an important issue for the same reasons as in factor one.

The pictures which were associated with the strongest feeling that climate change was unimportant are very similar to those in factor one and for similar reasons: they did not seem relevant; they illustrated relatively more positive aspects of climate change which diminished the importance of the issue; they represented there little change from the way things are now.

Café: (see previous explanation)

“I placed this under the not important category because it shows a hot, sunny day in Britain with which I can’t see any negative connotations associated.” (Helen, high school student)

“People sitting in cafes – will still happen regardless of the weather!” (Yvette, young professional)

Beach: Participants ranked the picture of the beach as making climate change seem unimportant because it shows a positive image. They felt that people will always go to the beach on nice days, nothing unusual. Many noted that it could be a picture of a normal British summer; if climate change brings more of this then that would be a good thing.

"This is just like what's always happened. It could be an everyday holiday snap. Shows a typical scene on a nice hot day. We have always had nice hot summers, it could be a normal British summer." (Theresa, working class mother)

"If climate change means more sunshine then good. Not a problem!" (Tanja, young professional)

Sunflower field: (see previous explanation)

"Just a picture of a field doing nothing." (Sara, working class mother)

Irrigation: This picture communicated that climate change is an unimportant issue to participants because it did not make climate change seem worrying; it did not demonstrate to them, any serious consequences. Participants noted that crops are already irrigated in many parts of the world and that the picture suggests that people have the technology to cope with climate changes.

"Crops are irrigated in many parts of the world. This seems irrelevant in comparison to the other pictures." (Mark, young professional)

"Didn't really worry me, as I didn't see the consequences of climate change." (Lee, high school student)

Rainy high street: (see previous explanation)

"This is a picture of everyday weather. It's the typical rainy day like we always get. It's not important because we've always got rain." (Theresa, working class mother)

Tram: (see previous explanation)

"Trains would help but it doesn't motivate." (Mark, young professional)

"This is just about getting somewhere, not really about climate change." (Sara, working class mother)

Those ranked as -1 in factor two are: women at standpipe, George Bush, biting mosquito, refugees, aeroplane and the cartoon. The images ranked towards making climate change seem unimportant did so because participants did not associate them with climate change. They felt that the pictures did not show the effects of climate change or represent any changes beyond the situation we live in at present, that they were more positive than negative (aeroplane), or not serious (cartoon).

Salience factor two was loaded onto predominantly by the working class mothers but is also defined by the young professional group. The high school students all demonstrated split loading between the two factors (see appendix 12b). The factor presents a viewpoint expressing

that it is not only the impacts of climate change that make the issue salient, but also those that represent the causes and what can be done about it. The participants who loaded onto this factor incorporated into the importance of climate change, judgements about its causes, effects and potential responses at both individual and societal levels as well as the negative impacts. Were these participants uninspired by images depicting situations they felt nothing could be done about, or those that caused some anxiety or stress? Did they make more rational judgements rather than principally responding emotionally to the more shocking climate change imagery? The loading participants considered climate change to be unimportant when faced with images demonstrating the positive aspects of climate change, images that they did not associate with the issue and those that did not represent much future change (similar to factor one).

6.4.1.3 Salience – summary

Participants encountered a number of difficulties during the completion of the salience Q-sort. In particular, they noted that most of the pictures in the sample made climate change seem important which made it difficult to sort the pictures, e.g., some participants noted that they felt uncomfortable about having to place positive pictures in negative rankings⁸³.

The images which made climate change seem important differ between factors, and appear to be more subject to individual variation than those making it seem unimportant; those ranked negatively are more consistent between the two. The main difference between the two factors is that mitigative images were ranked much more positively in factor two than in factor one, i.e. there was a presence of positively ranked mitigation images in factor two, but not in factor one. Images of the impacts of climate change and of people and animals suffering were ranked much more positively in factor one than in factor two. Factor one is the dominant viewpoint and profiles a person who is convinced that climate change is important by images showing the dramatic impacts of climate change and the suffering of people and animals. Participants loading onto this factor appeared solely to find that images of the impacts of climate change made the issue resonant. These tended to be the most ‘major’ impact and emotive images. Factor two gives quite a different viewpoint, profiling a person who might be influenced by images not only of the impacts of climate change but also its causes and possible mitigative options – signifiers that something needs to be and can be done about climate change. Participants loading onto factor two spoke about their difficulty in resolving a conflict between the great salience initiated by pictures of the causes and solutions as well as the impacts of climate change. Some participants therefore associated the importance of climate change with its causes and efforts being made to do something about it as well as with negative impacts. In

⁸³ Those making climate change seem most important are ranked at the extreme positive end and vice versa. Therefore participants’ arrangements still indicate which images make climate change seem most (un)important.

both cases, positive images, images that did not make climate change look like an issue they should be concerned about, those that were ambiguous (that participants did not understand the relevance of) and ones that did not represent great change to loading participants made them feel that climate change was unimportant.

6.4.2 Efficacy

Table 6.4 describes the images ranked as making participants feel most able and most unable to do anything about climate change for both efficacy factors. The following discussion presents an interpretation of the viewpoints projected by these factors.

Table 6.4 Strongly ranked images for efficacy factors one and two

Efficacy factor one		Efficacy factor two
HIGH Thermostat Fitting low energy light bulb Cyclist House with solar panels Wind turbines Tram	 +3	HIGH Fitting low energy light bulb Thermostat Cyclist House with solar panels Wind turbines Tram
LOW George Bush Storm at coast Refugees Starving children, famine Industrial smoke stacks Flood in Bangladesh	 -3	LOW Flooded house Polar bear Dried up lake with dead fish Industrial smoke stacks Beach Graph showing temperature rise

6.4.2.1 Factors one and two – able to make a difference

The six images ranked as making participants feel most able to do something about climate change in the efficacy sort are the same for both the efficacy factors extracted during the quantitative analysis of the data. While different participants load onto each factor, their comments were very similar and are thus, the outcomes of each factor are presented together. The images which made participants feel able to do something about climate change are all ‘doing’ images – pictures of actions that people can easily take, and pictures of renewables.

Fitting low energy light bulb: Participants ranked this image as making them feel able to do something personally about climate change because it shows something that everyone can do; ‘something that I can do’; something that is small and easy to do; a contribution that one person can make, adding up to make an overall difference. Some participants commented that this image depicts something they were already doing.

“Shows how we can do environmental things, this is something I can definitely do.”
(Vicky, working class mother)

“Yes I could use energy efficient lights. The photo makes it look easy compared to other pictures where I cannot change things.” (Kathryn, high school student)

“By using energy saving light bulbs I can personally help a bit. Its easy to do and I can do it.” (Tanja, young professional)

Thermostat: Participants ranked this image positively because it made them feel that they could do things in their own homes easily and without much effort. They stated that the image showed them something that makes a difference to climate change, one of the few contributions that they really felt they could make; it shows something that everyone can do, which will make a difference and which is also cost saving.

“I can do things at home with little effort.” (Anne, working class mother)

“One of the most accessible steps to take in terms of action that can be done about climate change. Everyone living in a house must have a thermostat that they can adjust.” (Jonny, high school student)

“I feel that turning down the heating thermostat just a little is something everyone can do to save energy.” (Yvette, young professional)

Cyclist: Participants ranked this image positively, commenting that the image shows how people can do something about climate change by cycling instead of using a car. Many stated that it is easy to cycle, that it is a realistic transport option, that people in general could cycle or that as individuals they could cycle (there is little demonstration of intention). Some stated that they already used a bicycle but feel motivated to use their bikes more often by the image. Others commented that while cycling is good for climate change, it is easier said than done or they did not consider it a practical option.

“Can be energy efficient, and I can do this – this is important because it shows what can be done.” (Sara, working class mother)

“This shows examples which makes you feel that there is something simple that I could do that would help without having to change much.” (Erica, high school student)

“An individual cycling to work, etc. shows that if we all did that, we could collectively do something.” (Paul, young professional)

House with solar panels: Participants felt that this image represented what could be done about climate change, that alternatives were available. They expressed their willingness to have solar panels on their own homes if they ever became affordable.

“If they were more affordable, solar roof tiles could be an excellent way for everyday folks to harness natural power.” (Yvette, young professional)

Wind turbines: Many participants felt that this image represented that something can be done about climate change. They commented that wind power is a clean and safe option and could make a big difference to the way we generate our power. Some felt that this is not a personal option, rather as a government or collective initiative. However, they still ranked it highly because it made them feel able to do something about climate change in comparison to other pictures in the set. Other participants felt that the image shows that something is being done about climate change and therefore small actions on a personal level will also help and are worth doing. Some stated that they would support campaigns for renewable energy or could use a renewable energy supplier.

“This makes you feel that something is being done so if you do little things it will all help.” (Erica, high school student)

Tram: This image initiated a mixture of comments. On the whole the image made participants feel more able to do something about climate change than others in the sample because: public transport is more environmentally friendly than travelling by car; this would encourage people to use public transport; they would use a tram system if there was one in Norwich. However, participants raised many drawbacks. They wondered how the electricity would be generated (implying that it should be from a renewable source) and noted that public transport at the moment is unreliable and expensive (consequently the picture was not very encouraging).

“It all depends on how the electricity is made. The technology involved. Although this is a cleaner way of getting around.” (Theresa, working class mother)

For most participants, the light bulb, thermostat and cyclist were the only images in the sample that initiated feelings of being able to do something personally to reduce the causes of climate change. Others were ranked more positively than the rest of the pictures in the sample, but did not seem to bring about such a clear sense of personal climate change efficacy.

In contrast with the above, there is little overlap between the images falling into the +1 ranking for both factors. The picture of the petrol station is common to both factors; participants stated that they felt that they could use their cars less or use unleaded petrol. In factor one the other images ranked as +1 were ambiguous and were not really associated with doing anything about climate change (cartoon, café, aeroplane, irrigation, sunflowers). This suggests that only six out of the 32 images were in any way interpreted in relation to climate change efficacy. Because of the forced distribution, the images that made participants feel unable to do anything about climate change, or that were neutral, carried over into the positive ranks. For factor two, as well as the picture of the petrol station, the images of the famine, refugees, flood in Bangladesh, irrigation, and sea defences were also ranked quite highly. The pictures of irrigation (as in factor one) and sea defences were noted by participants as not being relevant to feeling a sense

of efficacy. However the pictures of the famine, flood in Bangladesh and the refugees warrant an alternative explanation. Based on the comments, these were ranked positively because some participants felt that they could pay money and support charities dealing with the types of situations communicated in the images. This is possibly linked to being increasingly exposed to positive fundraising messages and images by development charities given a very high profile by media events such as the Comic Relief television programmes (designed to motivate people to feel that they can do something by giving money, that this money really makes a difference).

“These children need help, where do I send the money?” (Mark, young professional)

“I could give money to a charity which helps these people.” (Mary, working class mother)

6.4.2.2 Factors one and two – unable to make a difference

The images which made participants feel unable to make a difference to climate change for both factors include images of dramatic change and the impacts of climate change incorporating human and animal suffering, as well as causes of climate change perceived as being out of one's personal control. These are the same as or similar to the very images that made many participants feel that climate change was an important issue (in the salience sort). In efficacy factor one, the images of the refugees, starving children in a famine and the flood in Bangladesh were ranked at the very negative extreme i.e. they made participants feel very unable to make any difference to climate change. In factor two however, these images all lie towards the positive end of the rank order (+1) suggesting a sense of efficacy.

Efficacy *factor one* (the dominant factor) suggests a view that images which make the impacts of climate change seem severe lead people to feel unable to do anything to make a difference to climate change. The six images ranked as most extremely making participants feel unable to do anything about climate change are as follows with associated explanations.

Flood in Bangladesh: Participants who loaded on efficacy factor one felt unable to do anything about climate change in reaction to this image because they felt that flooding like this is a world problem happening in other countries, and there is nothing that an individual can do. They stated that the image shows a large-scale result of climate change which individuals cannot do anything about / make a difference to. They felt that one's personal contribution would make little difference to scenes like this, it seemed impossible to help.

“Worldwide scale, not up to me, my contribution will make little difference.”
(Kathryn, high school student)

“It can’t be helped, it’s a world problem. It shows the result of global warming, I can’t do anything about it.” (Anne, working class mother)

Industrial smoke stacks: This image made participants feel helpless largely because the image made the causes of climate change seem out of their control. They stated that as a cause of climate change, this is such a big problem on such a large scale that there is nothing one can do to change it. A couple of participants commented that this will continue because of the need for power and industrialisation, so they did not feel in a position to change it.

“Images like this seem out of my control and make my efforts seem worthless.” (Lee, high school student)

“This picture makes me think that there’s nothing I can do directly to help as it’s out of my control.” (Claire, young professional)

Starving children, famine: Participants commented that this picture made them feel unable to do anything about climate change because individuals cannot make any difference to such a big problem and that they felt too far away to be able to help. Participants felt that without significant aid, nothing could be done about this and that it is out of the hands of an individual. Some also mentioned that famine, drought and starvation are problems that might not be due to climate change.

“I find this very upsetting but I feel helpless to do anything about it.” (Sara, working class mother)

“This picture shows the importance but makes you feel like it is such a big problem that it is really out of our hands.” (Erica, high school student)

Refugees: Participants loading on this factor commented that they felt able to do very little for these people. Some felt that the picture gave the impression that we need to help those in need but not necessarily in the context of climate change. They commented that perhaps they could give money to charity but felt that this may not make a difference because of the vast scale.

“Worldwide scale, not up to me.” (Kathryn, high school student)

Stormy sea: Participants felt unable to do anything about climate change in reaction to this image because it seemed so impossible to do anything. Some felt that such conditions happen naturally and therefore, that no change could stop it. They mentioned that even as a result of global warming, people cannot do anything about it, and that it makes it seem too late to really do anything about climate change.

“Seems impossible to do anything, no change is going to stop this.” (Emma, young professional)

George Bush: Participants felt strongly that this image made them feel unable to do anything about climate change because George Bush could do a lot, but will not. Participants stated that they felt unable to do anything personally unless America were to commit, and that they had not a say in changing the situation because they could not vote him out. The picture represented to some that the real differences that can be made to climate change lie with those in power and that nothing an individual does would really make a difference; that George Bush in particular is too powerful and that the politics of climate change are out of an individual's reach.

"We can't change nothing about him, or the way he is. Can't change his opinions or the way he runs America apart from voting him out and we can't do that either."
(Theresa, working class mother)

"This picture makes me feel that any real difference is in the control of people in power so nothing I do will contribute enough to make a difference." (Erica, high school student)

"This makes me think that there's nothing I can do to help, it's all in the hands of politicians." (Claire, young professional)

Efficacy factor two also demonstrates that the images which most extremely made participants feel unable to do anything about climate change represent dramatic and large scale climate change, its causes and impacts which seem beyond an individual's control or influence.

Graph showing temperature rise: Participants were struck by the apparent inevitability of climate change in reaction to this image, which led them to feel helpless to change its course. They felt unable to influence climate change in the face of such statistics and that their efforts would not make any difference.

"This seems to be a growing trend that makes you feel helpless to change." (Karen, working class mother)

"Anything I do couldn't possibly make a difference on such a global scale."
(Yolander, high school student)

"The figures speak for themselves – can we really influence these?" (Ailsa, young professional)

Beach: Participants had mixed interpretations of this image. Most conclusively participants suggested that it will always be sunny from time to time and there is nothing that anyone can do about that. Otherwise it did not trigger participants to feel able to do anything to reduce the causes of climate change. Some participants commented that the image demonstrates a positive outcome and they felt therefore, that nothing need be done.

“This doesn’t make me feel like I can do anything because it’s always going to be sunny from time to time, we can’t change that. People always go to the beach on sunny days.” (Vicky, working class mother)

Industrial smoke stacks: (reasons same as for factor one)

“Unless we completely change the way we do everything, we can’t change this.” (Theresa, working class mother)

Dried up lake with dead fish: A dramatic picture of a climate change impact, which made participants feel helpless to do anything about. Some stated that they felt unable to see how they could make a difference personally, that climate change is impossible to do anything about and that it is probably too late.

“An individual can’t make much difference to this.” (Mary, working class mother)

“It’s hard to see how I could personally prevent things like this.” (Emily, high school student)

“Seems so impossible to do anything.” (Emma, young professional)

Polar bear: Participants stated that they felt that they had no control over climate change when they looked at this picture. They felt that it is personally impossible to make a difference to such large problems.

“Worldwide scale, not up to me, my contribution will make little difference.” (Kathryn, high school student)

Flooded house: Participants felt unable to do anything in reaction to this image because they felt unable to change the weather or stop flooding from happening.

“I can’t change the weather.” (Mary, working class mother)

“I don’t feel that I can help to prevent this.” (Vicky, high school student)

6.4.2.3 Efficacy - summary

The factors output from the efficacy sort are similar. The same images most strongly made participants feel a personal sense of climate change efficacy. The images towards the negative extreme are different for each factor, but similar in nature. They portray great climate changes and severe impacts which made participants feel helpless at an individual level.

Participants were eager to comment that there were very few images in the whole sample that made them feel at all able to make any difference to climate change. The others all made personal efforts seem irrelevant or insignificant, and brought about a sense of personal

powerlessness. Because of the fixed distribution, participants also had to place pictures that made them feel unable to make a difference into positive rankings which they found uncomfortable. One participant loading on both sorts (Tanja, young professional) specifically commented that the ones which made her feel particularly unable to do anything about climate change were the pictures of things that had already happened, the ones that made her feel that they are too big to stop. This was a generalisable outcome observable in both factors.

The images of the beach and George Bush also fell into the most negative rankings of the salience factors. The picture of Bush signified to participants that individual action is insignificant; because America is doing nothing about climate change and because George Bush is not committed to acting on it, it is hard to be concerned. The beach signified to participants that climate change might be positive and therefore that they need not be concerned or do anything about it. Other participants were confused as to what these two pictures had to do with climate change, another reason for them being ranked as making climate change seem both unimportant and making them feel unable to do anything about it.

6.5 Interpretation of results

The factors output from the Q-analysis of the salience and efficacy sorts were very dominant meaning that the viewpoints expressed are widely held. In each case the second factor was retained because of its significance. For both sorts, the first and second factors are similar.

The dramatic images of the impacts of climate change which appeared at the most positive extreme of the salience factors were all ranked negatively in either efficacy factors one and two (or both). The very images which made participants feel that the issue was of importance were disempowering at a personal level. These images are akin to a sense of helplessness, generally being remote, global impact images or those depicting causes perceived by the individual as being beyond their control. The images most likely to make participants feel able to do something about climate change were ranked negatively in salience factor one (i.e. climate change is unimportant). This highlights that the images that conveyed the greatest sense of salience, did not communicate personal efficacy. Appendix 12e presents all six images ranked at both extremes for all the factors discussed in this chapter. Highlighted in bold, the reader can see that the images which made climate change seem most important, at the same time brought about feelings of helplessness and inability to do anything about climate change.

Salience factors one and two show that participants were sensitive to human tragedy. While many of the other 'dramatic' images in the sample (e.g. melting ice) were ranked positively they did not so strongly bring about a sense of issue salience. Salience factor two is mixed because

as well as the severe impacts on humans making climate change seem important to participants, it also demonstrates some affiliation with the efficacy imagery. This is because the interpretation of the mitigative imagery played a role in the perception of the importance of climate change for the participants loading on this factor. There is no obvious relationship between the loading of certain participants on salience factor two and on the efficacy factors. However, based on the interviews, the participants who significantly and only loaded onto salience factor two were not situated in the low salience-low efficacy cluster towards the bottom left hand corner of the mapping of participants presented in chapter five (figure 5.5). They had a slightly different view of climate change relative to the majority of participants because they were positioned towards the relatively higher salience and efficacy end of the range.

The six images which most strongly made participants feel able to do something about climate change are shared by efficacy factors one and two. The qualities of the images at the opposite extreme are similar to each other. It appears that what makes climate change salient to people in a visual sense is a lot more complicated than what makes people feel able to do something about it. Possibly images of salience are more affected by a host of wider beliefs, influencing people's perceptions of climate change imagery whereas the interpretation of efficacy images is a lot more straightforward (particularly personal level action pictures). This issue is explored further in the focus groups.

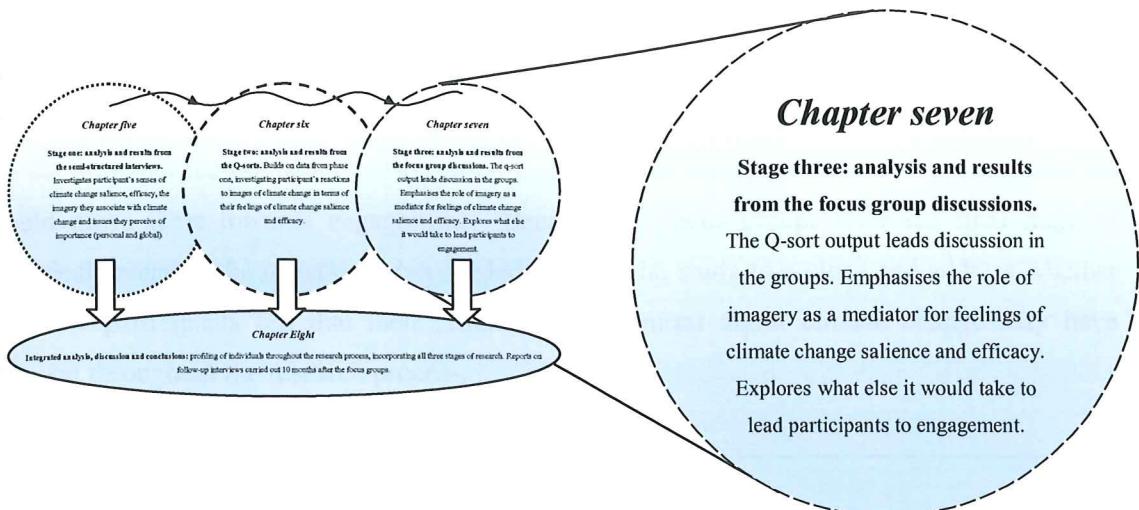
Some images were considered ambiguous by participants, e.g. rainy weather, sunflower field, building sea defences, irrigation. It was apparent that those found to be most ambiguous were selected on the basis of the scientific and expert input to the image selection process. The images that were most resonant to participants, particularly those featuring at the positive end of the salience sorts, reflect more of the imagery content generated from the interview data and therefore the participants themselves. These are also the types of images of climate change used in the media and accessible in the public domain. Participants perhaps recognised or found these images familiar and found such pictures complementary to their conceptions of climate change and hence easier to identify with than some of the others in the sample. This issue is addressed further in chapter eight.

While participants are clustered by their loadings onto the different factors, they may still be interpreting or personalising the images in different ways. Despite there being some common explanations given for the way in which participants interpreted many of the images, there were still subtle or sometimes more substantial differences apparent in terms of their interpretations. The interpretation of a single image is different for each participant because it is influenced by their wider associations and experiences; undeniably different meanings and messages are communicated to different people.

6.6 Conclusions

Having carried out the data analysis, an interpretation of the Q-sort data has been made on the basis of the comments supplied by participants. The results demonstrate that images apparently conveying a strong sense of climate change salience also bring about feelings of helplessness and disempowerment. Conversely, those conveying a sense of efficacy did not make participants feel that the issue was important. Climate change images can evoke powerful feelings of issue salience, but these do not make participants feel able to do anything about it. The results are consistent across the whole sample and there were no marked differences between groups, or clusters of individuals representing certain viewpoints. Overall, these results raise implications for the use of visual imagery to communicate about climate change.

The final empirical phase of research elaborates on the findings of the Q-methodology exercise by taking the images back to participants for discussion in small groups. The perspectives revealed by the Q-factors in relation to the same set of images are the basis for the focus group discussions, the design and results of which are presented in chapter seven. The purpose was to further interpret the results of the Q-sorts, the participants themselves confirming commonalities and highlighting disparities between their interpretations and the ways in which they sorted the images. The discussion of the images in terms of feelings of issue salience and personal climate change efficacy give a fuller sense of participants' interpretations (what they see in the images, what the images mean to them and the variety of associations they bring to each picture, etc.). In the focus groups, participants reflected on the way that they sorted and interpreted the images, and explored more explicitly the potential for images of climate change to motivate both feelings of salience and efficacy, and what else participants felt would really move them. They offered a forum for further points of view to be expressed in relation to the use of imagery to communicate to people about climate change with an engaging message.



7.1 Introduction

Chapter six presented the results of the Q-sorts which aimed to explore participants' senses of climate change salience and efficacy in reaction to a set of images. These were the basis for three focus group discussions constituting the third phase of empirical research, the results of which are presented here. The objectives of the focus group discussions were designed in light of the Q-sorts and aimed to substantiate their interpretation by exploring further the interaction between climate change imagery and people's senses of issue salience and personal efficacy. They also sought to explore: the potential for visual expressions of climate change to convey *both* feelings of salience and efficacy as a whole; what participants felt would really move them towards feeling engaged with climate change (beyond imagery); and how they felt their feelings about climate change might have altered as a result of their participation in this research.

Chapter seven begins with a description of the focus group design process in light of the methodology presented in chapter four and the results of the Q-sorts presented in chapter six. It then presents the results of the focus group discussions.

7.2 Designing the focus groups

Chapter four explains the objectives of the focus groups (box 4.4). The design of the focus group guide is addressed here. A focus group guide plays an important role in influencing the relevance or quality of the discussion; if the questions are not designed carefully, they can be confusing for participants, generating data which is complex and sometimes impossible to analyse (Krueger, 1998a).

Box 7.1 presents the requirements for the design of the focus group questions. These are based on the objectives given in chapter four. Further interpretation of the Q-sort results and exploration of the use of climate change images to convey both feelings of salience and efficacy are the principal requirements. Also central is the need to explore further what participants felt would move them towards engagement. Because the focus groups were the final stage of empirical research, the questions also needed to draw the study to a close and address whether and how participants felt that their attitudes and opinions about climate change may have changed throughout the research process.

Box 7.1 Design requirements for the focus group questions

1. To enable a group rapport to be established and to enable participants to collect their thoughts by discussing participants' experiences of the Q-sorting procedure, raising any problems they had, etc. Allow feedback on the method and demonstration of anything that may affect the interpretation of the results.
2. To elicit further feedback from participants concerning their interpretation of the images. Also to establish their explanations of the results of the two Q-sorts independently and comparatively.
3. To generate further discussion of whether and how the images could be motivating and bring about both feelings of salience and efficacy in conjunction. This should lead on to a wider discussion about what participants think would ultimately make them feel 'engaged'.
4. To facilitate a summary not only of each focus group discussion, but of the participants' involvement in the research; how they feel that their attitudes, opinions and feelings about climate change may have changed or developed as a result of their participation in the study.

The questions used in the focus groups are designed around the above requirements and are therefore logical and closely linked to the objectives of the task. The complete schedule used in the focus groups is attached in appendix 5⁸⁴ and the questions are presented in relation to the themes of the research in figure 4.6. The design of the questions is addressed in the following text. The need for a simple and sequential design is outlined, followed by an account of how the questions were generated in relation to the above requirements. Activities and facilitation strategies used in the groups are also addressed.

7.2.1 Question characteristics: simplicity, openness and sequencing

Questions need to be simple for the benefit of both the participants and researcher. Conversational and clear questions, which are direct and easy to ask are most likely to initiate comfortable discussion and maintain an informal environment (see Krueger, 1998a). Short and simple questions which are free of jargon and avoid introducing unnecessary phrasing or background material are also easy to remember and encourage participants to reflect on the intended meaning of the question. Limiting questions to a single dimension or concept can help

⁸⁴ Numerous revisions were made as a result of discussions with colleagues and the pilot focus group.

avoid confusion and these questions also tend to be easier to analyse (Krueger, 1998c). In this research, the prompts were also kept simple and straightforward to avoid confusion and to avoid introducing assumptions into the discussion.

A distinctive feature of focus group questions is their open-endedness. As in semi-structured interviews, these allow participants to determine the direction of the response and to explore the questions based on what is spontaneously associated with the topic being talked about (e.g. Gaskell, 2000; Krueger, 1998a). Krueger (1998a) recommends avoiding 'why' questions because they imply a rational answer and in real life, people are not always rational.

The sequence of the questions in a structured focus group such as those used in this study is important so that one question flows to the next; a clear and logically ordered set of questions are most likely to generate lively discussion (see Morgan, 1998). Morgan (1998) suggests that questions should go from being general to specific, creating context and focus for both the group and the researcher. Some questions are generally considered to be more important to the researcher than others and their relative priority for the study influence the sequence in which they are asked and the amount of time spent discussing each. Different types of questions can include opening, introductory, transition, key and ending questions (Krueger, 1998a)⁸⁵. The questioning route in this study recognises the different functions of different types of questions and these are outlined in table 7.1.

The focussed sequence provided participants with an opportunity to anchor their thoughts about climate change in their experience of the Q-sort and develop those views. Asking participants to think back to the Q-sort experience was found to be a successful strategy in order to generate group rapport as well as relevant discussion. Krueger (1998a) notes that this technique also encourages participants to personalise their responses and make comments that are grounded in their experiences rather than talking in general terms or on the basis of what they believe other people might think. Prompts were designed to be used when participants did not appear to understand the original question. Their use was dependent on the particular situation and my judgement as to whether they were necessary (as discussed in the context of the semi-structured interviews). The actual wording of the questions was also flexible, depending on the situation. However, the overall clear and simple design enabled them to be used almost verbatim in all three sample groups.

⁸⁵ Gaskell (2000) suggests a similar framework in the context of the stages of a focus group rather than the nature of the questions.

Table 7.1 Types of focus group questions and their application in this study

Type of question	Purpose	As employed in this study
Opening	<i>Participants get acquainted and feel connected.</i> Designed to be answered relatively quickly and act as a process to encourage participants to talk early in the group. Can be used to make participants feel comfortable and establish a group rapport or dynamic, often by identifying characteristics that participants have in common.	<i>Warm-up question and prompts reflecting on Q-sorting exercise.</i> In this study, the opening question was combined with a reflection on participants' experiences of the Q-sort exercise.
Introductory	<i>Begins discussion of topic.</i> Introduce the general topic of discussion, providing participants with an opportunity to reflect on experiences and their connection with the topic.	<i>Review of salience and efficacy Q-sort results, explanation and debate about image interpretation.</i> In this study, the questions most resembling introductory questions were designed to add to the interpretation of the Q-results.
Transition	<i>Moves smoothly and seamlessly into key questions.</i> Link the introductory questions with the latter content of the focus group.	<i>Whether images can bring about both salience and efficacy.</i> In this study, transition questions link the Q-sort exercise and further discussion based on the images and wider climate change issues.
Key	<i>Obtains insight on areas of central concern in the study.</i> Require great attention in the analysis. Sufficient time needs to be allowed for these questions.	<i>Exploring which images when combined as a set are most motivating; aside from an image, what would make participants feel engaged?</i> The questioning schedule was designed to allow this component of the focus groups plenty of time for exploration...
Ending	<i>Helps researchers determine where to place emphasis and brings closure to the discussion.</i> Bring the discussion to a close, enabling participants to reflect.	<i>Review of participation with a wrap-up question about how participants feel they may have been affected by the research.</i> In this study, the ending question did not so much act as a reflection on the actual focus group but on the research process as a whole, addressed further in chapter eight.

Adapted from Krueger (1998a:22)

7.2.2 Question design

The early part of each focus group also involved introducing myself and each participant as they liked to be known and setting the 'ground rules'. Krueger (1998a) notes that this is important in order to encourage participants to respect each others opinions, and for example to talk about their thoughts even if they felt that their thoughts were not clearly formed. An outline of the session was also given at the beginning of each group to give participants an idea about what would be discussed and a chance to bear in mind the end question (i.e. rather than coming in cold, participants were given a chance to think during the group discussion about what effect the research may have had on them).

Consistent within the methodological literature is the requirement in this study for some kind of warm-up or opening discussion. This was in order to establish a rapport among participants and

with myself (as facilitator), and to give participants a chance to recollect the details of their Q-sorts before discussing the key questions. Two constituents made up the ice-breaking discussion: feedback from participants about their experience of Q-sorting in order to substantiate the interpretation of the output from the Q-methodology component of this study; and reminding participants of the climate change images used in the Q-sorts because the rest of the focus group would employ these pictures as objects for discussion. Because participants had all completed the Q-sorts with exactly the same instructions and exactly the same set of images, the focus group would therefore begin on ‘common ground’, offering a forum in which participants could feel able to start expressing their feelings and opinions. It was thought that starting with a practical discussion of what participants found good, bad, easy, enjoyable or difficult about the task and how long it took would ease them into the discussion. By encouraging an environment early on in which participants felt able to put forward their perspectives about the practical task it was hoped that participants would later feel uninhibited to state their points of view. Box 7.2 presents the initial input into the focus group schedule.

Box 7.2 Opening questions for design objective one: ice breaker and Q-sort feedback

- You all completed the same sorting tasks using the same pictures. How did you get on with it? Were there any aspects that you found difficult for example? What were they?
- How long did it take you?

Prompts: What did you think was good about it? Did you enjoy it? Did you understand the instructions?

The second design requirement drove the further interpretation of the Q-results. During this second stage of the focus groups, the results of the Q-sorts were presented to the participants, offering the opportunity for them to make comments on the arising patterns and on their interpretations of the images in the sample. This stage had to be carefully considered in order to allow for the other objectives to be met in the time allotted for each group discussion. Firstly, the images most strongly ranked as making climate change seem important were presented for discussion (pointing out the discrepancy in the salience sort between factors one and two; one characterised by the dramatic impacts of climate change and two on images of the causes and potential solutions). Secondly, those images most strongly ranked as making climate change seem unimportant were presented. Participants were asked what they thought of these results and invited to elaborate on what they thought the images were ‘saying’ to them; what it was about certain images that made climate change seem important or unimportant. They were prompted to talk about such distinguishing characteristics and why the images typically falling into the middle of their sorts did not convey feelings either way. Participants were also asked whether they thought captions might make any or all of the images any more meaningful to them in the context of climate change salience. They were asked to brainstorm any appropriate image captions that they thought might make climate change seem even more important. This

introduced a turn in the discussion and offered further opportunity for participants to think about and discuss their interpretations of what the images were conveying to them before reflecting on the results of the efficacy Q-sort. The six images from both factors making participants feel able to do something about climate change were presented for discussion followed by all those making participants feel unable to do anything personally. Box 7.3 presents the input into the focus group schedule as a result of the above considerations.

Box 7.3 Introductory questions for design objective two: explanation of Q factors and image interpretation

SALIENCE

- These are the images that seemed most strongly to make climate change seem an important issue [starving children; famine; dried up lake with dead fish; flood in Bangladesh; graph showing temperature rise; flooded house; melting ice]. What do you think? Why do you think they make climate change seem important? These also featured [Industrial smoke stacks; wind turbines; petrol station; power station]. Why do you think that these make climate change seem important? What about any of the others?
- These are the images that came out most strongly as making climate change seem unimportant [café; beach; sunflowers; rainy high street; tram; irrigation; aeroplane; George Bush]. Why do you think this is the case?
- What distinguishes the important from the unimportant images?
- Do you think that captions would make a difference to how important the images make climate change seem? Can you think of captions for any of these images that would make climate change seem more important to you?

Prompts: What characteristics or associations in the images make climate change seem important / unimportant? What do you focus on when you look at these pictures? People pictures? Global images? Local images? What do you think these images are trying to say?

EFFICACY

- These are the images that seemed to make people feel most able to do something personally about climate change [fitting low energy light bulb; thermostat; cyclist; house with solar panels; wind turbines; tram]. How do you feel about these? Why do they make you feel able to do something about climate change, what is it about these images that make you feel that way?
- These are the images that seemed to make people feel most unable to do anything personally about climate change [industrial smoke stacks; dried up lake with dead fish; graph showing temperature rise; flood in Bangladesh; refugees; stormy coast; George Bush; flooded house; polar bear; beach]. Why do they make you feel unable to do anything about climate change, what is it about these images that make you feel that way?
- What distinguishes the ‘able’ images from the ‘unable images’?
- Would these images benefit from captions to make you feel more able to do something about climate change and if so what might they be?

Prompts: What characteristics or associations in the images make you feel able or unable to do anything personally about climate change and why? What do you focus on when you look at these pictures? What do you think these images are trying to say?

The penultimate requirement for the focus group schedule was to explore further the motivating potential of the climate change-related images. This part of the focus group was designed to explore how feelings of issue salience and personal efficacy might be brought together by the

images. Participants were asked to talk about whether any of the images brought about feelings of both climate change being important and of being able to do anything personally about it. They were asked if any of the images were motivating for them and how these compared to the images that had been discussed previously. An activity was then introduced with the objective of selecting a handful of images that in combination, most completely conveyed a sense of engagement (both feelings of salience and efficacy) to participants. This was designed as an elimination game in which participants were asked to collectively decide which images in the sample would not be included until they arrived at around five pictures that they were most satisfied with. The process of reaching this selection and the surrounding discussion was as important as the final set; during their selection, participants were asked to talk about the reasons for their preferences. This process thereby stimulated further discussion and debate amongst participants about the characteristics of each image in terms of its motivating potential, adding to my understanding of participants' interpretations of the images in the sample. The incorporation of a group activity introduced some variety into the discussions, keeping the groups lively and maintaining good group dynamics. Krueger (1998a) advocates this, particularly as a half way strategy because activities can be fun, and can engage participants in a different way thereby eliciting further useful information. Gaskell (2000) in particular suggests using picture sorting to promote ideas and discussion.

A further discussion was included about any pictures or types of image that participants felt should be in the sample but were not. This was intended to act as a neat end to the discussion of the actual images being used in the groups and as a way of moving the participants on to think more broadly about what would be more motivating for them. In order to give the group discussions some kind of context and to arrive at a broader insight into participants' wider conceptions and perceptions of their personal relationships with climate change, an extension to the discussion was introduced. Participants were asked what they thought might ultimately move them to feel engaged with climate change; what they thought would really move them to take personal action and to feel that the issue is genuinely of personal importance aside from pictures of climate change. Various prompts were prepared but the intention was to keep this part of the discussion as open as possible so as to avoid leading participants into particular channels of discussion. The results of this part of the discussion were intended to be compatible and comparable with the interview data, where some strong opinions were expressed with reference to what participants felt would really make them feel that climate change was important and drive them to do something about it. Box 7.4 presents the input into the focus group schedule as a result of the above considerations.

Box 7.4 Transitory and key questions for design objective three: engaging images, wider motivations

- Do you find that any of these images make you feel motivated, in other words that climate change is both important and that you feel personally able to do something about it? If so, why? If not, why not?
- How do these more motivating images compare with the ones that separately made climate change seem important and made you feel able to do something about it?

Prompts: which ones make you want to do something about climate change as well as making it seem important?

- Elimination game: Do you think you can find a group of about five of these pictures that together make you feel motivated? Begin by taking away the most un-motivating images a few at a time and mention why you think they are un-motivating? Why do you think these [chosen pictures] make you feel motivated? What is it about seeing these pictures together that makes you feel motivated?
- Are there any pictures or types of pictures that are not included here and should be? Are there any other images that you think might be more motivating than the ones in this set?
- Is motivation really possible with a picture? What do you think would ultimately make you feel that climate change is important and that you can do something about it?

Prompts: Do these pictures or any others that you can think of really make you feel motivated? What other things do you think would make you feel more committed? E.g. if the Government really took a stand on climate change, etc.

As Krueger (1998c) suggests, it was necessary to design part of the interview schedule to bring the discussions to a close and to offer some feedback on, or verification of, the research outcomes. As explained in chapter four, this was carried out as an evaluation of participants' feelings and involvement in the whole research process rather than purely for the focus groups (themselves a verification of earlier results). Participants were asked to talk about how their whole experience of participation in my research had had an effect on their opinions and feelings about climate change, if any. This part of the discussion also represented common ground for the participants as they had all experienced the same interactions with the study. I made it clear that it was fine to feel no different about climate change. This wrapping-up also involved thanking participants for their involvement in the research. Box 7.5 presents the input into the focus group schedule as a result of the above considerations.

Box 7.5 Ending questions for design objective four: wrap-up and assessment of participation

- Thank you very much for your participation...
- Wrapping up, I am very interested to know if you think that your feelings and opinions about climate change might have changed as a result of helping me with my research? Think back to the interviews last year if you can; I wonder if your feelings are at all different?

Prompts: Are you more aware of the issue of climate change? Have you found yourself talking about it with others at any point? Have you noticed any environmental changes that you now associate with climate change but might not have done before? Has any aspect of your day-to-day routine altered as a result of taking part in this research, e.g. have you made changes at home in the way you use energy, etc. because of your thoughts about climate change?

- Payment, information and leaflets, light bulbs, more coffee and tea, informal chatting, etc.

The objectives of the focus groups and the systematic procedure suggested by Krueger (1998a) were complementary in terms of question design. The focus group design was based on clearly defined objectives and the focus was kept simple by having logically connected questions. The questions were clear, easy to ask and directly relevant to the participants' experiences of the Q-sorts. The design of the schedule was logical in terms of the research requirements and for participants; the discussions generally moved naturally in the direction specified by the questions. As facilitator, I therefore had to maintain the structure of the group but not so rigorously as to compromise the free flow of discussion which was conversational and generally focussed. Because of the conversational nature of the questions, I had a good sense of confidence; knowing that the articulation of my questions had been thought about in advance made them easy to deliver. A reflection on the facilitation and the dynamics of each focus group is given at the end of this chapter. As well as adding to my confidence in facilitating the groups, the questioning route meant that the output of the groups was consistent and led to a clear analytical approach.

7.3 Analysing the focus group data

The analysis of the focus group data followed a systematic procedure. Each focus group recording was transcribed and supplemented by notes made immediately following each group. These recorded my feelings about the facilitation of each group, the mood and dynamics of the discussions and some analytical points. Each transcript was made verbatim, including the names of the speakers. The transcripts were read many times, and memos made to summarise thoughts and strong themes arising. The main points of discussion were summarised in a report for each group based on the four objectives. This overall perspective of each group discussion drew out salient themes and foci of discussion which were characteristic to each group. A summary was also made for each person's contribution as part of an overall individual profile (see appendix 9c and chapter eight for more explanation).

"The researcher's task is to prepare a statement about what was found, a statement that emerges from and is supported by available evidence...the researcher seeks primarily to identify evidence that repeats and is common to several participants. However, some attention is also placed on the range and diversity of experiences or perceptions." (Krueger, 1998c:7)

The management and analysis of the focus group data was aided by the use of Atlas.ti which enabled the transcripts to be electronically organised and coded. This was done according the objectives of the task as well as other issues of importance to participants, each individual's contribution in the discussions⁸⁶ and each image in the sample.

⁸⁶ Codes were generated for each individual's contribution to the group, as mentioned above to enable the generation of individual profiles tracking participants' thoughts and feelings as expressed throughout their

The analysis process and presentation of the results principally focuses on the objectives of the task (e.g. Krueger, 1998c; Krueger and Casey, 2000). The coding of the data helped to represent the range of points of view arising from the data in the context of each objective. Codes were also allocated for each of the images in the sample for easy referencing and comparison with the results of the Q-sorts, aiding their interpretation. Issues of common importance to participants which emerged in the discussions but which were not directly related to the objectives of the task were reflected in the analysis. As Krueger and Casey (2000:127) state, “Our focus on purpose doesn’t mean we aren’t open to different things. We don’t put blinders on.” Segments of the data which appeared to be tangents or peripheral to the discussion, for example, were considered to be representative of people’s wider pools of beliefs or frames of reference, and therefore they were taken into account and acknowledged in the presentation of results. The number of participants joining in with the discussion and how animated or enthusiastic they seemed to be gave an indication of the resonance of particular aspects (both clearly linked to the objectives and otherwise)⁸⁷.

Because the focus group discussions were based on the results of the Q-sorts which were very conclusive, there is naturally a lot of consensus in the results (nevertheless, debate was encouraged during the discussions and patterns of similarities and differences acknowledged in the analysis and presentation of results). The coding in this third stage of research was used mainly for data management purposes; the codes principally enabled the organisation, review and retrieval of text directly from the focus group transcripts⁸⁸. This is because the objectives are more focused at this third stage of research (e.g. see figure 4.2). The clear consensus, simple objectives and clear, sequential questions meant that the analysis was fairly straightforward.

“Analysis can be simple and straightforward if the patterns are clearly identifiable, when minimal differences exist within the group and across groups, or when participants clearly reject differing explanations and uniformly coalesce around common concerns.” (Krueger, 1998c:29)

participation in this study. It was expected that participants’ opinions about climate change would change and / or develop during their participation in the focus group (e.g. becoming aware of new evidence as presented by another participant or by a convincing logic determined in the group that might make an impression on some participants for example), and indeed throughout the research process (e.g. see Krueger, 1998c). The coding of the focus group data provided a method by which each individual’s involvement could be reviewed in isolation from the complexity of each whole transcript (the coded quotations included the context in which these were expressed). Chapter eight tracks each individual’s participation throughout the process and throughout the focus groups as part of this.

⁸⁷ Opinions or feelings expressed only once within a group are not considered as crucial for the analysis as shared views that were clearly repeated. In the interviews however, each and every point of view was considered to be as valid as another, whether or not it was expressed by more than one participant.

⁸⁸ The coding of the focus group data does not fulfil the same function as it did for the interview data; the different methods determine that different approaches to the analysis be taken. For the focus group data, codes were derived from the pre-determined criteria or categories outlined above. However, for the interview data, the analytical categories were drawn from the codes in a more bottom-up approach.

A number of analytical challenges arose during the analysis, particularly the striking of a balance between paying adequate versus excessive attention to the detail of the text. My strategy was to take participants' comments in context in order to clarify their meaning, i.e. interpreting them within a larger pattern of communication rather than in isolation (e.g. see Krueger, 1998c). This is reflected in the quotations presented as illustrations of the results. During the analysis I was mindful that the same words or phrases may be used by different individuals or groups; that these can have different meanings and that there were numerous triggers for participant responses (other people's comments, moderator questions obvious in the transcripts). The tone or intensity of the comments and other variations in emphasis were noted in the transcripts in order to infer particular depth of feeling about a point being discussed (e.g. participants raised their voices and became more animated about aspects they felt strongly about). The specificity of people's responses was taken into account; whether participants gave personal examples or responses that were more vague and impersonal. Krueger (1998c) adds that one must bear in mind the context of the discussion; what is happening in the wider environment that might initiate certain types of comments because social, political, personal and environmental factors can be very influential of the directions of focus group discussions. Such factors affecting the results of my study (as a whole) include media interest in climate change, unusual weather and predominant personal issues, etc. There had been no obvious media attention or notably unseasonable weather in the weeks before the focus group discussions were held. Personally resonant issues came up in the discussions, triggered by points being made about the climate change issue (e.g. a discussion of the local drug problem amongst the working class mothers, brought about by one participant who was having troubles at the time with her neighbours because of their involvement in drugs). Contextual factors were obviously influential of participants' feelings about climate change throughout the study and are reflected in the results in chapter five and six as well as this one.

The results are presented logically and descriptively, consistent with the objectives of the focus group discussions, using coded quotations taken from the discussion transcripts. Because the analysis was carried out with the questions in mind, emerging themes are presented accordingly. This is both a descriptive and interpretive process directly linked to evidence from the focus groups using edited quotations⁸⁹. Quotes are given as examples of the range and diversity of comments illustrating the points made by participants, and provide insights of typical, common or usual ways in which participants responded to the questions (it would be possible to add many more but these would not add further interpretative value).

⁸⁹ As noted in chapter five in the context of the interview data, excerpts from the verbatim transcripts are edited to remove pauses, hesitations and in this case, interruptions, etc.

7.4 Results

The results of the focus groups are presented logically in the order of the focus group stages outlined above. The chapter ends with a reflection on group dynamics and differences, other salient issues arising in the discussions and my facilitation. Participants' feedback on their involvement in the research process is presented in chapter eight as part of an integrated analysis and discussion of the results of this study.

7.4.1 *Ice breaker and Q-sort feedback*

Three issues arose within the groups concerning their experiences of completing the Q-sorts: finding it difficult to arrange the pictures into the Q-matrix pattern (resonant in the discussion in all three focus groups); finding it difficult not to take into account feelings of agency in the first sort (an issue common to the young professionals predominantly but also to the high school students); and not knowing why some of the pictures were there or feeling that some of the pictures did not answer the questions (particularly the working class mothers). With reference to the first point, participants found it difficult to arrange the pictures into the pattern, for example, feeling forced to place some of the pictures they felt positive about into neutral or negative rankings. Some participants found it difficult to make a clear distinction in the Q-grid between the ones that they felt very strongly about and the rest; that because of the pattern the boundaries between their choices were blurred. The working class mothers and young professionals talked about sorting the images quickly, without thinking about them too much because "the more you thought about it, the harder it got."

Emily: "*I found that the hardest thing was, once you've got your piles of yes and no, sorting them into the four here and six here, trying to grade how you feel about each one.*"

Jonny: "*Yeah, that's what I struggled most with as well. Trying to sort out the pictures into the various columns that were on that grid, in both cases.*"

Erica: "*Like, you have way too many in one pile and then not enough in the others. I had masses in only one pile for the first question, and only a few bad ones. So I had to put all the good ones into the bad columns because there wasn't enough space.*"

(High school students)

With reference to the second point, participants found that while the instructions were easy to follow, the conditions of instruction were rather open to interpretation, particularly for the salience sort. This was one reason that they found the second sort easier to complete than the first. The young professionals in particular realised that they were often bringing their own values into their interpretation of the pictures, making the sorting a very complex task (finding that they had to keep referring back to the conditions of instruction in order to finish the sorts). Not knowing why some of the pictures were in the sample, or finding that some of the pictures were not relevant to the questions were also stumbling blocks.

Mark: “*I chose some of the pictures because they made climate change important to me in the sense that I felt that I could make a difference. But then, it kind of blurred the two instructions in my mind. Because I was thinking along those lines. I'd be choosing a picture because it would motivate me to do something, because it would give me something to do. Partly because in the first question I was already trying to answer the second one, not having read through the second set of instructions.*”

(Young professional)

Mary: “*I just want to know why George Bush was there. I don't know why he was in there. And some of the others too.*”

These issues do not affect the quality of the Q-sort outputs for reasons explained in chapters four and six.

7.4.2 Explanation of Q factors and image interpretation

7.4.2.1 Issue salience

In all three groups, the climate change images with ‘local’ characteristics were particularly pinpointed as making participants feel that climate change was important (e.g. the flooded house and the picture of the house falling off the cliff). This was because they show the effects of climate change as they could be happening locally and scenes like these have been on the local television news. Participants in all groups felt that these images brought climate change closer to home because they depicted situations happening ‘on our doorstep’. Participants discussed feeling able to relate to these kinds of images because they could imagine themselves or others being personally affected in such ways. The picture of the flooded house particularly made climate change feel more real to participants because they could imagine it happening ‘round the corner’. All groups discussed the global pictures (e.g. flooding in Bangladesh; polar bear), and noted that these were the kinds of images shown in the media but that they were not so personally resonant because they do not show ‘what could happen to you’. While they brought about emotive feelings, they did not make climate change seem quite so important because they do not show something that could realistically have personal effects. For example, the image of the starving children in the famine was ranked strongly in the Q-sorts as making climate change seem like an important issue for both salience factors. This image has some of the ‘salience’ characteristics that participants attributed to the images making climate change seem relatively more important than others in the sample. However, all groups were keen to point out that even though it is emotive, this picture (and others, e.g. flood in Bangladesh) did not convey so much importance because it depicts a situation that probably happens regardless of climate change; the link with climate change is not strong. Participants in all groups talked about feeling desensitised by seeing flooding and famine pictures on the television; ‘overplayed’ images that have been ‘around for a long time’. The working class mothers also noted that these types of

images were easier to forget about in comparison to the more locally resonant ones. Therefore they did not make climate change seem as personally important as some of the other pictures.

Theresa: "*I think that this is where the cliff picture and the localised flooding come in. Because it's something that has happened around here, because of the changing climate. And maybe hearing about that is important.*"

Vicky: "*I think that these [house falling off cliff, flooded house] are like, on our doorsteps.*"

Mary: "*Yeah, they can hit home. You can relate to the local picture ones. You might know someone that's been in that situation or like, the flooding of the house or the cliffs caving in where their house is. But the graph, you know, it doesn't, it just doesn't hit home. It is important but until you really look at it closely it doesn't hit you.*"

Theresa: "*Yeah that one [house falling off cliff] has been on the news as well. And it's something that is in this area, we have heard a lot about it. It's happened in Cromer, Happisburgh, you know, close to home. And because it's on the local news as well, people can relate to that. And as well with the flooding. With all the floods that we've just had what have all been televised, there are things that have really stuck in our minds, because they have been on the news just recently. The icebergs fading away has also been something else that's been on the news quite a bit.*"

Vicky: "*Yeah, but these ones [famine, flooding in Bangladesh] are not actually on our doorstep so we can easily forget about them. Whereas these ones [flooded house, house falling off cliff] are in your face because it's happening here.*"

(Working class mothers)

The images which made climate change seem most important were considered by participants on the whole to be emotive, dramatic, drastic, shocking and worrying (e.g. the picture of the dried up river bed with dead fish). Participants in all groups felt that these pictures, often showing the destructive and terrible consequences of climate change, made the issue seem most important relative to others in the sample. In some cases participants felt that they were upsetting because one could see the effects of climate change on people and animals and could see that these were happening now. Participants agreed that these kinds of images were the most attention grabbing pictures in the sample. The picture of the graph was dramatic in a different sense; some of the participants were struck by the extent of the projected increase in temperature which they all found surprising. Participants persistently raised the point that because some of the pictures were showing the obvious consequences of climate change affecting people, they made the issue seem more important than others.

Kathryn: "*I think that until you actually see suffering you are less likely to respond. If you just see a scene or something...*"

Emily: "*I think like, ones with people and with animals show that it does all these different terrible things. You know, it doesn't just cause floods and stuff.*"

Erica: "*Yeah, they are more sort of about what happens when it does, and how it affects people. It sort of shows you that it's important because this is how it affects people in really bad ways.*"

Kathryn: "*I think that the ones that show people and animals have quite strong messages...because that kind of upsets you, because they are pictures of other people,*"

and of animals. The polar bear, I suppose that was more effective than the picture of the ice caps melting because you can actually see it.”

Helen: “It's more emotive, that one.”

Yolander: “Yeah, I think that the ones with people in them are more emotive than the fire one or whatever. I'm sorry, but those are just trees, and they are people.”

(High school students)

Another salient characteristic of the images ranked as making climate change seem important to participants is that they were perceived to be showing climate change happening now. Both the working class mothers and high school students in particular felt that the photographic images were much more resonant and made climate change seem much more important than the graph and cartoon for example. This was because they seemed realistic, striking and easy to relate to, highlighting that climate change is affecting people now and is not just something for the future. The mothers agreed for example, that the graph did not stand out for them like some of the photographs, even though it shows a dramatic effect; that one would have to really stop and think about it for the image to convey climate change salience.

Kathryn: “*It [cartoon] makes fun of it really doesn't it? It doesn't really make me feel that it's serious. I mean it gets the point across that we'll be more affected by that, that you can actually see than like the ice caps melting or something like that.”*

Erica: “*Yeah, and like the graph, it's not the same as information about what's happening now, is it. I didn't think that a graph really means that much when compared to some of the other pictures which show what actually is happening. I mean, it obviously shows that it's getting warmer, but not about how it actually affects people.”*

(High school students)

Mary: “*The cartoon doesn't hit home as much.”*

Anne: “*It doesn't. And I think everybody feels like that.”*

Vicky: “*I thought that as well.”*

Kerry: “*It doesn't stand out like an actual photograph or something.”*

Mary: “*Yeah, like some of the other ones.”*

Kerry: “*And like with the graph. I mean, if you actually think about it a lot then you would think it was serious. But if you are just looking it quickly then it isn't.”*

(Working class mothers)

Other image characteristics were also discussed. The young professionals felt that the immediately familiar climate change pictures made the issue seem more important to them than some of the others. In the case of the graph, seeing the scientific evidence also made the issue seem important (and scary); the graph was particularly resonant for this group. The high school students on the other hand, noted that the graph was not so resonant for them because they often found themselves questioning the source of the data (i.e. who is presenting this data? Is it being used as propaganda? Is this really plausible, is it true?). The working class mothers felt that the pictures of the renewables (e.g. the wind turbines) made climate change seem important because they show the changes that are being made to deal with the issue.

Tanja: "This one definitely, because it's a graph that kind of shows you scientific evidence. That's what scared me, was that. Because, I mean, there is famine in the world anyway, so one part of me was thinking more specifically. Yeah, that was the one that really made me feel strongly [points to graph]."

Claire: "Yeah, you see, the thing about the graph for me is that you can actually see it. It is spelt out for you. And that's what might be the easiest to deal with for me, because I can actually see facts rather than perhaps images on their own."

(Young professionals)

There was some discussion in each group about why some of the images were more neutral in terms of conveying climate change salience than others. All groups mentioned the refugees in this context because they did not necessarily make the link with climate change (even though it is depicting a sad situation); this could be a picture of the results of war. All groups commented that because some of the scenes were thought to happen naturally (e.g. forest fire), the images did not make climate change seem particularly important. Participants also had fairly neutral reactions to the cartoon, because it is not a photographic image (participants could not see climate change really happening) and because it seemed almost slapstick in its nature (did not portray climate change seriously). Images were also ranked neutrally when participants did not understand what they were depicting, or their relevance to climate change i.e. feelings that they were rather ambiguous (e.g. pictures of sea defences, sunflowers, mosquito). Some felt that because they did not fully understand some of these images, these did not make climate change seem important. Other images were associated climate change but were not considered to be very inspiring or exciting to look at and were deemed consequently less likely to attract attention or to make climate change seem important (e.g. melting ice).

Yvette: "I just thought that that one [forest fire] is of another naturally occurring thing. It happens regardless of climate change. I just couldn't see generally that it would make too much difference."

Mark: "Yeah, I wasn't really sure about this one [refugees]."

Tanja: "I wasn't sure either, I was thinking, that picture does not make me think climate change, it makes me think that there's been a disaster, or a war or something like that."

Claire: "Yeah, I put it in the 'don't know' pile. I really didn't know what to do with that one. I had trouble with that one because that didn't make me think of climate change. I just thought, that's horrific, but I didn't think about climate change. That's the trouble I had with some of the other pictures as well. Like the one of George Bush and some of the others. I didn't think of climate change, I sort of thought of war and other things."

Mark: "Yeah and then there's this one, the cartoon. I think that this one is a bit too quirky for me. It says a story, but it's too quirky. It's not serious enough."

(Young professionals)

Participants mentioned at various points that it was difficult to place some of the pictures in the Q-pattern or difficult to understand them without more context about why they were there. The young professionals particularly felt that the images should be accompanied by captions to give them context and to make clearer links with climate change; that many of the images would

become more powerful when combined with some sort of slogan, e.g. a caption somehow stating that the starving children in the desert were due to excessive energy consumption in the West. The working class mothers felt that the pictures generally did not need captions, and that the ones conveying the most importance spoke for themselves. The high school students had mixed feelings, but generally agreed that the resonance of the images would be strengthened by captions to make them more personally applicable, e.g. pointing out that the flooded house 'could be you'.

Erica: *"It really depends on your interpretation. So if you have got captions then you can try and make people think in a certain way that you want them to think."*
(High school student)

Claire: *"I looked at it and I thought...well, it doesn't really say climate change to me."*

Tanja: *"Yeah, climate change didn't spring to mind for me either."*

Claire: *"Yeah, it just said, oh there's a tram and that was it."*

Mark: *"But if it was linked with a good slogan, it could be quite a lot more powerful."*

(Young professionals)

Kerry: *"Some of them don't need captions."*

Mary: *"They speak for themselves."*

(Working class mothers)

The discussions around the images making climate change seem unimportant to participants (e.g. sunflowers, beach, café and rainy weather) were consistent with the explanations presented in chapter six. Such images were characterised by participants in the focus groups as: being everyday scenes which seem no different from usual; depicting situations that would not be adverse or that are positive and that climate change is not worth worrying about because people will not mind the changes; and being uninspiring or boring pictures that do not catch ones interest. For example, all groups found the picture of the women at the standpipe neutral or making climate change seem unimportant because it looked dated. Some of the images making climate change seem unimportant did so because participants did not understand their links to climate change. The young professionals felt that the picture of George Bush made climate change seem unimportant because of his position on the issue: a powerful figure considering climate change unimportant and blocking action on the issue (and the environment more broadly).

Emily: *"It's difficult though because it's such a very everyday, it's just such a boring picture really. It doesn't really catch your interest."*

Erica: *"You wouldn't read a story if you just saw some picture of some people on the beach, or a sunflower, or some person in the rain. You know, it's not very, it's nothing different is it. This one is like, really sunny and it makes it look like we can go to the beach."*

Emily: *"Yeah, the unimportant ones are also more like everyday scenes aren't they."*

Kathryn: *"Everyday pictures, yeah."*

Helen: *"Yeah, those important ones are more emotive."*

Jonny: "Yeah, and I wasn't quite sure about the one of the dump truck on the shoreline. I wasn't quite sure what that was supposed to show so it seemed rather unimportant."

Angela: "And like, this one [George Bush], I think it depends how you interpret it. Because he's on the tele, he's always saying that climate change is not happening and therefore we are not going to agree on measures to chop CO2 emissions. It depends if you believe him or if you think that global warming is an issue, then he might be important or not."

(High school students)

7.4.2.2. Personal efficacy

The focus group discussions were conclusive in relation to what made certain images convey a sense of efficacy, confirming the results of the Q-sorts; the images most strongly ranked as making participants feel able to do something about climate change did so because they made it clear what people could do about climate change personally. Their simplicity, accessibility and personal relevance appealed and really conveyed a sense of being able to do something about the issue on an individual basis. These are personal-level action pictures depicting manageable, easy things that individuals can do. Participants felt that because some of the pictures showed things that they could do every day, they would also be likely to actually do them. A key point made by the high school students is that these images did not convey any sense of losing out by taking action; that while it did not seem that such small actions would make much of a difference to climate change they would if everyone carried them out. The working class mothers also discussed feeling that the images made them feel that even taking the odd action would be better than nothing; they would still be doing something worthwhile. There was discussion amongst the high school students however, that while some of the images made them feel able to do something they would not necessarily take any action. For example, they felt that the tram picture should encourage people to use public transport however the buses are so unreliable and expensive that people would not actually bother (even if the picture was more inspiring). They felt generally that it is good to take preventative measures rather than always trying to provide cures for the consequences and this was encouraging for them. The pictures of the wind turbines and solar panels conveyed such a sense of agency to all three groups because they portrayed action being taken on climate change at a higher level. This made them feel that it was worth taking action individually. The young professionals saw an individual relevance in these pictures because the solar panels represented how individual actions could fit in with the bigger picture. Participants in all groups talked about being able to give money to charities (e.g. in response to the picture of the starving children). Essentially, participants felt that the less dramatic pictures and the ones that did not show impacts, but showed actions made them feel able to do something about climate change, even if it would not make a 'massive' difference.

Kerry: "Well they are up to individuals aren't they."

Karen: "They make you feel as if you are doing something. Even if they may be slightly token gestures. It's better than sitting back and doing nothing."

Vicky: "If enough individuals did it then that would make a big difference."

Theresa: "It's something that you can do on a personal level."

Anne: "It might not seem a lot but you feel as if you are doing something for the environment."

Theresa: "Yeah, even the solar panels on the roof. If you had the money, that's something that you could do. Because while I was over in Kos, they actually use solar panels to heat their water and everything."

Mary: "The solar panels is actually something you can do yourself whereas the wind turbines, usually the Government."

(Working class mothers)

Vicky: "It's mainly their simplicity I think."

Jonny: "Yeah - the accessibility of those things."

Vicky: "Yeah, they are all things that you can do. They are so easy to do."

Emily: "Yeah, I thought that like, the light bulb one was just the best one, because it's just such a simple thing. And you know, you could give like, five pounds to these charities, which help these people who are in a famine and stuff, but I would feel much happier about spending like five pounds on a light bulb that I know is going to make a difference. A light bulb is something that you can have and say, look I've got that now and that helps."

Kathryn: "And also its preventative as well rather than trying to cure the effects. And one of the main questions is...is it easy for me to do something every day. If it's easy then it's then a case of well, would you do it. Because I mean all those things, we necessarily do, but we think yeah, it's easy to do. So they make you feel like you can do something, even if you don't actually do it. So you think you can, in theory do it."

(High school students)

Participants agreed that there were very few images in the sample that conveyed to them a sense of being able to do anything about climate change. Most of the images either made them feel very unable to do anything about climate change, or feel fairly neutral. In all three groups, participants discussed this distinction agreeing that there was not a lot of difference between the neutral and 'unable' ones because the characteristics of the two were related. Participants felt unable to do anything in response to the images ranked at the very extreme end of the Q-sorts because they represented 'impossible situations for an individual to fix'; big issues, big causes and big consequences of climate change that seemed to be out of reach, situations which nobody can personally influence (e.g. industrial smoke stacks, flooding).

Many of these pictures depict situations that are 'huge and far away', that people in this country cannot do anything about. Some were considered by participants (causes as well as consequences), always to have been there, bolstering a sense of powerlessness unless everyone's lifestyles are changed radically and this did not seem realistic. The environmental impacts seemed to participants to be so overwhelming or drastic that whatever people do, nature could not be stopped, particularly by an individual (e.g. by sea defences, the sea will break through eventually). Participants in all three groups felt that the picture of George Bush made

them feel unable to make any difference because of his stance on climate change; because he has so much power, will not listen and certainly will not change. Participants agreed that they consequently felt that any action they took would be pointless and useless. The high school students talked about feeling unable to make a difference because ultimately money was the main driver and so individual members of the public have little power. Money was also important in terms of commitments to climate change by other countries, and driving forward alternatives to fossil fuels.

There was some debate about the picture of the graph in relation to feelings of efficacy. Some participants across groups felt that because of the variation in the prediction of future temperature rise, humans could choose to progress along the lower curve and this represented being able to make a difference. There was a real split of opinion however, because others felt that the overall increase was so large that they were powerless to influence the change and that there was little point taking any action. Otherwise, images depicting changes that could happen naturally made participants feel unable to do anything about climate change (e.g. dead tree in the desert) though not as strongly as the more dramatic impact and cause pictures. Participants found that some of the images were not clearly connected to climate change, particularly in the context of the question so these were ranked more neutrally. The aeroplane picture was talked about as possibly conveying a feeling of being able to do something about climate change but that in general it portrayed quite the opposite. This was because participants felt that people (including themselves) will always go on holiday and aeroplanes would still fly if they did not (also because it takes too long by other means). In contrast to the point about making donations to charities in response to the famine picture, participants felt that in terms of efficacy this also represented such a large problem that one person could not possibly do anything to make it better (and that ones donation may not even reach those in need of it).

Tanja: *"That was one I can't do anything about [points to melting ice picture]."*

Claire: *"Yeah I think I put that one in the 'can't do anything' pile."*

Tanja: *"Yeah, its one of the big things, big powers that I can't really do anything about. Yeah, you're right."*

Mark: *"These are impossible situations that I can't fix."*

Tanja: *"Yeah, they are the most dramatic ones aren't they?"*

Yvette: *"I see what you mean. Most of them are out of reach. Yeah, I don't feel that I can personally have any effect on flooding or things like that."*

Claire: *"Yeah and number 2 [industrial smoke stacks] was quite high. I put Bush I think quite high up on this one as well I think. Because he has a lot of power and I don't. So he's in a position where he could do something but nothing I say is going to make him do anything."*

Yvette: *"And also I think there was a certain sense of whatever...his influence or views or, you know, it's completely out of our hands. He has the power to dictate whether they do this or that, or reduce emissions or whatever, but or on a personal level I can't say to him, well you should be doing this or that, or you should have considered this."*

Mark: *"Yes, I agree."*

(Young professionals)

All groups realised that the images they were discussing in terms of feeling unable to do anything about climate change were similar or exactly the same as the ones that made the issue seem important to them. For all, this seemed to be a surprising realisation, however they were keen to emphasise that this really was the case; the images making climate change seem important were the same as the ones making them feel unable to do anything about it. Participants felt that this was because the images were largely drastic and dramatic; daunting when interpreted in the context of individual action. They confirmed that the 'able' pictures were instructive and encouraging, however, these were not always directly associated with climate change, but with acting in a generally environmentally-friendly way.

7.4.3 Engaging and motivating imagery and beyond

Participants in all groups agreed that no single image in the set conveyed a sense of motivation; none was able to convey both feelings of climate change salience and efficacy. Some participants felt that captions might be useful to make single images more motivating and to demonstrate the connections between people's actions and climate change. However, all three group discussions led naturally to establishing that a combination of pictures was most likely to achieve this. The following section describes the characteristics making images motivating and un-motivating to participants. Wider motivational issues and feelings of engagement with climate change are subsequently considered.

Kathryn: *"I think they need to be shown together. For example, that wouldn't motivate me to go and get an energy saving light bulb, but if you saw that next to, like the one of the house, well you think, gosh this'll happen if I don't kind of thing. You kind of associate them together. So they aren't really giving a message by themselves I don't think. You need to see the consequences of not doing things."*

Emily: *"Yeah I think the important thing is to have things like that, that are really shocking images to make you think, oh my god that's terrible and then show you the simple things that you can do to make people think, you know, to make the link between little things like the light bulb helping climate change. And to make people think that, you know if they ride their bikes, it will stop the ice caps melting. You have got to have those, it doesn't work otherwise."*

Kathryn: *"Yeah, I definitely think you need two really, to say this is what you can do to prevent this kind of thing."*

(High school students)

All three groups found that combining the images to form a 'storyboard' most successfully portrayed a message about climate change; depicting the seriousness of the issue and what people can do about it. Even the strongest efficacy images did not deliver a coherent message about climate change to participants when viewed alone. Participants also felt that simply seeing the high salience pictures did not make them think about doing anything about climate change. Seeing the pictures together helped them to clarify the links between individual activities and the consequences of climate change, e.g. combining pictures of the impacts of

climate change with images showing the causes and what people can do to reduce the causes of climate change; they felt that people need help to put the issues together so that they can relate to the climate change issue more easily and realise that they can do something to help. Participants in all three groups felt more able to do something about climate change when they could see the images in partnership. They also talked about the need to involve an emotional component in order to make the messages memorable. The high school students in particular raised the point that emotive images (e.g. involving human or animal suffering) made them respond and care about climate change and therefore want to do something about it. They felt that seeing these images in conjunction with the 'doing' pictures made them more likely to want to do something and feel able to than seeing them in isolation.

Claire: *"I think it really needs to be spelt out to me particularly. Like, ok, I can see the graph, I can see that cartoon picture and then I can see this one about using energy saving light bulbs. I need that in between bit and seeing them together helps."*

Yvette: *"I almost grouped some of the pictures into two kinds of categories. Like, kind of cause and effect I suppose. I mean, if you see some of those more dramatic ones of terrible things happening and then you see the smaller ones, where you can see that you can do this or that or the other, then you feel like you can do this to try and prevent that. So in one sense, I know its not going to make a massive difference, and certainly not immediately, but you think, well if everybody tried adopting this, or using more eco-friendly ways of generating power and stuff like that, then you think that maybe then, the effects will be lessened. It's only by seeing the two side by side as well, that you get into that kind of way of thinking about them."*

(Young professionals)

Six images were common to the motivating sets of images put together by all groups who all ended up with a set of nine pictures. These are presented in table 7.2 accompanied by some explanatory comments derived from each group discussion. The working class mothers were the only group to incorporate an image depicting a wider cause of climate change beyond the individual (e.g. representing industry and energy production). The high school students felt that the motivating images were the ones depicting things that an individual can do rather than things that 'you see as not your responsibility'. This was an explanation why the picture of the smoke stacks for example, was not included by participants in this latter group.

Table 7.2 Most motivating sets of pictures for each group

	Working class mothers	Young professionals	High school students
Motivating	Dried up lake with dead fish Flooded house Light bulb Wind turbines Cyclist Melting ice Graph Smoke stacks House falling off cliff	Dried up lake with dead fish Flooded house Light bulb Wind turbines Cyclist Melting ice Graph Famine Solar panels	Dried up lake with dead fish Flooded house Light bulb Wind turbines Cyclist Melting ice Polar bear Famine Solar panels
Why?	Dried up river bed because it's dramatic and emotive, can see that the river used to thrive. Flooded house because of personal impact; would be better with people in it. House falling off cliff also has personal resonance. Graph shows how climate is changing in a short time. Smoke stacks image is a dramatic picture of the cause, standing out more than the power station picture...	Flooded house is locally important, although needs something more, e.g. a person in the picture. Famine and dried up lake are emotive, showing effects on humans and animals. Melting ice and graph really show the scale of things. Light bulb and cyclist show personal actions that can be taken. Wind turbines and solar panels – a positive image of change...	Dried up lake because animals are dying which is bad. Flooded house looks believable and is close to home, happening more often and relates to our lives; remember news reports. Light bulb because it's easy to do but a boring picture. Works well with the others though. Famine because it's disturbing. Cyclist because it's quite motivating in behavioural terms...
Uncertain	<ul style="list-style-type: none"> • <i>Thermostat</i> (good message but boring picture so light bulb is enough) • <i>Solar panels</i> (as above, wind turbines are enough) • <i>Polar bear</i> (good because it has an animal in it; dried up lake and melting ice are enough) • <i>Flood in Bangladesh</i> (not local although this is still important) 	<ul style="list-style-type: none"> • <i>Thermostat</i> • <i>Polar bear</i> • <i>House falling off cliff</i> 	<ul style="list-style-type: none"> • <i>Flooding in Bangladesh</i> (in the news a lot but not directly affecting us, people do not look like they are suffering too much) • <i>Refugees</i> • <i>Graph</i> (needs to be explained, also not showing something that's actually happening so not so motivating) • <i>House falling off cliff</i>

There were some differences of opinion within and between the groups about the ways in which images were conveying salience and efficacy and the images that should included in the final set. The young professionals felt that the image of the graph should definitely be included alongside others in order for the pictures to be motivating. They felt that on a larger scale pictures like the ones being used could be matched up with different lines on the graph. These combinations could be used as scenarios to illustrate to people the different ways that we can progress in terms of our emissions and the possible consequences with different levels of severity. The working class mothers also felt that the graph should be included but the high school students disagreed. However they did suggest that some sort of scientific image could be used in relation to pictures of East Anglia over time to show sea level rise and flooding changes as this would be resonant for people living in Norfolk. The high school students felt that images depicting real examples of people using renewable energy would be useful, e.g. pictures of places in Africa where people's development has been aided using renewable power. Pictures of people protesting and taking direct action measures regarding climate change would also be resonant, as would illustrating big organisations doing something positive rather than mostly showing the problems associated with climate change. The high school students would have liked to see more pictures of people doing things easily (mentioning recycling, as the working

class mothers also did many times). Some participants discussed that as well as seeing static images, they would find real time or video imagery appealing and that this would have more effect (e.g. films or adverts). The high school students in particular felt that hearing stories from people who are being affected by climate change would be very persuasive, making them feel more driven to act. The young professionals felt that many of the images might have been more inspiring, for example if they had been professionally composed and so on. They and the working class mothers felt that the impacts of climate change on people's health is a very important point and that this would be a resonant point for people, e.g. if they could see that problems like asthma might get worse then they may be more motivated to do something about climate change. The financial effects of climate change were also discussed in the working class mothers group, in both cases because climate change would be brought closer to home and would become directly relevant to their lives.

Karen: "I have got a daughter with asthma. And so, I mean fortunately it isn't that serious, but the fact that you see that people are affected by asthma, the increase; that's worrying."

Kerry: "Yeah, you think about what's in the air and stuff."

Karen: "Yeah, I mean, what's in the air to cause it? It's worrying, it's really worrying. You know, and if you think as well about people living near power stations and things like that, how that affects their health. I think that if you can get it across to people just how all these things, I mean ok, its affecting the climate, but how it's affecting us as individuals health wise or financially, because obviously if someone's house is flooded then the insurance is going to go up and all that sort of thing."

(Working class mothers)

Yolander: "I think they should have some pictures as well, of like Greenpeace in action, doing something. Or like, the rainbow warrior or something. Some big organisation actually doing something positive rather than just problems that are happening and the negative effects."

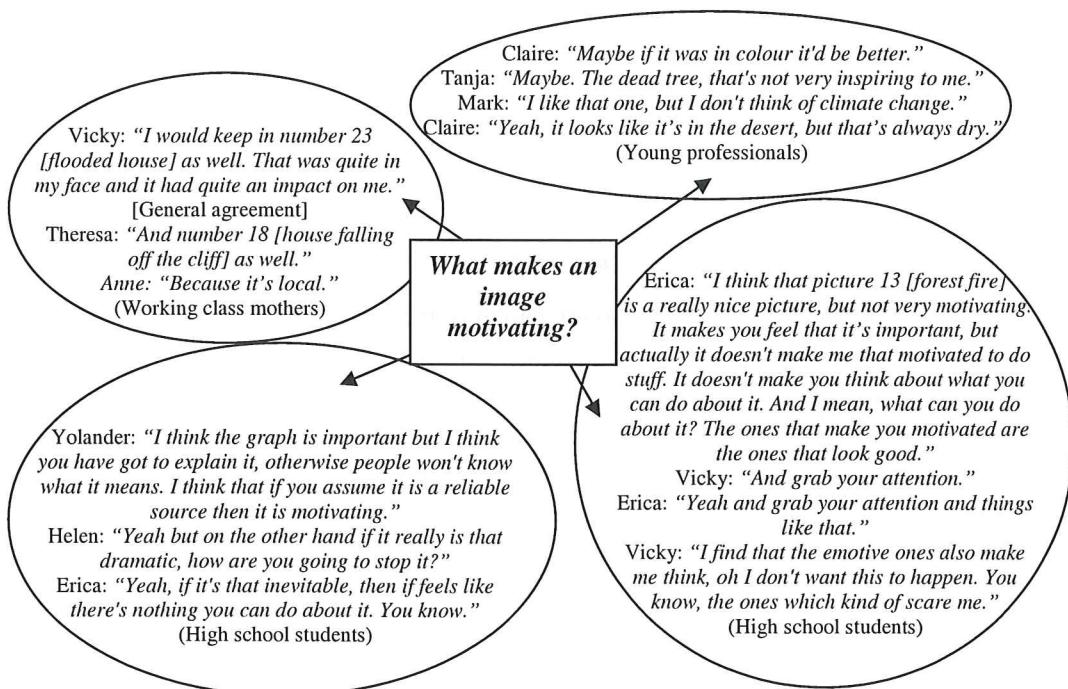
(High school student)

The characteristics participants associated with motivating and un-motivating images represent a mixture of those identified by participants as conveying senses of salience and efficacy. These are presented in table 7.3. They demonstrate a fine balance between visually conveying feelings of motivation and instilling feelings of distance and remoteness when using pictures of climate change. For example, while emotive pictures make people feel concerned and motivated to take action, they might also be associated with feelings of desensitisation, being overwhelmed and powerless (which are un-motivating). The motivating characteristics are most successful when combined vice versa. The characteristics presented in the table highlight issues raised in chapter three, particularly the discussion surrounding the types of 'hooks' and strategies employed in visually communicating environmental issues and their distancing potential. Figure 7.1 presents some brief examples of the debating processes that participants went through when deciding on which images to retain and what made certain images motivating (or not).

Table 7.3 Motivating / un-motivating image characteristics

Motivating characteristics	Un-motivating characteristics
<ul style="list-style-type: none"> • A combination or contrast. • Well taken, colourful pictures; look good, interesting to look at, attention grabbing. • Emotive and dramatic pictures. • Local, familiar or everyday pictures that make the effects of climate change seem closer – direct relevance • Things that individuals can easily do. • Pictures with people and animals in them (sometimes suffering); personalisation of the issue • Images of real situations and examples (photographs, etc.) • Positive and fun (rather than overwhelmingly negative) 	<ul style="list-style-type: none"> • Uninspiring, uninteresting or boring pictures, with dull colours. • Feeling desensitised by shocking and depressing pictures. • Far-away pictures that ‘seem a million miles away’. • Feeling powerless (big, dramatic, terrible pictures); situations that do not seem to be changeable. • Everyday situations that do not seem any different. • No clear message. Not clearly linked to climate change. • Could be caused because of another issue, e.g. due to nature or war (and other things that ‘happen anyway’). • Not understanding a picture’s relevance to climate change; situations that do not seem related, e.g. Beach, more relevant to skin cancer and ozone layer. • Pictures that make climate change look nice. • Pictures that do not portray climate change as a serious issue. • Feeling guilty or scared

Figure 7.1 Debating extracts – are these images really motivating?



The young professionals felt that to take the task further, the pictures could be produced into posters perhaps with some slogans. They felt that in order to be really motivating it would also depend who the pictures were being aimed at, so that the pictures could be designed to be personally meaningful. The high school students discussed the importance of where pictures of climate change might be published and by who, as well as a consideration of the target audience. They felt that different audiences require different styles of appeal; that different

visual communications would appeal differentially to people living in East Anglia or in Australia for example (highlighting their requirement for some local relevance). Consistent with their speculation about the source of the graph image, issues of trust in the sources of the pictures was discussed as being an important issue in visually depicting climate change.

Helen: “*You need pictures of people in our country.*”

Kathryn: “*And like that picture of the house in England, people say that's effective because it's close to home, but that kind of means that you are not going to find a picture that will be good for everyone everywhere, as has already been said, for different audiences you need different kind of styles of advertising. I suppose it would also depend a lot on where you are like appealing to. Because if it was just to East Anglia, then that would be a really good one, by saying about the coastline. But if it were someone in the Midlands, then that probably would not affect them quite so much as something else.*”

Erica: “*Yeah and I reckon that some of these pictures, depending on where they were, whether it was in some magazine, that people who would read it would be quite interested in that sort of thing, then you might want to put a picture that was less emotive, or that was more about making you do something. Because it was like, in a scientific magazine or something then you are going to have a picture which will mean something to them that they can do, rather than if it was just in an everyday paper, for everybody, any old Joe who maybe didn't know anything about it. It would have to be something that would get them to do something and mean something to them personally. So it's totally dependent on who it was and where it was put.*”

(High school students)

When salience and efficacy were conveyed together, they were most likely to make participants feel motivated and engaged with the climate change issue. However, the group discussions highlighted that even if individuals considered climate change important and felt able do something about it, they would not necessarily act on these feelings. The young professionals and high school students in particular felt that motivating messages must make sure that in association with the impacts pictures, they show people behavioural changes that are easy, positive, hassle free and that do not cost anything. All groups noted that, whilst one might feel personally able to do something about climate change it is very unlikely that one can actually make a difference to climate change because the lack of global political and economic commitment. However, all the groups mentioned at various points that there is little point *not* taking small and easy actions; even if they seem like token efforts they are still worth doing because even those reduce an individual’s contribution to climate change.

Kathryn: “*You're not going to be doing anything wrong with doing that, so even if you think, oh, its not really going to make much of a difference, its still going to cut down on your bills in the end and by turning your thermostat down you are also saving gas and things. So even in a selfish way you would still be doing right by the environment. It's not going to matter because America isn't doing it either.*”

(High school student)

Participants felt that there were many other factors affecting their feelings of salience and efficacy, and ultimately their engagement with climate change. These overlap with the barriers to senses of issue salience and personal efficacy articulated in the interviews (see chapter five). They also reflect the findings of Stoll-Kleemann *et al.*, (2001), and other literature presented in chapter two. The discussions highlighted factors that act as both barriers and potential motivators and these are presented in table 7.4. Appendix 14 presents some quotations to demonstrate some of the ways in which these were articulated in the focus group discussions.

Table 7.4 Motivating factors (aside from imagery)

- *Being given the opportunity to act.* Making change easy and having incentives for action. In the case of recycling, a new curbside scheme in Norwich had encouraged participants to recycle; this was a salient point in all groups particularly, for the working class mothers. Lots of discussion in all groups about the poor public transport system and need for improvement (cost, reliability) before many participants felt that they would be able to use it. The provision of alternatives and environmentally friendly choices for consumers; participants suggested the sole availability of energy saving light bulbs, phasing out the regular ones for example and encouraging the affordability and purchase of efficient cars so that these choices become mainstream. Cost is an issue, participants would all be prepared to take measures that did not cost any more than their regular activities. The working class mothers in particular note that people will not buy energy saving products unless they are the cheaper option.
- *Other government action and commitment.* Participants in all groups felt that they would be more engaged with climate change if the government were to have a more obvious commitment to the issue and 'do more'. This overlaps with the previous point about provision of alternatives and measures that people can take. Also examples such as more congestion charging and road tolls, investing in renewables, encouraging goods transport by train, environmental surcharges on air travel, etc. (and explaining why, to make the links clear to people). Participants also felt that responsibility for climate change needs to be instilled into the way companies and public services work (e.g. energy saving in businesses and schools).
- *If America (and others) committed to doing something about climate change.* If this were the case, participants in all groups would feel much more motivated to take action at a personal level. The current situation is a major de-motivator. Overlaps with the point that unless other countries commit, it does not seem worth doing anything (or that effort is wasted). The extent to which other people are making an effort is a very important issue to participants; need to know that others are also acting. As individuals, many feel that they could make all the effort in the world but others still will not bother. The high school students suggested that some people are more inclined to act than others, who may never take action. Working class mothers feel that no matter how good the information is, at the end of the day there are some people who will not do the right thing no matter what (e.g. even when they know and are reminded that drugs are dangerous they still take them – a salient local problem).
- *If obvious climate changes were to start happening in the UK.* Participants in all groups agreed that they would feel more engaged were there to be local impacts, particularly if these had personal effects.
- *Being constantly reminded about climate change and having more information, particularly from the Government.* The issue and the impacts it is having but also what people could be doing (otherwise it's easy to forget about). The working class mothers feel that people need to be made more regularly aware of climate change impacts and what people can do by being given more regular input through the television news, adverts, schools and nurseries, the internet, on buses, in soap operas, children's TV programmes, etc. Would also illustrate Government commitment. Needs to be easily accessible.
- *More activities in schools, celebrity promotion and campaign days.* Raise awareness amongst young people who become more able to make changes as they get older (these would need to be fun, and positive); Instilling responsibility for climate change in young people and bringing children up with an ethic of care so that they are not so held back by financial issues, laziness, etc. People in general need to be more educated rather than simply scared or 'guilt-tripped' into doing things. The high school student and young professionals in particular felt that campaigns on climate change involving celebrities would appeal to them; the Beckham's riding bikes would mean that cycling became 'trendier' and people would be encouraged to cycle more. Also having a 'national climate change day' for example.

7.4.4 Other issues – differential interpretations and other issues of importance to participants

All three focus group discussions addressed people's different ways of interpreting the images. Participants in all groups discussed the role and influence of their previous levels of knowledge, associated experiences and understanding of the issue. For example, the young professionals noted that the picture of the house falling off the cliff would be more salient for people living in Norfolk rather than those from elsewhere in the country where erosion is a big issue. On the other hand it might not be if they did not know about it. The working class mothers also picked up on this issue and a couple of participants in the group were very moved by this picture because they knew people who were being affected. They felt that because the picture was so salient, its presence would add to the motivation of a set of pictures as a whole. The participants established towards the end of the discussions that in these ways their individual feelings of salience, efficacy, motivation and engagement were distinct, even though as groups they were able to come to some broad agreements and combine the images.

Claire: *"The thing about the graph for me is that you can actually see it. It is spelt out for you. And that's what might be the easiest to deal with for me. Because I can actually see facts rather than perhaps images on their own. Because sometimes with images I am not very aware of climate change and things like that, so I don't know much about it I admit. So when I see factual things like that, it makes more sense to me than sometimes when I see pictures, because I don't necessarily relate them."*

(Young professional)

In each focus group discussion, there were areas of discussion which did not arise in others, or which were particularly prominent in one or two and not the other(s) (the issues discussed were on the whole consistent across groups). While all groups talked about the role and significance of the graph image, the high school students really concentrated on this image and had more than one in-depth discussion about it during the duration of their group. This was also the only group to explore the issues of 'truth' and the uncertainty associated with climate change based on the predictions shown on the graph. Participants in all three groups also brought a number of other issues into their discussions. Salient issues in life were often introduced to the discussions as examples or associations with aspects of climate change. Sometimes these became tangents in the group discussion, in which case I, as facilitator, had to draw the discussion back to its focus. However they were always driven by association with the topic in discussion. The working class mothers were most likely to expand on their discussion, talking at times about local crime problems, drugs, money (lack of it) and often their children's wellbeing. It was noted that many of the examples they gave concerning the images or points they were making about the issue in general were in the context of their children's lives.

Vicky: "It's the same with anything though isn't it? It's always going to go on. And then until it actually does happen, then you don't change."

Mary: "And then that's exactly what they are going to say about this. Oh well, don't worry about me Jack, I'll be dead by the time it happens so why should I worry? People have stopped caring."

Anne: "That's inevitable, that sort of attitude, you always get that, and it's sad."

Karen: "Yeah, I don't know, I mean I am just thinking of litter as an example. I mean, even though they are sort of doing that in schools, it it's not really having an effect, you know, they don't respect."

Anne: "Yeah, well school children, who leave school, I mean, it's just awful. It's bad."

Karen: "Yeah, I'm just thinking, well, what impact does it make on them? I mean, I suppose really it has got to be scare tactics at the end of the day. Which is sad but then it is their future which we are talking about."

Theresa: "Like saying, well this could happen to your home if you don't do this."

Mary: "Yeah, I think it has got to be quite dramatic to affect young people. It's like drugs. You tell them don't take drugs, this is going to happen, and they still don't listen. It's got to be something really strong."

Theresa: "Yeah, that's difficult. My neighbour is dealing. And she has been seen dealing to an 8 year old. And my son is 10. So I won't let him play out. I mean, that's..."

Mary: "That's what I am saying about young people. You can show them a person dying, a young child dying with all the, like, apparatus in the hospital, and you tell them that that will happen to them but they still do it."

(Working class mothers)

The working class mothers were also very vocal about the issue of recycling and this was brought up in relation to the discussion of the 'able' images of climate change, 'motivating' imagery and the wider issues affecting people's motivation to engage with climate change. Both the young professionals and high school students were less inclined than the working class mothers to deviate from talking about the images and about specific aspects of climate change. This could be for a number of reasons. The participants in these latter groups may have been more used to a group discussion set-up such as in class or meeting situations and having relatively more scientific understanding about the topic may also have contributed to their focus, reducing the likelihood of tangents arising. Where wider issues in life were raised in these groups, they were generally discussed in the specific context of climate change and were often given as personal examples or associations of a point they were making. The young professionals talked for example about their jobs, food and health, the high school students about school and their near future (e.g. university). The high school students also talked a lot about public transport in a negative sense and the need for something to be done about it. This was both during the discussion of the images and the wider discussion about motivating images and factors. Most of the students at the school travel into Norwich from outlying suburbs and villages and so this is a pertinent daily issue for them – also closely related to doing something about climate change.

The nature of the issues arising in each discussion group confirmed and complemented those arising in the interview data and this is addressed further in chapter eight. The results presented in chapter five suggest that the high school students and young professionals talked less about significant priorities in life in comparison to the working class mothers which might explain their tendency to deviate from the discussion more often than the other groups.

Mark: *"I never used to turn lights on and off when I left my classroom at school. But I do now."*

Tanja: *"I do now too. I have got light monitors in my class now too. And also teaching the children as well in whatever way we can. I suppose in whatever work situation you're in I guess you can take something to it."*

Mark: *"Yeah."*

Yvette: *"We have many offices and they all have computers in them, there are probably about 50 computers just on my floor. And that's for only half of our laboratory. And I spoke to the guy who was in charge of all of that sort of thing, and asked him why no-one switches off their computers overnight. You know, everyone goes home, and they are not using them, they are just sitting there munching up all the electricity. And he said to me that they were designed to be left switched on. And that is what he tells everyone. It's ridiculous."*

(Young professionals)

7.5 Group dynamics and reflection

In all three groups, a comfortable rapport and relaxed mood was successfully established amongst participants and with me as facilitator. The working class mothers and high school discussion groups both developed good group dynamics and all participants joined in. There did not seem to be any particularly overt characters or dominating personalities controlling the discussions. The working class mothers were the most balanced in terms of participation; their involvement seemed to be more or less equal and all participants seemed at ease and generally eager to participate. During the high school group discussion, two noticeably quieter participants were given opportunities to offer their points of view at which points they seemed happy to do so. Sometimes they simply did not have anything to add. In the young professionals group there was one participant who was noticeably quieter than the others. This seemed to be due to shyness and being a reflective character rather than intimidation. This participant was happy to join in and contribute her opinions when she had something definitive to say. She often took the opportunity to add her point when there was a pause in the discussion (or when invited to add her thoughts), rather than interrupting or being in a hurry to speak during a flow of discussion amongst the other participants. There was also a participant in this group who was a little more talkative than the others but did not dominate the group discussion and never interrupted or challenged others but seemed to simply have more thoughts to contribute. In all groups, there was little conflict between participants. Based on knowledge of the preceding results, this was likely to be due to the conclusive nature of the results and

agreement over the issues being discussed rather than because of divergent opinions remaining unspoken (although this may still be a factor). Minor points of contention did arise, and participants were not shy about voicing these.

The young professionals' discussion was not quite as dynamic as the others; the discussion was not as lively as that in the other groups. For example there were more natural pauses and more prompting was used. This was for two reasons: participants did not know each other before hand and only four out of an expected seven participants attended the focus group (this group had the smallest turnout of the three). It is difficult to ascertain also how much group dynamism has to do with the number of participants or the constituent personalities for example. A group may be made up of naturally quiet or laid back characters, happy to sit back in a group situation and take it slowly or vice versa. The relatively less dynamic nature of the young professionals' discussion group is attributed to both the small number of participants attending and their more considered or reserved approach to discussion. The more active nature of the other groups was because the participants were more numerous and because in both cases they knew each other. The locations for the working class mothers and high school students were also familiar for both groups who were used to meeting in these venues which represented their common link and the context in which they had come to know each other. The young professionals however, had never met and were brought together in an unfamiliar and uncommon environment. Even though the discussions were conversational and informal, the high school students were the most familiar with a group discussion set-up, because they were used to working in such an environment (e.g. in lessons at school) which may have accounted for such a good group dynamic. The combination of having at least six participants attending, participants knowing each other, and participants being familiar and comfortable with the surroundings were therefore the strongest drivers of successful group dynamics in this study. These aspects also affected the experience of facilitation which I consider to be closely linked to group dynamics (see for example, Krueger, 1998b).

Because of having limited experience of facilitating focus groups and because only one pilot focus group was carried out, I had taken the opportunity in previous weeks to act as an assistant moderator for colleagues undertaking focus groups on other research projects. This gave me a chance to apply ideas from the literature to the practice of running focus groups and gain an insight into the potential pitfalls. I took various measures to ensure that the focus groups in this study would be well attending (to ensure enough participants for good group dynamics to develop) and that my facilitation was appropriate. These are listed as points in table 7.5 (Morgan, 1998, gives a good introduction to these kinds of issues). They overlap with those presented in box 4.5 which outlined the measures taken to encourage a good rate of attendance, partly because they are generally important aspects to consider in focus group research. This

preparation was crucial because the focus groups could only be held once and with the same people; there would be no second chance.

Table 7.5 Measures taken to ensure successful focus groups

Measures taken	Consequent advantages for facilitation and group dynamics
<ul style="list-style-type: none"> Question design: simple, relevant, understandable, easy to analyse. 	Participants had no problem understanding what was asked of them; all groups launched into relevant discussions, clear about what they were discussing. Little facilitation involved apart from the odd prompt or to give quiet participants the opportunity to speak, etc.
<ul style="list-style-type: none"> Ground rules: no interrupting or speaking over each other; respect one another's opinions, all feelings are valid; no right or wrong answers. 	Laying 'ground rules' at the beginning of each group meant that participants were conscious of interrupting and speaking over each other. Also they seemed to feel happy about stating their opinions. Very little need for facilitation to deal with rudeness, people talking at once or apparent inhibition.
<ul style="list-style-type: none"> Back up plans / strategies: how to cope with dominant and quiet participants and moderate their involvement. 	Preparation for dealing with the quieter and louder participants meant that I was not shy to ask some participants on occasions to let others speak, and was able to judge when to open up opportunities for others.
<ul style="list-style-type: none"> Prompts: suggesting different ways of approaching/thinking about what was being asked. 	Prompts were useful to use as pointers and as ways to help participants overcome stumbling blocks or areas of contention by approaching the issues slightly differently.
<ul style="list-style-type: none"> Maximising participation: letter, reminder phone calls and paying participants (inviting them to donate the payment to charity if they did not want to accept it personally). 	As explained in chapter four, various measures were taken to ensure that enough participants would attend because there would be no second chance (presuming that the more participants that attended, the more productive the discussion). It was hoped that paying participants for their involvement in both the Q-sorts and focus groups would also encourage them to attend. Perhaps more of an incentive for the working class mothers and the high school students than the young professionals (a particularly poor turnout). All participants seemed willing to attend anyway, and many stated that they would have done regardless of payment.
<ul style="list-style-type: none"> Arranging familiar venues at convenient times: asked participants. 	Likely to be a factor maximising turnout as well as contributing to group dynamics (it was thought that discussions would be more productive given an environment in which participants felt familiar and at ease). Timing the groups for when participants would be available to attend was of course crucial. Venues and times were identified in conversation with participants and are presented in chapter four (table 4.4).

After approximately an hour, the high school students group began to get restless and their attention seemed to flit more easily from one topic of discussion to another. They became excitable, speaking over and interrupting each other. My involvement as facilitator therefore became more active. After an hour and a half the discussion was brought to a close because the participants were losing interest. This problem did not arise in either of the other groups in which participants talked for between one and a half and two hours. After each focus group, participants were invited to stay for refreshments and informal conversation. At this point, some participants became more vocal about experience of being involved in the research process than during the recorded discussions. I believe that this was because of fatigue and not having had a chance to reflect on how their opinions may have changed as a result of their participation (including in the focus group discussions). Given a change of mood, refreshments and informal chatting, participants were more forthcoming with their reflections. Subsequently, I took the opportunity to make notes about various aspects of the focus group discussions and

the conversations afterwards. Participants' feelings about their involvement in the research and how they might have changed throughout it are discussed in chapter eight.

7.6 Conclusions

The focus group questions fulfilled the objectives of the task and worked well in practice. The design went beyond simply further interpretation of the Q-sorts, by using the results as a spring-board to explore the motivating and engaging potential of climate change imagery. This exploration initiated a wider discussion about what would give participants a more significant sense of propulsion to engage with and do something about climate change. The results demonstrate a strong consensus throughout, with minor differences between groups, and these have been described.

Focus group participants in all groups agreed that local images or those with a personal relevance were most likely to bring about feelings of issue salience and were the most meaningful in all groups. Emotive or dramatic global images were also very resonant for participants, particularly those featuring suffering people or animals. Images perceived as ambiguous or everyday and those with positive connotations most typically made participants feel that climate change was unimportant. Conveying salience in an image is challenging because of a whole host of interpretations and prior knowledge that is brought to the images by participants. Conveying a sense of efficacy seems to be more straightforward. Strong efficacy images were conclusively those making clear what people can do personally, making actions seem simple, accessible and easy to sustain. Few of the images in the sample appealed to participants in terms of efficacy, most of them instilled a sense of personal powerlessness or seemed irrelevant in this context.

Participants agreed that some images are contradictory in terms of conveying senses of climate change salience and efficacy; some of the images conveyed a strong sense of salience but at the same time made participants feel powerless, particularly the global and dramatic depictions of climate change impacts. When grouped together however, images were complementary, conveying both feelings of salience and efficacy more strongly. In this way, they also brought about a sense of understanding and motivation. Without each other they were not placed in context and coupled feelings of climate change being important or that one can do something about it were lost. Participants in all three groups therefore felt that no single image could really be motivating or convey both feelings of salience and efficacy, but that when presented together they could. Combinations of local and global impacts and images of what can be done about climate change were the most resonant. Participants felt that the local impact images took priority but that a global context should be included, though carefully so as to avoid making

people feel that climate change is a problem too big to do anything about. A group of images can convey the links between the causes, consequences and solutions to climate change visually, and participants in all groups seemed surprised when they led themselves to seeing this. Participants found that the combination of images made the links between oneself and climate change clear, made it easier to imagine climate change, and made it easier to place oneself in the context of climate change, both in terms of the impacts and in terms of doing something about it. The discussions resulted in the identification of some characteristics that make climate change images motivating and un-motivating.

Beyond the discussion of the role of imagery, participants felt that there were some fundamentally bigger issues that really affected them in terms of their engagement with climate change (both how important they felt that climate change is and how able they felt to do something about it). They felt basically powerless to do anything about climate change and that the issue was too big and overwhelming for them to engage with. Coupled with a lack of infrastructure for leading an environmentally friendly way of life, related to lack of apparent commitment by government, regulators, business, etc., in the UK and abroad, participants felt that images of climate change would be unable to move them to feel more than tokenistically engaged with the issue.

Chapter eight presents to the reader an integrated interpretation of the results of the study, demonstrated with some individual case examples. It also explores participants' feelings about their experience of participating in the research process as discussed in the focus groups and in some short follow-up interviews.

Chapter eight – Integrated analysis

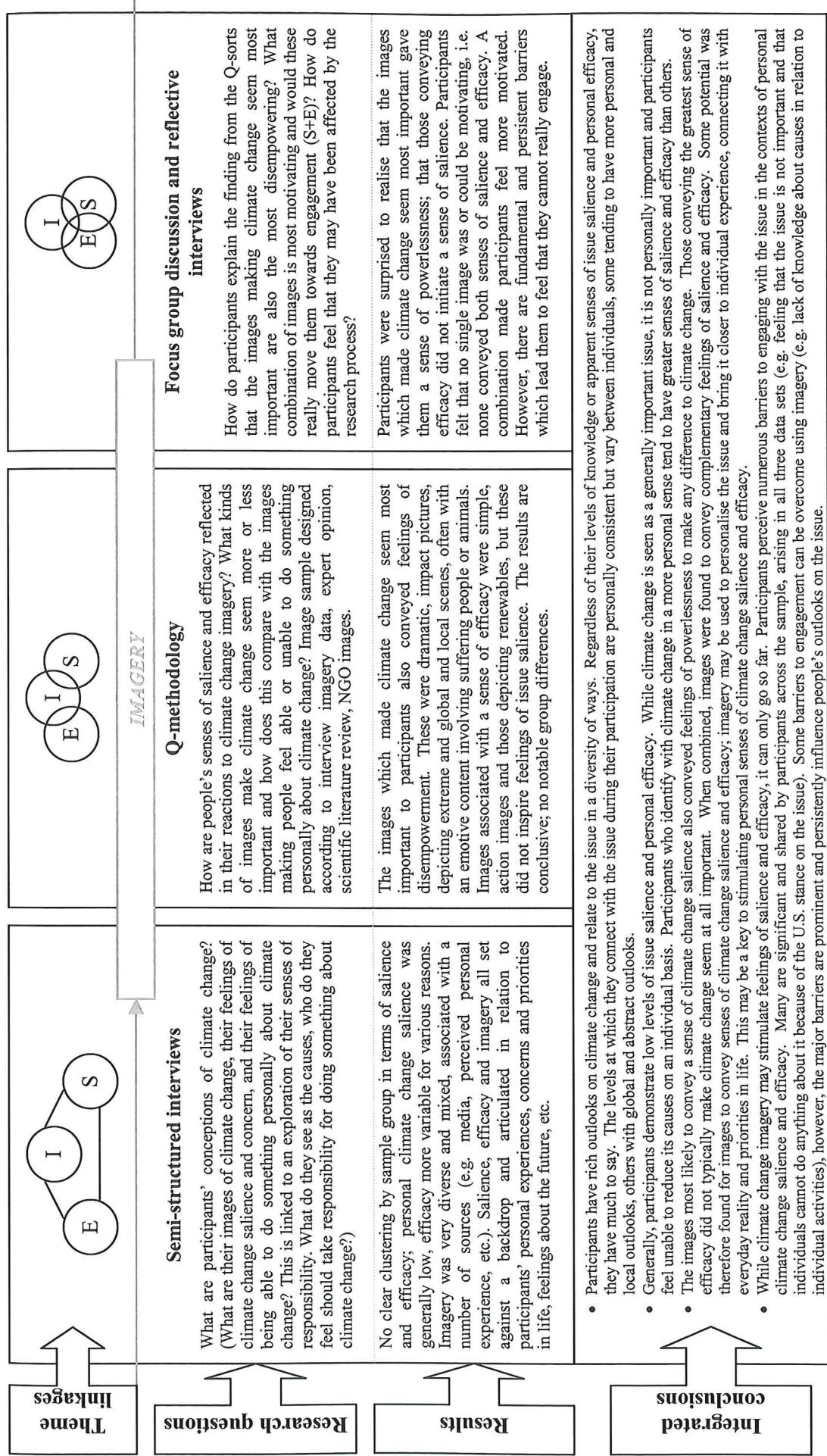
8.1 Introduction

The preceding chapters have presented the objectives and background to this thesis, its methodological approach, and the results of the three stages of empirical research. These are consistent and complementary across methods. They are brought together in this chapter, which presents an integrated view of the results, anchoring them in three individual case examples. These demonstrate at a micro-level the main findings and the interacting research themes, set against the backdrop of the sample-wide level of analysis presented in chapters five, six and seven. Participants' reflections on their involvement in the research process are then addressed, as expressed in discussions in the focus groups and in short follow-up interviews.

8.2 Integrating the results

The research presented in this thesis was based on a multi-method design, which allowed different ways of exploring participants' outlooks on climate change using visual imagery as a driver. The three sets of results offer different perspectives on participants' outlooks on climate change. The semi-structured interviews explored participants' outlooks on climate change in relation to the themes of the research and provided a basis for the following stages of research. Q-methodology delivered a more concise exploration of the relationships between imagery and issue salience, and imagery and personal efficacy. The focus group discussions took the results back to participants for explanation and exploration. The group discussions were also designed to investigate further how climate change images might stimulate a sense of engagement with climate change (both senses of salience and efficacy). Figure 8.1 summarises the research questions and main results of each stage. It also outlines the main conclusions that have been drawn from these three sets of results, which are discussed later in the chapter.

Figure 8.1 Research overview: methods, results, emerging patterns



The different methods were complementary; the multi-method strategy combined with repeated contact with the same participants generated consistent data both at a sample-wide and individual level. Chapters five, six and seven drew general conclusions and have identified patterns emerging from the sample as a whole. This chapter demonstrates how the results from the three stages of research correspond at an individual level, in light of these general conclusions. An individual approach is taken as well as an overall one, because there are no apparent trends according to social or sample groups. The results reveal a common sense that climate change was not very important personally and that individuals felt unable to make a substantial difference to reducing the causes of climate change for various reasons. The individual level analysis complements the preceding presentations of results by demonstrating how individual contributions consistently reflect the conclusions drawn from each stage in different ways. Individual differences highlight the person-centred as well as broad nature of the patterns arising from the results (outlined at the bottom of figure 8.1).

8.2.1 Individual profiles

During the course of data collection, organisation and analysis, a profile was put together for each participant to summarise their contribution to the research. The profiles give an overview of each individual's input into the research by summarising their contribution at each stage of their participation. An example of one complete profile is attached in appendix 9. Seidman (1998) suggests that crafting a profile or 'vignette' of a participant's experience is an effective way of sharing data and opening up ones material to analysis and interpretation. Each can be thought of as a micro-level demonstration of the multi-method research process. The profiling was an on-going process, which enabled me to become familiar with the results of each stage of the research and by the end, as a whole. It helped me to see how the broad patterns arising from the data were applicable at individual levels in different ways. It also illustrated the striking consistency of individual outlooks on climate change and the compatibility of the data across methods. The profiles tell a coherent story of each participant's perceived relationship with and outlook on climate change, viewed through a more focussed lens at each stage of the research. The social contexts in which participants relate to the issue throughout become clearer at an individual level of data analysis than at a sample-wide one.

Complete profiles were put together for eighteen out of the thirty participants (those who participated throughout). A one-page summary was put together for each individual profile (figure 8.1 acts as a generic framework). Three of these are presented in due course. One individual profile from each sample group is presented to represent a range of salience and efficacy outlooks and associated imagery. The three cases give an impression of the diversity of outlooks on climate change expressed by participants in this study. One represents the low salience, low efficacy cluster (KR) apparent in figure 5.5; one represents the middle of the range

(TG); and one demonstrates relatively higher salience – higher efficacy characteristics (KaT). The profiles highlight the range and specificity of people's outlooks on climate change within the broad patterns identified; they do not represent types or clusters of participants with particular outlooks on the issue. Each summary profile is included as follows (figures 8.2, 8.3 and 8.4), preceded by a brief commentary.

Kathryn (KR, high school student, figure 8.2)

Throughout the study, Kathryn demonstrates a tendency to imagine and respond predominantly to global images of climate change; she does not imagine it in a local or personal sense. Global and disastrous types of imagery, generally depicting the suffering of people and animals make climate change seem most important. However they are also the most disempowering. Those making her feel able to do something about climate change show easy and simple things that she can do. The images have more impact on her senses of salience and efficacy when presented together and when they make a local link.

Kathryn has low levels of both salience and efficacy. During the research stages, she attributes her low levels of salience and efficacy to barriers which lead her to feel that one person's actions cannot really make a difference. She does not find climate change important because of a feeling of powerlessness driven by climate change seeming such a big and distant issue. Climate change is also unimportant personally because she does not understand it and is not aware of what she can do; Kathryn perceives that she knows very little about the issue, what its causes, impacts and solutions might be and hence does not feel a sense of climate change being personally important or being able to do anything about it as an individual. A further barrier to salience and efficacy is that climate change is not a high profile issue and the issue is not immediate (it would be more important to her if it was taught in schools, prominent in the news and if it affected her personally). She feels that action should come from above, but in reaction to the picture of George Bush, felt that climate change is not important because Governments are not concerned, and the U.S. in particular will not change. Kathryn feels slightly more motivated when discussion around the images in the focus group help her to see the links between herself and climate change, as well as the links between the causes, consequences and possible solutions to climate change; she realises that climate change might be having local effects, that her actions play a part and when she becomes aware of the small things that she can do personally to help. Kathryn states at each stage of participation that climate change is a big issue and out of her control and that her efforts would not make a difference. The barriers that Kathryn perceives to salience and efficacy reflect the way she relates to climate change as a huge, future, far-away issue over which she has not control. Kathryn states that her main concerns also focus on her immediate future; A levels and university. Other than this, she does not link any broader issues with climate change.

Figure 8.2 Individual profile summary for Kathryn (KR, high school student)

<p>Semi-structured interview</p> <ul style="list-style-type: none"> Kathryn imagines the future involving population and resource problems, and people living a different way of life. Her personal concerns relate to her immediate future. Climate change does not compare: it is not an important issue to her because it is not a high profile issue, she does not understand it, it is not immediate, she cannot feel the effects and she feels powerless to do anything about it. She expresses some concern for future generations. She feels that climate change, would become more important if it were prominent in the news, taught in schools, if people were in danger or if it affected her personally. She also notes that being more aware, knowing and feeling able to do things to prevent it would make the issue more important to her. Imagery is large scale; she mainly imagines climate change in a global sense e.g. ice caps melting, people drowning, extreme weather. Kathryn's imagery is mostly influenced by what she has picked up at school and in the media. She does not perceive any local climate changes. She regards the issue as being negative. When she thinks about climate change in the future, she expresses catastrophic imagery. Kathryn attributes climate change to human activity and feels that everyone is responsible for doing something about it. However, she feels that as individuals people are powerless to do anything about climate change. She feels that the responsibility for action must come from above. She needs to be encouraged and told what she can do in order to feel that she can do anything about climate change. 	<p>Q-sort</p> <ul style="list-style-type: none"> Climate change important: The graph because of the worrying 'proof' shown by the image, and dramatic impact images of climate change (forest fire, melting ice, flood in Bangladesh, dried up lake with dead fish and the famine) because of the importance of rising sea levels (learnt at school) and the negative impacts on animals and humans in the other pictures. These are pictures of current consequences, adding seriousness. Without the animals, the pictures would not make climate change seem so important to her, they make her feel sympathy and empathy. Climate change unimportant: Images at the negative end of both factors in chapter six (café, irrigation, sunflowers) or in the more ambiguous middle ground (GWB, women at standpipe, wind turbines). The picture of George Bush makes climate change seem unimportant to Kathryn because it represents that Governments do not seem concerned. She feels that the other pictures are insignificant or is not sure why they are relevant. Feel able to do something about climate change: Similar to those presented by factors one and two in chapter six (light bulb, cyclist, thermostat, solar panels and tram) because they are easy things that she can do, that make a difference (solar panels could become more widespread). Kathryn also ranks the petrol station highly because she can use public transport / unleaded petrol. Feel unable to do anything about climate change: The graph, famine, smoke stacks, forest fire, refugees and mosquito pictures because they are worldwide and large scale images making her feel that her efforts would not make a difference; out of her control, not up to her to solve. 	<p>Focus group discussion & follow-up interview</p> <ul style="list-style-type: none"> Kathryn played a moderate role in the discussion group (there were other more and less active participants). In general she did not know why some of the pictures were included. Kathryn notes that the pictures making climate change seem most important show the destructive effects of climate change and that those making it seem unimportant were the more everyday pictures. She states that she feels desensitised by the famine picture but moved by those with animals and suffering people in them because they are upsetting and you can actually see the effects. She comments on the graph making climate change seem important because it shows real facts and shows that it's worth doing something. She states in the group that pictures need to be drastic and negative, and probably local to make people care. She feels that the pictures making people feel able to do something about climate change were chosen because of their simplicity. She notes that even if she felt able to do something she might not do it, but if things are easy to do she'd be more likely to. She feels that the actions shown in the pictures would not really make much difference because the USA will not change, but that they are still worth doing. Kathryn states that the pictures have more impact when they are presented together. She feels that there needs to be some pictures with suffering people or animals so that one can actually see it happening, otherwise people are less likely to respond. She also feels that there needs to be a 'close to home' picture. Did not comment in the focus group on whether she'd been affected by participating. In a follow-up interview Kathryn felt that both her senses of salience and efficacy had increased since participating, partly because the process had enabled her to understand the links within the issue and its relevance to herself. The discussion process resulted in her feeling more aware of the issue and she stated that she is taking actions on an everyday basis.
---	---	---

Kathryn thinks about climate change in a global sense; for her it is a distant and far away issue. In the Q-sort, she chooses the most global and dramatic images as making climate change seem most important to her however these also make her feel unable to do anything about climate change; she certainly does not connect them with taking actions. She feels that the images need to be presented in combination and that some local imagery as part of this would make people care more about climate change. Overall, the issue is not important to her because of its scale and distance, and because she feels powerless to do anything about it. Her low sense of efficacy is apparently connected with her feelings about the salience of climate change. She feels that in general climate change may be an important issue, for example when considering future generations but at a personal level it is not. She does not feel able to do anything about climate change beyond taking small easy actions as represented by the positive images she chose in the efficacy Q sort, her related comments and contributions to the focus group. The interview, Q-sort and focus group discussion reveal that Kathryn feels there needs to be more commitment from Governments and particularly the USA. 10 months later, Kathryn feels that climate change is more important to her and that she feels more able to do things about it (and is doing them) than she did initially.

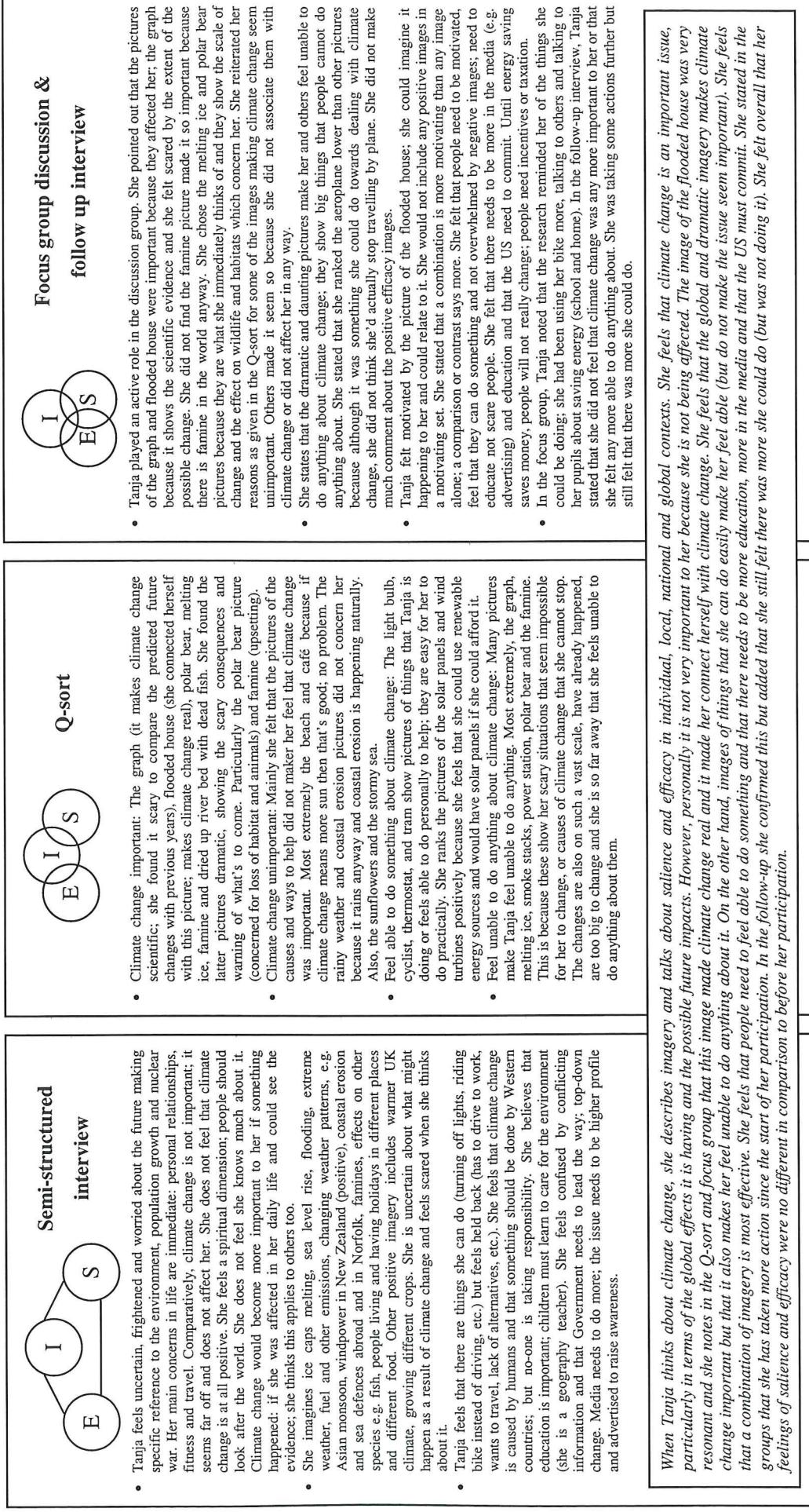
Tanja (TG, young professional, figure 8.3)

Tanja imagines climate change in both global and local terms, erring towards a local context. She tends to imagine climate change in terms of its effects on Norfolk as well as global imagery such as melting ice caps. Global and emotive images of human and animal suffering and the extent of climate change make climate change seem most important. The picture of the flooded house is particularly resonant because she connects this image with herself; it makes climate change seem real to her. The global impact images make Tanja feel unable to do anything about climate change however, because of the vastness of their scale. She feels able to do something about climate change in reaction to images which show her things that she can easily and practically do. She felt that a combination of images was motivating; says more than the images alone and makes the issue seem less overwhelming.

Tanja is well informed about climate change; what it is and what she can do about it. However, in the interview and in reaction to the images presented in the Q-sort and focus group, Tanja states that she feels that climate change is not personally important. This is because it seems far off, she cannot see the evidence and it does not affect her; that until it does, she doubts it will become an important issue. She also feels that the issue is not very important because of other priorities in life and lack of media attention. Tanja does not feel able to do very much to reduce the causes of climate change. She states that she can do small things to reduce the causes of climate change however, she does not do everything that she is aware she could do because of personal barriers (including needing to drive to work, and wanting to travel) and larger scale hindrances (including the scale of the issue, a lack of facilities and alternatives, and a lack of Government and US commitment). She feels that people in general will not change until there are financial incentives to do so.

Tanja's personal concerns are also immediate and they are her personal relationships, her fitness and travelling. Her fitness and travel come up when she talks about her sense of efficacy, because she feels that it's good to ride her bike both for environmental and health reasons. Travelling is a priority and she seems troubled when she thinks about what she could do to reduce the causes of climate change, realising that she would not want to give up travelling by aeroplane. Her job as a geography teacher is pertinent throughout her participation. She is particularly concerned that children should be educated and made more aware of climate change and as a result of her participation has incorporated more climate change related projects into her teaching.

Figure 8.3 Individual profile summary for Tanja (TG, young professional)



When Tanja thinks about climate change, she describes imagery and talks about salience and efficacy in individual, local, national and global contexts. She feels that climate change is an important issue, particularly in terms of the global effects it is having and the possible future impacts. However, personally it is not very important to her because she is not being affected. The image of the flooded house was very resonant and she notes in the Q-sort and focus group that this image made climate change real and it made her connect herself with climate change. She feels that the global and dramatic imagery makes climate change important but that it also makes her feel unable to do anything about it. On the other hand, images of things that she can do easily make her feel able (but do not make the issue seem important). She feels that a combination of imagery is most effective. She feels that people need to feel able to do something and that there needs to be more education, more in the media and that the US must commit. She stated in the groups that she has taken more action since the start of her participation. In the follow-up she confirmed this but added that she still felt there was more she could do (but was not doing it). She felt overall that her feelings of salience and efficacy were no different in comparison to before her participation.

Karen (KaT, working class mother, figure 8.4)

Karen's imagery is largely local and personal. When she thinks about climate change, she predominantly imagines things like changes in the weather and seasons that she perceives as happening 'here and now'. Karen responds to both local and global imagery in the context of climate change salience, but dramatic or destructive images make her feel disempowered. Her sense of efficacy is bolstered in reaction to images showing things that people can easily do at a personal level as well as those that represent larger scale changes being made, e.g. renewable energy. The picture of George Bush in particular makes Karen feel unable to do anything about climate change because he represents a major barrier to change; a point noted at all stages of participation. Seeing images of climate change impacts (local and global) in combination with the things that people can do brought climate change home to her more than the images alone.

Karen feels that climate change is generally but not personally important in comparison to everyday concerns and priorities, and that conflicting information and views on the issue lead to it seeming less important than it might do. The issue of climate change would become more important to her if Governments (UK and USA specifically) were to take more action. She feels that desensitisation to some climate change images detracts from the personal importance of the issue. Karen feels a high sense of efficacy and talks about being very active, doing everything she is aware that she can do; her lifestyle incorporates many environmental activities including energy saving, cycling, recycling, etc. She feels that she would feel able to do more beyond the 'small things' if the Government provided facilities and alternatives and generally took more action. She feels that the USA and other Governments need to become greener and more committed and notes this at all stages of the research. She adds that the pure scale of the issue acts as a barrier to efficacy. Throughout, Karen feels that a lack of education and lack of information in the media are barriers for people's senses of climate change being important and feeling personally able to do anything about it.

Karen states in the interview that her children and financial pressures are her main priorities in life. She talks about her concern for future generations when she thinks about climate change and notes that the pictures of the dramatic impacts of climate change make it seem important to her because they represent a worry for future generations. She is keen to point out that education is very important and that children need to learn about climate change and be brought up to have respect for the environment. Health is a key issue for Karen, e.g. in relation to the effects that climate change might have on her daughter's asthma. She also talks about her concern about insurance premiums going up because of bad weather and flooding.

Figure 8.4 Individual profile summary for Karen (KaT, working class mother)

Focus group discussion & follow-up interview
<ul style="list-style-type: none"> • Karen was fairly active in the discussion group, more in the second half than the first. She was not as active as some of the other participants; she very carefully considered her contributions. • Karen noted that she felt some pictures really brought climate change home. E.g. the cartoon because having warmer winters is what we've come to expect. She feels that the beach makes her also realise that our weather and seasons are not as reliable as they used to be. • She feels able to do something about climate change in reaction to the thermostat and light bulb images because they are so easy, and show what people can do to help. She felt that the picture of George Bush made her feel really unable and stated that Governments including in the UK need to do more, e.g. realise that people actually like wind turbines and think that we should have more of them. She feels that they need to make more investment and promote renewable energy. • She feels that the most motivating pictures should include the graph as well as some of the 'doing' images and the picture of the famine because it is really worrying showing the extent of change in a short time. Seeing what is projected and then what people could do (i.e. thermostat) to make the increase as low as possible brought it home to her. She felt that the picture of the flooded house was important because everyone would take action if their home was at stake. She feels that there are other issues that would motivate her, e.g. more facilities for recycling and being given more information about what people can do personally. She feels that young people need to be targeted so that they grow up to respect the environment but is worried they will not. As a parent she thinks it's important to instil this in the children and that for adults and young people, there should be more on television about climate change. Health is important, especially her daughters asthma and she is worried about insurance premiums going up for people living in flood areas. • She has noticed the congestion charge and more traffic on the roads during her participation in the study. In the follow-up interview she stated that she did not feel that climate change was any more important to her or that she felt able to do any more about it. However she was taking some of her actions further and felt more aware of climate changes and associated events.
<ul style="list-style-type: none"> • Climate change important: The flood in Bangladesh, dried up riverbed with dead fish, famine, flooded house, polar bear and melting ice. Karen chose these pictures because they show how climate change is affecting us on a drastic scale and some of the images are becoming a common sight (flooded house, dried up river). Karen comments that seeing how climate change is having such effects is a worry for future generations. • Climate change not important: The pictures of the café and sunflowers do not make climate change seem important because they are nice pictures. Karen also chose the cyclist, solar panels, thermostat and wind turbines, commenting that these things help to make a difference and keep the climate safer; things that people should do. She did not explain exactly why they make climate change seem unimportant and ranked these four images as making her feel able. • Feel able to do something about climate change: Karen felt that the pictures of the light bulb, thermostat, cyclist and tram made her feel able to do something about climate change because they show things that people can easily do. She feels that these things make a difference and are worth doing, no matter how small the contribution. The pictures of the solar panels and wind turbines make her feel more able to do something than other pictures in the sample because they show greener energy which is clean, safe and should be used wherever possible. • Feel unable to do anything about climate change: The petrol station because she worries that we do not have any fuel alternatives and the melting ice, flooded house, dried up riverbed with dead fish, women at standpipe and the polar bear because of the scale of the impacts; she is not sure that anything can be done.
<ul style="list-style-type: none"> • Karen feels pessimistic about the future in terms of the environment judging by the way people live now. She imagines differences in people's health, and medical advances and hopes that there will not be war. Her main concerns are her children and financial pressures (cost of living). Climate change comes up in conversation, she thinks about in terms of her everyday activities and she has noticed changes in the weather and seasons. However, it is not of great importance when compared with her daily concerns. She talks about the uncertainty and conflicting information about climate change which she finds worrying. She is concerned when she talks to others because they have also noticed changes (especially older people). If the USA were committed, there was more in the media and more opportunities to make her views heard then climate change would become more important to her. • Karen imagines unpredictable weather, changing seasons (becoming more unpredictable), wetter and cooler summers, effects of climate change on crops and food supply, ice sheets melting, flooding in developing countries, flooding in the UK (e.g. in York, 2000), people being made homeless by flooding in this country, coastal flooding – Great Yarmouth will not exist anymore, coastal erosion, possible effects in Norwich, bush fires, drought, less snow in Scotland. Positive changes include warmer winters but she mainly imagines negative ones. She feels uncertain about what will happen in the future. She associates Chernobyl, skin cancer and Gulf war oil fires. • Karen feels that fossil fuels emissions from human activity are causing climate change and that it's everyone's responsibility to do something about it. She is very active personally but feels that she could do more and would like to do more (e.g. if there were more facilities). Would like to see more renewable energy (wind turbines). She feels concerned that people in developing countries who have not caused climate change are suffering from the consequences; Governments need to become greener especially the USA, and people need to be more educated. Karen feels that people have a choice as to whether climate change happens or not; we have time to change; that countries should spend more on climate change.

Karen perceives climate change as happening and relates to it as a local issue as well as a global one. Her imagery reflects this as well as her comments about salience and efficacy (talking to others about it, noticing local changes, doing things personally as well as feeling that more needs to be done at a higher level). The issue is important to her and she feels able to do something about it however feels held back by lack of USA and UK government commitment. The pictures making climate change seem important and unimportant drew parallels with those making her feel unable and able to do anything about climate change respectively. She was very keen to comment that we should use more renewable energy as well as making our own small contributions. Karen noted in the group that there were some images that brought climate change home to her and these were connected with her own perceived experiences of it. She perceives many barriers to real change, mainly beyond the personal realm, particularly the lack of commitment by the UK and US Governments. In the follow-up interview she indicates that her feelings of salience and efficacy have not changed, but that she feels more aware of the issue and is taking her actions a little further.

8.3 Reflections on participation

This research was not designed as a participation exercise, as noted in chapters four and seven. The research was purely exploratory and did not intend to lead participants towards any further engagement; it was not assumed that participation would increase participants' senses of salience and efficacy. The wrapping up of the focus groups and the follow-up interviews were intended to be reflective exercises to explore how and whether participation in the research process involving the three different methods may have affected participants' outlooks on climate change.

Participants were asked at the beginning of the focus group discussions to think about the ways in which their outlooks on climate change might have altered as a result of participating in my research. The 'wrapping-up' session held at the end of each group then gave participants a chance to respond. The feedback discussions were not very revealing for reasons, as suggested in chapter seven. Many participants expanded on their feelings during informal discussions afterwards (notes were made to record these). Asking participants to reflect during the focus groups may have been a little premature. This is because the discussions themselves probably had a relatively substantial impact on participants; the groups gave them the opportunity to interact with others and discuss the issue in more depth, airing a range of views. At this stage, participants had not had time to reflect on the impact of the discussion as well as on their previous involvement; they had not had time to experience how and whether the totality of their participation had had an impact on their feelings about climate change. Informal chatting afterwards gave the impression that participants were beginning to reflect on their involvement. This was why a series of brief follow-up interviews was conducted.

The follow-up interviews were carried out approximately 10 months after the focus groups were held. They therefore addressed at a much later stage whether participation had had any lasting impact on participants' senses of climate change salience, efficacy, motivation to 'engage' and perhaps even on their behaviour (although a consideration of the latter not being an objective of this study as explained in chapter two). The questions asked are attached in appendix 15. The interview asked participants openly whether they felt that their feelings about climate change had changed at all as a result of being involved in my research. This was followed by some elaborative and probing questions to define how participants felt that their outlooks may have changed, in the contexts of salience and efficacy. Most of the interviews were conducted over the telephone and with participants' consent, they were recorded. A couple of participants were not contactable by telephone, but by email and so recorded their thoughts in writing. Thirteen participants were successfully contacted. The feedback generated during and shortly after the focus group discussion is presented first, followed by participants' later reflections.

8.3.1 Results of the discussion group feedback

Based on the feedback from all groups and the informal discussions afterwards, participants felt that their feelings about climate change had altered to various degrees as a result of participating in the study. These incorporated changes in understanding, awareness, intention to act and taking action on climate change. At this stage, participants were not asked directly whether they felt that climate change was any more important to them or if they felt any more able to do anything about it as a result; the questions were left open⁹⁰.

The principal change as a result of participating was a greater sense of awareness of the issue. Feeling more aware of the causes, impacts and positive things that can be done about climate change were the predominant outcomes; more specifically, noticing more in terms of the impacts of climate changes in the media and in the local environment, noticing the causes of climate change, particularly in terms of traffic, feeling that the issue is more predominant in ones mind generally, and feeling slightly more likely to talk about climate change.

Anne: *"I think it has made me more aware."*

Mary: *"It has made me notice more, especially with this group thing, you think about it more."*

(Working class mothers)

Helen: *"Instead of something that's just in your mind, it's more at the front of my mind now. I am more conscious about it than before when it was a subconscious thing. I was kind of worried about it but not much, but now it's more at the forefront."*

(High school student)

Changes in understanding included comments about how participants felt that as a result of participating they had 'made the links'; knowing what causes climate change, what the impacts are and what can be done to lessen the causes of climate change.

Claire: *"I literally had no idea about climate change before this. I've now actually discussed it with my boyfriend...I was asking him how everything links up to actually produce such drastic things. I just literally had no idea, so it really did help me."*

(Young professional)

Some participants felt that as a result of participating, they intended to take some action. This was partly as a result of feeling more aware of what they could do about reducing the causes of climate change. Some felt encouraged by knowing what people can easily do.

Angela: *"I think that it's been encouraging. You can see more what you can do and it makes you think more like, yeah, well there is a point in doing something about it."*

Erica: *"Yeah, when I'm a student I'm going to go on lots of protests."*

(High school students)

⁹⁰ This was to avoid leading participants into feeling that they should say that they felt climate change was more important to them etc. (or 'pleasing the researcher' as noted in many methodological texts on question design).

Some participants stated that they had begun to make efforts, which they were not doing before. Using the low energy light bulbs they have been given as a result of their participation was a common response and participants also talked about using bicycles and walking more often instead of using cars, saving energy by turning lights off, being more conscious of other ways of saving energy at home, etc. (mostly everyday actions which they could easily take at home).

Mark: *"I never used to turn lights off when I left my classroom at school but I do now."*

Tanja: *"I do now too. I have got light monitors in my class now too."*
(Young professionals)

Theresa: *"I know that now I do tend to try and either bike in or walk, or take a bus or something."*

(Working class mother)

8.3.2 Results of follow-up interviews

The follow-up interviews yielded further reflections on the way participants felt that participating in the research process may have affected them. They gave a positive impression about their experience, and they were keen to give feedback on the process. The interviews revealed that participants generally felt more aware of climate change since participating and were taking a number of energy-saving actions as a result.

Examples of increased awareness include: understanding the issue better and hence being more aware of it; knowing more about its impacts (e.g. refugees, the extent of the impacts; finding it a more noticeable issue (e.g. in the media, local environment); finding the issue more at the forefront of their minds and thinking about it more in the context of their daily activities (when otherwise they would not have done); feeling more aware about how their actions contribute to climate change and what they could easily do about it. Most participants mentioned taking some or relatively more action as a result of their involvement in the research and appeared to feel good about this. They generally seemed encouraged by their involvement in the study to make small efforts, often indicating that they found there were lots of things they could easily do at home to contribute. At the most basic level, most participants commented that they were using the low energy light bulbs that they had been given. Some were keen to point out that they were taking some of the activities they were doing previously further as a result of participating, e.g. turning the heating down a bit more, cycling and walking more, making more effort to turn lights off. Some participants pointed out that they were making other environmental efforts in their day-to-day-lives doing, e.g., more recycling because of a recent council curbside collection scheme (the working class mothers were particularly keen to note that they were doing much more recycling than they used to). One or two participants noted that they were aware of lots of things that they could do, however they were not taking all the actions that they could take.

The findings demonstrate a range between feeling no different in terms of issue salience and personal efficacy and feeling slightly more engaged in terms of salience and efficacy as a result of participating in the research process. Figure 8.5 presents edited quotations from all the interviews which summarise the essence of each, approximately placed along the range suggested. Some participants interpreted changes in their awareness and extent of behavioural action in terms of the issue having become, to a small extent, more important and feeling more personally able to do something about climate change. Others stated that they felt more aware, for example, but did not feel that their feelings of salience and efficacy had actually changed. This highlights that each person's perspective is very subjective and that participants had different notions of what issue importance and personal efficacy involved.

More perceived change was apparent amongst the relatively less engaged participants in the sample. This appeared to be due to overcoming some of the more practical barriers to issue salience and personal efficacy during the participation process. For example, reaching an understanding of the causes, consequences and possible solutions to climate change and how these relate to the individual; knowing what an individual can easily do as part of their everyday life and being able to visualise how climate change affects, or could affect us at local levels and so on. The example profile summaries (figures 8.2, 8.3 and 8.4) include reference to the feedback given by the three participants, demonstrating the points made above:

Kathryn (high school student, figure 8.2) stated that she felt greater senses of both salience and efficacy as a result of her participation. She felt that the tasks in the Q-sort and focus groups involving the pictures made her aware of the extent of climate change and feel more concerned about it, as well as of some things that she could do personally to help. Discussing the issue with others led to it becoming a bit more important to her because she consequently thought about it more. Since participating, she stated that she feels much more able to do something about climate change and had begun taking actions at home and by using public transport more to save energy. One of her principal barriers was a lack of understanding about climate change and about what she could do about it. She stated that as a result of her participation she understood the issue and how it links together.

Tanja (young professional, figure 8.3) does not really feel that climate change is any more important and does not feel much more able to do anything about climate change. However, she noted that she is using her bike more, and her car less, and that she is doing a lot of projects with her class at school about energy and climate change as a result of her participation. She states that she is more conscious of buying energy saving light bulbs rather than normal ones but beyond this has not made any 'major' changes. She states that she does not think she does enough, however she does the 'little things' and feels that it's important to teach her class about it and make them aware.

Karen (working class mother, figure 8.4) stated that she did not feel very different as a result of participating, beyond feeling slightly more aware of the issue; she'd noticed more related changes happening locally and more in the media (e.g. she has noticed more traffic on the roads, news about the

London congestion charge which she supports and more unpredictable weather recently). She added that she'd been taking her actions a little further, for example by turning the heating down a bit more and by using a the low energy lightbulbs she'd been given but that essentially she did not feel that climate change was any more important or that she felt any more able to do anything about it.

Kathryn was the only participant of the three who felt greater senses of salience and efficacy as a result of participating in the research. Throughout the process she seemed to have a tendency to think of climate change as a distant issue, but by the end of it and on reflection she made more of a personal connection and felt that climate change was more important and that she felt more able to do something about it (and was doing things about it). This was mainly due to arriving at an understanding of the links within the issue via the process of participation around the images. Tanja and Karen on the other hand, felt that their senses of salience and efficacy had not really changed as a result of their participation. All three participants were taking more actions on a small scale since participating; however this was not necessarily associated with feeling that they were more able to do anything to reduce the causes of climate change.

On the whole, the differences between participants' feelings of change in terms of issue salience and personal efficacy are minor – none of the participants stated that the issue had become significantly more important to them personally or that they were much more able to do anything to reduce the causes of climate change as a result of their participation. This is not surprising given that the research experience was not intended to be an exercise in persuasion and constituted only one of many potential triggers that might initiate a shift in the extent of people's engagement with climate change (see section 8.4 for elaboration). Some participants noted that major barriers were still preventing them from feeling really able to do anything to reduce the causes of climate change or to do anything more substantial beyond the 'little' things. For example, feeling that one's actions would make a difference if everyone else felt the same; as an individual member of a global population, one's effort cannot and will not make a difference. Two of the high school students actually felt less engaged with the issue since participating, but not because of their participation. One explained that since the end of the study, she had learnt to drive and had begun to understand why people want and need to drive; that she therefore felt that she was doing comparatively less to reduce the causes of climate change. The other had learned more at university, finding the issue less interesting and more overwhelming in the contexts of personal salience and efficacy than she did originally.

Figure 8.5 Quotations summarising the reflective interviews

No / little change	Some perceived change in salience and efficacy	"I installed a few energy saving lightbulbs. I also made more of an effort to recycle things (added by the council). I now car share with two other people to work...Before I spoke with you I initially had no idea what climate change really meant and how I could help at all." (CM, young professional)
<p>"Not really. I mean we've used those light bulbs. We have got a lot of them. But not really. I'm more aware of it, of things that are happening in the world... they've got all those wind turbines off the coast haven't they." (KET, working class mother)</p> <p>"My feelings are pretty much the same as when you first asked the questions. I mean, we've put the heating down a little bit, you know, the thermostat down, and we're recycling far more than we were before. I'm just sort of very aware of what's going on you know, with regards the global warming issue. I've noticed more. I mean just this year, I think that was a good example of what global warming is doing isn't it. You know the fact that we had all that heavy snow and then, you know, about two weeks after that there was all, you know, it was quite warm and you just don't know where you are, that brings it home." (KAT, working class mother)</p>	<p>"I suppose now that I've got a car I suppose I am more aware of things. I'm working for the buses as well, if we've got any standing time, I turn the engine off and stuff like that. I'm more aware. I still feel, you know that we can't help what's happening, but there are ways of helping." (TL, working class mother)</p> <p>"Not really. But I drive a lot more now. I thought that was a bad thing, everyone driving round everywhere, but now I realise why people want to. I guess through need and necessity I've changed. When I did it I was into all that sort of thing anyway. So I don't think I've changed other than realising a bit more and like, noticing adverts and things. [Would you say that climate change feels any more important to you than it did before, or that you feel any more able to do anything about it?] Yes I would say that it's more important to me. I wouldn't say that there is any more that I can do about it." (EP, high school student)</p> <p>"I would say that definitely it's all made me bring my attention to it more than I would have done probably. I've paid more attention to it and I use your light bulbs... I try harder to walk rather than use the car, for my own health benefit as well. [Do you feel any more able to do something about it than you did before?] Only in a small way, I mean, just little things. But if everybody had the same opinion then that would make a difference overall wouldn't it. [Do you think that the issue seems any more important to you now, or do you feel about the same?] I think it's a bit more important to me now." (VG, working class mother)</p>	<p>"I certainly became more aware of climate change and its multitude of potential impacts as a direct result of your study. I also became a little more eco-friendly and have sought to use things like energy saving lightbulbs and alternate energy sources, and have remained conscious of the effects of everyday living on the environment. For me, your study and brainstorming sessions put the whole topic of climate change into a different sphere, a far wider-reaching picture than I had previously imagined." (YW, young professional)</p> <p>"I would say that definitely it's all made me bring my attention to it more than I would have done probably. I've paid more attention to it and I use your light bulbs... I try harder to walk rather than use the car, for my own health benefit as well. [Do you feel any more able to do something about it than you did before?] Only in a small way, I mean, just little things. But if everybody had the same opinion then that would make a difference overall wouldn't it. [Do you think that the issue seems any more important to you now, or do you feel about the same?] I think it's a bit more important to me now." (VG, working class mother)</p> <p>"It made us discuss it more than you would have done, you most probably wouldn't have bothered about it. I think like, recycling we've always done but we're doing it on a bigger scale. So that all helps because it's the environment isn't it. And the light bulbs, I've changed the light bulbs in the house to the energy efficient ones. [Do you feel that the issue is at all anymore important to you than it was before?] Oh definitely, yeah, it's more important because it makes you think about what you're doing to the environment. I've learnt to drive now but I would think more about where I'm driving and if I can cut it down to doing two things at once then I will. I would try and use the car less than I most probably would have done before." (MP, working class mother)</p> <p>"I don't think I've changed at all since then. I try and buy energy saving light bulbs more but that's really just because I've moved out and I have to buy and pay for that kind of stuff myself. So things like that, switching off lights. Around the house kind of things, but nothing major." (EL, high school student)</p> <p>"I'm surprised about the amount of environmental refugees. I hadn't not realised that. I think that has made me think a bit differently about it. [Does the issue seem any more important to you than it did?] Probably not. I don't feel different... if anything it makes me feel like I can do less. On realise just how many people there are in the world, what is just one person going to do that is going to make a scrap of difference." (AS, high school student)</p> <p>"I'm more conscious of buying energy saving light bulbs because you gave me one. I'm definitely much more into that now, rather than grabbing any old one. I've been talking about it quite a lot with the kids, and we've just done a flooding project, so it's a bit more awareness for them. I can't think of much else because I knew quite a bit anyway. I haven't made any major changes... It worries me when I think about it. But I don't think about it too much. I recycle and do energy saving things but I feel about the same. All the photographs and stuff that you had were really good. There were lots of other ideas in there. Like cycling which before I didn't actually think was that useful, so I try and cycle as much as I can. I don't feel that I do enough. But I think it's important to make the kids aware of it. And doing little things, like turning the heating off and the lights. I'm quite conscious of it anyway." (TG, young professional)</p>

8.4 Conclusions

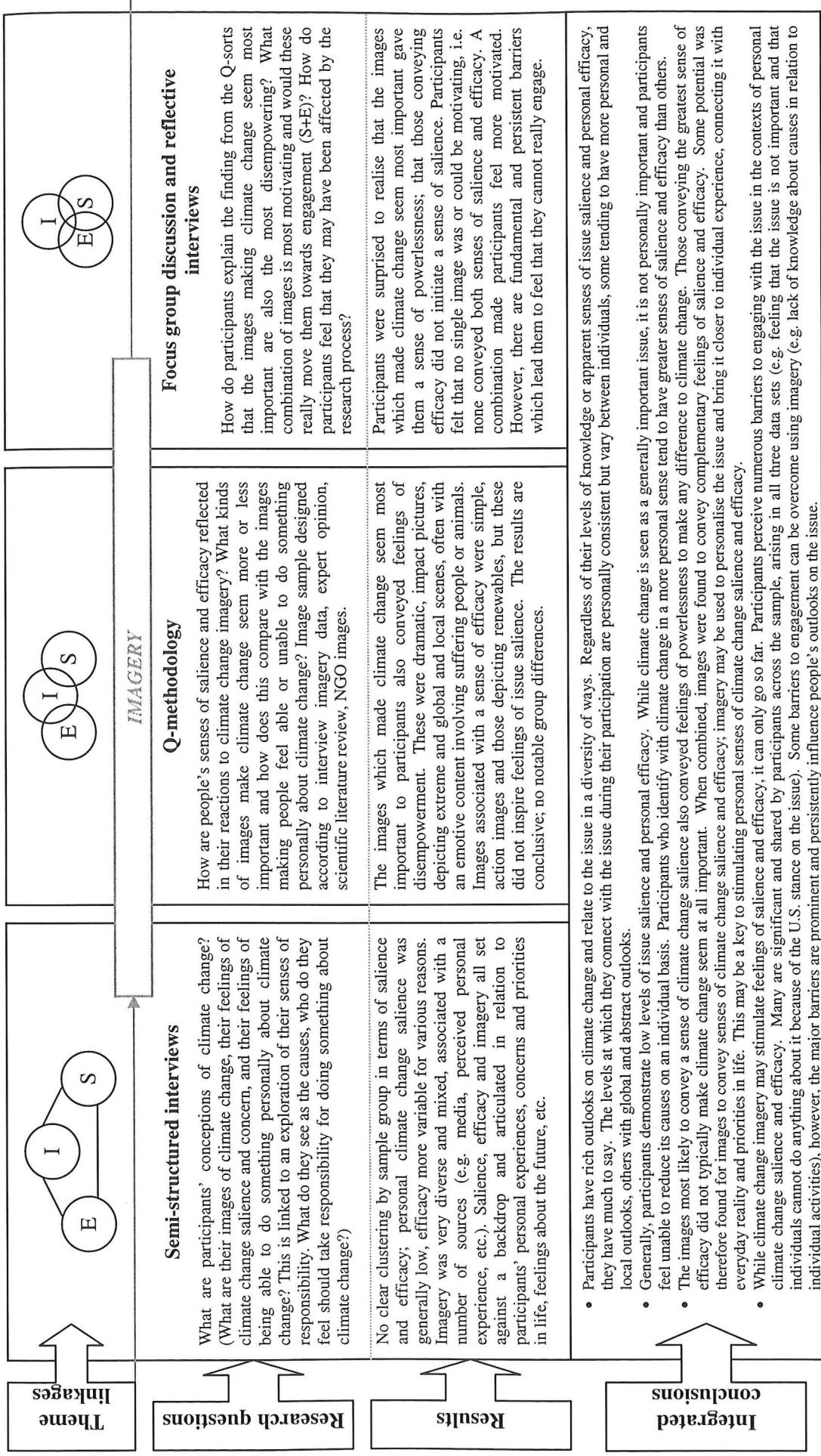
The reflective responses from participants following their involvement in the research suggest that their senses of salience and efficacy were slightly stimulated on a long-term basis as a result of their participation in the research. Participants felt that climate change was slightly more important to them and that they felt slightly more able to do something. Participation had a particular impact on those who felt that they had gained further knowledge and understanding about climate change and its relevance to them (its causes, consequences and potential solutions) as a result of linking the images together. The results demonstrate a small change overall; participants did not feel that climate change was significantly more important personally or that they felt much more able to do anything about it personally in relation to their original outlooks.

It is not surprising that participants felt only slightly more engaged with climate change as a result of their involvement in the research. The situations they were placed in led to climate change being more on people's minds as a result of their participation and this was apparent in the follow-up interviews conducted. By participating, they were caused to engage with the issue in a way that otherwise they would not have done, and to make connections with their personal lives and activities. Participating in the deliberative process forced participants to think and talk about climate change, to view and respond to climate change images, and finally to engage in discussion with others as noted above. Having to respond to particular questions and pictures encouraged them to think about climate change in relation to their own lives and to explore the issue of climate change in a personal sense. It pushed them to explore climate change and construct views which they might not have held or thought about otherwise. The research exposed participants to resources on which to build these thoughts which were not considered to be concrete at any stage, but to be evolving throughout the deliberative research process and via interaction with others. Many participants' declared on reflection, that their thoughts about the issue had undergone some change as a result of the participation process. Chapter two addressed the notion that outlooks on climate change are flexible and undergoing construction as suggested by Kempton (1991; 1997) and Read *et al.* (1994). Work by Eiser (1994) also suggests that people's attitudes are not fixed but always evolving in reaction to incoming stimuli which are incorporated into existing concepts and networks by mental processes. People's minds are active in the construction of knowledge, forming concepts and abstractions from the stimuli that they are presented with (e.g. Schwandt, 1998). Working around the images and interacting with others deepened participants' experiences of climate change, way beyond their initial discourse.

It is also unsurprising that participants only felt a marginally greater sense of engagement after their involvement in comparison to before. The results suggest that feelings of salience and efficacy will require substantial ‘triggers’ – that involvement in a research project and being forced to consider the issue over a relatively small period of time is unlikely to provide significant grounds for engagement. Imagery has been shown to establish a basic knowledge about the issue and to encourage a personalisation of outlooks on climate change in the contexts of salience and efficacy; to bring climate change into a personal realm and in this way moving people some way towards a sense of engagement (particularly for those who initially saw climate change as a distant, remote issue). Imagery which brings about a sense of climate change being linked with priorities in life and social concerns may also play a role in moving people a little bit further towards feeling a personal commitment to the issue. However, whether engagement with climate change results from this shift is questionable; there is no guarantee that ‘removing’ any of people’s stated barriers will act as triggers for them to engage, let alone change their everyday behaviours and lifestyles towards a low carbon way of living (highlighting the problem of inferring behavioural actions on the basis of value statements and expression of attitudes, etc.).

The discussion makes clear that major barriers still exist to a real sense of engagement beyond feeling that climate change is generally important and that one can make a tokenistic difference (e.g. lack of US commitment; perceived lack of alternatives to enable the individual to act). Feeling that they are little more engaged after participating in a fairly lengthy and involving research process suggests that these barriers are fundamental and overwhelming; that they have a significant effect on people’s senses of climate change salience and efficacy, and hence their engagement with the issue. They continue to be given as justifications for not engaging with climate change, even if participants know what they can do (and feel they should do). They are also practically preventing people from developing personal senses of salience and efficacy and from taking substantial action.

Figure 8.1 Research overview: methods, results, emerging patterns



The different methods were complementary; the multi-method strategy combined with repeated contact with the same participants generated consistent data both at a sample-wide and individual level. Chapters five, six and seven drew general conclusions and have identified patterns emerging from the sample as a whole. This chapter demonstrates how the results from the three stages of research correspond at an individual level, in light of these general conclusions. An individual approach is taken as well as an overall one, because there are no apparent trends according to social or sample groups. The results reveal a common sense that climate change was not very important personally and that individuals felt unable to make a substantial difference to reducing the causes of climate change for various reasons. The individual level analysis complements the preceding presentations of results by demonstrating how individual contributions consistently reflect the conclusions drawn from each stage in different ways. Individual differences highlight the person-centred as well as broad nature of the patterns arising from the results (outlined at the bottom of figure 8.1).

8.2.1 Individual profiles

During the course of data collection, organisation and analysis, a profile was put together for each participant to summarise their contribution to the research. The profiles give an overview of each individual's input into the research by summarising their contribution at each stage of their participation. An example of one complete profile is attached in appendix 9. Seidman (1998) suggests that crafting a profile or 'vignette' of a participant's experience is an effective way of sharing data and opening up ones material to analysis and interpretation. Each can be thought of as a micro-level demonstration of the multi-method research process. The profiling was an on-going process, which enabled me to become familiar with the results of each stage of the research and by the end, as a whole. It helped me to see how the broad patterns arising from the data were applicable at individual levels in different ways. It also illustrated the striking consistency of individual outlooks on climate change and the compatibility of the data across methods. The profiles tell a coherent story of each participant's perceived relationship with and outlook on climate change, viewed through a more focussed lens at each stage of the research. The social contexts in which participants relate to the issue throughout become clearer at an individual level of data analysis than at a sample-wide one.

Complete profiles were put together for eighteen out of the thirty participants (those who participated throughout). A one-page summary was put together for each individual profile (figure 8.1 acts as a generic framework). Three of these are presented in due course. One individual profile from each sample group is presented to represent a range of salience and efficacy outlooks and associated imagery. The three cases give an impression of the diversity of outlooks on climate change expressed by participants in this study. One represents the low salience, low efficacy cluster (KR) apparent in figure 5.5; one represents the middle of the range

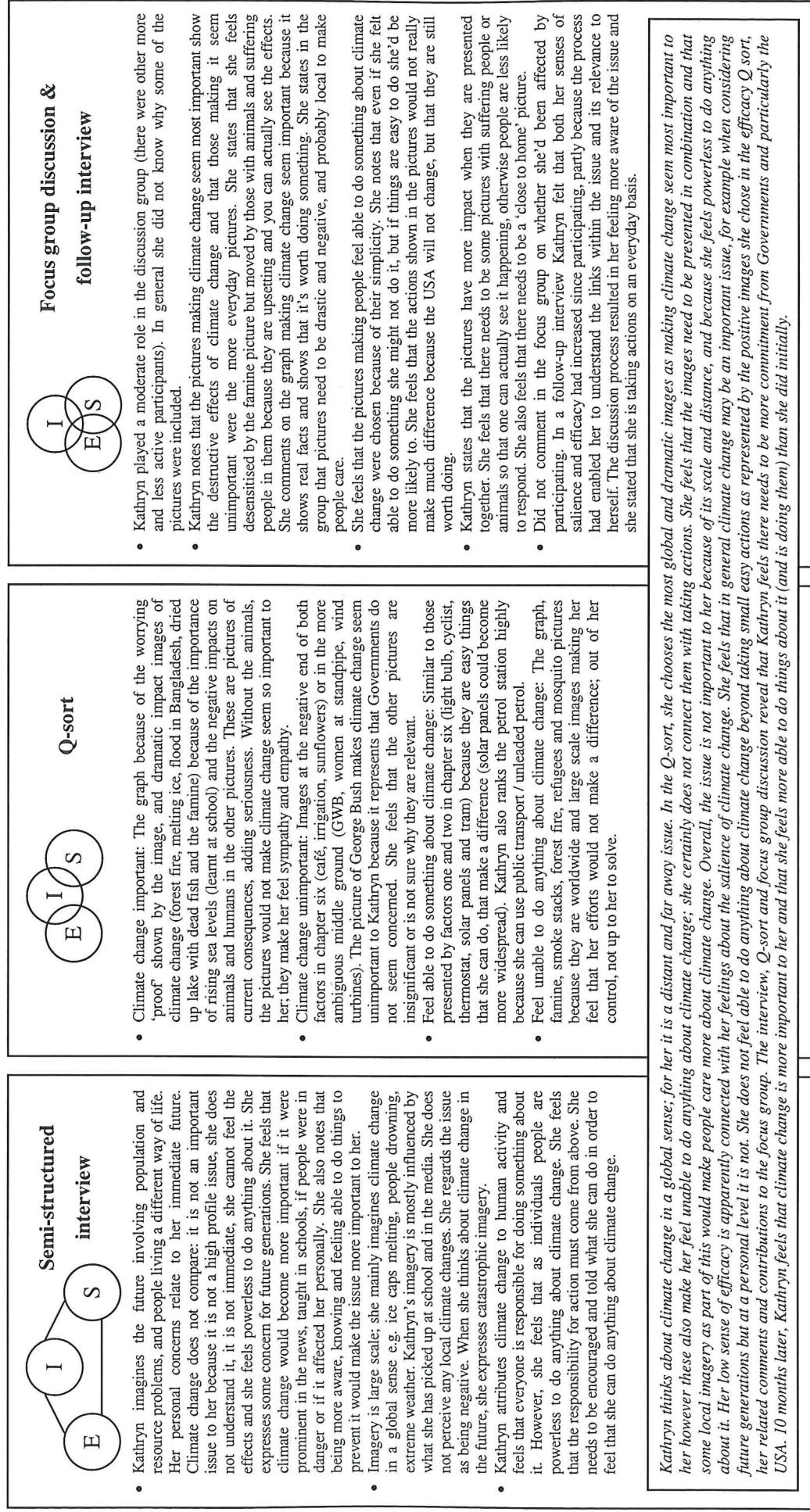
(TG); and one demonstrates relatively higher salience – higher efficacy characteristics (KaT). The profiles highlight the range and specificity of people's outlooks on climate change within the broad patterns identified; they do not represent types or clusters of participants with particular outlooks on the issue. Each summary profile is included as follows (figures 8.2, 8.3 and 8.4), preceded by a brief commentary.

Kathryn (KR, high school student, figure 8.2)

Throughout the study, Kathryn demonstrates a tendency to imagine and respond predominantly to global images of climate change; she does not imagine it in a local or personal sense. Global and disastrous types of imagery, generally depicting the suffering of people and animals make climate change seem most important. However they are also the most disempowering. Those making her feel able to do something about climate change show easy and simple things that she can do. The images have more impact on her senses of salience and efficacy when presented together and when they make a local link.

Kathryn has low levels of both salience and efficacy. During the research stages, she attributes her low levels of salience and efficacy to barriers which lead her to feel that one person's actions cannot really make a difference. She does not find climate change important because of a feeling of powerlessness driven by climate change seeming such a big and distant issue. Climate change is also unimportant personally because she does not understand it and is not aware of what she can do; Kathryn perceives that she knows very little about the issue, what its causes, impacts and solutions might be and hence does not feel a sense of climate change being personally important or being able to do anything about it as an individual. A further barrier to salience and efficacy is that climate change is not a high profile issue and the issue is not immediate (it would be more important to her if it was taught in schools, prominent in the news and if it affected her personally). She feels that action should come from above, but in reaction to the picture of George Bush, felt that climate change is not important because Governments are not concerned, and the U.S. in particular will not change. Kathryn feels slightly more motivated when discussion around the images in the focus group help her to see the links between herself and climate change, as well as the links between the causes, consequences and possible solutions to climate change; she realises that climate change might be having local effects, that her actions play a part and when she becomes aware of the small things that she can do personally to help. Kathryn states at each stage of participation that climate change is a big issue and out of her control and that her efforts would not make a difference. The barriers that Kathryn perceives to salience and efficacy reflect the way she relates to climate change as a huge, future, far-away issue over which she has not control. Kathryn states that her main concerns also focus on her immediate future; A levels and university. Other than this, she does not link any broader issues with climate change.

Figure 8.2 Individual profile summary for Kathryn (KR, high school student)



Kathryn thinks about climate change in a global sense; for her it is a distant and far away issue. In the Q-sort, she chooses the most global and dramatic images as making climate change seem most important to her however these also make her feel unable to do anything about climate change; she certainly does not connect them with taking actions. She feels that the images need to be presented in combination and that some local imagery as part of this would make people care more about climate change. Overall, the issue is not important to her because of its scale and distance, and because she feels powerless to do anything about it. Her low sense of efficacy is apparently connected with her feelings about the salience of climate change. She feels that in general climate change may be an important issue, for example when considering future generations but at a personal level it is not. She does not feel able to do anything about climate change beyond taking small easy actions as represented by the positive images she chose in the efficacy Q sort, USA related comments and contributions to the focus group. The interview, Q-sort and focus group discussion reveal that Kathryn feels there needs to be more commitment from Governments and particularly the USA. 10 months later, Kathryn feels that climate change is more important to her and that she feels more able to do things about it (and is doing them) than she did initially.

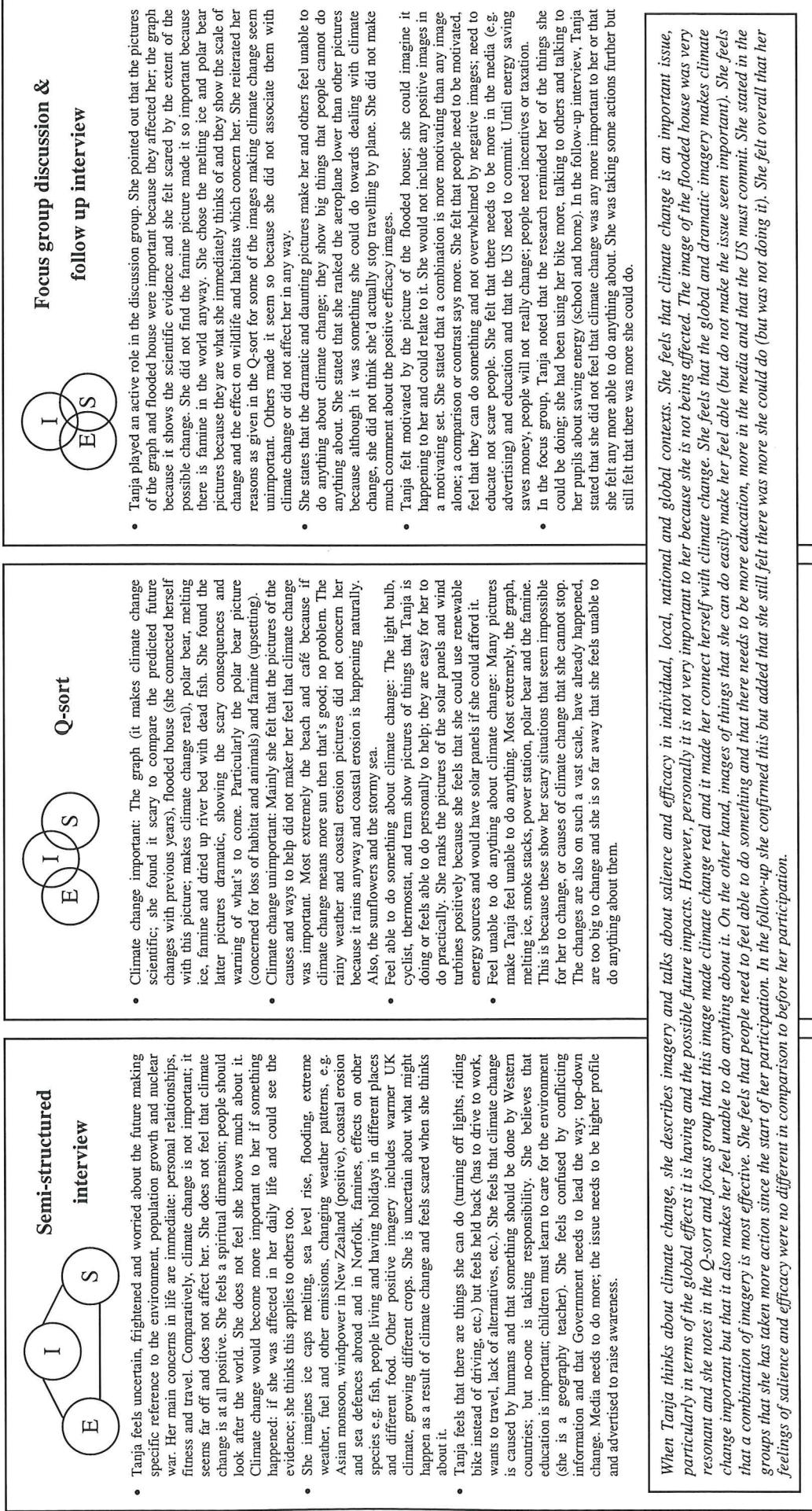
Tanja (TG, young professional, figure 8.3)

Tanja imagines climate change in both global and local terms, erring towards a local context. She tends to imagine climate change in terms of its effects on Norfolk as well as global imagery such as melting ice caps. Global and emotive images of human and animal suffering and the extent of climate change make climate change seem most important. The picture of the flooded house is particularly resonant because she connects this image with herself; it makes climate change seem real to her. The global impact images make Tanja feel unable to do anything about climate change however, because of the vastness of their scale. She feels able to do something about climate change in reaction to images which show her things that she can easily and practically do. She felt that a combination of images was motivating; says more than the images alone and makes the issue seem less overwhelming.

Tanja is well informed about climate change; what it is and what she can do about it. However, in the interview and in reaction to the images presented in the Q-sort and focus group, Tanja states that she feels that climate change is not personally important. This is because it seems far off, she cannot see the evidence and it does not affect her; that until it does, she doubts it will become an important issue. She also feels that the issue is not very important because of other priorities in life and lack of media attention. Tanja does not feel able to do very much to reduce the causes of climate change. She states that she can do small things to reduce the causes of climate change however, she does not do everything that she is aware she could do because of personal barriers (including needing to drive to work, and wanting to travel) and larger scale hindrances (including the scale of the issue, a lack of facilities and alternatives, and a lack of Government and US commitment). She feels that people in general will not change until there are financial incentives to do so.

Tanja's personal concerns are also immediate and they are her personal relationships, her fitness and travelling. Her fitness and travel come up when she talks about her sense of efficacy, because she feels that it's good to ride her bike both for environmental and health reasons. Travelling is a priority and she seems troubled when she thinks about what she could do to reduce the causes of climate change, realising that she would not want to give up travelling by aeroplane. Her job as a geography teacher is pertinent throughout her participation. She is particularly concerned that children should be educated and made more aware of climate change and as a result of her participation has incorporated more climate change related projects into her teaching.

Figure 8.3 Individual profile summary for Tanja (TG, young professional)



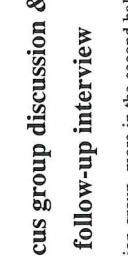
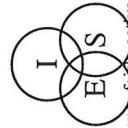
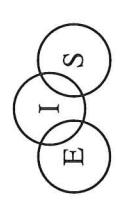
Karen (KaT, working class mother, figure 8.4)

Karen's imagery is largely local and personal. When she thinks about climate change, she predominantly imagines things like changes in the weather and seasons that she perceives as happening 'here and now'. Karen responds to both local and global imagery in the context of climate change salience, but dramatic or destructive images make her feel disempowered. Her sense of efficacy is bolstered in reaction to images showing things that people can easily do at a personal level as well as those that represent larger scale changes being made, e.g. renewable energy. The picture of George Bush in particular makes Karen feel unable to do anything about climate change because he represents a major barrier to change; a point noted at all stages of participation. Seeing images of climate change impacts (local and global) in combination with the things that people can do brought climate change home to her more than the images alone.

Karen feels that climate change is generally but not personally important in comparison to everyday concerns and priorities, and that conflicting information and views on the issue lead to it seeming less important than it might do. The issue of climate change would become more important to her if Governments (UK and USA specifically) were to take more action. She feels that desensitisation to some climate change images detracts from the personal importance of the issue. Karen feels a high sense of efficacy and talks about being very active, doing everything she is aware that she can do; her lifestyle incorporates many environmental activities including energy saving, cycling, recycling, etc. She feels that she would feel able to do more beyond the 'small things' if the Government provided facilities and alternatives and generally took more action. She feels that the USA and other Governments need to become greener and more committed and notes this at all stages of the research. She adds that the pure scale of the issue acts as a barrier to efficacy. Throughout, Karen feels that a lack of education and lack of information in the media are barriers for people's senses of climate change being important and feeling personally able to do anything about it.

Karen states in the interview that her children and financial pressures are her main priorities in life. She talks about her concern for future generations when she thinks about climate change and notes that the pictures of the dramatic impacts of climate change make it seem important to her because they represent a worry for future generations. She is keen to point out that education is very important and that children need to learn about climate change and be brought up to have respect for the environment. Health is a key issue for Karen, e.g. in relation to the effects that climate change might have on her daughter's asthma. She also talks about her concern about insurance premiums going up because of bad weather and flooding.

Figure 8.4 Individual profile summary for Karen (KaT, working class mother)

Focus group discussion & follow-up interview	Q-sort	Semi-structured interview
 <ul style="list-style-type: none"> Karen was family centric in the discussion group, more in the second half than the first. She was not as active as some of the other participants; she very carefully considered her contributions. Karen noted that she felt some pictures really brought climate change home. E.g. the cartoon because having warmer winters is what we've come to expect. She feels that the beach makes her also realise that our weather and seasons are not as reliable as they used to be. She feels able to do something about climate change in reaction to the thermostat and light bulb images because they are so easy, and show what people can do to help. She felt that the picture of George Bush made her feel really unable and stated that Governments including in the UK need to do more, e.g. realise that people actually like wind turbines and think that we should have more of them. She feels that they need to make more investment and promote renewable energy. She feels that the most motivating pictures should include the graph as well as some of the 'doing' images and the picture of the famine because it is really worrying showing the extent of change in a short time. Seeing what is projected and then what people could do (i.e. thermostat) to make the increase as low as possible brought it home to her. She felt that the picture of the flooded house was important because everyone would take action if their home was at stake. She feels that there are other issues that would motivate her, e.g. more facilities for recycling and being given more information about what people can do personally. She feels that young people need to be targeted so that they grow up to respect the environment but is worried they will not. As a parent she thinks it's important to instil this in the children and that for adults and young people, there should be more on television about climate change. Health is important, especially her daughter's asthma and she is worried about insurance premiums going up for people living in flood areas. She has noticed the congestion charge and more traffic on the roads during her participation in the study. In the follow-up interview she stated that she did not feel that climate change was any more important to her or that she felt able to do any more about it. However she was taking some of her actions further and felt more aware of climate changes and associated events. 	 <ul style="list-style-type: none"> Climate change important: The flood in Bangladesh, dried up riverbed with dead fish, famine, flooded house, polar bear and melting ice. Karen chose these pictures because they show how climate change is affecting us on a drastic scale and some of the images are becoming a common sight (flooded house, dried up river). Karen comments that seeing how climate change is having such effects is a worry for future generations. Climate change not important: The pictures of the café and sunflowers do not make climate change seem important because they are nice pictures. Karen also chose the cyclist, solar panels, thermostat and wind turbines, commenting that these things help to make a difference and keep the climate safe; things that people should do. She did not explain exactly why they make climate change seem unimportant and ranked these four images as making her feel able. Feel able to do something about climate change: Karen felt that the pictures of the light bulb, thermostat, cyclist and tram made her feel able to do something about climate change because they show things that people can easily do. She feels that these things make a difference and are worth doing, no matter how small the contribution. The pictures of the solar panels and wind turbines make her feel more able to do something than other pictures in the sample because they show greener energy which is clean, safe and should be used wherever possible. Feel unable to do anything about climate change: The petrol station because she worries that we do not have any fuel alternatives and the melting ice, flooded house, dried up riverbed with dead fish, women at standpipe and the polar bear because of the scale of the impacts; she is not sure that anything can be done. 	 <ul style="list-style-type: none"> Karen feels pessimistic about the future in terms of the environment judging by the way people live now. She imagines differences in people's health, and medical advances and hopes that there will not be war. Her main concerns are her children and financial pressures (cost of living). Climate change comes up in conversation, she thinks about in terms of her everyday activities and she has noticed changes in the weather and seasons. However, it is not of great importance when compared with her daily concerns. She talks about the uncertainty and conflicting information about climate change which she finds noticed changes (especially older people). If the USA were committed, there was more in the media and more opportunities to make her views heard then climate change would become more important to her. Karen imagines unpredictable weather, changing seasons (becoming more unpredictable), wetter and cooler summers, effects of climate change on crops and food supply, ice sheets melting, flooding in developing countries, flooding in the UK (e.g. in York, 2000), people being made homeless by flooding in this country, coastal flooding – Great Yarmouth will not exist anymore, coastal erosion, possible effects in Norwich, bush fires, drought, less snow in Scotland. Positive changes include warmer winters but she mainly imagines negative ones. She feels uncertain about what will happen in the future. She associates Chernobyl, skin cancer and Gulf war oil fires. Karen feels that fossil fuels emissions from human activity are causing climate change and that it's everyone's responsibility to do something about it. She is very active personally but feels that she could do more and would like to do more (e.g. if there were more facilities). Would like to see more renewable energy (wind turbines). She feels concerned that people in developing countries who have not caused climate change are suffering from the consequences; Governments need to become greener especially the USA, and people need to be more educated. Karen feels that people have a choice as to whether climate change happens or not, we have time to change; that countries should spend more on climate change.

Karen perceives climate change as happening and relates to it as a global one. Her imagery reflects this as well as her comments about salience and efficacy (talking to others about it, noticing local changes, doing things personally as well as feeling that more needs to be done at a higher level). The issue is important to her and she feels able to do something about it however feels held back by lack of USA and UK government commitment. The pictures making climate change seem important and unimportant drew parallels with those making her feel unable and able to do anything about climate change respectively. She was very keen to comment that we should use more renewable energy as well as making our own small contributions. Karen noted in the group that there were some images that brought climate change home to her and these were connected with her own perceived experiences of it. She perceives many barriers to real change, mainly beyond the personal realm, particularly the lack of commitment by the UK and US Governments. In the follow-up interview she indicates that her feelings of salience and efficacy have not changed, but that she feels more aware of the issue and is taking her actions a little further.

8.3 Reflections on participation

This research was not designed as a participation exercise, as noted in chapters four and seven. The research was purely exploratory and did not intend to lead participants towards any further engagement; it was not assumed that participation would increase participants' senses of salience and efficacy. The wrapping up of the focus groups and the follow-up interviews were intended to be reflective exercises to explore how and whether participation in the research process involving the three different methods may have affected participants' outlooks on climate change.

Participants were asked at the beginning of the focus group discussions to think about the ways in which their outlooks on climate change might have altered as a result of participating in my research. The 'wrapping-up' session held at the end of each group then gave participants a chance to respond. The feedback discussions were not very revealing for reasons, as suggested in chapter seven. Many participants expanded on their feelings during informal discussions afterwards (notes were made to record these). Asking participants to reflect during the focus groups may have been a little premature. This is because the discussions themselves probably had a relatively substantial impact on participants; the groups gave them the opportunity to interact with others and discuss the issue in more depth, airing a range of views. At this stage, participants had not had time to reflect on the impact of the discussion as well as on their previous involvement; they had not had time to experience how and whether the totality of their participation had had an impact on their feelings about climate change. Informal chatting afterwards gave the impression that participants were beginning to reflect on their involvement. This was why a series of brief follow-up interviews was conducted.

The follow-up interviews were carried out approximately 10 months after the focus groups were held. They therefore addressed at a much later stage whether participation had had any lasting impact on participants' senses of climate change salience, efficacy, motivation to 'engage' and perhaps even on their behaviour (although a consideration of the latter not being an objective of this study as explained in chapter two). The questions asked are attached in appendix 15. The interview asked participants openly whether they felt that their feelings about climate change had changed at all as a result of being involved in my research. This was followed by some elaborative and probing questions to define how participants felt that their outlooks may have changed, in the contexts of salience and efficacy. Most of the interviews were conducted over the telephone and with participants' consent, they were recorded. A couple of participants were not contactable by telephone, but by email and so recorded their thoughts in writing. Thirteen participants were successfully contacted. The feedback generated during and shortly after the focus group discussion is presented first, followed by participants' later reflections.

8.3.1 Results of the discussion group feedback

Based on the feedback from all groups and the informal discussions afterwards, participants felt that their feelings about climate change had altered to various degrees as a result of participating in the study. These incorporated changes in understanding, awareness, intention to act and taking action on climate change. At this stage, participants were not asked directly whether they felt that climate change was any more important to them or if they felt any more able to do anything about it as a result; the questions were left open⁹⁰.

The principal change as a result of participating was a greater sense of awareness of the issue. Feeling more aware of the causes, impacts and positive things that can be done about climate change were the predominant outcomes; more specifically, noticing more in terms of the impacts of climate changes in the media and in the local environment, noticing the causes of climate change, particularly in terms of traffic, feeling that the issue is more predominant in ones mind generally, and feeling slightly more likely to talk about climate change.

Anne: *"I think it has made me more aware."*

Mary: *"It has made me notice more, especially with this group thing, you think about it more."*

(Working class mothers)

Helen: *"Instead of something that's just in your mind, it's more at the front of my mind now. I am more conscious about it than before when it was a subconscious thing. I was kind of worried about it but not much, but now it's more at the forefront."*

(High school student)

Changes in understanding included comments about how participants felt that as a result of participating they had 'made the links'; knowing what causes climate change, what the impacts are and what can be done to lessen the causes of climate change.

Claire: *"I literally had no idea about climate change before this. I've now actually discussed it with my boyfriend...I was asking him how everything links up to actually produce such drastic things. I just literally had no idea, so it really did help me."*

(Young professional)

Some participants felt that as a result of participating, they intended to take some action. This was partly as a result of feeling more aware of what they could do about reducing the causes of climate change. Some felt encouraged by knowing what people can easily do.

Angela: *"I think that it's been encouraging. You can see more what you can do and it makes you think more like, yeah, well there is a point in doing something about it."*

Erica: *"Yeah, when I'm a student I'm going to go on lots of protests."*

(High school students)

⁹⁰ This was to avoid leading participants into feeling that they should say that they felt climate change was more important to them etc. (or 'pleasing the researcher' as noted in many methodological texts on question design).

Some participants stated that they had begun to make efforts, which they were not doing before. Using the low energy light bulbs they have been given as a result of their participation was a common response and participants also talked about using bicycles and walking more often instead of using cars, saving energy by turning lights off, being more conscious of other ways of saving energy at home, etc. (mostly everyday actions which they could easily take at home).

Mark: *"I never used to turn lights off when I left my classroom at school but I do now."*

Tanja: *"I do now too. I have got light monitors in my class now too."*

(Young professionals)

Theresa: *"I know that now I do tend to try and either bike in or walk, or take a bus or something."*

(Working class mother)

8.3.2 Results of follow-up interviews

The follow-up interviews yielded further reflections on the way participants felt that participating in the research process may have affected them. They gave a positive impression about their experience, and they were keen to give feedback on the process. The interviews revealed that participants generally felt more aware of climate change since participating and were taking a number of energy-saving actions as a result.

Examples of increased awareness include: understanding the issue better and hence being more aware of it; knowing more about its impacts (e.g. refugees, the extent of the impacts; finding it a more noticeable issue (e.g. in the media, local environment); finding the issue more at the forefront of their minds and thinking about it more in the context of their daily activities (when otherwise they would not have done); feeling more aware about how their actions contribute to climate change and what they could easily do about it. Most participants mentioned taking some or relatively more action as a result of their involvement in the research and appeared to feel good about this. They generally seemed encouraged by their involvement in the study to make small efforts, often indicating that they found there were lots of things they could easily do at home to contribute. At the most basic level, most participants commented that they were using the low energy light bulbs that they had been given. Some were keen to point out that they were taking some of the activities they were doing previously further as a result of participating, e.g. turning the heating down a bit more, cycling and walking more, making more effort to turn lights off. Some participants pointed out that they were making other environmental efforts in their day-to-day-lives doing, e.g., more recycling because of a recent council curbside collection scheme (the working class mothers were particularly keen to note that they were doing much more recycling than they used to). One or two participants noted that they were aware of lots of things that they could do, however they were not taking all the actions that they could take.

The findings demonstrate a range between feeling no different in terms of issue salience and personal efficacy and feeling slightly more engaged in terms of salience and efficacy as a result of participating in the research process. Figure 8.5 presents edited quotations from all the interviews which summarise the essence of each, approximately placed along the range suggested. Some participants interpreted changes in their awareness and extent of behavioural action in terms of the issue having become, to a small extent, more important and feeling more personally able to do something about climate change. Others stated that they felt more aware, for example, but did not feel that their feelings of salience and efficacy had actually changed. This highlights that each person's perspective is very subjective and that participants had different notions of what issue importance and personal efficacy involved.

More perceived change was apparent amongst the relatively less engaged participants in the sample. This appeared to be due to overcoming some of the more practical barriers to issue salience and personal efficacy during the participation process. For example, reaching an understanding of the causes, consequences and possible solutions to climate change and how these relate to the individual; knowing what an individual can easily do as part of their everyday life and being able to visualise how climate change affects, or could affect us at local levels and so on. The example profile summaries (figures 8.2, 8.3 and 8.4) include reference to the feedback given by the three participants, demonstrating the points made above:

Kathryn (high school student, figure 8.2) stated that she felt greater senses of both salience and efficacy as a result of her participation. She felt that the tasks in the Q-sort and focus groups involving the pictures made her aware of the extent of climate change and feel more concerned about it, as well as of some things that she could do personally to help. Discussing the issue with others led to it becoming a bit more important to her because she consequently thought about it more. Since participating, she stated that she feels much more able to do something about climate change and had begun taking actions at home and by using public transport more to save energy. One of her principal barriers was a lack of understanding about climate change and about what she could do about it. She stated that as a result of her participation she understood the issue and how it links together.

Tanja (young professional, figure 8.3) does not really feel that climate change is any more important and does not feel much more able to do anything about climate change. However, she noted that she is using her bike more, and her car less, and that she is doing a lot of projects with her class at school about energy and climate change as a result of her participation. She states that she is more conscious of buying energy saving light bulbs rather than normal ones but beyond this has not made any 'major' changes. She states that she does not think she does enough, however she does the 'little things' and feels that it's important to teach her class about it and make them aware.

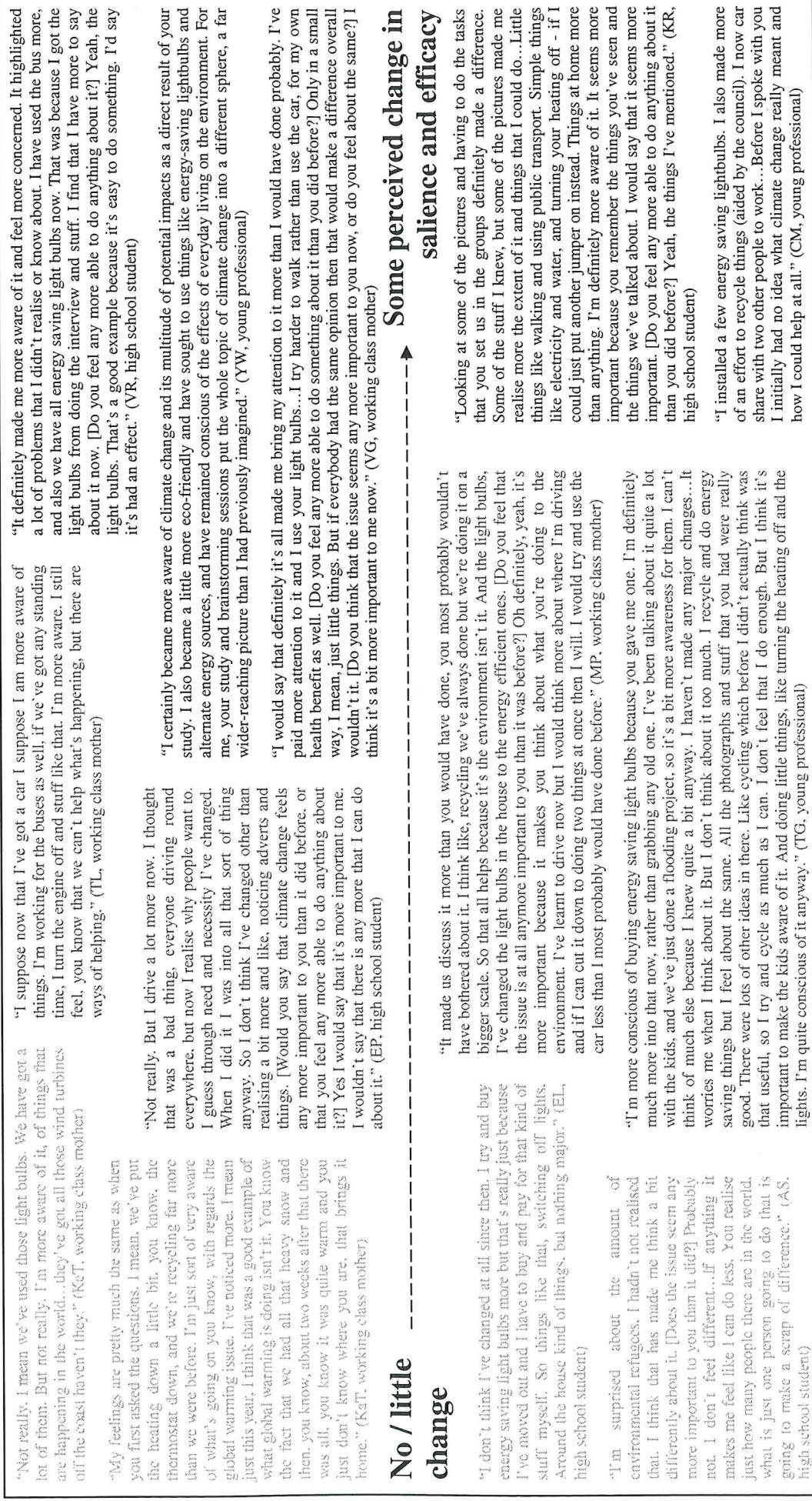
Karen (working class mother, figure 8.4) stated that she did not feel very different as a result of participating, beyond feeling slightly more aware of the issue; she'd noticed more related changes happening locally and more in the media (e.g. she has noticed more traffic on the roads, news about the

London congestion charge which she supports and more unpredictable weather recently). She added that she'd been taking her actions a little further, for example by turning the heating down a bit more and by using a the low energy lightbulbs she'd been given but that essentially she did not feel that climate change was any more important or that she felt any more able to do anything about it.

Kathryn was the only participant of the three who felt greater senses of salience and efficacy as a result of participating in the research. Throughout the process she seemed to have a tendency to think of climate change as a distant issue, but by the end of it and on reflection she made more of a personal connection and felt that climate change was more important and that she felt more able to do something about it (and was doing things about it). This was mainly due to arriving at an understanding of the links within the issue via the process of participation around the images. Tanja and Karen on the other hand, felt that their senses of salience and efficacy had not really changed as a result of their participation. All three participants were taking more actions on a small scale since participating; however this was not necessarily associated with feeling that they were more able to do anything to reduce the causes of climate change.

On the whole, the differences between participants' feelings of change in terms of issue salience and personal efficacy are minor – none of the participants stated that the issue had become significantly more important to them personally or that they were much more able to do anything to reduce the causes of climate change as a result of their participation. This is not surprising given that the research experience was not intended to be an exercise in persuasion and constituted only one of many potential triggers that might initiate a shift in the extent of people's engagement with climate change (see section 8.4 for elaboration). Some participants noted that major barriers were still preventing them from feeling really able to do anything to reduce the causes of climate change or to do anything more substantial beyond the 'little' things. For example, feeling that one's actions would make a difference if everyone else felt the same; as an individual member of a global population, one's effort cannot and will not make a difference. Two of the high school students actually felt less engaged with the issue since participating, but not because of their participation. One explained that since the end of the study, she had learnt to drive and had begun to understand why people want and need to drive; that she therefore felt that she was doing comparatively less to reduce the causes of climate change. The other had learned more at university, finding the issue less interesting and more overwhelming in the contexts of personal salience and efficacy than she did originally.

Figure 8.5 Quotations summarising the reflective interviews



8.4 Conclusions

The reflective responses from participants following their involvement in the research suggest that their senses of salience and efficacy were slightly stimulated on a long-term basis as a result of their participation in the research. Participants felt that climate change was slightly more important to them and that they felt slightly more able to do something. Participation had a particular impact on those who felt that they had gained further knowledge and understanding about climate change and its relevance to them (its causes, consequences and potential solutions) as a result of linking the images together. The results demonstrate a small change overall; participants did not feel that climate change was significantly more important personally or that they felt much more able to do anything about it personally in relation to their original outlooks.

It is not surprising that participants felt only slightly more engaged with climate change as a result of their involvement in the research. The situations they were placed in led to climate change being more on people's minds as a result of their participation and this was apparent in the follow-up interviews conducted. By participating, they were caused to engage with the issue in a way that otherwise they would not have done, and to make connections with their personal lives and activities. Participating in the deliberative process forced participants to think and talk about climate change, to view and respond to climate change images, and finally to engage in discussion with others as noted above. Having to respond to particular questions and pictures encouraged them to think about climate change in relation to their own lives and to explore the issue of climate change in a personal sense. It pushed them to explore climate change and construct views which they might not have held or thought about otherwise. The research exposed participants to resources on which to build these thoughts which were not considered to be concrete at any stage, but to be evolving throughout the deliberative research process and via interaction with others. Many participants' declared on reflection, that their thoughts about the issue had undergone some change as a result of the participation process. Chapter two addressed the notion that outlooks on climate change are flexible and undergoing construction as suggested by Kempton (1991; 1997) and Read *et al.* (1994). Work by Eiser (1994) also suggests that people's attitudes are not fixed but always evolving in reaction to incoming stimuli which are incorporated into existing concepts and networks by mental processes. People's minds are active in the construction of knowledge, forming concepts and abstractions from the stimuli that they are presented with (e.g. Schwandt, 1998). Working around the images and interacting with others deepened participants' experiences of climate change, way beyond their initial discourse.

It is also unsurprising that participants only felt a marginally greater sense of engagement after their involvement in comparison to before. The results suggest that feelings of salience and efficacy will require substantial ‘triggers’ – that involvement in a research project and being forced to consider the issue over a relatively small period of time is unlikely to provide significant grounds for engagement. Imagery has been shown to establish a basic knowledge about the issue and to encourage a personalisation of outlooks on climate change in the contexts of salience and efficacy; to bring climate change into a personal realm and in this way moving people some way towards a sense of engagement (particularly for those who initially saw climate change as a distant, remote issue). Imagery which brings about a sense of climate change being linked with priorities in life and social concerns may also play a role in moving people a little bit further towards feeling a personal commitment to the issue. However, whether engagement with climate change results from this shift is questionable; there is no guarantee that ‘removing’ any of people’s stated barriers will act as triggers for them to engage, let alone change their everyday behaviours and lifestyles towards a low carbon way of living (highlighting the problem of inferring behavioural actions on the basis of value statements and expression of attitudes, etc.).

The discussion makes clear that major barriers still exist to a real sense of engagement beyond feeling that climate change is generally important and that one can make a tokenistic difference (e.g. lack of US commitment; perceived lack of alternatives to enable the individual to act). Feeling that they are little more engaged after participating in a fairly lengthy and involving research process suggests that these barriers are fundamental and overwhelming; that they have a significant effect on people’s senses of climate change salience and efficacy, and hence their engagement with the issue. They continue to be given as justifications for not engaging with climate change, even if participants know what they can do (and feel they should do). They are also practically preventing people from developing personal senses of salience and efficacy and from taking substantial action.

Chapter nine – methodological reflection, discussion and conclusions

9.1 Introduction

This chapter begins by presenting a brief reflection on the methodology of this thesis which assesses the various strengths and weaknesses and outlines opportunities for future research. This is followed by a discussion of the results summarised in chapters five, six, seven and eight. The chapter is drawn to a close with the conclusions to this thesis which review the implications of this research for future public engagement with climate change.

9.2 Methodological reflection

The methodology of this research has allowed an in-depth exploration of participants' outlooks on climate change. It has specifically explored these outlooks in a visual sense, connecting a study of people's mental representations of climate change, and their responses to images of climate change with their feelings of issue salience and personal efficacy. The investigation of feelings of issue salience and personal efficacy in relation to climate change imagery is an unusual and novel approach. It has not previously been taken in research concerning public perceptions of climate change. The research results generated offer new insight into the relationship between imagery and people's outlooks on climate change.

The interviews provided a broad base for the study by investigating participants' thoughts about climate change in relation to the research themes. These gave a comprehensive picture of a range of mental imagery and beliefs about climate change. Visual Q-sorts then explored their immediate responses to images of climate change in the contexts of salience and efficacy. The focus group discussions gave participants an opportunity to consider their interpretations of these images more deeply, and to discuss with each other their implications for engaging with climate change. The follow-up interviews gave the participants a chance to reflect on their participation experience and outlooks on climate change as a result. The combination of overall analysis and individual focus was enabled by the continuation of the same sample groups of participants throughout the research. This longitudinal research design generated conclusive findings which link the research themes, are consistent across methods and transcend sample groups.

The unusual combination of methods and intensive, longitudinal research design has enabled the research questions to be investigated interactively as part of an adaptive and creative learning

process, both for me and for the participants involved in the study. For example, as the study progressed, participants became more confident engaging with the images of climate change and developed their understanding of the science of the issue. This was both as a result of having the opportunity to think and talk about the issue on an individual basis and of being involved in discussion and deliberation with others. Throughout the research, participants had much to say about climate change, regardless of their levels of knowledge about the issue or apparent senses of issue salience and personal efficacy (see also, Lorenzoni, 2003), and participants appeared to enjoy being invited to talk about climate change (an issue which many had not had cause to think about until their involvement in the research). The follow-up interviews demonstrated that many felt that they understood the issue more clearly in relation to their own lives and felt a little more able to undertake individual actions.

A number of aspects of the study might be re-considered, if research along similar lines or topics is to be conducted in future. The mapping of participants in chapter five, on the basis of their semi-structured interviews is problematic: it is difficult to establish their positions in terms of climate change salience and personal efficacy in a rigorous way, based on the qualitative data. A quantitative component would have been useful at this stage in the form of a quantitative attitudinal scale (e.g. Likert scale) to measure salience and efficacy, mapping participants more firmly into the framework and forcing the operational clarification of these concepts. This may have been done using quotes from the interviews which captured various degrees of salience and efficacy for example.

Alternatively, the study may have begun with a wide quantitative questionnaire incorporating attitude scales similar to the above, in order to identify potential sample groups and to select three or four of these, composed of participants with clear salience and efficacy orientations who could subsequently be interviewed in more depth. The three sample groups employed in the study were selected because they allowed a range of opinions about climate change in relation to different walks and stages of life to be expressed. However, the selection of the sample might have been improved by incorporating a wider sample of people with different senses of salience and efficacy, and the propensity to act on climate change. Alternative or further sample groups of interest in this context may include those already leading “low carbon” lifestyles (people engaging in low carbon activities and living according to green moral convictions, e.g. members of Ecoteams) or environmental activists engaging in climate change campaigns. Other groups such as older people (who may have a different stake / outlook on the future) and people from different ethnic populations or religious backgrounds (cultural differences and alternative moral foundations) may also have revealed alternative senses of salience and efficacy.

I have also learnt personally from the experience of analysing the qualitative data. In retrospect, the interview analysis was more complicated than was needed. I was influenced by the Grounded Theory approach and keen to complete the analysis according to bottom-up principles to analysing qualitative data. However, this resulted in an extremely time consuming and labour intensive analytical process which, in retrospect, might not have been entirely necessary. If the research were to be carried out again, the interview analysis could have been more focussed and structured by the original research and interview questions. However, the iterative and evolutionary research design, as demonstrated in figure 4.1, meant that I was able to learn from the early experience of analysis and apply a more structured approach to the analysis of the large amount of focus group data.

A number of issues arose concerning the selection of images used in the study. For example, the systematic selection process did not control adequately for issues of aesthetic variation across the pictures used in the sample. The results presented in chapters six and seven highlighted that people's interpretations of the images was sophisticated; that the issues intended to be depicted by the photographs were possibly complicated by meanings associated with their aesthetic qualities, apparent ownership and other contextual issues. This introduced an element of ambiguity in the aspects of climate change that the pictures were intended to portray, despite the various measures taken employed to override these problems (e.g. expert consultation). The variety of images presented to participants was also not fully exhaustive of the range of climate change efficacy issues, despite my attempts to develop a thorough, representative classification as outlined in chapter six. For example, in retrospect, the sample should have included a depiction of environmental activism. This was included in the review of NGO climate change imagery, and may have been included to portray political action being taken in civil society as a collective response (i.e. some collective action or depiction of collective political agency; all of the 'agency' images included depicted individual level actions).

Notwithstanding the limitations outlined above, the research has produced consistent results, the implications of which are discussed as follows.

9.3 Discussion

9.3.1 People's outlooks on climate change

The results from all three stages of research demonstrate that the ways in which participants imagined, thought and talked about climate change were complex. For example, across the sample, participants' imagery of climate change ranged from imaginations of changes

happening presently and locally, to wild and catastrophic consequences happening far away and into the future.

Nevertheless, the characteristics of participants' climate change imagery, their senses of salience and efficacy, and the ways in which they responded to visual depictions of the issue were individually consistent throughout the study. For example, regular references to particular confusions or misconceptions or notable experiences that they associated with climate change (as suggested by Bostrom *et al.*, 1994; Kempton, 1991, 1997; Morgan, 1995; Read *et al.*, 1994; Rebetez, 1996). Participants also demonstrated consistent tendencies to relate to climate change at various levels. For example, some tended to articulate their outlooks in more personal and local terms than others, describing local imagery and talking about their feelings of salience and efficacy in these contexts. These findings confirm those of Lorenzoni (2003) who found that people's belief patterns are rich, complex and very individual.

The participants who tended to make more personal and local references to climate change demonstrated relatively stronger feelings of salience and efficacy than those who talked about climate change as a more remote and distant issue. These people imagined climate change in more global and abstract terms. Some participants specifically linked some of their personal concerns, experiences and everyday priorities to climate change (e.g. money, children, travel, job, etc., see chapter five for more detail) during the research process. The connections made tended to reflect individual circumstances and the ways in which participants appeared to think about environmental issues in relation to their own lives. Those who related to climate change in more abstract terms did not link the issue with personal experiences or concerns, and paid the issue little or no attention in daily life. They talked much more generally about climate change, usually referring to it as a distant, irrelevant issue.

While some participants felt relatively greater senses of personal salience and efficacy than others, climate change was still a generally but not personally salient issue and feelings of personal efficacy were marginal. The results clearly demonstrate that most participants felt that climate change was a backseat issue in relation to their personal concerns, as proposed by Poortinga and Pidgeon (2004) for example. These results support those of Bord *et al.* (1998) which also demonstrated that while levels of concern for global warming are not trivial, it is not an issue lying near the top of people's "burning issues" list (see also Lorenzoni and Langford, 2001b; Seacrest *et al.*, 2000). The literature in chapter two highlights that there appears to be a general concern for climate change, but places this in the context of other issues which take precedence, e.g. immediate personal priorities and social concerns such as the threat of terrorism, war, etc. (e.g. Norton and Leaman, 2004). This prevalent view that climate change was generally, but not personally important was combined with a feeling amongst the sample

that individuals could do little about climate change (see also Blake, 1999; Bulkeley, 2000; Hinchliffe, 1996; McDaniels *et al.*, 1996). These findings confirm suggestions in the literature that climate change is often perceived as a remote issue. Due to its complexity and global scale, it is a difficult issue to comprehend in everyday terms and relate to one's own environment and activities (e.g. Bord *et al.*, 1998; Kempton, 1991; Lorenzoni and Langford, 2001b; Peterson *et al.*, 1997; Stehr and Von Storch, 1995). Participants clearly articulated that it is difficult to see how their activities could affect the climate or how climate change could have local impacts (e.g. Jaeger *et al.*, 2000; Rebetez, 1996).

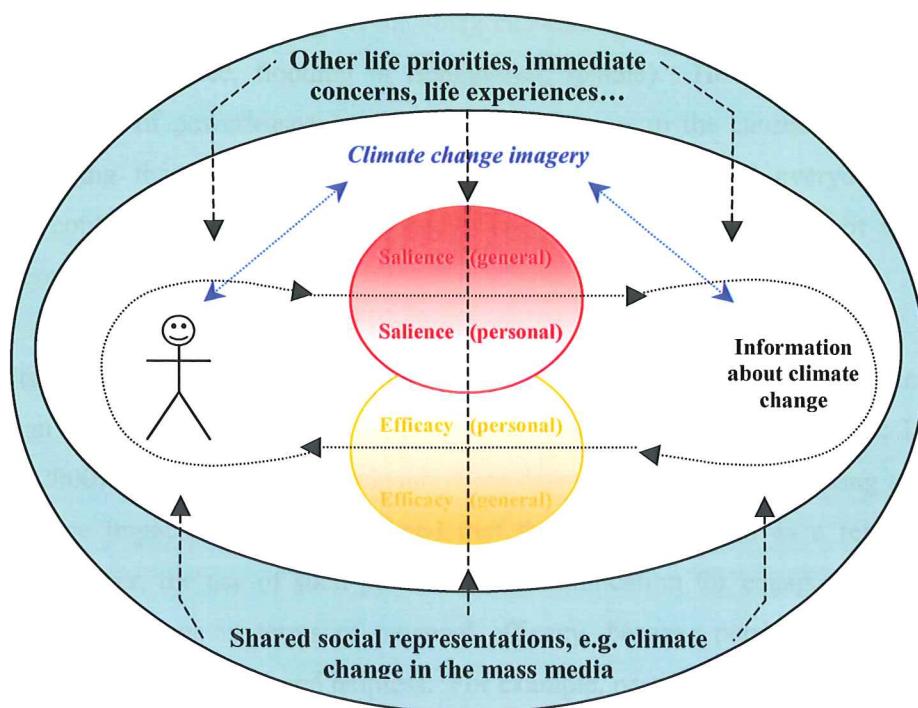
People do not passively perceive information about climate change (e.g. from the mass media), but interpret it in line with their concerns in life and social circumstances. The mental models approach contributes to the interpretation of the results of this study because it highlights that people's perceptions of climate change are set within a wider frame of influence, which embodies life experiences, attitudes, belief patterns, underlying values, cultural settings, immediate priorities and the issues in life that they consider of importance or concern (see chapter three). As Eiser (1994) suggests, attitudes particular issues such as climate change, are not addressed in isolation, but as a result of a whole network of connected concepts and traces of previous thoughts and experiences. People's knowledge about climate change and their uptake of new information is also guided by these underlying constructs (e.g. Mason and Santi, 1998; Rachlinski, 2000), and this partly explains the individual nature of participants' outlooks on the issue.

The results also demonstrate that some aspects of participants' outlooks on climate change were shared by most or all of the participants, e.g. climate change seeming to be a distant issue. Such perceptions can be argued to reflect more general social representations of climate change. They may also highlight impact of the mass media as a primary source of information and therefore selective knowledge provider and agenda setter (e.g. Bauer and Gaskell, 1999; Farr, 1993; Joffe, 1999). For example, climate change is often portrayed in global, sensational and catastrophic terms in order to hook and maintain audiences (e.g. Burgess and Carvalho, 2004; Deacon *et al.*, 1999). This kind of imagery and common examples such as melting ice caps, were elicited from the majority of participants in the semi-structured interviews.

Both Social Representations Theory and the mental models approach highlight a range of important influences on the way in which people interpret risks such as climate change (e.g. Breakwell, 2001; Joffe, 2003; Morgan *et al.*, 2002). Figure 9.1 illustrates how participants' outlooks on climate change are dependent both on their personal frames of reference as well as social representations of the issue; how their mental imagery, senses of salience and efficacy are related to their underlying beliefs, thoughts and experiences as well as social representations

which affect their interpretations of information and subsequent attitudes about the issue (e.g. Finke, 1985; Gregory, 1990; Kosslyn, 1980; Pylyshyn, 1981).

Figure 9.1 The setting of personal climate change imagery, salience and efficacy



Neither Social Representations Theory nor the mental models approach alone is sufficient to explain the construction of people's outlooks on climate change in reaction to the various incoming stimuli and demands in life which contribute to these. However, in conjunction they help to explain the great individual diversity of outlooks within broad patterns of consensus which have emerged from the data. As noted in chapter three, Breakwell (2001) argues that mental models of issues are not purely idiosyncratic but generated through processes of social representation. The results of this study support suggestions that whilst people do indeed have very individual mental models of the issue, there are also some common perspectives which would suggest the existence of some shared social representations of climate change. In the focus groups for example, where participants were brought together to discuss their thoughts about climate change and their reactions to the images presented, they articulated both a range of personal points of view and areas of clear group consensus. These areas of consensus could be observed both in participants' interpretations of the pictures and in common attitudes concerning, for example, the motivations of industry to act on climate change, or the level of Government commitment to the issue.

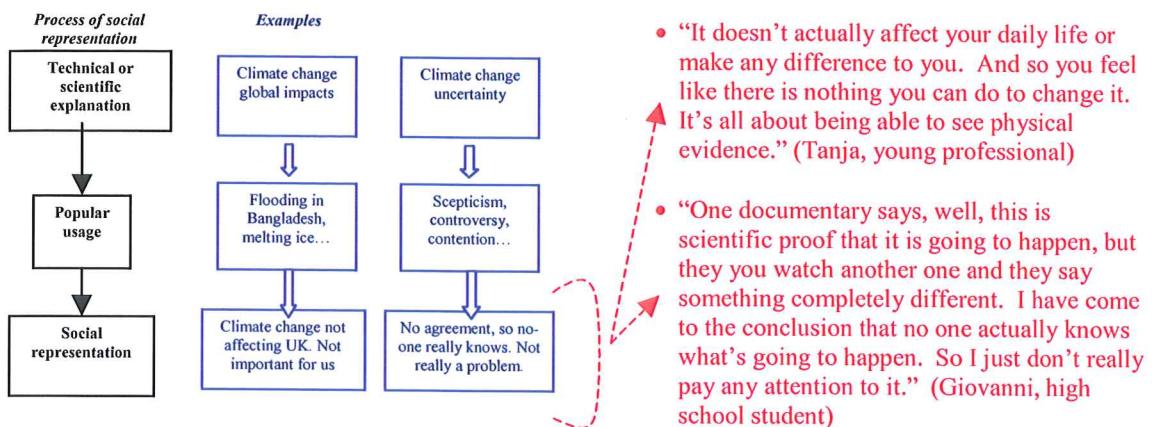
9.3.2 Climate change images = salience and efficacy?

The results reveal a paradox concerning the relationship between images of climate change and participants' senses of issue salience and personal efficacy. The pictures which most strongly conveyed a sense of climate change salience illustrated: global, dramatic, far-away and catastrophic situations; serious climate change impacts, both global and local (the latter being the flooded house and house falling off the cliff); and emotive scenes featuring human or animal suffering (e.g. melting ice, flooding in Bangladesh, famine). However, these images also prompted feelings of powerlessness to make any difference to the causes of climate change. Those conveying the greatest sense of efficacy depicted easy and everyday actions that individuals could take and showed renewable energy initiatives, but did not make climate change seem important.

The results support suggestions in the literature that affective or emotional, vivid and dramatic imagery can act as hooks for people's attention (e.g. Emsley, 2001; Graber, 1990; Trumbo and Shanahan, 2000). In this study, participants were drawn to pictures of suffering and dramatic climate change impacts and felt concerned that these could happen as a result of climate changes. However, the use of such pictures in communication for engagement with climate change has implications in terms of personal efficacy, because participants were left with feelings of being overwhelmed and helpless. For example, participants talked about feeling that their efforts could not make even a tiny difference in the face of such a crisis. The results are comparable to those presented by Myers and Macnaghten (1998), who argue that depictions of global crisis might be motivating but do not sit comfortably with the suggestion to take personal action, because they do not help people to make a connection between their everyday actions and global climate changes. Accordingly, the social representations of climate change reproduced in the mass media – the most significant source of information for most people – have been influential in shaping public response, e.g. confusion about the issue and a sense of impotency to respond (Wilson, 2000). This is because media representations of climate change tend to be dramatic, emotive and sensational with little connection to everyday behaviours. Such representations, portraying climate change as a significant but distant issue, appear to lead people to feeling that climate change is remote and consequently leaves them with a sense of powerlessness as discussed in chapters two and three (e.g. Bator and Cialdini, 2000; Bell, 1994; Gooch, 1996; Graber, 1990; see also Seppanen and Valiverronen, 2003). The reliance on these types of images in media communications have implications for public engagement with climate change because they are unlikely to instil a sense that the issue is of personal importance or that it is necessary and possible to take personal action; representations of global catastrophe might attract attention to a story but do not convey any notion of personal responsibility for acting on climate change or a sense of individual agency.

Figure 9.2 (based on figure 3.3) depicts the process by which scientific information becomes a social representation, and gives examples in the context of climate change. It demonstrates how the construction of social representations may mediate people's actual propensity to change their outlooks and behaviour. Figure 9.2 highlights the propensity for information to be detached from its original context and re-interpreted, and emphasises the complex and interacting nature of information, knowledge about and perceptions of climate change.

Figure 9.2 Social representations of climate change mediating people's propensity for issue salience and personal efficacy.



The results of the Q-sorts and focus groups highlight the complexity and sophistication of people's interpretations of images, the results demonstrating that people are skilled and perceptive in their interpretations of images, and critical of the messages that they consider are being portrayed⁹¹. For example, in the focus groups, participants reflected upon the emotive power of various images, questioning their context, source and purpose, why and in what contexts such pictures might be used to communicate messages about climate change. All these aspects have implications for the way in which climate change is visually communicated. Participants noted, for example, that the photographic images were more resonant than others (e.g. the cartoon) because of their realism and depiction of actual events (important qualities according to Deacon *et al.*, 1999). The visual quality and aesthetic appeal of various pictures was also considered by participants to be effective in drawing their attention to the issue being portrayed. During discussion however, participants in all groups raised issues of scepticism concerning the construction of some of the images, particularly those involving people and animals (e.g. famine, dried up river bed with dead fish). Participants in all three focus groups agreed for example, that they may have been staged for a particular purpose and to portray a

⁹¹ Deacon *et al.* (1999) state that this is probably because many of the central forms of mass communication (e.g. film, television, magazines, popular newspapers, advertising, the internet) are saturated with images, making image interpretation an everyday activity that people have become good at.

particular message according to the photographer's interests; that the apparent reality they depict may actually have been constructed. The participants were viewing the images used in the study out of their original contexts and this point was also emphasised; they wanted to identify the institutions responsible for the creation and selection of the images, where they were used and for what purposes, etc. Participants felt that issues of image source, ownership and context were pertinent in terms of the issue salience and senses of efficacy conveyed. For example, participants in the young professionals and high school groups suggested that their interpretations of the graph and subsequent feelings of issue salience would differ depending on who was employing the image in communication (e.g. if BP were to use the graph they would take it more seriously and consider the issue more important than if Greenpeace were to use it, stating that it would be just another piece of green propaganda for example).

Chapter three introduced the issue of perceived trust and credibility in the institutions providing people with visual information. A clear concern to identify the source of statements and images was also found in the work conducted by Myers and Macnaghten (1998). They also noted that distrust in institutions affects responses to sustainability information. The results of this research certainly suggest that the understanding and uptake of scientific messages and perceptions of environmental risks is affected by people's attitudes concerning the credibility of scientific expertise (e.g. Kasemir *et al.*, 2000a; Wynne, 1996). The findings emphasise the complexity of people's reading of images; sometimes viewing them at face value and at other times raising questions about their realism and how the images are constructed and mediated (and by whom). The results indicate that images are not taken as an information source alone, but are quickly deconstructed according to their context, accompanying information, perceptions of their sources, etc. These points have implications for people's senses of salience and efficacy. For example, distrust in institutions, associated with people's social representations and mental models of these organisations, may lead to scepticism about the purpose or point of the image and whether to believe what it is suggesting; whether to take climate change seriously and take behavioural actions, and so on.

Some of the images in the sample carried significant resonances for participants. However, others were considered more ambiguous or seem as irrelevant to the topic of climate change. The most resonant tended to be those derived from the interview data (and therefore the participants themselves). These were most familiar to participants, depicting situations or experiences associated with climate change by the participants, supportive of their mental models of the issue and reflective of the social representations circulating in the public domain (e.g. in the media). Representations of science held by lay people are more likely to originate in the mass media than in the scientific community, the media being a key mediator of this

information as noted above (e.g. Joffe, 2003)⁹². The images considered ambiguous and/or irrelevant were largely derived directly from the contributions from expert consultation and review of the scientific literature. This outcome highlights a divide between expert and lay views of climate change, suggesting implications for the communication of climate change science, by experts to a public audience (e.g. Rebetez, 1996, emphasises the need for representations of climate change to escape the format of climatic data). It supports the argument posed by Irwin and Wynne (1996), that people do not simply need to be provided with information, and that communication of scientific issues should carefully consider the needs and interpretations of the publics and the ways in which personal understandings fit together with scientific information. It highlights that it is not only people's individual mental models, based on their personal concerns, experience and underlying values that influence their interpretations of images and climate change information, but also shared representations of climate change which are quite different from expert representations of the issue.

Participants worked in groups, through a process of elimination and deliberation, to select a set of climate change images which made them feel most engaged. In combination, participants found that the images gave each other context and conveyed complementary feelings of salience and efficacy and more powerful feelings of engagement than when viewed independently. This was particularly the case when the causes, impacts and potential solutions to climate change from global to individual levels were linked. In other words, when the personal relevance of climate change causes and impacts were made clear. In the combined format, the images were most motivating, giving a positive message and conveying senses of both salience and efficacy, which the images viewed alone did not have the capacity to do. Potential was also found for images of climate change, particularly when combined with group deliberation, to override misconceptions or gaps in knowledge (e.g. Kempton, 1991, 1997).

All groups indicated that communications for engagement should incorporate and link the causes, consequences and possible responses, making reference to both personal or local and more global scales. The data suggest that climate change images are most meaningful when they convey an integrated message which is personally relevant but set against a backdrop of the global seriousness of the issue. For example, depictions of the global impacts of climate change added a strong element of issue salience for participants when presented in context. People need to be provided with the knowledge about what one can do as well as the means by which they can act on this concern. Bator and Cialdini (2000) suggest that messages promoting specific goals will have the most persistent effects. The results do indicate, however, that while

⁹² The presence of educational social representations of climate change were also apparent in the results of this research (particularly as a result of the inclusion of the high school students), highlighting the role of education as a further key mediator of climate change information for some groups in society.

a sense of efficacy may be conveyed by images, this is somewhat restricted to those considered simple and easy in everyday terms (see also Gibson, 2001; Rossiter and Percy, 1980). Section 9.3.4 revisits this point.

9.3.3 Implications for communicating climate change

The results raise issues for communications about climate change which are intended to be engaging and to stimulate behavioural action (or change). This discussion has noted that representations of climate change in global and catastrophic terms may well act as a hook, but that these have implications for conveying senses of salience and efficacy. It has also indicated that a deficit model of public understanding does not appropriately inform the communication of engaging climate change messages (e.g. Irwin and Wynne, 1996; Sturgis and Allum, 2004). As suggested by Farr (1993) in the context of health, engaging communications should be designed with consideration of the nature of people's existing mental models and social representations of an issue if they are to be understood and taken on board (issues of institutional trust and credibility form part of this). This is because people define issues and situations and interpret information according to their personal frames of reference, daily lives and immediate social worlds. Farr argues for example, that because people act on the basis of their social representations, messages which do not take these into account will not be effective. He states that to effectively communicate messages or policy measures about climate change, the communicator needs to understand both the science and people's 'common sense' interpretations or social representations of an issue as outlined in chapter three (in other words, understanding the social and cultural contexts of target audiences as suggested by Burgess *et al.*, 1998; see also, Bator and Cialdini, 2000; OST and The Wellcome Trust, 2001). Myers and Macnaghten (1998) add that approaches to communicating sustainability messages have thus far failed to take into account the ways in which people interpret information in terms of their 'commonplaces' – their everyday lives, immediate worlds.

Climate change imagery and deliberation with others may help to make climate change seem more real or immediate, more personally relevant, tangible and worth doing something about. The results suggest that if messages about the importance of climate change and relevant behavioural change are to be taken up, it is necessary to clarify the relevance of climate change and issue-related behavioural actions to the everyday lives of target audiences. Using appropriately designed imagery to make climate change personally relevant (both its impacts and mitigative actions that can be taken) is one potential way of making climate change more personally meaningful to people. The results of this study emphasise the need for such messages, which appeal to people's daily lives and connect with their concerns, everyday experience, attitudes and behaviours. These include priority concerns and issues of personal importance such as children and family, local environment, health, money, etc. Images of

climate change can be used to establish personal links with the global dimensions of climate change and to give people clear and consistent indications of what they can do. However, communicators must also consider the barriers that people perceive to engaging with climate change, addressed in more detail in the following section. This is because people need to be given behavioural cues which are perceived to be realistic and achievable within one's daily life. For example, suggestions for 'no regrets' actions – activities and behaviours which are personally beneficial as well as good for climate change, making life easier and better in various ways (e.g. health and financial benefits). Communication strategies must also highlight positive alternatives for habits which to some extent direct people's behaviour and everyday activities.

The effectiveness of visual communications about climate change have been shown to benefit from people being given the opportunity to engage in personal thought and social deliberation about the information they are presented with. The interview process gave participants the chance to think about climate change, an issue many had not considered before. The subsequent deliberative processes led participants to explore the meanings of the images and to discuss these others, enabling them to visually link the causes, impacts and possible options for doing something about climate change. These results demonstrate that these processes were influential of participants' understanding and outlooks on the issue.

This study indicates that the apparently least engaged participants who initially knew very little about climate change, did not understand it, had the most abstract outlooks, and who had not considered the issue from a personal point of view before, were most moved by the experience of participating and interacting with the images. The research process gave them the opportunity to develop their understanding of climate change, by driving participants to think about the issue, respond to the images, consider and discuss how the images and the issue related to oneself and ones locality, and so on. Social Representations Theory outlines the role of anchoring and objectification – the processes by which incoming information is transformed, by which representations are re-thought and re-presented. The research has to some extent demonstrated this process in action: as individuals participated, their understandings of climate change (their representations and mental models) altered in response to the combination of visual images and social interaction with others.

These results suggest that the effectiveness of visual information in the media or publicity campaigns will have added value if people are given the time and space, or the cues to really think about it and to engage in dialogue with others. The use of imagery certainly represents a starting point; exposing people to climate change and causing them to address it when otherwise it may remain dormant. Personal 'hooks' and links with relevant everyday issues as outlined above may play some part in triggering such a process.

9.3.4 Barriers to engagement

Participants generally felt that their involvement in the research process had stimulated their senses of salience and efficacy. This was largely because the interaction with images of climate change and group deliberation enabled some of the participants to overcome a lack of knowledge or understanding of the personal relevance of the issue. However, on later reflection, participants reported that their feelings of issue salience and personal efficacy had undergone little substantial change. The data suggests that however well designed visual communications might be, there are numerous barriers which are likely to stop people from engaging with climate change and taking personal action. On completion of the study, climate change was still seen by participants as being generally but not personally important and beyond taking small measures, participants did not feel able to do anything significant to reduce its causes. In the discourse surrounding imaginations and images of climate change, salience and efficacy, participants articulated a wide variety of different explanations for these feelings.

Some of the perceived barriers to engaging with climate change are individually specific, relating to a lack of knowledge, other priorities in life, and more immediate or pressing concerns for example. The research indicates that these may have the potential to be overcome using engaging communications, particularly those associated with a lack of knowledge or understanding of the issue (e.g. Kempton, 1997; Stamm *et al.*, 2000). This is principally as a result of reaching an understanding of how climate change is personally relevant and what one can do about it. This learning, as a result of participants' involvement in the study also involved overcoming misconceptions; an example of alteration of inaccurate mental models caused by misunderstanding and in some cases a lack of knowledge about the issue (e.g. Kempton, 1991, 1997; Read *et al.*, 1994).

The results from all three stages of research highlight however, that there are many more major barriers which are significant, and shared by the majority of participants (e.g. the U.S. stance on the issue and its lack of commitment, controversy related to scientific uncertainty, not being affected by climate change, lack of acceptable public transport options, etc.). Regardless of their knowledge about climate change or their sense of the issue being salient, these widely perceived barriers appear to prevent participants from engaging with climate change, particularly from a behavioural point of view. They override even the relatively greatest feelings of personal issue salience and personal efficacy amongst participants. The results indicate that these barriers tend to relate to the global political nature of climate change, issues concerning infrastructure, facilities and options for change, and perceptual issues of the scale of climate change in time and space (addressed in more detail in the results chapters and reflective of the literature reviewed in chapter two, e.g., Lorenzoni and Langford, 2001a, 2001b; Lorenzoni, 2003; Peterson *et al.*, 1997; Rachlinski, 2000). A consequence is that while people

feel that they may be able to take small actions, it is not considered possible at an individual level to substantially reduce the causes of climate change. Table 9.1 presents a summary of the barriers arising in the data at all three stages of empirical research and distinguishes between those cited as barriers to salience or efficacy, although some are common to both.

Table 9.1 Barriers to engagement

Barriers	Interview	Q-sort	Focus groups
SALIENCE (and imagery)	<ul style="list-style-type: none"> • America / other countries do not take it seriously • Government does not do anything or take it seriously / businesses and industry do not care • Can not imagine the future, let alone climate change; have never thought about it / climate change is not happening / cannot see it happening / climate change is not relevant to me / does not affect me / does not seem real / I cannot relate to climate change / future issue not present / do not care (I'll be dead) • Other priorities, climate change does not come close / not interested / others are not interested • Lack of awareness / knowledge / understanding / confused by conflicting information, do not know what to think / sceptical about the science; no-one really knows what will happen • Feel helpless / unable to do anything • No reason to be concerned about climate change, might be a good thing • Not much in the media, is not topical / not enough in schools • Do not know or think about it because it's depressing 	<ul style="list-style-type: none"> • GW Bush does not consider climate change important; represents that climate change is not important to Governments • Changes will not be that bad, we can cope / climate change is positive / image shows the advantages / image does not show a hazard / does not show consequences • Climate change is not relevant to me / is not happening / cannot see relevance of this image / do not know what this has to do with climate change / the impacts in these images might not be due to climate change 	<ul style="list-style-type: none"> • George Bush finds climate change unimportant • Government not bothered • Images show situations that might not be to do with climate change / images showing things happening naturally / images are irrelevant / do not understand what these images are showing / how they relate to climate change • Images not serious / realistic • Images are uninspiring / unexciting / everyday scenes, no different, does not matter if climate change is like this / images make climate change look positive
EFFICACY (and imagery)	<ul style="list-style-type: none"> • America / other countries not taking action • Government not doing anything / business and industry just carry on polluting / not my responsibility; down to Government / others • International disagreement about what to do • Climate change is natural / will happen anyway / people cannot stop it / one person cannot make a difference to such a big issue / other people not taking action • Future issue not a present one; no point doing anything / threat is not real / not affecting me • No need to do anything about climate change, might be a good thing / technology can cope – will solve problem • Lack of facilities or alternatives – public transport is expensive / smelly / unreliable • Lack of awareness and understanding / do not know causes / what to do / do not know if it's worth making an effort • Not enough in schools or in the media • Cannot be bothered to do anything / it's a waste of time / I'm too busy, do not have time / other things to do / would prefer to do other things / costs too much 	<ul style="list-style-type: none"> • Bush is too powerful, does not consider climate change important; why should I do anything? Without political action, I can do nothing • Worldwide scale: individuals have no control over causes or consequences / impacts are too severe: nothing I can do / happening in other countries, I'm too far away to help • Will happen anyway; seems impossible to do anything / major causes (e.g. industry) will not stop, so individual action is pointless / it's too late to do anything, will happen anyway • Climate change is natural / inevitable / will happen anyway so no point taking action (will continue even if I do) / I cannot stop the weather • Technology can cope • Image is not motivating • Lack of alternatives / facilities; poor public transport 	<ul style="list-style-type: none"> • America not taking action; GWB will not listen, will not change • Government not doing anything / other people not taking action, will just carry on regardless / cannot stop the causes, industry will continue • Individuals cannot do anything about such big impacts / people cannot stop climate change / will happen anyway / impacts are far-away / too far to help • Lack of facilities and alternatives – public transport is unreliable and expensive • Costs money to change • Might not take action even if I know what to do

The most fundamental barriers (emphasised by participants and mentioned on many occasions, throughout the research stages) are listed toward the top of the boxes. All of the perceived barriers to salience, efficacy and actually taking action operate at different levels and scales. They also often overlap with one another, making it difficult to give a definitive list. However, they have been approximately grouped in table 9.1 in order to summarise the variety of obstacles perceived by participants to engaging with climate change. The most consistent are the more major or fundamental barriers, e.g. participants noted at all stages that the issue felt big and overwhelming and that there was a lack of Governmental commitment and leadership on the issue. The subsidence of some of the initial barriers to salience and efficacy elicited in the interviews possibly reflects the learning element of the participation process and clarification of confusions or misunderstandings. The results give little actual indication of people's propensity for behavioural change if barriers are overcome. This is because of the notorious difficulty associated with measuring people's behaviour on the basis of how they claim to or state that they intend to act, no matter how engaged they appear to be. This issue is outlined in the literature in the field of environmental perceptions and behaviour (e.g. Blake, 1999). Some participants clearly pointed out that they doubted whether actual behavioural action would occur even they intended it. Participants were determined that real action must come from above – that until there is collective action, it is unlikely that people will make voluntary behavioural commitments. Participants also noted on occasions that even if some of the fundamental barriers were to be overcome, they would not feel much more engaged with the issue.

Chapter two outlined the Theories of Reasoned Action (TRA) and Planned Behaviour (TPB) and argued that the latter may offer a way in which people's perceptions of issue salience and personal efficacy might be linked to behavioural change. The TPB includes a measure of perceived behavioural control, which may obstruct the intention-behaviour link. It is likened to the concept of self-efficacy, and helps to determine whether an individual attempts a given behaviour, offering some explanation for the mismatch between concern about climate change and associated behavioural action. The barriers revealed in this research may constitute obstructions to the attitude-behaviour link, as outlined by Ajzen (1985). They are also comparable to the framework proposed by Blake (1999) who asked participants to identify barriers preventing them from carrying out particular environmental actions despite feeling generally concerned about the environment.

As its name indicates, the TPB infers that behaviours are planned, however the reasons for carrying out some behaviours (or not) are not necessarily conscious, and therefore not necessarily planned. One may therefore interpret various barriers as examples of people's reliance on habitual, socially accustomed, and often carbon intensive lifestyle behaviours. Jackson (2004) notes that unplanned and habitual behaviours are very important in terms of

climate change causing activities; that they are socially relevant but not necessarily dictated by rational choice (e.g. driving children to school, taking holidays overseas, buying food from a supermarket rather than local produce from local shops). Such behaviours are important because many are associated with significant emissions and are carried out over and above people's stated environmental concern. They are often reinforced, for example, by the infrastructure of our towns and cities. Consumption-related habitual behaviours are likely to be hard to change because they are culturally embedded and often inconspicuous (e.g. Eden, 1993; Hobson, 2003). These unplanned behaviours compromise the likelihood of people developing the intention to act and of acting on their intention, questioning the applicability of the TPB to this study. For example, Verplanken *et al.* (1997) argue that habits are strong predictors of future behaviour over and above measures of attitude and social norm. Habitual behaviours mean that people do not always consider the more environmentally friendly alternatives even if they know about them, and even if these are more personally beneficial. They obstruct people from carrying out alternative action, because decisions about whether or not to carry out habitual behaviours are not made consciously in accordance with one's environmental concerns (e.g. when the children are running late for school, alternatives to driving are not given a passing thought).

Some of the examples or indicators of these types of barriers are unintentionally classified by Blake (1999) as 'individual' and 'individual in social context' (in figure 2.3). Unintentional, because they cannot be explicitly determined on the basis of accounts from participants if they are related to unconsciously carried out behaviours. Figure 9.3 highlights the situation of such 'routineised' behaviours to Blake's framework. The influence of such barriers in relation to the TPB is illustrated in figure 9.4.

Figure 9.3 Contemporary barriers to action on climate change (based on figure 2.3, adapted from Blake, 1999:267)

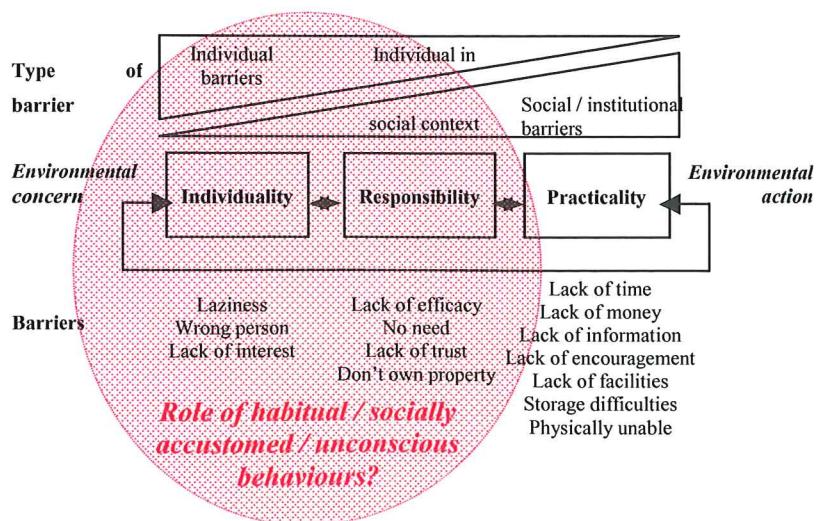
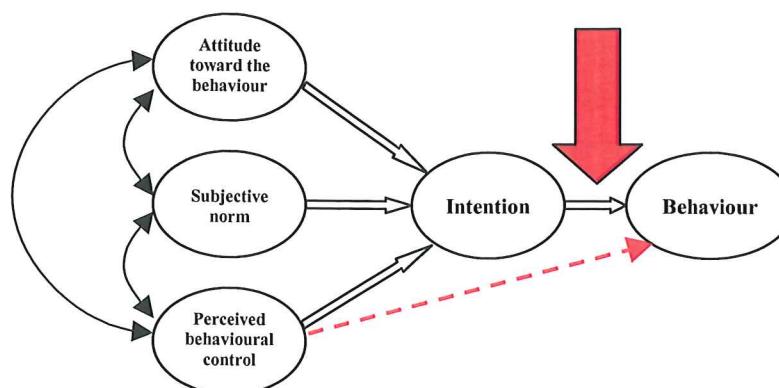


Figure 9.4 Barriers to engagement and the Theory of Planned Behaviour (adapted from Potter, 1996:132)



While Verplanken *et al.* (1997), argue that habits are stronger predictors of future behaviour than attitudes and social norms, the role of subjective norm and attitude elements in the TPB are still of relevance. Subjective or social norms (i.e. attitudes of friends, peer groups etc., toward the behaviour) influence the formation of intention to act; the results indicate that in the case of climate change this plays an obstructing role. Throughout the research, participants spoke about not feeling able to do very much about climate change because of a lack of action being taken by others, and perceptions of a widespread disinterest in taking environmentally friendly behavioural actions. This can be applied to the perception of a lack of national commitment by Government to take action on climate change, right down to the efforts made (or not made) by other people in one's social circles and local communities. The role of subjective norms in driving intention and action is demonstrated in the literature concerning environmental activists (e.g. Eden, 1993) and amongst communities practicing environmentally friendly living, e.g., people involved in 'Ecoteams' (Global Action Plan, 2004; Nottinghamshire County Council, 2004). Intention and action amongst these groups are driven not only by their senses of efficacy to make a difference (or perceived behavioural control), but also by the influence of social norms (peers believing that eco-behaviours should be carried out) and by personal attitudes toward the behaviours (morally the right thing to do). In contrast, people for whom climate change or the environment may not be a prominent and everyday issue of importance are more likely to be held back by their perceived behavioural control and social norms concerning environmentally friendly behaviours (even if their attitudinal belief indicates that they feel it is morally important to care for the environment and to act to protect it).

The literature suggests that attitudes are strong predictors of behaviour in the TPB (e.g. Hagger *et al.*, 2001). However, the preceding discussion highlights that even if people state that they believe that humans should behave in environmentally responsible ways, they frequently do not do so. This has been shown to be because of the influence of the barriers noted above, and

habits which drive people toward acting in more socially accustomed and personally more rewarding ways (e.g. quicker, cheaper, easier, etc.), thereby reducing the positive influence of subjective norm and PBC, and obstructing the intention-behaviour link. For the most disengaged participants in this research (e.g. or “deniers”, as Lorenzoni, 2003 has labelled them), attitudes toward environmental friendly behaviours may also be negative leading to no intentions to act, e.g. there is too much uncertainty, I don’t believe climate change is serious and so there is no need to act, in which case the TRA and TPB do not apply at all.

The mismatch between concern and behaviours which remain unchanged, appears to lead people to a sense of unease and the construction of justifications for such behaviour in order to manage this. Some of the barriers identified throughout this thesis are characteristic of these justifications and the types of defence or dissonance mechanisms as outlined in chapter two (Joffe, 2003; Stoll-Kleemann et al., 2001). The results support the suggestion that these dissonance mechanisms are used to reduce the sense of unease experienced by participants who do not act according to their stated beliefs that people (including themselves) should take action on climate change. Some of the barriers can be interpreted as justifications to dissuade the dissonance experienced when one is reluctant, for example, to give up some of the lifestyle luxuries one is accustomed to (e.g. “it’s not me who should take action, others are to blame”). Perceived external barriers are valid in themselves but sometimes overlap with dissonance-related justifications for feeling concerned, yet not taking action, e.g. “I could take the bus, but it would take time and effort to get to the bus stop – going by car saves time and money”. These barriers tend to be related to people’s lifestyle choices and preferences, e.g. being ‘too busy to think about it’ (see also Oskamp, 2000; Rachlinski, 2000). The results also suggest that taking simply tokenistic measures also represent justifications for not having to engage any further.

The results of this study offer a range of insights, useful for those involved in policy making, climate change communications, engaging the public with the issue and researching public perceptions of environmental issues. The study highlights the positive role which climate change imagery may play in helping people to consider what climate change means for them and what they can do about it. It also underlines the potential for deliberation and dialogue to play a part in public engagement activities. Further research involving deliberation around images of climate change as a learning and engagement process would further inform policy makers and environmental communicators. Future research might also take a longitudinal design involving sustained contact with participants, and support to help them implement lifestyle changes and work around the their barriers to action. Such an arrangement could act as a responsive forum for ideas and a local organisational network to enable collective action, e.g. community or school energy saving programmes (including energy efficiency in the home /

habits which drive people toward acting in more socially accustomed and personally more rewarding ways (e.g. quicker, cheaper, easier, etc.), thereby reducing the positive influence of subjective norm and PBC, and obstructing the intention-behaviour link. For the most disengaged participants in this research (e.g. or “deniers”, as Lorenzoni, 2003 has labelled them), attitudes toward environmental friendly behaviours may also be negative leading to no intentions to act, e.g. there is too much uncertainty, I don’t believe climate change is serious and so there is no need to act, in which case the TRA and TPB do not apply at all.

The mismatch between concern and behaviours which remain unchanged, appears to lead people to a sense of unease and the construction of justifications for such behaviour in order to manage this. Some of the barriers identified throughout this thesis are characteristic of these justifications and the types of defence or dissonance mechanisms as outlined in chapter two (Joffe, 2003; Stoll-Kleemann et al., 2001). The results support the suggestion that these dissonance mechanisms are used to reduce the sense of unease experienced by participants who do not act according to their stated beliefs that people (including themselves) should take action on climate change. Some of the barriers can be interpreted as justifications to dissuade the dissonance experienced when one is reluctant, for example, to give up some of the lifestyle luxuries one is accustomed to (e.g. “it’s not me who should take action, others are to blame”). Perceived external barriers are valid in themselves but sometimes overlap with dissonance-related justifications for feeling concerned, yet not taking action, e.g. “I could take the bus, but it would take time and effort to get to the bus stop – going by car saves time and money”. These barriers tend to be related to people’s lifestyle choices and preferences, e.g. being ‘too busy to think about it’ (see also Oskamp, 2000; Rachlinski, 2000). The results also suggest that taking simply tokenistic measures also represent justifications for not having to engage any further.

The results of this study offer a range of insights, useful for those involved in policy making, climate change communications, engaging the public with the issue and researching public perceptions of environmental issues. The study highlights the positive role which climate change imagery may play in helping people to consider what climate change means for them and what they can do about it. It also underlines the potential for deliberation and dialogue to play a part in public engagement activities. Further research involving deliberation around images of climate change as a learning and engagement process would further inform policy makers and environmental communicators. Future research might also take a longitudinal design involving sustained contact with participants, and support to help them implement lifestyle changes and work around the their barriers to action. Such an arrangement could act as a responsive forum for ideas and a local organisational network to enable collective action, e.g. community or school energy saving programmes (including energy efficiency in the home /

school and advice on buying habits, etc.); group forums for working with local councils and government for better infrastructure and sustainable services.

9.4 Conclusions and wider implications

This research reveals a paradoxical impact of visual imagery on people's senses of issue salience and personal efficacy; dramatic and sometimes emotive imagery conveyed a sense of issue salience but was disempowering, leaving people with a sense of helplessness and of being overwhelmed by the issue. Conversely, those images which conveyed a sense of efficacy did not stimulate feelings of issue salience. These results raise implications of the way in which climate change is communicated in the public domain. For example, the media tend to represent climate change in dramatic and newsworthy ways. Media representations of climate change are the main source of information on the subject for most lay people. However, these are the very kinds of representations which this research suggests are likely to leave people feeling unable to take action on climate change. Carefully designed visual communications may counter these dominant disempowering representations and engage people with the issue. As the research has shown, images of climate change can be combined in ways that convey both a sense of issue salience and of personal efficacy. By linking images of personally relevant impacts of climate change with those of its causes, and of mitigative actions that can be taken by the individual, the images were found to be both informative and behaviourally motivating (particularly for those participants with the least awareness and knowledge about the issue). These combinations of images were thus found to be powerful in driving an understanding of the personal relevance of climate change and motivation to engage. When partnered with group deliberation, such combinations were found to be particularly useful in helping people to visualise the potential consequences of their everyday lifestyle choices and behaviours.

Overall, the results demonstrate that climate change is not considered to be personally important in comparison to people's everyday priorities and concerns, and that they do not generally feel able to do anything significant about climate change on an individual basis. Even when they understand the issue, state that they are concerned about climate change and know what to do about it, people's behavioural responses to the issue are at best, minimal, e.g. using low-energy light bulbs. Even in apparently the most engaged cases, there is a lack of action, explained by the many perceived barriers which affect people's senses of issue salience and self efficacy, and which obstruct the links between concern, intention and action.

This thesis offers many examples of the barriers which help to explain the apparent gap between people's stated concern about climate change (and sometimes intention), and their propensity for taking behavioural action. These vary in scale from those specific to the individual, to those

experienced by participants across the sample. The majority of these barriers were in many ways shared and reflective of the wider political and cultural context, e.g. the lack of commitment by the US, high-consuming western lifestyles. Knowledge also plays a part. People's lack of awareness of the significant carbon embeddedness of their activities, of the extent to which their lifestyles are carbon dependent on a whole network of activities, has serious implications for their ability to cut household carbon budgets (e.g., where food and goods come from, how these are manufactured, etc.). However, the research demonstrates that those who are even somewhat aware construct powerful justifications for maintaining their lifestyles, even if less energy intensive alternatives are recognised and understood. Habitual, social and cultural behaviours have been shown to have implications for people's sense of issue salience and of personal efficacy, and therefore their engagement with climate change. These behaviours are hard to change (e.g. the seatbelt campaign has continued for nearly 20 years, however people are still killed in car accidents because they do not always wear them).

These findings may inform the design of policy and campaign messages which aim to engage the public in order to reduce societal carbon emissions. They indicate that messages need to offer positive (e.g. 'no regrets') and easily achievable alternatives to everyday behaviours, outlining specific examples of actions that can be taken. Combining a sense of motivation with an understanding of what one can do is important if people are to feel compelled to make decarbonising lifestyle changes. The issue needs to appear to be both globally and personally relevant and important; a 'global' emphasis is not an adequate stimulus as this research has demonstrated. It can lead to a state of being overwhelmed and unsure about how to comprehend a distant issue, leading to feelings of ambivalence. There is a role for basic information provision within carefully designed communication packages, but communicators also need to take account of people's 'common sense' interpretations of the issue if policy messages are to be communicated effectively. This means that a simple top-down flow of information aimed at filling a knowledge deficit is inadequate. Climate change imagery can be used to anchor climate change to everyday issues of importance and concern, being instructive and highlighting beneficial actions at the same time. This study demonstrates that currently, people's tendency is to consider climate change as a remote issue, unrelated to personal priorities and the demands of daily living. It does not feature on individual agendas, is not in the forefront of people's minds and is therefore not of personal salience or an issue considered in relation to one's everyday consumption behaviour. The research also suggests that a regular and consistent flow of information and practical reminders from many different directions could counter this, as participants felt that they were most likely to engage if climate change is prominent in their minds, and related to everyday issues.

While the findings highlight ways in which images of climate change may help to raise people's understanding and awareness of the personal relevance of climate change and of what they can positively do about it and possibly help future policy changes, they also suggest that visual communication, however sophisticated, is not sufficient to move people beyond tokenistic engagement. Even when persuasive visual appeals are implemented, people may still find it difficult to act. This is because of the collection of perceived barriers to engagement articulated by participants as justifications for lack of personal issue salience and a lack of personal efficacy and inaction. Rather than treat these merely as excuses, the strength and influence of the many different types of barriers pinpointed by this research should not be underestimated; they have serious implications for the likelihood of the UK substantially reducing its emissions over the coming decades.

Technological development alone cannot ensure the 20% reduction in fossil fuel emissions suggested by the UK Climate Change Programme or long-term emissions reduction beyond 2050. Reducing greenhouse gas emissions by 60% as suggested in chapter one will require radical changes in social behaviour and consumption patterns. Achieving these changes within a consumerist democracy clearly poses significant political challenges because unsustainable energy consumption is linked to the ways in which people desire and are accustomed to live. This research lends to the conclusion that only a tiny fraction of the 20%, let alone 60% target can be achieved through popular commitment; low carbon lifestyles are not currently considered to represent a way of life that people are willing to adopt and they currently feel unable to make the substantial behavioural changes necessary. Given a lack of political emphasis on changing social patterns of consumption combined with the view that technical shifts will substantially reduce emissions, there seems little prospect for appropriate social change. Indeed, this position is likely to reinforce unsustainable behaviours, or at least leave them unquestioned and encourage habitual, carbon intense behaviours to continue.

Given participants' current outlooks on climate change in relation to their own lives and activities, the prospect for voluntary action beyond the trivial is unlikely. People's outlooks on the issue are particularly influenced by an apparent lack of consistent signals to suggest that climate change is an important issue characterised by collective action. A distinct lack of priority is being given to climate change both economically and morally in the day to day running of our society, policy, the economy, etc. Without concerted action from the UK and the prospect of American commitment for example, the average person is unlikely to adopt what they consider would be an altruistic approach. At best they will continue to take minimal actions which deliver short term rewards and that are economically beneficial (but at present not typically environmentally friendly). While much is said publicly in support of the issue, for example, by the Prime Minister and the Government's Chief Scientist in recent speeches, there

is no perception of a clear commitment by Government, business and industry to taking significant action on climate change. Most of the participants involved in this study expressed some degree of willingness to engage with climate change and other environmental issues, and felt it morally important to do so but felt ineffective and unsupported. They perceived considerable restrictions to being able to change aspects of their lifestyles. Many of these were associated with a lack of top-down commitment and a consequent lack of trust in Government itself to seriously engage with the issue of climate change.

The research indicates that change needs to be driven from above and be consistent at all levels of government and in business and industry because currently people do not feel a sense that climate change is a really important issue; they are reluctant to make, what are seen as significant changes to their lifestyles while they perceive a lack of commitment and action from above and by others around them. Therefore, people need to receive the types of communications as outlined above *in conjunction with* complementary infrastructural changes and mechanisms driven from the top downwards; visually communicating engaging messages about climate change should be employed as part of a long-term process of cultural change because people are unlikely to commit themselves to engaging with climate change until they see society as a whole beginning to shift towards a low carbon and more sustainable way of life. People need to feel that they are part of a broader response to climate change; they need to feel that there is commitment, guidance and leadership from the UK Government at all levels, businesses, schools and education, technology, pricing, infrastructure, as well as from the other sectors from the global down to the local level.

In summary, this research highlights the propensity for visualisations of climate change to convey a sense of the issue being important and that individuals can take more action as a contribution to reducing the causes of climate change. In appropriate combinations, carefully tailored to the audience with an understanding of their prior perspectives, visual images may enhance communication about climate change, increasing awareness and understanding, thereby moving people some way to feeling more engaged. However, until this is reinforced by significant political commitment, and economic and social change, it seems likely that people will continue to perceive significant barriers to changing the lifestyles to which they are accustomed.

Bibliography

Addams, H. (2000) Q Methodology. In *Social Discourses and Environmental Policy: An Application of Q Methodology*. Addams, H. and Proops, J. (eds). Cheltenham: Edward Elgar.

Addams, H., and Proops, J. (2000) Introduction. In *Social Discourse and Environmental Policy: An Application of Q Methodology*. Addams, H. and Proops, J. (eds). Cheltenham: Edward Elgar.

Ader, C.R. (1995) A Longitudinal Study of Agenda Setting for the Issue of Environmental Pollution. *Journalism and Mass Communication Quarterly* **72**: 300-311.

Ajzen, I. (2001) Nature and Operation of Attitudes. *Annual Review of Psychology* **52**: 27-58.

Ajzen, I. (1985) From Intentions to Actions: A Theory of Planned Behaviour. In *Action Control: From Cognition to Behaviour*. Kuhl, J. and Beckmann, J. (eds). Berlin: Springer-Verlag, pp. 11-39.

Ajzen, I., and Fishbein, M. (1980) *Understanding attitudes and predicting social behaviour*. Englewood Cliffs; London: Prentice-Hall.

Al-Kodmany, K. (1999) Using visualisation techniques for enhancing public participation in planning and design: process, implementation, and evaluation. *Landscape and Urban Planning* **45**: 37-45.

Alerby, E. (2000) A Way of Visualising Children's and Young People's Thoughts about the Environment: a study of drawings. *Environmental Education Research* **6**: 205-222.

Allen, M. (2004) Making Heavy Weather. *Nature* **429**: 347-348.

Ambler, T., and Burne, T. (1999) The Impact of Affect on Memory of Advertising. *Journal of Advertising Research* **39**: 25-34.

Ambler, T., Inannides, A., and Rose, S. (2000) Brands on the Brain: Neuro-Images of Advertising. *Business Strategy Review* **11**: 17-30.

Amedeo, D., Pitt, D.G., and Zube, E.H. (1989) Landscape Feature Classification as a Determinant of Perceived Scenic Value. *Landscape Journal* **8**: 36-50.

Ametller, J., and Pinto, R. (2002) Students' reading of innovative images of energy at secondary school level. *International Journal of Science Education* **24**: 285-312.

Appleton, K., and Lovett, A. (forthcoming) GIS-based visualisation of development proposals: reactions from planning and related professionals. *Computers, Environment and Urban Systems*.

Armitage, C.J., and Conner, M. (2001) Efficacy of the Theory of Planned Behaviour: A meta-analytic review. *British Journal of Social Psychology* **40**: 471-499.

Armitage, C., and Conner, M. (1999) The theory of planned behaviour: assessment of predictive validity and 'perceived control'. *British Journal of Social Psychology* **38**: 35-54.

Bagozzi, R.P. (1992) The Self-Regulation of Attitudes, Intentions, and Behaviour. *Social Psychology Quarterly* **55**: 178-204.

Bandura, A. (1977) *Social Learning Theory*. Englewood Cliffs, NJ: Prentice Hall.

Barraza, L. (1999) Children's drawings about the environment. *Environmental Education Research* **5**: 49-67.

Barry, J., and Proops, J. (2000) *Citizenship, Sustainability and Environmental Research: Q methodology and local exchange trading systems*. Cheltenham: Edward Elgar.

Bartolomeo, P. (2002) The relationship between visual perception and visual mental imagery: A reappraisal of the neuropsychological evidence. *Cortex* **38**: 357-378.

Bator, R.J., and Cialdini, R.B. (2000) The Application of Persuasion Theory to the Development Of Effective Pro-environmental Public Service Announcements. *Journal of Social Issues* **56**: 527-541.

Bauer, M.W., and Gaskell, G. (1999) Towards a Paradigm for Research on Social Representations. *Journal for the Theory of Social Behaviour* **29**: 163-186.

Beck, U. (1986) *The risk society: Towards a new modernity*. London: Sage.

Bell, A. (1994) Climate of Opinion: public and media discourse on the global environment. *Discourse & Society* **5**: 33-64.

Bell, S. (2001) Landscape pattern, perception and visualisation in the visual management of forests. *Landscape and Urban Planning* **54**: 201-211.

Berger, J., Blomberg, S., Fox, C., Dibb, M., and Hollis, R. (1972) *Ways of Seeing*. London: Penguin.

Berk, R.A., and Fovell, R.G. (1999) Public Perceptions of Climate Change: A 'Willingness to Pay' Assessment. *Climatic Change* **41**: 413-446.

Berkhout, F., Hertin, J., and Jordan, A. (2001) Socio-economic futures in climate change impact assessment: using scenarios as 'learning machines'. Norwich: The Tyndall Centre for Climate Change Research, University of East Anglia.

Bernard, R.H. (2000) *Social Research Methods: Qualitative and Quantitative Approaches*. Thousand Oaks: Sage.

Best, J.B. (1986) *Cognitive Psychology*. St. Paul: West Publishing Company.

Bickerstaff, K., and Walker, G. (2001) Public understandings of air pollution: the 'localisation' of environmental risk. *Global Environmental Change* **11**: 133-145.

Blackburn, S. (1996) *Oxford Dictionary of Philosophy*. Oxford: Oxford University Press.

Blair, T. (2004) Speech by the Prime Minister at the launch of the Climate Group, 27th April. London.

Blair, T. (2003) Prime Minister's speech on sustainable development, 24th February. London.

Blake, D.E. (2001) Contextual effects on environmental attitudes and behaviour. *Environment and Behaviour* **33**: 708-725.

Blake, J. (1999) Overcoming the 'Value-Action Gap' in Environmental Policy: tensions between national policy and local experience. *Local Environment* **4**: 257-278.

Block, N. (ed) (1981) *Imagery*. Cambridge: MIT Press.

Boholm, A. (1998) Visual images and risk messages: commemorating Chernobyl. *Risk Decision and Policy* **3**: 125-143.

Bord, R.J., Fisher, A., and O'Connor, R.E. (1998) Public perceptions of global warming: United States and international perspectives. *Climate Research* **11**: 75-84.

Bord, R.J., O'Connor, R.E., and Fisher, A. (2000) In what sense does the public need to understand global climate change? *Public Understanding of Science* **9**: 205-218.

Bostrom, A., Morgan, M.G., Fischhoff, B., and Read, D. (1994) What Do People Know About Global Climate Change? 1. Mental Models. *Risk Analysis* **14**: 959-970.

Breakwell, G.M. (2001) Mental models and social representations of hazards: the significance of identity processes. *Journal of Risk Research* **4**: 341-351.

Bronnimann, S. (2002) Picturing Climate Change. *Climate Research* **22**: 87-95.

Brown, S.R. (2002) Forced distributions. Posting to Q-Method email discussion list.

Brown, S.R. (1999) Subjective Behaviour Analysis. In *25th anniversary annual convention for the Association for Behaviour Analysis* Chicago.

Brown, S.R. (1996) Q Methodology and Qualitative Research. *Qualitative Health Research* **6**: 561-567.

Brown, S.R. (1991) A Q Methodological Tutorial. 27th March.
<http://facstaff.uww.edu/cottlec/QArchive/Primer1.html>.

Brown, S.R. (1980) *Political Subjectivity*. New Haven: Yale University Press.

Bryman, A. (2001) *Social Research Methods*. Oxford: Oxford University Press.

Bulkeley, H. (2000) Common Knowledge? Public understanding of climate change in Newcastle, Australia. *Public Understanding of Science* **9**: 313-333.

Burgess, J., and Carvalho, A. (2004) Cultural circuits of climate change: an analysis of representations of 'dangerous' climate change in the UK broadsheet press, 1985-2003. In *'Perspectives on dangerous climate change'* Draft discussion paper for an international workshop. University of East Anglia, Norwich, UK.

Becker, H.S. (1998) Visual Sociology, Documentary Photography, and Photojournalism: It's (Almost) All a Matter of Context. In *Image-based Research: A Sourcebook for Qualitative Researchers*. Prosser, J. (ed). Oxford: Falmer Press.

Burgess, J., Harrison, C.M., and Filius, P. (1998) Environmental communication and the cultural politics of environmental citizenship. *Environment and Planning A* **30**: 1461-1472.

Burgess, J., Limb, M., and Harrison, C.M. (1988a) Exploring environmental values through the medium of small groups: 1. Theory and practice. *Environment and Planning A* **20**: 309-326.

Burgess, J., Limb, M., and Harrison, C.M. (1988b) Exploring environmental values through the medium of small groups: 2. Illustrations of a group at work. *Environment and Planning A* **20**: 457-476.

Carter, A. (2001) Can We Harm Future People? *Environmental Values* **10**: 429-454.

Chan, K. (1998) Mass communication and pro-environmental behaviour: waste recycling in Hong Kong. *Journal of Environmental Management* **52**: 317-325.

Chaplin, E. (1994) *Sociology and visual representation*. London: Routledge.

Charmaz, K. (2000) Grounded Theory: Objectivist and Constructivist Methods. In *Handbook of Qualitative Research*. Denzin, N.K. and Lincoln, Y.S. (eds). Thousand Oaks: Sage.

Clay, G.R., and Daniel, T.C. (2000) Scenic landscape assessment: the effects of land management jurisdiction on public perception of scenic beauty. *Landscape and Urban Planning* **49**: 1-13.

Coffey, A., and Atkinson, P. (1996) *Making Sense of Qualitative Data: Complimentary Research Strategies*. Thousand Oaks: Sage.

Coffey, A., Holbrook, B., and Atkinson, P. (1996) Qualitative Data Analysis: Technologies and Representations. *Sociological Research Online* **1**.

Collins (2000) *Collins Paperback English Dictionary*. Glasgow: HarperCollins Publishers.

Connell, S., Fien, J., Lee, J., Sykes, H., and Yencken, D. (1999) 'If It Doesn't Directly Affect You, You Don't Think About It': a qualitative study of young people's environmental attitudes in two Australian cities. *Environmental Education Research* **5**: 95-114.

Corner, J., Richardson, K., and Fenton, N. (1990) *Nuclear reactions: Form and response in public issue television*. London: Libbey.

Cosgrove, D. (1994) Contested Global Visions: One-world, Whole-earth, and the Apollo Space Photographs. *Annals of the Association of American Geographers* **84**: 270-294.

Cox, P., Niewöhner, J., Pidgeon, N., Gerrard, S., Fischhoff, B., and Riley, D. (2003) The Use of Mental Models in Chemical Risk Protection: Developing a Generic Workplace Methodology. *Risk Analysis* **23**: 311-324.

Creswell, J.W. (2003) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Thousand Oaks: Sage.

Cronin, O. (1998) Psychology and Photographic Theory. In *Image-based Research: A Sourcebook for Qualitative Researchers*. Prosser, J. (ed). Oxford: Falmer Press.

Daniel, T.C., and Meitner, M.M. (2001) Representational validity of landscape visualizations: the effects of graphical realism on perceived scenic beauty of forest vistas. *Journal of Environmental Psychology* **21**: 61-72.

Daniel, T.C., and Meitner, M.M. (2001) Representational validity of landscape visualizations: the effects of graphical realism on perceived scenic beauty of forest vistas. *Journal of Environmental Psychology* **21**: 61-72.

Davis, J.J. (1995) The Effects of Message Framing on Response to Environmental Communications. *Journalism and Mass Communication Quarterly* **72**: 285-299.

Deacon, D., Pickering, M., Golding, P., and Murdock, G. (1999) *Researching Communications: A practical guide to methods in media and cultural analysis*. London: Arnold.

De Fleur, M.L., and Ball-Rokeach, S.J. (1982) *Theories of Mass Communication*. London, New York: Longman.

DEFRA (2002) Survey of public attitudes to quality of life and to the environment: 2001. London: Department for Environment, Food and Rural Affairs.

DEFRA (2001) Climate Change UK Programme. London: Department for Environment, Food and Rural Affairs.

Demeritt, D. (2001) The Construction of Global Warming and the Politics of Science. *Annals of the Association of American Geographers* **91**: 307-337.

Denis, M. (1989) *Image and Cognition*. New York: Harvester Wheatsheaf.

Dennett, D.C. (1981) The Nature of Images and the Introspective Trap. In *Imagery*. Block, N. (ed). Cambridge: The MIT Press, pp. 51-61.

Denzin, N.K., and Lincoln, Y.S. (2000) Introduction. In *Handbook of Qualitative Research*. Denzin, N.K. and Lincoln, Y.S. (eds). Thousand Oaks: Sage.

Denzin, N.K., and Lincoln, Y.S. (1998) Methods of Collecting and Analyzing Empirical Materials. In *Collecting and Interpreting Qualitative Materials*. Denzin, N.K. and Lincoln, Y.S. (eds). Thousand Oaks: Sage, pp. 35-45.

DETR (2000) Climate Change: The UK Programme. London: Department of the Environment, Transport and the Regions.

Di Fazio, A. (1998) So you reckon that efficiency will save us? (Well, think again...). *Town and Country Planning* **67**: 293-295.

Donner, J.C. (2001) Using Q-Sorts in Participatory Processes: An Introduction to the Methodology. In *Social Analysis: Selected Tools and Techniques*. Vol. 36. Krueger, R.A., Casey, M.A., Donner, J., Kirsch, S. and Maack, J.N. (eds). Washington: The World Bank, pp. 24-49.

Dotto, L. (2000) Proof or Consequences. *Alternatives Journal* **26**: 8-12.

Drottz-Sjöberg, B.M., and Sjöberg, L. (1991) Adolescents' Attitudes to Nuclear Power and Radioactive Wastes. *Journal of Applied Social Psychology* **21**: 2007-2036.

Dryzek, J.S., and Berejikian, J. (1993) Reconstructive Democratic Theory. *The American Political Science Review* **87**: 48-60.

DTI (2003) Energy White Paper: Our energy future - creating a low carbon economy. London: Department of Trade and Industry.

DTI (2002) Energy: its impact on the environment and society. London: Department of Trade and Industry.

Dunlap, R.E. (1998) Lay Perceptions of Global Risk: Public Views of Global Warming in Cross-National Context. *International Sociology* **13**: 473-498.

Dunlap, R.E., Liere, K.D.V., Mertig, A.G., and Jones, R.E. (2000) Measuring Endorsement of the New Ecological Paradigm: A Revised NEP Scale. *Journal of Social Issues* **56**: 425-442.

Duveen, G. (2000) The Power of Ideas. In *Social Representations: Explorations in Social Psychology*. Moscovici, S. and Duveen, G. (eds). Cambridge: Polity Press, pp. 1-17.

EC (2002) Choices for a greener future; The European Union and the environment. Brussels: European Commission.

Eckersley, R. (1999) Dreams and expectations: young people's expected and preferred futures and their significance for education. *Futures* **31**: 73-90.

Edell, J.A., and Staelin, R. (1983) The Information Processing of Pictures in Print Advertisements. *Journal of Consumer Research* **10**: 45-61.

Edelson, D.C., and Gordin, D. (1998) Visualization for Learners: A Framework for Adapting Scientists' Tools. *Computers & Geosciences* **24**: 607-616.

Eden, S.E. (1993) Individual environmental responsibility and its role in public environmentalism. *Environment and Planning A* **25**: 1743-1758.

Eiser, J.R. (1994) *Attitudes, chaos & the connectionist mind*. Oxford: Blackwell.

Eiser, J.R. (1986) *Social Psychology*. Cambridge, UK: Cambridge University Press.

Ellen, P.S., Wiener, J.L., and Cobb-Walgren, C. (1991) The Role of Perceived Consumer Effectiveness in Motivating Environmentally Conscious Behaviours. *Journal of Public Policy and Marketing* **10**: 102-117.

Elwood, S.A., and Martin, D.G. (2000) "Placing" Interviews: Location and Scales of Power in Qualitative Research. *Professional Geographer* **52**: 649-657.

Emmerich, R. (2004) *The Day After Tomorrow*. United States of America: Twentieth Century Fox.

Emsley, J. (2001) Good news is no news: How can scientists use the media to give their side of the story to the public? *Nature* **413**: 113.

Ervin, S.M. (2001) Digital landscape modeling and visualization: a research agenda. *Landscape and Urban Planning* **54**: 49-62.

ESEF (2001) Climate Science and Policy: Making the Connection. Cambridge: The European Science and Environment Forum, pp. 46.

Fabrigar, L.R., and Petty, R.E. (1999) The Role of the Affective and Cognitive Bases of Attitudes in Susceptibility to Affectively and Cognitively Based Persuasion. *Journal of Personality and Social Psychology* **25**: 363-381.

Fairweather, J.R., and Swaffield, S.R. (2001) Visitor Experiences of Kaikoura, New Zealand: an interpretative study using photographs of landscapes and Q method. *Tourism Management* **22**: 219-228.

Fairweather, J.R., and Swaffield, S.R. (2000) Q Method Using Photographs to Study Perceptions of the Environment in New Zealand. In *Social Discourse and Environmental Policy: An Application of Q Methodology*. Addams, H. and Proops, J. (eds). Cheltenham: Edward Elgar, pp. 138-151.

Farr, R.M. (1993) Common sense, science and social representations. *Public Understanding of Science* 2: 189-204.

Fern, E.F. (1982) The Use of Focus Groups for Idea Generation: The Effects of Group Size, Aquaintanceship, and Moderator on Response Quantity and Quality. *Journal of Marketing Research* 19.

Festinger, L. (1957) *A Theory of Cognitive Dissonance*. Stanford, CA, USA: Stanford University Press.

Fielding, N.G., and Fielding, J.L. (1986) *Linking Data*. Newbury Park: Sage.

Finke, R.A. (1989) *Principles of Mental Imagery*. Cambridge: The MIT Press.

Finke, R.A. (1985) Theories Relating Mental Imagery to Perception. *Psychological Bulletin* 98: 236-259.

Finlay, L. (2002) Negotiating the swamp: the opportunity and challenge of reflexivity in research practice. *Qualitative Research* 2: 209-230.

Fleer, M. (2002) Curriculum Compartmentalisation?: a futures perspective on environmental education. *Environmental Education Research* 8: 137-154.

Flick, U. (2002) *An Introduction to Qualitative Research*. London: Sage.

Flick, U. (1998) *An Introduction to Qualitative Research*. London: Sage.

Fodor, J.A. (1981) Imagistic Representation. In *Imagery*. Block, N. (ed). Cambridge: MIT Press, pp. 63-86.

Fontana, A., and Frey, J.H. (1998) Interviewing: The Art of Science. In *Collecting and Interpreting Qualitative Materials*. Denzin, N.K. and Lincoln, Y.S. (eds). Thousand Oaks: Sage, pp. 47-78.

Fortner, R.W., Lee, J.Y., Corney, J.R., Romanello, S., Bonnell, J., et al. (2000) Public Understanding of Climate Change: certainty and willingness to act. *Environmental Education Research* 6: 127-141.

Franklin, S., Lury, C., and Stacey, J. (2000) *Global Nature, Global Culture*. London: Sage.

Fransson, N., and Garling, T. (1999) Environmental concern: conceptual definitions, measurement methods, and research findings. *Journal of Environmental Psychology* 19: 369-382.

Gardner, G.T., and Stern, P.C. (1996) *Environmental Problems and Human Behaviour*. Boston: Allyn and Bacon.

Gaskell, G. (2000) Individual and Group Interviewing. In *Qualitative Researching with Text, Image and Sound: A Practical Handbook*. Bauer, M.W. and Gaskell, G. (eds). London: Sage, pp. 38-56.

Gibson, P. (2001) Recycling the Public Image. *Sustain Magazine* 4: 32.

Gimblett, R., Daniel, T., Cherry, S., and Meitner, M.J. (2001) The simulation and visualization of complex human-environment interactions. *Landscape and Urban Planning* 54: 63-78.

Glaser, B.G., and Strauss, A.L. (1967) *The Discovery of Grounded Theory: Strategies for Qualitative Research*. London: Weidenfeld and Nicolson.

Global Action Plan (2004) Ecoteams website.
http://www.globalactionplan.org.uk/index.cfm?TERTIARY_ID=0&PRIMARY_ID=31&SECONDARY_ID=38.

Gombrich, E.H. (1982) *The Image and the Eye*. Oxford: Phaidon.

Gooch, G.D. (1996) Environmental Concern and the Swedish Press. *European Journal of Communication* **11**: 107-127.

Goodman, N. (1990) Pictures in the Mind? In *Images and Understanding*. Barlow, H., Blakemore, C. and Weston-Smith, M. (eds). Cambridge: Cambridge University Press.

Graber, D.A. (1990) Seeing Is Remembering: How Visuals Contribute to Learning from Television News. *Journal of Communication* **40**: 134-155.

Gregory, R. (1990) How do we interpret images? In *Images and Understanding*. Barlow, H. (ed). Cambridge: Cambridge University Press, pp. 310-330.

Guba, E.G., and Lincoln, Y.S. (1998) Competing Paradigms in Qualitative Research. In *The landscape of qualitative research*. Denzin, N.K. and Lincoln, Y.S. (eds). Thousand Oaks: Sage, pp. 195-220.

Guba, E.G., and Lincoln, Y.S. (1994) Competing Paradigms in Qualitative Research. In *Handbook of Qualitative Research*. Denzin, N. and Lincoln, Y.S. (eds). Cambridge: Polity Press, pp. 105-117.

Gummer, J. (1998) The Moral Dimension. *Town and Country Planning* **67**: 298-299.

Habermas, J. (1990) Reconstruction and interpretation in the social sciences. In *Moral Consciousness and Communicative Action*. Habermas, J. (ed). Cambridge: Polity Press.

Hagger, M.S., Chatzisarantis, N., and Biddle, S.J.H. (2001) The influence of self-efficacy and past behaviour on the physical activity intentions of young people. *Journal of Sports Sciences* **19**: 711-725.

Hajer, M.A. (1995) *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*. Oxford: Clarendon Press.

Hammitt, J.K., and Harvey, C.M. (2000) Equity, Efficiency, Uncertainty, and the Mitigation of Global Climate Change. *Risk Analysis* **20**: 851-860.

Hands, D.E., and Brown, R.D. (2002) Enhancing visual preference of ecological rehabilitation sites. *Landscape and Urban Planning* **58**: 57-70.

Hardin, G. (1968) The tragedy of the commons. *Science* **162**: 1243-1248.

Hargreaves, I., Lewis, J., and Spears, T. (2002) Towards a Better Map: Science, The Public and The Media. Cardiff: School of Journalism, Media and Cultural Studies, Cardiff University.

Harrington, L.M.B. (2001) Attitudes toward climate change: major emitters in southwestern Kansas. *Climate Research* **16**: 113-122.

Hayes, N. (1994) *Foundations of Psychology: An Introductory Text*. London: Routledge.

Healey, C.G., and Enns, J.T. (2002) Perception and Painting: A Search for Effective, Engaging Visualizations. *IEEE Computer Graphics & Applications (Visualization Viewpoints)* **22**: 10-15.

Held, R. (1990) Images and thought. In *Images and Understanding*. Barlow, H., Blakemore, C. and Weston-Smith, M. (eds). Cambridge: Cambridge University Press, pp. 255-256.

Hillman, M. (1998) Carbon Budget Watchers. *Town and Country Planning* **67**: 305.

Hinchliffe, S. (1996) Helping the earth begins at home. *Global Environmental Change* **6**: 53-62.

Hobson, K. (2003) Thinking Habits into Action: the role of knowledge and process in questioning household consumption practices. *Local Environment* **8**: 95-112.

Holman, I.P., Loveland, P.J., Nicholls, T.J., Shackley, S., Berry, P.M., *et al.* (2002) REGIS: Regional Climate Change Impact and Response Studies in East Anglia and North West England. London, UK: Department for Environment, Food and Rural Affairs.

Houghton, J. (2003) Global warming is now a weapon of mass destruction. In *The Guardian* London.

Houghton, J. (1998) Global Warming: The science and the challenge. *Town and Country Planning* **67**: 289-292.

Huddy, L., and Gunnthorsdottir, A.H. (2000) The Persuasive Effects of Emotive Visual Imagery: Superficial Manipulation or the Product of Passionate Reason? *Political Psychology* **21**: 745-778.

Hulme, M. (2000) Global Warming. *Progress in Physical Geography* **24**: 591-599.

Hulme, M., Jenkins, G.J., Lu, X., Turnpenny, J.R., Mitchell, T.D., *et al.* (2002) Climate Change Scenarios for the United Kingdom: The UKCIP02 Scientific Report. Norwich: Tyndall Centre for Climate Research, School of Environmental Sciences, University of East Anglia.

IPCC (2001a) Climate Change 2001: Synthesis Report. Summary for Policymakers. Watson, R.T., Albritton, D.L., Barker, T., Bashmakov, I.A., Canziani, O., *et al.* (eds.) London: Intergovernmental Panel on Climate Change.

IPCC (2001b) Climate Change 2001: The Scientific Basis: Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Houghton, J.T., Ding, Y., Griggs, D.J., Noguer, M., Linden, P.J.v.d., *et al.* (eds.) Geneva: Intergovernmental Panel on Climate Change.

IPCC (2001c) Climate Change 2001: Impacts, Adaptation, and Vulnerability: Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. McCarthy, J.J., Canziani, O.F., Leary, N.A., Dokken, D.J. and White, K.S. (eds.) Geneva: Intergovernmental Panel on Climate Change.

IPCC (2001d) Climate Change 2001: Mitigation: Contribution of Working Group III to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Metz, B., Davidson, O., Swart, R. and Pan, J. (eds.) Geneva: Intergovernmental Panel on Climate Change.

IPCC (2000) *Special Report on Emissions Scenarios: a special report of Working Group III of the Intergovernmental Panel on Climate Change*. Nakicenovic, N. and Swart, R. (eds.) Cambridge: Cambridge University Press.

IPCC (1996) Climate change 1995: the science of climate change. Houghton, J.T. and *et. al.* (eds.) Cambridge: Published for the Intergovernmental Panel on Climate Change [by] Cambridge University Press.

IPCC (1990) Climate change: the IPCC scientific assessment. Houghton, J.T., Jenkins, G.J. and Ephraums, J.J. (eds.) Cambridge: Cambridge University Press.

Irwin, A. (1995) *Citizen Science: A Study of People, Expertise and Sustainable Development*. London: Routledge.

Irwin, A., and Wynne, B. (1996) Introduction. In *Misunderstanding science? The public reconstruction of science and technology*. Irwin, A. and Wynne, B. (eds). Cambridge: Cambridge University Press.

Ishai, A., and Sagi, D. (1997) Visual Imagery Facilitates Visual Perception: Psychophysical Evidence. *Journal of Cognitive Neuroscience* **9**: 476-489.

Iversen, H., and Rundmo, T. (2002) Environmental concern and environmental behaviour among the Norwegian public. *Journal of Risk Research* **5**: 265-279.

Jackson, T. (2004) Motivating Sustainable Consumption: a review of evidence on consumer behaviour and behavioural change. Guildford: Centre for Environmental Strategy, University of Surrey.

Jaeger, C.C., and Kasemir, B. (1996) Climatic risks and rational actors. *Global Environmental Change* **6**: 23-36.

Jaeger, C.C., Kasemir, B., Stoll-Kleemann, S., Schibli, D., and Dahinden, U. (2000) Climate change and the voice of the public. *Integrated Assessment* **1**: 339-349.

Janesick, V.J. (2000) The Choreography of Qualitative Research Design. In *Handbook of Qualitative Research*. Denzin, N.K. and Lincoln, Y.S. (eds). Thousand Oaks: Sage.

Jewitt, C., Kress, G., Ogborn, J., and Tsatsarelis, C. (2001) Exploring Learning Through Visual, Actional and Linguistic Communication: the multimodal environment of a science classroom. *Educational Review* **53**: 5-18.

Jodha, N.S., and Maunder, W.J. (1991) Climate, Climate Change and the Economy. In *Climate Change: Science, Impacts and Policy. Proceedings of the Second World Climate Conference*. Jaeger, J. and Ferguson, H.L. (eds). Cambridge: Cambridge University Press, pp. 409-414.

Joffe, H. (2003) Risk: Form perception of social representation. *British Journal of Social Psychology* **42**: 55-73.

Joffe, H. (1999) *Risk and 'the other'*. Cambridge: Cambridge University Press.

Jordan, A., and O'Riordan, T. (2003) Institutions for global environmental change. *Global Environmental Change* **13**: 149.

Kaiser, F.G., Wolfing, S., and Fuhrer, U. (1999) Environmental Attitude and Ecological Behaviour. *Journal of Environmental Psychology* **19**: 1-19.

Kaplan, S. (2000) Human Nature and Environmentally Responsible Behaviour. *Journal of Social Issues* **56**: 491-508.

Kaplan, S., and Kaplan, R. (1989) The Visual Environment: Public Participation in Design and Planning. *Journal of Social Issues* **45**: 59-86.

Kasemir, B., Dahinden, U., Swartling, A.G., Schule, R., Tabara, D., *et al.* (2000a) Citizens' perspectives on climate change and energy use. *Global Environmental Change* **10**: 169-184.

Kaski, D. (2002) Revision: Is visual perception a requisite for visual imagery? *Perception* **31**: 717-731.

Kempton, W. (1997) How the Public Views Climate Change. *Environment* **39**: 12-21.

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

King, D.A. (2004) Climate change science: Adapt, mitigate, or ignore? *Science* **303**: 176-177.

Kingston, R., Carver, S., Evans, A., and Turton, I. (2000) Web-based public participation geographical information systems: an aid to local environmental decision-making. *Computers, Environment and Urban Systems* **24**: 109-125.

Kirby, D.A. (2003) Scientists on the set: science consultants and the communication of science in visual fiction. *Public Understanding of Science* **12**: 261-278.

Kitzinger, C. (1999) Researching subjectivity and diversity: Q-Methodology in Feminist Psychology. *Psychology of Women Quarterly* **23**: 267-276.

Kitzinger, J. (1994) The methodology of Focus Groups: the importance of interaction between research participants. *Sociology of Health and Illness* **16**: 103-121.

Kortenkamp, K.V., and Moore, C.F. (2001) Ecocentrism and anthropocentrism: moral reasoning about ecological commons dilemmas. *Journal of Environmental Psychology* **21**: 261-272.

Kosslyn, S.M. (1981) The Medium and the Message in Mental Imagery. In *Imagery*. Block, N. (ed). Cambridge: The MIT Press, pp. 201-244.

Kosslyn, S.M. (1980) *Image and Mind*. Cambridge: Harvard University Press.

Kosslyn, S.M., Pinker, S., Smith, G.E., and Shwartz, S.P. (1981) On the Demystification of Mental Imagery. In *Imagery*. Block, N. (ed). Cambridge: The MIT Press, pp. 131-150.

Krueger, R.A. (1998a) Developing Questions for Focus Groups. In *The Focus Group Kit*. Vol. 3. Morgan, D.L. and Krueger, R.A. (eds). Thousand Oaks: Sage.

Krueger, R.A. (1998b) Moderating Focus Groups. In *The Focus Group Kit*. Vol. 4. Morgan, D.L. and Krueger, R.A. (eds). Thousand Oaks: Sage.

Krueger, R.A. (1998c) Analyzing & Reporting Focus Group Results. In *The Focus Group Kit*. Vol. 6. Morgan, D.L. and Krueger, R.A. (eds). Thousand Oaks: Sage.

Krueger, R.A., and Casey, M.A. (2000) *Focus Groups: A practical guide for applied research*. Thousand Oaks: Sage.

Lacey, C., and Longman, D. (1993) The press and public access to the environment and development debate. *The Sociological Review* **41**: 207-243.

Lange, E. (1994) Integration of computerized visual stimulation and visual assessment in environmental planning. *Landscape and Urban Planning* **30**: 99-112.

Langford, I.H. (2002) An Existential Approach to Risk Perception. *Risk Analysis* **22**: 101-120.

Leibowitz, H.W. (1965) *Visual Perception*. New York: Macmillan.

Leiserowitz, T. (forthcoming) Before and After *The Day After Tomorrow*: A National Study of Climate Change Risk Perception and Behaviour. *Environment*.

Lincoln, Y.S., and Guba, E.C. (2000) Paradigmatic controversies, contradictions, and emerging confluences. In *Handbook of Qualitative Research*. Denzin, N.K. and Lincoln, Y.S. (eds). Thousand Oaks: Sage, pp. 163-188.

Lockwood, M. (1999) Humans Valuing Nature: Synthesising Insights from Philosophy, Psychology and Economics. *Environmental Values* **8**: 381-401.

Lofstedt, R.E. (1995) Why are public perception studies of the environment ignored? *Global Environmental Change* **5**: 83-85.

Lomborg, B. (2001) *The Sceptical Environmentalist: Measuring the real state of the world*. Cambridge: Cambridge University Press.

Lorenzoni, I. (2003) Present Choices, Future Climates; A Cross-cultural Study of Perceptions in Italy and in the UK. *Unpublished PhD thesis* Norwich: School of Environmental Sciences, University of East Anglia.

Lorenzoni, I., and Langford, I.H. (2001a) Climate Change now and in the future: A mixed methodological study of public perceptions in Norwich, UK. Norwich: CSERGE.

Lorenzoni, I., and Langford, I. (2001b) Dealing with climate change: the role of institutions in the eyes of the public. In *Human Dimensions of Global Environmental Change "Global Environmental Change and the Nation State"*. Biermann, F., Brohm, R. and Dingwerth, K. (eds.) Berlin: Potsdam Institute for Climate Impact Research, Potsdam, Germany, pp. 342-351.

Lorenzoni, I., Jordan, A., Hulme, M., Turner, R.K., and O'Riordan, T. (2000a) A co-evolutionary approach to climate change impact assessment: Part 1. Integrating socio-economic and climate change scenarios. *Global Environmental Change* **10**: 57-68.

Lorenzoni, I., Jordan, A., O'Riordan, T., Turner, R.K., and Hulme, M. (2000b) A co-evolutionary approach to climate change impact assessment: Part II. A scenario-based case study in East Anglia (UK). *Global Environmental Change* **10**: 145-155.

Luttrell, C. (2001) An institutional approach to livelihood resilience in Vietnam. In *Unpublished PhD thesis* Norwich: School of Environmental Sciences, University of East Anglia.

Lutz, K.A., and Lutz, R.J. (1977) Effects of Interactive Imagery on Learning: Application to Advertising. *Journal of Applied Psychology* **62**: 493-498.

MacFarlane, R., Stagg, H., Turner, K., and Lievesley, M. (forthcoming) Peering through the smoke? Tensions in Landscape Visualisation. *Computers, Environment and Urban Systems*.

Macnaghten, P., and Jacobs, M. (1997) Public identification with sustainable development: investigating cultural barriers to participation. *Global Environmental Change* 7: 5-24.

Maiteny, P. (2000) The psychodynamics of meaning and action for a sustainable future. *Futures* 32: 339-360.

Malim, T., and Birch, A. (1998) *Introductory Psychology*. Hounds Mills: Macmillan Press.

Manstead, A. (2000) The Role of Moral Norm in the Attitude-Behaviour Relationship. In *Attitudes, Behaviour and Social Context: the role of norms and group membership*. Terry, D. and Hogg, M. (eds). Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Manstead, A.S.R., and Hewstone, M., (eds) (1996) *The Blackwell Encyclopaedia of Social Psychology*. Oxford: Blackwell.

Marshall, G., and Lynas, M. (2003) Why we don't give a damn. In *New Statesman*. 132: 18-20.

Mason, J. (1996) *Qualitative Researching*. London: Sage.

Mason, L., and Santi, M. (1998) Discussing the greenhouse effect: children's collaborative discourse reasoning and conceptual change. *Environmental Education Research* 4: 67-86.

May, T. (1993) *Social research: issues, methods and processes*. Buckingham: Open University Press.

Mazur, A. (1998) Global Environmental Change in the News 1987-90 vs 1992-6. *International Sociology* 13: 457-472.

McComas, K.A., Shanahan, J., and Butler, J.S. (2001) Environmental Content in Prime-Time Network TV's Non-News Entertainment and Fictional Programs. *Society and Natural Resources* 14: 533-542.

McCombs, M. (1999) Personal Involvement with Issues on the Public Agenda. *International Journal of Public Opinion Research* 11: 152-168.

McCoy, J., and Evans, G. (2002) The potential role of the physical environment in fostering creativity. *Creativity Research Journal* 14: 409-426.

McDaniels, T., Axelrod, L.J., and Slovic, P. (1996) Perceived ecological risks of global change; A psychometric comparison of causes and consequences. *Global Environmental Change* 6: 159-171.

McKeown, B., and Thomas, D. (1988) *Q Methodology*. Newbury Park: Sage.

McQuarrie, E.F., and Mick, D.G. (1999) Visual Rhetoric in Advertising: Text-Interpretive, Experimental, and Reader-Response Analyses. *Journal of Consumer Research* 26: 37-54.

Meijnders, A.L., Midden, C.J.H., and Wilke, H.A.M. (2001) Role of Negative Emotion in Communication about CO₂ Risks. *Risk Analysis* 21: 955-966.

Misgav, A. (2000) Visual preference of the public for vegetation groups in Israel. *Landscape and Urban Planning* 48: 143-159.

Mitchell, A.A. (1986) The Effect of Verbal and Visual components of Advertisements on Brand Attitudes and Attitude Toward the Advertisement. *Journal of Consumer Research* **13**: 12-24.

Morgan, D.L. (1998) Planning focus groups. In *The Focus Group Kit*. Vol. 2. Morgan, D.L. and Krueger, R.A. (eds). Thousand Oaks: Sage.

Morgan, M.G. (1995) What Do People Believe About Climate Change? *The Bridge: US National Academy of Engineering* **25**: 16-19.

Morgan, M.G., Fischoff, B., Bostrom, A., and Atman, C.J. (2002) *Risk Communication: A Mental Models Approach*. Cambridge: Cambridge University Press.

Moscovici, S. (2000) The Phenomenon of Social Representations. In *Social Representations: Explorations in Social Psychology*. Moscovici, S. and Duveen, G. (eds). Cambridge: Polity Press, pp. 18-77.

Moscovici, S. (1976) *Social influence and social change*. London: Academic Press (for the European Association of Experimental Social Psychology).

Munasinghe, M. (2001) Exploring the Linkages between Climate Change and Sustainable Development: A Challenge for Transdisciplinary Research. *Conservation Ecology* **5**: 14.

Murlis, J., and Davies, G. (2001) Public Perception of the Health Impacts of Climate Change. In *The Health Effects of Climate Change in the UK*. London: Department of Health.

Myers, G. (1994) *Words in Ads*. London: Routledge.

Myers, G., and Macnaghten, P. (1998) Rhetorics of environmental sustainability: commonplaces and places. *Environment and Planning A* **30**: 333-353.

Nisbett, R., and Ross, L. (1980) *Human Inference: Strategies and shortcomings of social judgment*. Englewood Cliffs, NJ: Prentice-Hall.

Norton, A., and Leaman, J. (2004) The Day After Tomorrow: Public Opinion on Climate Change. London: MORI.

Nottinghamshire County Council (2004) Ecoteams website.
<http://www.nottinghamshire.gov.uk/pr/home/environment/greenissues/ecoteams.htm>.

O'Connor, R.E., Bord, R.J., and Fisher, A. (1999) Risk Perceptions, General Environmental Beliefs, and Willingness to Address Climate Change. *Risk Analysis* **19**: 461-471.

OECD (2001) *Environmental Outlook*. Paris: Organisation for Economic Co-operation and Development.

Oring, S.A. (1999) A call for visual literacy. *School Arts* **99**: 58-59.

O'Riordan, T., Cameron, J., and Jordan, A., (eds) (2001) *Reinterpreting the Precautionary Principle*. London: Cameron May.

Oskamp, S. (2000) Psychological Contributions to Achieving an Ecologically Sustainable Future for Humanity. *Journal of Social Issues* **56**: 373-390.

OST, and The Wellcome Trust (2001) Science and the public: a review of science communication and public attitudes to science in Britain. *Public Understanding of Science* **10**: 315-330.

Page, E. (1999) Intergenerational Justice and Climate Change. *Political Studies* **47**: 53-66.

Paivio, A. (1991) *Images in Mind: The Evolution of a Theory*. New York: Harvester Wheatsheaf.

Palmer, J.F. (1997) Stability of landscape perceptions in the face of landscape change. *Landscape and Urban Planning* **37**: 109-113.

Parry, M. (2000) Assessment of Potential Effects and Adaptations for Climate Change in Europe: Summary and Conclusions. Norwich, UK: Jackson Environment Institute, School of Environmental Sciences, University of East Anglia.

Patton, M.J. (2002) *Qualitative Research and Evaluation Methods*. Thousand Oaks CA: Sage.

Peters, E., and Slovic, P. (1996) The Role of Affect and Worldviews as Orienting Dispositions in the Perception and Acceptance of Nuclear Power. *Journal of Applied Social Psychology* **26**: 1427-1453.

Peterson, G., Leo, G.A.D., Hellmann, J.J., Janssen, M.A., Kinzig, A., et al. (1997) Uncertainty, Climate Change, and Adaptive Management. *Conservation Ecology* **1**: 4.

Pielke, R.A. (1998) Rethinking the role of adaptation in climate policy. *Global Environmental Change* **8**: 159-170.

Pidgeon, N.F., and Henwood, K.L. (2004) Grounded Theory. In *Handbook of Data Analysis*. Hardy, M. and Bryman, A. (eds). London: Sage, pp. 625-648.

Pinsky, L.E., and Wipf, J.E. (2000) A Picture is Worth a Thousand Words: Practical Use of Videotape in Teaching. *Journal of General Internal Medicine* **15**: 805-810.

Pinto, R., and Ametller, J. (2002) Students' difficulties in reading images. Comparing results from four national research groups. *International Journal of Science Education* **24**: 333-341.

Poortinga, W. (2002) Environmental Risk Concern and Preferences for Energy-Saving Measures. *Environment and Behaviour* **34**: 455-478.

Poortinga, W., and Pidgeon, N. (2003) Public Perceptions of Risk, Science and Governance: Main findings of a British survey of five risk cases. Norwich: University of East Anglia and MORI.

Poortinga, W., Steg, L., Vlek, C., and Wiersma, G. (2003) Household preferences for energy-saving measures: A conjoint analysis. *Journal of Economic Psychology* **24**: 49-64.

Potter, J. (1996) Chapter 3: Attitudes, Social Representations and Discursive Psychology. In *Identities, Groups and Social Issues*. Wetherell, M. (ed). London: Sage.

Prosser, J. (1998) The status of Image-based Research. In *Image-based Research: A Sourcebook for Qualitative Researchers*. Prosser, J. (ed). Oxford: Falmer Press.

Pullar, D.V., and Tidey, M.E. (2001) Coupling 3D visualisation to qualitative assessment of built environment designs. *Landscape and Urban Planning* **55**: 29-40.

Purcell, T., Peron, E., and Berto, R. (2001) Why do preferences differ between scene types? *Environment & Behaviour* **33**: 93-107.

Pylyshyn, Z.W. (1981) The Imagery Debate: Analog Media versus Tacit Knowledge. In *Imagery*. Block, N. (ed). Cambridge: The MIT Press, pp. 151-206.

Rachlinski, J.J. (2000) The psychology of global climate change. *University of Illinois Law Review* **1**: 299-319.

RCEP (2000) Energy: The Changing Climate. London: The Royal Commission on Environmental Pollution.

Read, D., Bostrom, A., Morgan, M.G., Fischhoff, B., and Smuts, T. (1994) What Do People Know About Global Climate Change? 2. Survey Studies of Educated Laypeople. *Risk Analysis* **14**: 971-982.

Rebetez, M. (1996) Public expectation as an element of human perception of climate change. *Climatic Change* **32**: 495-509.

Richardson, J.T.E. (1999) *Imagery*. East Sussex: Psychology Press Ltd.

Roberts, J.A. (1996) Green Consumers in the 1990's: Profile and Implications for Advertising. *Journal of Business Research* **36**: 217-231.

Robbins, P., and Krueger, R. (2000) Beyond Bias? The Promise and Limits of Q Method in Human Geography. *Professional Geographer* **52**: 636-648.

Robins, K. (1996) *Into the Image: Culture and politics in the field of vision*. London: Routledge.

Rogers, C.L. (2000) Making the Audience a Key Participant in the Science Communication Process. *Science and Engineering Ethics* **6**: 553-557.

Rosenstone, R.A. (2003) Comments on science in the visual media. *Public Understanding of Science* **12**: 335-339.

Rossiter, J.R., and Percy, L. (1980) Attitude change through visual imagery in advertising. *Journal of Advertising* **9**: 10-16.

Rowe, G., Frewer, L., and Sjöberg, L. (2000) Newspaper reporting of hazards in the UK and Sweden. *Public Understanding of Science* **9**: 59-78.

Rubin, H.J., and Rubin, I.S. (1995) *Qualitative Interviewing: The art of hearing data*. Thousand Oaks: Sage.

Rundmo, T. (2002) Associations between affect and risk perception. *Journal of Risk Research* **5**: 119-135.

Satterfield, T. (2001) In Search of Value Literacy: Suggestions for the Elicitation of Environmental Values. *Environmental Values* **10**: 331-359.

Schahn, J., and Holzer, E. (1990) Studies of Individual Environmental Concern: The Role of Knowledge, Gender, and Background Variables. *Environment and Behaviour* **22**: 767-786.

Scheraga, J.D., and Grambsch, A.E. (1998) Risks, opportunities, and adaptation to climate change. *Climate Research* **10**: 85-95.

Schlänger, M.J. (1969) Cues on Q-Technique. *Journal of Advertising Research* **9**: 53-60.

Schultz, P.W. (2001) The structure of environmental concern: Concern for self, other people, and the biosphere. *Journal of Environmental Psychology* **21**: 327-339.

Schultz, P.W. (2000) Empathizing With Nature: The Effects of Perspective Taking on Concern for Environmental Issues. *Journal of Social Issues* **56**: 391-406.

Schultz, P.W., and Zelezny, L. (1999) Values as predictors of environmental attitudes: evidence for consistency across 14 countries. *Journal of Environmental Psychology* **19**: 255-265.

Schultz, W., and Oskamp, S. (1996) Effort as a Moderator of the Attitude-Behaviour Relationship: General Environmental Concern and Recycling. *Social Psychology Quarterly* **59**: 375-383.

Schwandt, T.A. (2000) Three Epistemological Stances for Qualitative Inquiry: Interpretivism, Hermeneutics, and Social Constructivism. In *Handbook of Qualitative Research*. Denzin, N.K. and Lincoln, Y.S. (eds). Thousand Oaks: Sage, pp. 189-214.

Schwartz, R. (1981) IMAGERY: There's More to It Than Meets the Eye. In *Imagery*. Block, N. (ed). Cambridge: The MIT Press, pp. 109-130.

Scott, D., and Willits, F.K. (1994) Environmental Attitudes and Behaviour. *Environment & Behaviour* **26**: 239-261.

Scott, L.M. (1994) Images in Advertising: The Need for a Theory of Visual Rhetoric. *Journal of Consumer Research* **21**: 252-273.

SDC (2003) UK Climate Change Programme: a policy audit. London: The UK Sustainable Development Commission.

Seacrest, S., Kuzelka, R., and Leonard, R. (2000) Global climate change and public perception: the challenge of translation. *Journal of the American Water Resources Association* **36**: 253-263.

Seidman, I. (1998) *Interviewing as Qualitative Research: A guide for researchers in education and the social sciences*. New York: Teachers College Press.

Seppanen, J., and Valiverronen, E. (2003) Visualizing Biodiversity: The Role of Photographs in Environmental Discourse. *Science as Culture* **12**: 59-85.

Sexton, D., Snyder, P., Wadsworth, D., Jardine, A., and Ernest, J. (1998) Applying Q Methodology to Investigations of Subjective Judgments of Early Intervention Effectiveness. *Topics in Early Childhood Special Education* **18**.

Shanahan, J., and Good, J. (2000) Heat and hot air: influence of local temperature on journalists' coverage of global warming. *Public Understanding of Science* **9**: 285-295.

Sheehy, N., Wylie, J., and McKeown, G. (2002) *Quantifying risk amplification processes: A multi-level approach*. CRR 367/2002. London: The Health and Safety Executive.

Shepard, R. (1990) On Understanding Mental Images. In *Images and Understanding*. Barlow, H., Blakemore, C. and Weston-Smith, M. (eds). Cambridge: Cambridge University Press, pp. 365-370.

Sheppard, S.R.J. (2001) Guidance for crystal ball gazers: developing a code of ethics for landscape visualization. *Landscape and Urban Planning* **54**: 183-199.

Silverman, D. (2001) *Interpreting Qualitative Data: Methods for Analysing Talk, Text and Interaction*. London: Sage.

Silverman, D. (1999) The New Language of Qualitative Method. *American Journal of Sociology* **105**: 578-579.

Sjöberg, L. (2000) The Methodology of Risk Perception Research. *Quality & Quantity* **34**: 407-418.

Sjöberg, L. (1998) Worry and Risk Perception. *Risk Analysis* **18**: 85-93.

Slovic, P. (2000) *The perception of risk*. London: Earthscan.

Slovic, P., Fischhoff, B., and Lichtenstein, S. (1981) Perceived risk: psychological factors and social implications. *Proceedings of the Royal Society, London A* **376**: 17-34.

Smith, R.A. (1991) The effects of visual and verbal advertising information on consumers' inferences. *Journal of Advertising* **20**: 13-25.

Spencer, T. (1998) Contraction and Convergence. *Town and Country Planning* **67**: 300-301.

Stainton-Rogers, W. (2003) *Social Psychology: Experimental and Critical Approaches*. Maidenhead: Open University Press.

Stamm, K.R., Clark, F., and Eblacas, P.R. (2000) Mass communication and public understanding of environmental problems: the case of global warming. *Public Understanding of Science* **9**: 219-237.

Steg, L., and Sievers, I. (2000) Cultural theory and individual perceptions of environmental risks. *Environment and Behaviour* **32**: 250-269.

Stehr, N., and Von Storch, H. (1995) The Social Construct of Climate and Climate-Change. *Climate Research* **5**: 99-105.

Stephenson, W. (1953) *The Study of Behaviour: Q-Technique and Its Methodology*. Chicago: The University of Chicago Press.

Stern, P.C., and Dietz, T. (1994) The Value Basis of Environmental Concern. *Journal of Social Issues* **50**: 65-84.

Stern, P.C., Dietz, T., and Kalof, L. (1993) Value Orientations, Gender, and Environmental Concern. *Environment and Behaviour* **25**: 322-348.

Stern, P.C., Dietz, T., Kalof, L., and Guagnano, G.A. (1995) Values, Beliefs, and Proenvironmental Action: Attitude Formation Toward Emergent Attitude Objects. *Journal of Applied Social Psychology* **25**: 1611-1636.

Stevenson, N. (2000) Questions of Hermeneutics: Beyond Empiricism and Post-Modernism. In *Research Training for Social Scientists: A Handbook for Postgraduate Researchers*. Burton, D. (ed). London: Sage, pp. 21-32.

Stoll-Kleemann, S., O'Riordan, T., and Jaeger, C.C. (2001) The psychology of denial concerning climate mitigation measures: evidence from Swiss focus groups. *Global Environmental Change* **11**: 107-117.

Stone, J.C., and Green, J.L. (1971) The double Q-sort as a research tool. *The Journal of Experimental Education* **40**: 81-88.

Strauss, A., and Corbin, J. (1990) *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. London: Sage.

Streets, D.G., and Glantz, M.H. (2000) Exploring the concept of climate surprise. *Global Environmental Change* **10**: 97-107.

Sturgis, P., and Allum, N. (2004) Science in society: re-evaluating the deficit model of public attitudes. *Public Understanding of Science* **13**: 55-74.

Stylianidou, F., Ormerod, F., and Ogborn, J. (2002) Analysis of science textbook pictures about energy and pupils' readings of them. *International Journal of Science Education* **24**: 257-283.

Swaffield, S.R., and Fairweather, J.R. (1996) Investigation of attitudes towards the effects of land use change using image editing and Q sort method. *Landscape and Urban Planning* **35**: 213-230.

Tesch, R. (1990) *Qualitative Research: Analysis Types and Software Tools*. New York: The Falmer Press.

Theodori, G.L., and Luloff, A.E. (2002) Position on Environmental Issues and Engagement in Proenvironmental Behaviours. *Society and Natural Resources* **15**: 471-482.

Thompson, M., and Rayner, S. (1998) Cultural discourses. In *Human Choice and Climate Change: Volume One, The Societal Framework*. Rayner, S. and Malone, E. (eds). Ohio: Battelle, pp. 265-344.

Tonglet, M., Phillips, P.S., and Bates, M.P. (2004) Determining the drivers for householder pro-environmental behaviour: waste minimisation compared to recycling. *Resources, Conservation and Recycling* **42**: 27-48.

Treagust, D.F., Chittleborough, G., and Mamiala, T.L. (2002) Students' understanding of the role of scientific models in learning science. *International Journal of Science Education* **24**: 357-368.

Trumbo, J. (2000) Seeing Science: Research Opportunities in the Visual Communication of Science. *Science Communication* **21**: 379-391.

Trumbo, J. (1999) Visual Literacy and Science Communication. *Science Communication* **20**: 409-425.

Trumbo, C.W., and Shanahan, J. (2000) Social research on climate change: where we have been, where we are, and where we might go. *Public Understanding of Science* **9**: 199-204.

UN (2002) Understanding climate change: A beginner's guide to the UN Framework Convention and its Kyoto Protocol. Bonn: United Nations.

UN (1992) United Nations Framework Convention on Climate Change. Bonn: United Nations.

Ungar, S. (2000) Knowledge, ignorance and the popular culture: climate change versus the ozone hole. *Public Understanding of Science* **9**: 297-312.

Ungar, S. (1995) Social Scares and Global Warming: Beyond the Rio Convention. *Society and Natural Resources* **8**: 443-456.

Ungar, S. (1992) The rise and (relative) decline of global warming as a social problem. *Sociological Quarterly* **33**: 483-503.

Urmetzer, P., Blake, D.E., and Guppy, N. (1999) Individualized Solutions to Environmental Problems: The Case of Automobile Pollution. *Canadian Public Policy* **25**: 345-359.

Valenta, A.L., and Wigger, U. (1997) Q-methodology: Definition and Application in Health Care Informatics. *Journal of the American Medical Informatics Association* **4**: 501-510.

Van den Hoonaard, W.C. (1997) *Working with Sensitizing Concepts: Analytical Field Research*. Thousand Oaks: Sage.

Van Liere, K.D., and Dunlap, R.E. (1980) The Social Bases of Environmental Concern: A Review of Hypotheses, Explanations and Empirical Evidence. *Public Opinion Quarterly* **44**: 181-197.

Verplanken, B., Aarts, H., and Knippenberg, A.v. (1997) Habit, information acquisition and the process of making travel mode choices. *European Journal of Social Psychology* **27**: 539-560.

Vigar, G. (2000) Local 'Barriers' to Environmentally Sustainable Transport Planning. *Local Environment* **5**: 19-32.

Wade, N.J., and Swanston, M.T. (2001) *Visual Perception: An introduction*. East Sussex: Psychology Press.

Wahlberg, A.A., and Sjöberg, L. (2000) Risk perception and the media. *Journal of Risk Research* **3**: 31-50.

Warren, S. (1995) *From margin to mainstream: British press coverage of environmental issues*. Chichester: Packard.

Weaver, A.J., and Hillaire-Marcel, C. (2004) Global Warming and the Next Ice Age. *Science* **304**: 400-402.

Weingart, P., and Pansengrau, P. (2003) Introduction: perception and representation of science in literature and fiction film. *Public Understanding of Science* **12**: 227-228.

Weingart, P., Engela, A., and Pansengrau, P. (2000) Risks of communication: discourses on climate change in science, politics, and the mass media. *Public Understanding of Science* **9**: 261-283.

Wherrett, J.R. (1999) Issues in using the Internet as a medium for landscape preference research. *Landscape and Urban Planning* **45**: 209-217.

Wicks, R.H. (1995) Remembering the News: Effects of Medium and Message Discrepancy of News Recall over Time. *Journalism and Mass Communication Quarterly* **72**: 666-681.

Wilson, K.M. (2000) Communicating climate change through the media: Predictions, politics and perceptions of risk. In *Environmental Risks and the Media*. Allan, S., Adam, B. and Carter, C. (eds). London: Routledge, pp. 201-218.

Winston, B. (1998) 'The Camera Never Lies': The Partiality of Photographic Evidence. In *Image-based Research: A Sourcebook for Qualitative Researchers*. Prosser, J. (ed). London: Falmer Press.

Wollensak, A. (2002) Curricular modules: 3D and immersive visualization tools for learning. *Computers & Graphics* **26**: 599-602.

Wynne, B. (1996) Misunderstood misunderstandings: social identities and public uptake of science. In *Misunderstanding science? The public reconstruction of science and technology*. Wynne, A.I.a.B. (ed). Cambridge: Cambridge University Press.

Young, R.D. (2000) Expanding and Evaluating Motives for Environmentally Responsible Behaviour. *Journal of Social Issues* **56**: 509-526.

Zehr, S.C. (2000) Public representations of scientific uncertainty about global climate change. *Public Understanding of Science* **9**: 85-103.

Appendix 1 - Interview guide

1. Can you imagine what the world will be like in 50 years time?

- a) Can you imagine what might be different from today?
- b) What are your main hopes and / or concerns about the future of the world in general?

2. What do you feel are the main concerns facing *your* life, if any?

- a) Prompt: what would you change to make your life better?
- b) What sort of things do you worry about on a daily basis?

3. Have you heard about the issue of climate change before now?

Prompt: Global warming, the greenhouse effect...

- a) How much, if at all does climate change concern you when you think about it along side the concerns in your life which you have mentioned?
 - i. Prompt: Do you feel that climate change is at all important to you personally, and your life?
 - ii. If so, to what extent?
 - iii. Prompt: How does it compare to the other worries in life?
- b) If concerned: can you think what it is about climate change that particularly concerns you?

4. What thoughts, feelings or pictures come into your mind, if any, when you consider the issue of climate change?

- a) Are there any other images or thoughts you associate with climate change?
 - i. Prompt: Keep asking but if none, prompt, e.g. TV, radio, papers, etc....
- b) Is there anything *positive* about climate change that comes into your mind?
- c) If you think about the *negative* aspects of climate change what do you imagine?

5. Can you think where the thoughts, feelings and pictures you have described might have come from?

- i. Prompt: Can you remember having seen or heard about climate change in the media? If so what?, e.g. TV, Radio, in newspapers, in magazines, children or elsewhere?
- ii. Prompt: Can you remember when and in what context?
- b) Approximately when did you become aware of climate change?
 - i. Prompt: what is your earliest memory of hearing about climate change? Where were you?

- c) Has climate change [prompt: 'the greenhouse effect'] ever been mentioned in conversation with anyone?
 - i. Probe to find out who, what relationship, what kind of comment, etc. (factual info, opinion, dismissal, joke, etc.), what context, what significance was attached to it or impression made.
- d) Has anything else influenced how you think about climate change over the last couple of years?

6. Have you personally noticed any local changes, which may suggest that the climate is changing?

- i. If so what?

7. In your opinion, what do you consider to be the main causes of climate change?

- i. Prompt: only in extreme cases of non response include: natural variation, world economy, attitudes of governments, individual attitudes and industry.

8. Do you personally believe that human activities can affect the climate?

- i. Prompt: Do you feel able to decide, or can you come to a conclusion about whether people can affect the climate?
- ii. Prompt: What would help you to decide about whether humans are having an effect on the climate or not?
- iii. If NO, and without elaboration... what has influenced your view?

- b) Do you think that people are affecting the climate now?
- c) Do you believe that human activities will affect the climate in the *future*?
- d) Do you think climate change is inevitable, or is it a matter of choice?

9. Do you feel that the way that humans may be affecting the world's climate raises any moral issues?

- i. Probe: prompt them to elaborate.
- ii. Do you think there is anything particularly wrong or right about it?

- a) Do you feel that it raises, in any sense, any spiritual issues? [prompt: for example about the relationship between human beings and whole planet]?

10. Who do you think should take responsibility for doing something about climate change?

- a) Do you believe anyone is taking responsibility at the moment?

11. Do you feel able to do anything personally to lessen the effects of climate change?

- i. Prompt: Do you feel *capable* of doing anything personally...?
- b) Are you doing anything at present?
 - i. Prompt: Why is that? Or is any thing stopping you?
 - ii. Could anything help you to do something if you wanted to?
- c) In principle, would you consider doing these things (see end page) if you knew they would contribute towards solving the problem of climate change?
 - i. Prompt: Would anything encourage or help you to?

12. What sort of information would help you learn more about or help you to decide what to do about climate change?

13. Could anything happen to make climate change a more important issue to you?

- i. Prompt: what event or change for example could happen...

14. What do you think the significance of climate change will be to society, if any, in 50 years time?

Is there anything else you'd like to add?

Appendix 2 – Excerpt from interview transcript

[Can you imagine what the world will be like in 50 years?]

Oh god [laughs]...very space-agey, I should imagine. All computers, everything run by computers, I should well imagine...you know.

[Do you think the world will be better than it is now or not?]

I don't think it will personally...I think that will be too much...no good for the planet. Pauses. Even just recently, the changes that have been made, with mobile phones and everything...everything's just computers, computers, computers.

[Do you feel pessimistic about the future?]

Yeah, I do.

[Can you think of anything else that would be different from the way it is now?]

Well I don't think there'll be so much...Ummm...like, countryside and stuff. I think that'll all just be overridden by...development, housing developments...and same with vehicles...Just big roads and houses everywhere. A bit like what Bowthorpe is getting like. Exactly, yeah.

[What are your main hopes for the future?]

Well, just like peace really. Peace in the world. And none of this...what's going on at the minute. It's either just going to get worse or...it's gonna stop. I'd like to think it's gonna stop, but I don't think it will. I think it'll probably get worse...before it gets better.

[Is that one of your concerns as well?]

Yeah, yeah...especially with having a little one...ermmm on September the 11th, she'd just turned one then, and I thought...I got really worried about it all. I felt really bad, you know, having a baby...and bringing it into this world...which is not nice really is it.

[So do you worry about your little girl's future?]

Yeah I do, definitely...war and things like that.

[What about on a day to day basis. What are your main concerns about life in general?]

On a day-to-day basis... not...nothing...not really. It's only until something big happens, like that that you really...puts everything into pers... perspective. When you watch the news and stuff. But on a day-to-day basis...don't suppose I really...think about it.

[What sort of things do you worry about more?]

Ummm...well money, yeah. Yeah definitely.

[Is there anything else?]

Yeah, just...money, security, money...you know. Yeah. Mmmm.

[Have you heard about climate change before?]

Briefly but not really.

[Have you heard of global warming?]

Yeah...but not really...sort of I'm not really into geography, and things like that [laughs]...I don't know too much about it, but I've heard the words. I don't understand it all.

[Can you remember when you first heard of it?]

Probably when I was at school ummm...probably more high school...and ummm that, yeah, sort of...geography, at high school.

[Do you remember hearing anything else?]

Yeah, when it comes up in the news...you know. Briefly but not...ummm, I mean, not too much.

[Does climate change concern you at all, when you think about it?]

[pauses] yeah...yeah it does. I mean, they say...ummm...like, the sea's getting bigger isn't it, and like, in so many years time, um parts of our country won't even be here. Stuff like that concern me. And the rainforest, and that sort of thing...[pauses] yeah, it does. But not like, dramatically. I don't sit back and think, oh my god, you know, what am I going to do about it, but like, it does go through my mind, yeah. More generally, not like, all the time. Just when I hear about it.

[How do things like global warming compare with your other worries like getting by and security?]

I suppose it kind of doesn't really, I suppose it's quite insignificant. I suppose until you sit and think about it. But on a day to day basis, I suppose it's kind of...not something I actually think about it. Yeah.

[Where would global warming come on a list of your personal concerns for instance?]

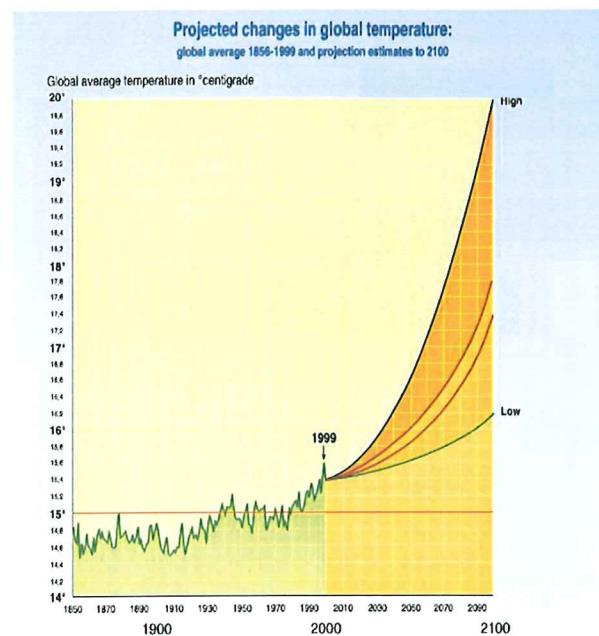
Well it would probably be closer to the bottom than the top...only because I suppose it's not ummm...a major issue through the news and stuff like that. I mean you don't hear about it an awful lot do you...really...they don't press on it like they do other issues.

Appendix 3 – The images used in this study

Climate change images used in this research (and their sources)



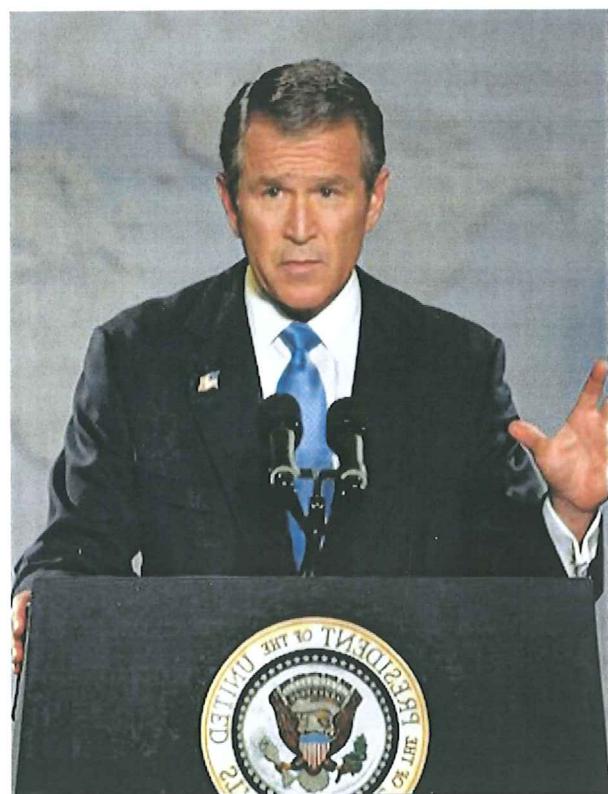
Thermostat (www.ecoscene.co.uk)



Graph of temperature rise
(www.grida.no)



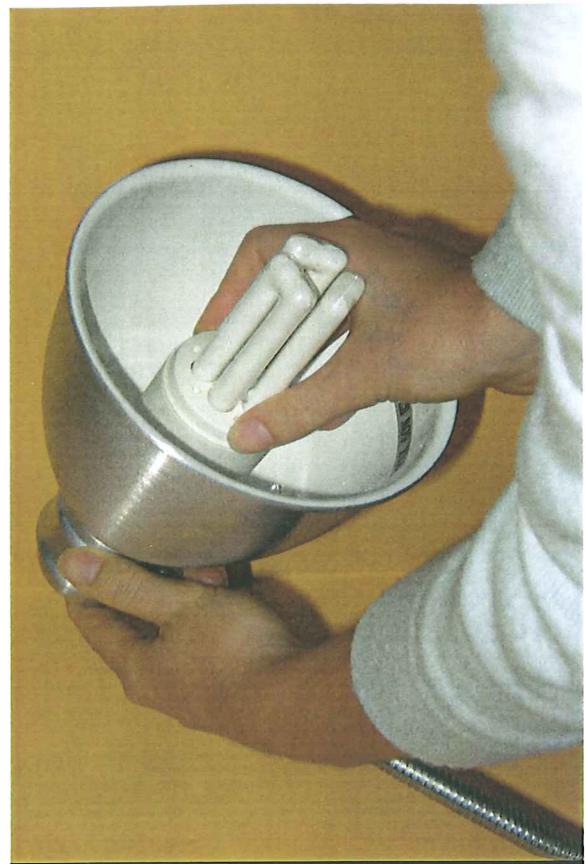
Industrial smoke stacks (www.stillpictures.com)



George Bush
(www.whitehouse.gov)



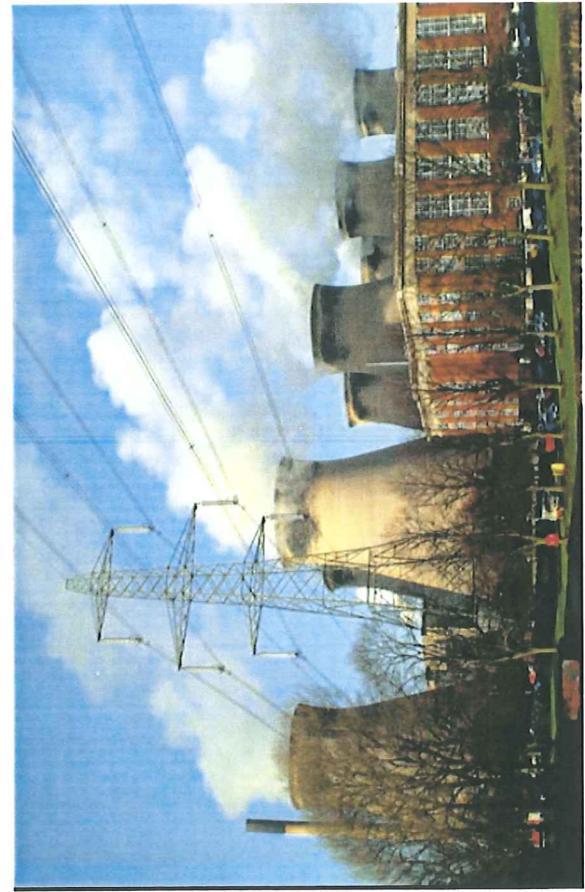
Aeroplane (www.freefoto.com)



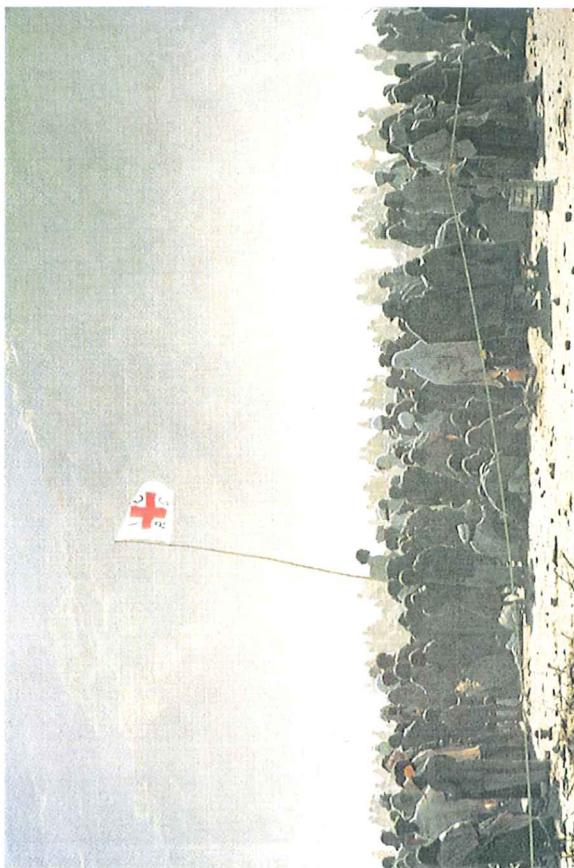
Low energy light bulb
(own picture)



Petrol station (www.freeimages.co.uk)



Power station (www.freefoto.com)



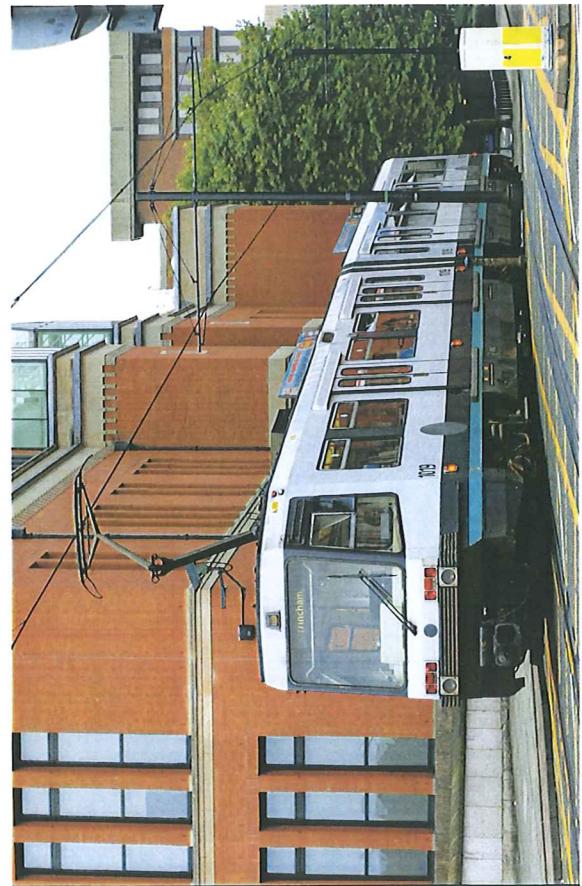
Refugees (www.stillpictures.com)



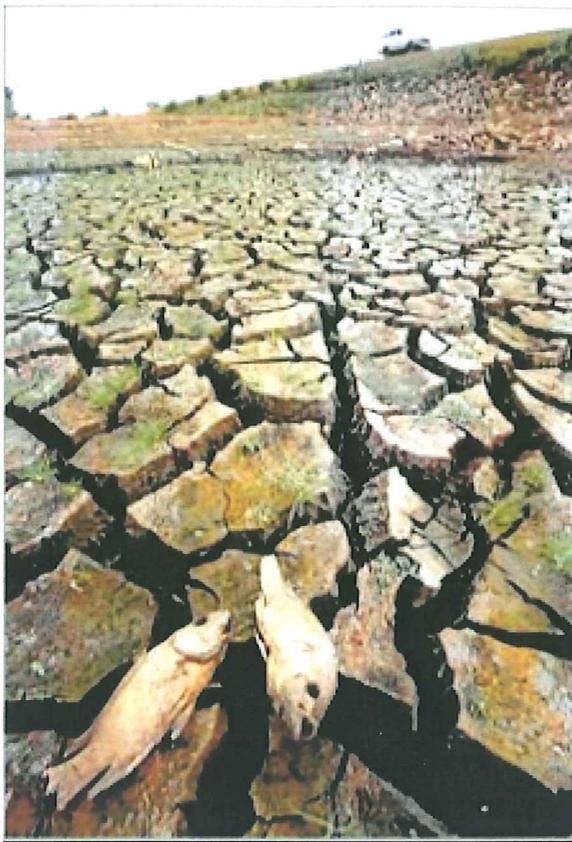
Wind turbines
(www.nrel.gov\data\pix/)



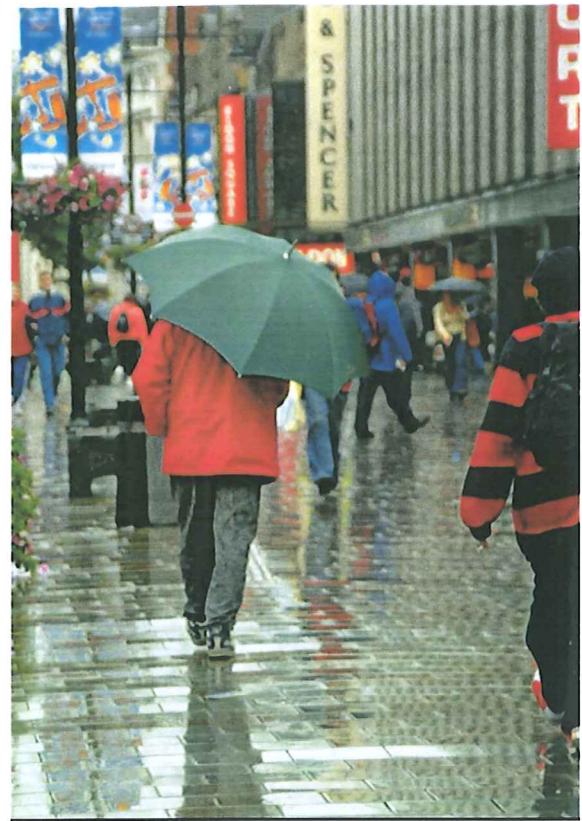
House with solar panels (www.nrel.gov\data\pix/)



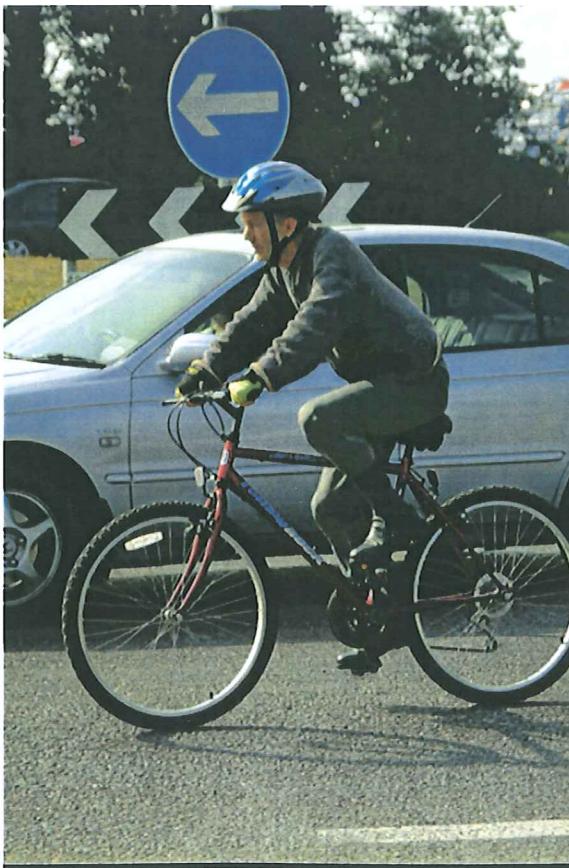
Tram
(www.samsonrail.co.uk)



Dried up riverbed with dead fish
(www.smh.com)



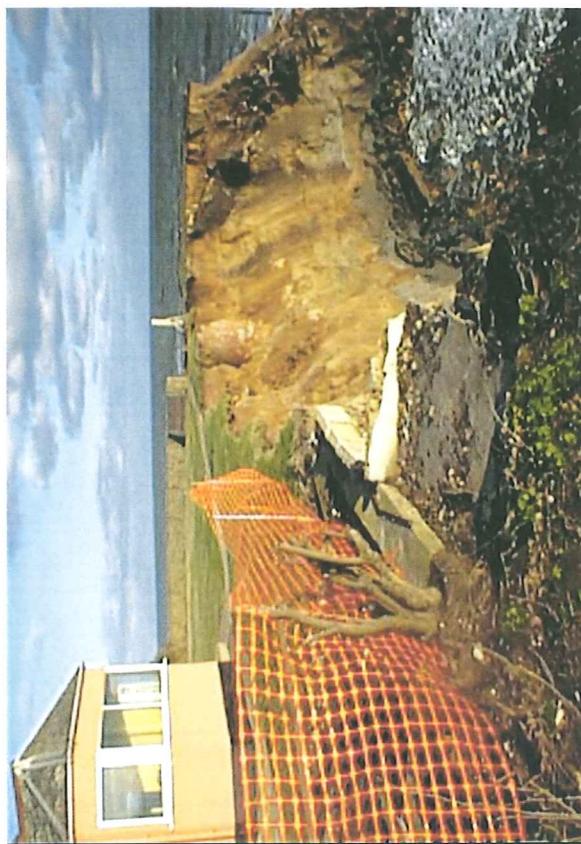
Rainy high street
(www.freefoto.com)



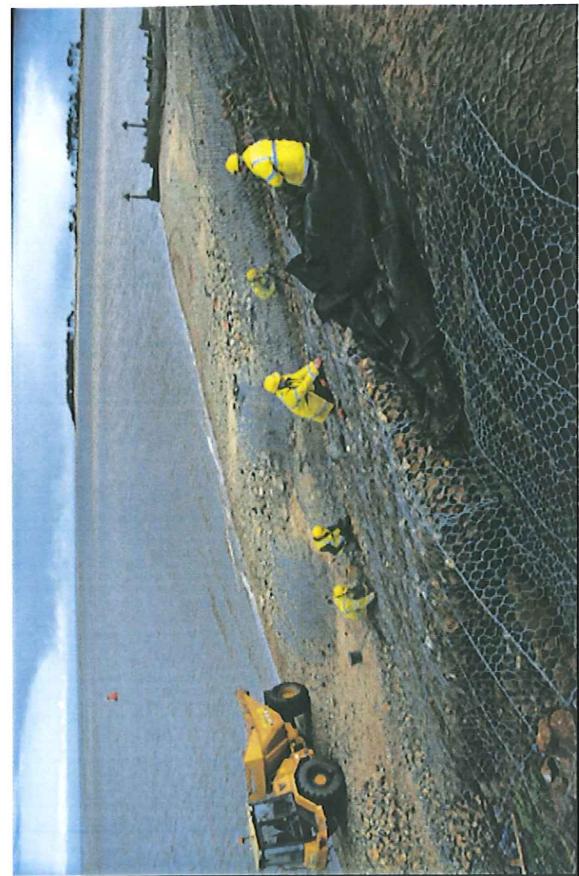
Cyclist
(www.freefoto.com)



Women at standpipe
(www.halifaxcouriertoday.co.uk)



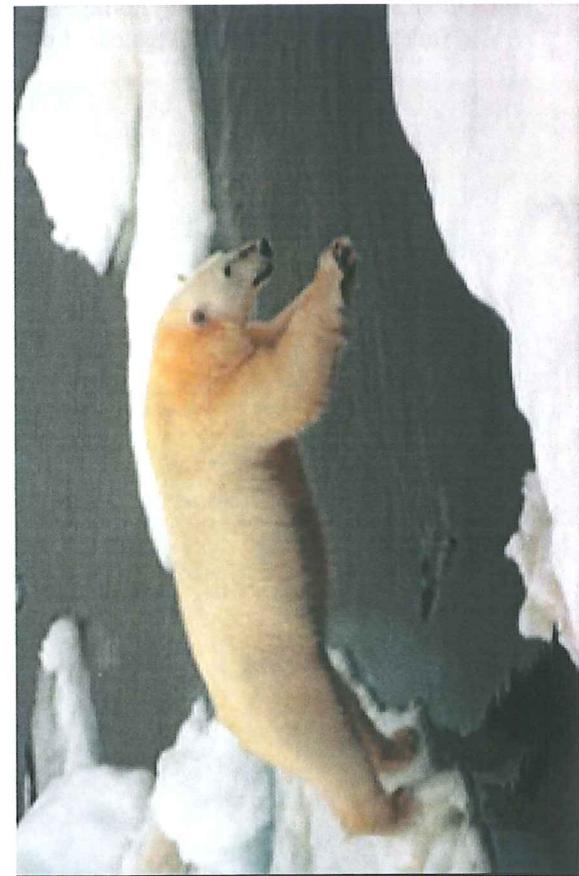
House falling off cliff
(www.happisburgh.org.uk)



Building sea defences (www.rspb-images.com)



Melting ice (www.stillpictures.com)



Polar bear (www.greenpeace.org.uk)



Flood in Bangladesh
(www.google.co.uk/images) CHECK



Irrigation (http://www.cru.uea.ac.uk/link/new_link/photographs/irrigation/index.htm)



Flooded house
(www.selbynet.co.uk)



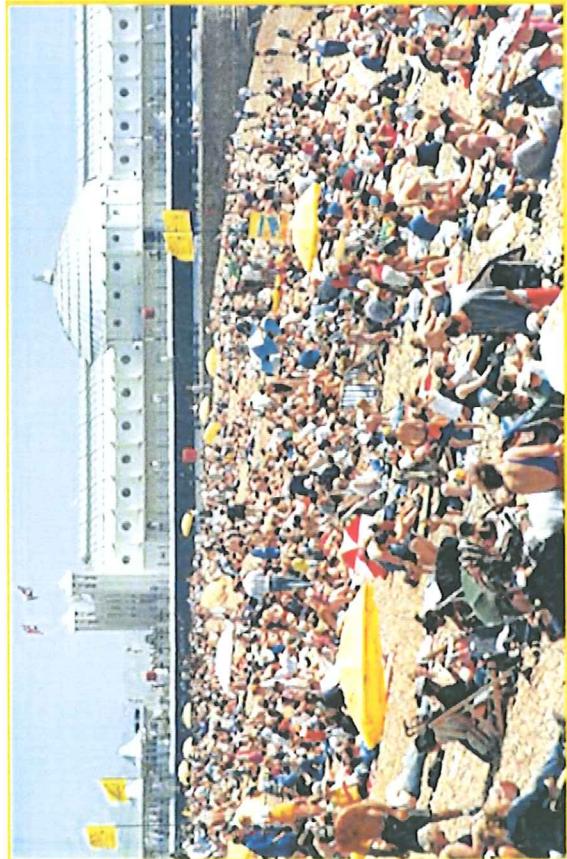
Sunflower field (http://www.cru.uea.ac.uk/link/new_link/photographs/agriculture/index.htm)



Stormy sea at coast
(www.troononline.net)



Cartoon (www.envirocitizen.org/issue/cc/gallery.html)



Beach (www.burgerkingseaviewrestaurant.co.uk)



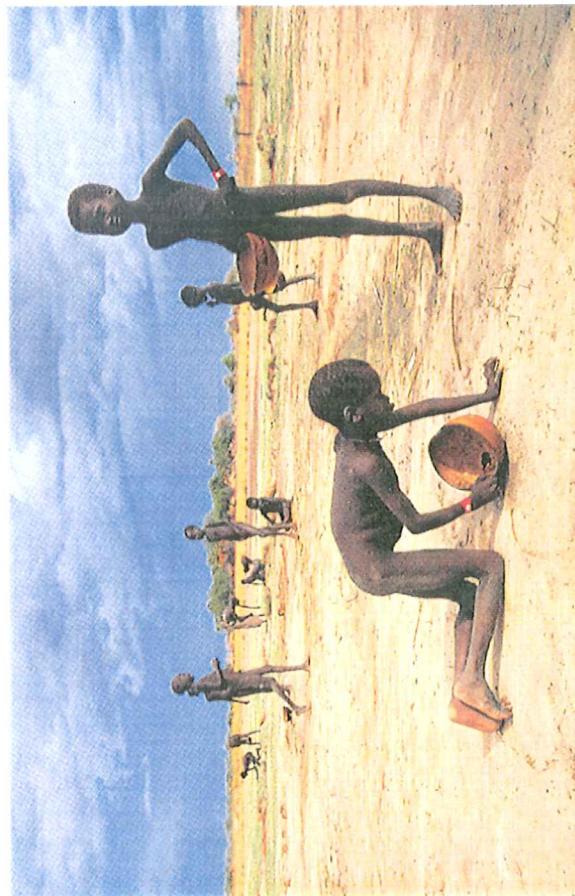
Café (www.city.toronto.on.ca)



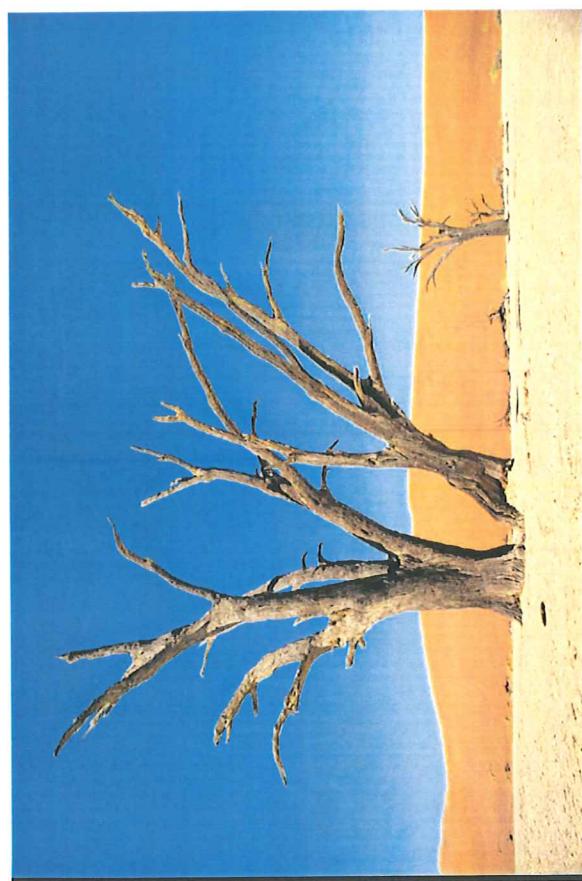
Mosquito
(www.fiocruz.br)



Forest fire
(www.hotrodsandclassics.net)



Starving children, famine
(www.stillpictures.com)



Dead tree in desert
(www.stillpictures.com)

Appendix 4 – Q-materials

a) Q-sort booklet

b) Q-sort matrix (or quasi-normal distribution into which participants sorted the stimuli)

A) Q-sort instructions

Instructions

Please allow about half an hour to complete this exercise. All the materials you need are enclosed. There are two picture-sorting exercises which these instructions go on to explain. The materials for the first sorting exercise are yellow and those for the second sorting exercise are blue. You should have:

- An envelope containing a set of pictures. The pictures are numbered to identify them but are not in any order. You will be using these pictures for both the sorts.

- A set of numbered markers (-3 to +3), also in the envelope.

- 2 sheets headed 'Sorting Grid 1' (yellow) and 'Sorting Grid 2' (blue).

- Two booklets for your comments, which each contain a list of the pictures (by number) and space for your comments. The yellow booklet is for your comments on the first sort and the blue booklet is for your comments on the second sort.

- A stamped addressed envelope for you to return the materials to me.

- My contact details (on the cover letter) so that you can get in touch with me by phone or email at any point if the instructions are unclear, or if you have any questions.

Doing the first sorting exercise

1: Find a space on a tabletop or on the floor where you can lay out the pictures as you complete this exercise.

2: Take the markers out of the envelope. Across the top of the space you have chosen, lay out the numbered markers in a line like this:

-3 -2 -1 0 +1 +2 +3

3: Now, take the pile of pictures and sort them into *three* piles:

These pictures make me feel that climate change isn't important	I am unsure or undecided about these pictures, or they seem unimportant to me	These pictures make me feel that climate change is important	These pictures make me feel that climate change is unimportant to me
---	---	--	--

It doesn't matter how many pictures are in each pile, or which pictures you put in each pile, there are no right or wrong answers.

4: Take the pile of pictures that DO make you feel that climate change is important. Choose the two that you think most strongly make you feel that climate change is important (or very important) and place them under the marker numbered +3.

5: In the rest of the task, you will continue to lay out the pictures beneath the markers. This is a good time to look at the yellow sorting grid. It shows you how your final pattern of pictures will be arranged when you have finished sorting them according to the following instructions.

(You may have noticed that at the bottom of each marker is a small number in brackets. This tells you how many pictures there should be under that marker when you have finished sorting the pictures. The small number at the bottom of each column on the yellow grid tells you the same thing.)

6: Now go back to the rest of the pictures in the 'DO' make me feel that climate change is important' pile. Place the next four pictures that most strongly make you feel that climate change is important underneath the +2 marker. It doesn't matter what order they are in from top to bottom. If you have run out of pictures move on to step 8, otherwise carry on to number 7.

7: If you have any left, place rest of the 'DO' pictures underneath the +1 marker. If you still have some left, put them in the middle column.

(You don't need to spend too much time thinking about your choices – rely on your first reactions and settle for what you think is a reasonable estimate.)

8: Then start at the other end with the pictures that make you feel that climate change isn't important. Choose the two that you think most strongly make you feel this way and place them underneath the -3 marker.

9: Take the rest of the pile. Out of the ones left over take the four pictures that most strongly make you feel that climate change isn't important and place them underneath the -2 marker like you did at the other end of the pattern. Again, arrange the rest of the pictures left in the 'not important' pile, working inwards until they run out.

10: Finally, arrange the pictures you are unsure about into the spaces that are left over. Check the final layout and rearrange the pictures until you feel happy with the order that they are in. Don't spend too long doing this. Just go with what feels right.

(It doesn't matter how many 'do', 'don't', or 'undecided' pictures you have, as long as the ones you feel most strongly about are placed at the far ends of the pattern, and the more neutral ones are towards the middle. If you want to, draw lines on the grid to show me where the boundaries are between the 'do', 'undecided' and 'don't' pictures.)

11: When you have finished sorting the pictures they should be arranged in the same pattern as you can see on the sorting grid sheet you looked at earlier. Please do not add any extra pictures to any of the columns.

12: If you have had any problems deciding where to put a particular picture, or you don't know what some of the pictures are of, write in the yellow comments booklet next to the number of the picture you are commenting on. Also please comment on why you feel strongly about the images that you have put underneath the +3 and -3 markers (and neutral or uncertain about others). All of your opinions and comments are very useful for helping me to understand why you have sorted the pictures out in a particular way.

Doing the second sorting exercise

1: Sort the pile of pictures again into three new piles:

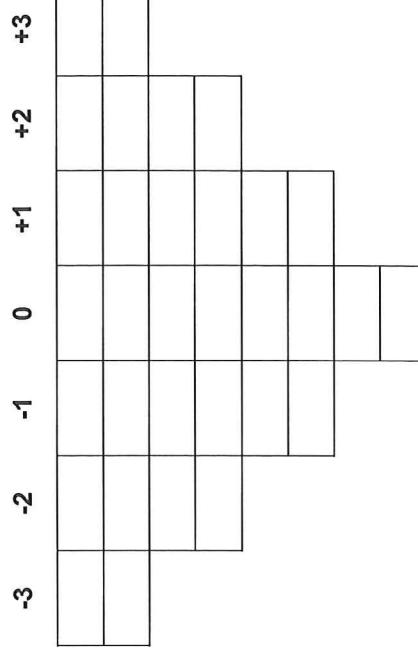
These pictures make me feel that nothing I do will make any difference to climate change

These pictures make me feel that I can do something about climate change personally

1: Sort the pile of pictures again into three new piles:

2: Like last time, place the two pictures that make you feel most strongly that you can personally do something about climate change under the +3 marker.

13: Now write the numbers of the pictures you have arranged on to the yellow grid titled 'Sorting Grid 1'. Again, please do not alter the shape of the grid. Make sure you write the numbers on the grid exactly as you have placed them. Please also make sure that you write your name on the sheets – this is for my information only and will remain confidential.



-3	-2	-1	0	+1	+2	+3

Leaving the markers where they are, gather up the pictures, mix them up and move onto the blue section.

The grid shape for this sort is exactly the same as for the last one.

3: As you did before, place the next four beneath the +2 marker. Then if you have any left over place them beneath the +1 marker and so on, towards the middle until they run out.

4: Then take the pile of pictures that make you feel that there's nothing that you can do personally about climate change. Place the two pictures which make you feel most strongly under the -3 marker.

5: Again, place the next four underneath the -2 marker and so on, moving towards the middle of the grid shape.

(Again, it doesn't matter how many 'can', 'can't', or 'undecided' pictures you have, as long as the ones you feel most strongly about are placed at the far ends of the pattern, and the more neutral ones are towards the middle. If you want to, draw lines on the grid to show me where the boundaries are between the 'do', 'undecided' and 'don't' pictures.)

6: Finally, arrange the pictures from the undecided pile into the free space until your grid shape is complete. Once again, don't spend too long deciding on the order. Make sure that the pattern is exactly the same as the grid shape on the blue/yellow paper.

7: Once again, if you have any difficulties with the task, or comments about the pictures, write them down in the blue comments booklet. Again, please comment on why you have placed certain pictures at the far ends of the grid (under the +3 and -3 markers). Please also

comment on why some of the pictures don't make you feel very strongly either way, or tell me why you are unsure about them.

8: Now take the sheet titled 'Sorting Grid 2' on the blue paper, and fill in the numbers exactly as you have arranged them.

Returning the materials

Now you have finished, please make sure that you have:

- Completed both the yellow and blue sorting grids and written your name on the sheets
- Written any comments you have about the pictures in the booklets

Put the grids and the comments booklets in the stamped addressed envelope and return it to me as soon as possible, preferably by Friday 30th May.

Thanks again for taking the time to help me with my study, your help is very much appreciated and is crucial for my research. When I see you again at the group discussion I'll be very glad to hear any more opinions you have about the sorting exercise or about the pictures themselves.

I look forward to seeing you again soon.

Sorting Grid 1

B) Q-SORT MATRIX

Most disagree

111

Most agree

3 -2 -1 0 +1 +2 +3

Name..... Date.....

Appendix 5 – Focus group guide

Part one: Ice breaker and Q-sort feedback (10 minutes)

- You all completed the same sorting tasks using the same pictures. I am very interested to hear more about how you got on with it. For example were there any aspects that you found difficult and what were they?
- How long did it take you?

Prompts: *What did you think was good about it? Did you enjoy it? Did you understand the instructions?*

Part two: Explanation of Q factors and image interpretation (30-35 minutes)

SALIENCE (15-20 minutes)

- Now we'll talk about the pictures. These are the images that came out most strongly as making climate change seem an important issue [*starving children; famine; dried up lake with dead fish; flood in Bangladesh; graph showing temperature rise; flooded house; melting ice*].
- What do you think? Why do you think they make climate change seem important?
- These ones also featured [*Industrial smoke stacks; wind turbines; petrol station; power station*]. Why do you think that these make climate change seem important?
- Are there any images that make you feel that you can make a really meaningful difference?
- These are the images that came out most strongly as making climate change seem unimportant [*café; beach; sunflowers; rainy high street; tram; irrigation; aeroplane; George Bush*]. Why do you think this is the case?
- What distinguishes the important from the unimportant images?

Prompts: *What characteristics or associations in the images make climate change seem important / unimportant? What do you focus on when you look at these pictures? People pictures? Global images? Local images? What do you think these images are trying to say?*

- Do you think that captions would make a difference to how important the images make climate change seem? Can you think of any captions for any of these images that would make climate change seem more important to you? Would they strengthen any of the images?

EFFICACY (15 minutes)

- These are the images that seemed to make people feel most able to do something personally about climate change [*fitting low energy light bulb; thermostat; cyclist; house with solar panels; wind turbines; tram*]. How do you feel about these?
- Why do they make you feel able to do something about climate change, what is it about these images that make you feel that way?
- These are the images that seemed to make people feel most unable to do anything personally about climate change [*industrial smoke stacks; dried up lake with dead fish; graph showing temperature rise; flood in Bangladesh; refugees; stormy coast; George Bush; flooded house; polar bear; beach*]. Why do they make you feel unable to do anything about climate change? What is it about these images that make you feel that way?
- What distinguishes the ‘able’ images from the ‘unable’ images?

Prompts: *What characteristics or associations in the images make you feel able or unable to do anything personally about climate change and why? What do you focus on when you look at these pictures? What do you think these images are trying to say?*

- Would these images benefit from captions to make you feel more able to do something about climate change and if so what might they be?

Part three: Engaging images, wider motivations (30-35 minutes)

- Do you find any that any of these images make you feel motivated, in other words that climate change is both important and that you feel personally able to do something about it?
- If so, why? If not, why not?
- How do these more motivating images compare with the ones that separately made climate change seem important and made you feel able to do something about it?

Prompts: *which ones make you want to do something about climate change as well as making it seem important?*

- Elimination game: Do you think you can find a group of about five of these pictures that together make you feel motivated? Begin by taking away the most un-motivating images a few at a time and mention why you think they are un-motivating? Why do you think these ones [chosen pictures] make you feel motivated? What is it about seeing these pictures together that makes you feel motivated?
- Are there any pictures or types of pictures that aren’t included here and should be? Are there any other images that you think might be more motivating than the ones in this set?

- Is motivation really possible with a picture? What do you think would ultimately make you feel that climate change is important and that you can do something about it?

Prompts: Do these pictures or any others that you can think of really make you feel motivated? What other things do you think would make you feel more committed?, e.g. if the Government really took a stand on climate change, etc.

Part four: Wrap-up and assessment of participation (10 – 15 minutes)

- Thank you very much for your participation
- Wrapping up, I am very interested to know if you feel that your feelings and opinions about climate change might have changed as a result of helping me with my research. Think back to the interviews last year if you can; I wonder if your feelings are at all different? If so, how?

Prompts: Are you more aware of the issue of climate change? Have you found yourself talking about it with others at any point? Have you noticed any environmental changes that you now associate with climate change but might not have done before? Has any aspect of your day-to-day routine altered as a result of taking part in this research, e.g. have you made changes at home in the way you use energy, etc. because of your thoughts about climate change?

- Payment, information and leaflets, light bulbs, more drinks, informal chatting, etc.

Appendix 6 – Examples of code diversity

Theme	EFFICACY
Main category	Barriers
Sub-category	Lack of government commitment / international disagreement
Codes	EFFICACY/CC/government efforts not really working EFFICACY/CC/government don't seem to be bothered EFFICACY/CC/government are making it worse EFFICACY/CC/government aren't taking responsibility EFFICACY/CC/government don't do enough EFFICACY/CC/government don't seem to be doing much EFFICACY/CC/government not giving a good impression EFFICACY/CC/government only want to win the next election EFFICACY/CC/government/have other issues to deal with EFFICACY/CC/international CC treaties haven't worked EFFICACY/CC/international disagreement EFFICACY/CC/no laws to make change EFFICACY/CC/people don't have a say EFFICACY/CC/targets are too far ahead EFFICACY/CC/USA inaction EFFICACY/CC/USA/nothing will happen until they commit

Theme	IMAGERY	
Main category	Impacts of climate change	
Sub-category	Sea level rise	
Codes	IMAGERY/CC/antarctic IMAGERY/CC/big lake IMAGERY/CC/Britain is sinking IMAGERY/CC/future/underwater IMAGERY/CC/ice bergs IMAGERY/CC/losing homes IMAGERY/CC/loss of land IMAGERY/CC/melting/melting ice caps IMAGERY/CC/polar bears [starving] IMAGERY/CC/people drowning IMAGERY/CC/penguins IMAGERY/CC/poles	
	Changing seasons	
	IMAGERY/CC/bad/worse summers IMAGERY/CC/can't predict the seasons IMAGERY/CC/changing seasons IMAGERY/CC/drier summers IMAGERY/CC/garden [flowers out earlier/plants last longer] IMAGERY/CC/hotter summers/UK and abroad IMAGERY/CC/no summer/shorter summers	
	IMAGERY/CC/sea defences IMAGERY/CC/sea getting bigger IMAGERY/CC/sea level rise IMAGERY/CC/sea level rise/East Anglia IMAGERY/CC/sea level rise/global IMAGERY/CC/sea level rise/population relocation? IMAGERY/CC/sea level/flooding general IMAGERY/CC/tidal waves	
	IMAGERY/CC/positive/warmer winters IMAGERY/CC/severe winter IMAGERY/CC/shorter/longer winters IMAGERY/CC/summer is earlier/later IMAGERY/CC/warmer/milder winters IMAGERY/CC/wetter winters IMAGERY/CC/winter is earlier/later IMAGERY/CC/worse winters	

Appendix 7 – Categorical breakdown of interview data by theme

- a) Breakdown of the main categories for general and personal concerns, future outlook, future imagery**
- b) Breakdown of the main salience categories**
- c) Breakdown of the main efficacy categories**
- d) Breakdown of the main imagery categories**

a) Breakdown of the main categories for general and personal concerns, future outlook, future imagery

Main categories	Sub-categories
Overall outlook on life and the future How participants view and approach the future. Own lifespan or short time horizon, generally an uncertain feeling about what the future holds and pessimistic / fatalistic outlook.	<ul style="list-style-type: none"> • Generic • Personal / short time horizon • Uncertain / pessimistic outlook
Hopes and concerns for the world (present and future) Hopes and concerns socially include: present global issues (e.g. AIDS, the rich and poor divide, international disagreements, famine and terrorism); future global issues (e.g. nuclear weapons, population problems, trade dominance); present local or national issues (e.g. crime, asylum seekers and urban problems); wider social issues (e.g. consumerism, globalisation, pace of life). Environmentally salient hopes and concerns are the second major thread in this category. Beyond general comment on the environment; environmental issues are referred to locally (e.g. litter, loss of countryside) and more globally (e.g. ozone layer, waste).	<ul style="list-style-type: none"> • Present global social issues • Future global social issues • Present local social issues • Wider / general social issues • Environmental hopes and concerns • Global environmental issues • Local environmental issues
Imagery – salient issues, hopes and concerns People's non climate change imagery with reference to the present can be classified as: environmental (e.g. urban pollution, the ozone layer, oil slicks, enjoying nature, etc.); and social (e.g. population issues, drugs, famine, poverty, terrorism, etc.).	<ul style="list-style-type: none"> • Environmental • Social
Priorities in life / personal daily concerns People's main priorities in life and personal / day-to-day concerns. These include concerns about family (e.g. children's safety), education, jobs and career (e.g. career, university), personal life (e.g. lifestyle, relationships, happiness), personal health & safety (e.g. security, stress) and money (e.g. cost of living, mortgage).	<ul style="list-style-type: none"> • Generic • Family • Education, jobs and career • Personal life • Personal health and safety • Money
Imagery of the future General imagery of how people view the future (e.g. it being futuristic, there not being much change). This is followed by: social imagery (e.g. development, global health issues, urban change, space travel, population issues, war); personal imagery (e.g. careers, family, money, quality of life images); environmental imagery (e.g. global warming, pollution, resources running out, loss of countryside). People have much general uncertainty in their imagery about the future too (e.g. wonder what the world will be like for my children) and express a lot of pessimism or negativity (e.g. the future will be bleak, nothing left, world collapse, frightening).	<ul style="list-style-type: none"> • Generic • Social (generally and global) • Personal • Environmental • General future uncertainty • Negative/pessimistic about the future

b) Breakdown of the main salience categories

Main categories	Sub-categories
Awareness of climate change Codes characterising people's feelings of their own awareness about climate change and that of others (e.g. at least I know something, people are aware). Not being aware (e.g. not aware, no info available, people aren't aware). When they became aware (e.g. first hearing about CC/school) and how this might change on a wider level in the future (e.g. people will be more aware in the future).	<ul style="list-style-type: none"> • Personal and general awareness of climate change • Not aware of climate change (personal and general) • First becoming aware of climate change • People's awareness in future
Climate change is / isn't happening Feelings that climate change is happening (e.g. already happening, believe it), versus climate change isn't happening (e.g. can't see it happening, can't feel effects).	<ul style="list-style-type: none"> • Is happening • Isn't happening
Can't relate to climate change Feeling unable to relate to climate change because of its distance, lack of reality in life, long-term nature and feeling that it happens in the future rather than the present. Also that it is happening abroad but not in the UK.	<ul style="list-style-type: none"> • Generic • Too far ahead • Not affecting me / UK
Climate change is negative / worries me Climate change as a negative issue (e.g. depressing, climate change is negative, scary when you think about it), characterised by people not wanting it to happen (don't want change, hope it's not happening / won't happen); stating that it is not positive (don't think it's positive); media interpretation (media only tell you the bad things); not realising until it's too late (e.g. we won't realise until it's too late, we won't be able to stop it).	<ul style="list-style-type: none"> • Generic • Don't want CC to happen • Not positive • Media interpretation is negative • Too little too late
Personal experiences and personal effects of climate change People talk about personal experiences making climate change seem important (e.g. brings it home, makes me think). Personal experiences of climate change span the effects of the impacts of climate change on families, lifestyles (e.g. house buying), local environmental conditions (e.g. extreme events, current weather, national effects), and personal issues (e.g. health effects, worries about CC affecting self). Also, they would find climate change important if they were affected (within category 'What would make climate change more important?'). Includes thoughts about others being affected / losing out	<ul style="list-style-type: none"> • Generic • Families • Lifestyles • Local environmental conditions • Personal issues
Not important / not concerned / don't think about it A strong category representing that some participants didn't find climate change important or aren't interested (e.g. insignificant, don't pay attention, not important to our society); don't feel concerned, bothered or worried (e.g. doesn't bother me / don't care, not a priority); don't think or talk about the issue (e.g. doesn't come up in conversation, never thought about it).	<ul style="list-style-type: none"> • Not important / disinterested • Don't feel concerned, bothered or worried • Don't think or talk about it
Not important / don't think about it because... There are many reasons for not finding climate change important and not thinking about it: lack of awareness and understanding personally and generally (e.g. haven't heard about it, people are ignorant); not finding it a priority or an appealing issue (e.g. boring, other short term demands, life's too short to be concerned; not a big issue for England); not feeling able to do anything (can't do anything about it so what's the point learning about it); a lack of interest by others (e.g. Government don't seem to be bothered, other people aren't concerned); lack of personal relevance (e.g. future issue so don't worry about it, not concerned / it's not personal); and reasons feeling no need to do anything (e.g. some say climate change doesn't exist, people are more important than climate change).	<ul style="list-style-type: none"> • Lack of awareness and understanding • Not a priority / not an appealing issue • Feeling unable to do anything • Lack of interest by others • Lack of personal relevance • No need to do anything
Important / concerned / think about it Statements (generally and personally) that: climate change is important and they are interested (e.g. climate change is important, interested); people are concerned, bothered or worried (e.g. concerned personally, some people care, worrying); and that they think and talk about it (e.g. think about it, daily / general conversation).	<ul style="list-style-type: none"> • Climate change is important/am interested • Concerned, bothered or worried about it • Think and talk about it
Climate change is important because... Climate change is important because: it is a global issue with issues of equity and ethics (e.g. future generations, equality); it has impacts in other countries (e.g. more serious in other countries); it has potential for local effects (e.g. if East Anglia was affected, local weather changes); potential for personal impacts (e.g. seeing the effects, very concerned / if it flooded my house); it's importance also depends on other things such as people's personalities and what happens in the future.	<ul style="list-style-type: none"> • Global, equity, ethical issues • Impacts in other countries • Potential for local effects makes CC important • Potential for personal impacts makes CC important • Other: Importance depends on personality, what happens, etc.

Continued overleaf...

Appendix 7b) continued...

<p>Importance of climate change in the future The possible importance of climate change in 50 years is variable. Many statements that it will not be important for various reasons (might not happen, I am only here for 80 years). Others think it will be important because of future generations (e.g. what sort of world will my children live in?). Some argue that it is important simply because it will happen – and that it may get worse if action isn't taken (e.g. will get worse if nothing is done, will affect everyone's lives).</p>	<ul style="list-style-type: none"> • Generic • Not important in the future • Effects on children and future generations • Important because it will inevitably happen
<p>Moral, religious, ethical, spiritual issues People raise a number of moral, religious, ethical and spiritual issues in relation to the causes and effects of climate change (international inequality, our actions affect others, selfish) and our relationship with nature (e.g. humans shouldn't damage the earth, respect for others and animals). For others there are no moral issues (e.g. no moral feelings, ethics, religion).</p>	<ul style="list-style-type: none"> • Generic • Disparate causes and effects • Our relationship with nature
<p>Responsibility and blame Various levels of responsibility: human level (we should take responsibility, people blame it on each other); personal level (my effects on the environment, I should think about or do something about it); and other levels (e.g. companies don't care about the environment, countries blaming it on each other, government not doing anything). Responsibility for climate change is talked about in a largely political light: globally (e.g. USA/nothing will happen unless they agree, political controversy / international disagreement); and nationally (e.g. government seem to have other priorities).</p>	<ul style="list-style-type: none"> • People's responsibility • Personal responsibility • Government, companies, other countries • Global political issue • UK government
<p>Lack of knowledge / uncertainty / confusion Characterising this category: Lack of knowledge personally and more widely (e.g. don't know how serious it is, don't understand, lack of proof, some people don't know anything about it); confusion and uncertainty due to conflicting information (e.g. confused by conflicting info, don't know what to believe, no clear message); uncertainty due to apparent lack of commitment and political disagreement (e.g. government don't seem to be bothered, political controversy); uncertainty due to future and uncertain nature of the issue (e.g. no-one knows what will happen, we could be wrong); and confusion with other environmental issues (e.g. association with ozone issue).</p>	<ul style="list-style-type: none"> • Lack of knowledge • Confusion and uncertainty due to conflicting information • Uncertainty due to apparent lack of commitment and political disagreement • Uncertainty due to future and uncertain nature of the issue • Confusion with other environmental issues
<p>Important causes and what should be done This category overlaps with the efficacy dimension where it is developed further. Major problems and causes (e.g. culture, energy resources, natural fluctuation). Alternatives suggested are: renewables, transport, technology, where food comes from. Commentary about being not sure if anything can be done and that it's worth changing because we can't take the chance.</p>	<ul style="list-style-type: none"> • Major problems / causes • Alternatives • Not sure if anything can be done but can't risk it
<p>What would make climate change more important? Generally making climate change more important, e.g. changing the culture, renewables, transport. In more detail: if more was done by the government in the UK and at the international level (e.g. government should give climate change more priority, USA commitment / nothing will happen unless they agree); if more action was taken in education and the media, by corporations and NGO's involving campaigns and celebrities (e.g. media should do more, schools should do more, supermarkets promote it); if efforts were targeted at specific sectors of the population to catch attention, increase awareness and be personally relevant (e.g. be specific, issue needs to appeal, must apply to individual, target children); if there was a consistent message involving more than simply information (e.g. consistency, info mustn't be conflicting, people need to know what they can do); if something happened that had local and personal effects (e.g. would be concerned if it happened, it needs to be affecting me, something drastic has to happen before people will notice, need to see the effects). Participants also talked about different types of approaches to make such appeals (e.g. entertaining, shock, mustn't scare, Internet, make it real).</p>	<ul style="list-style-type: none"> • Wide scale, generic • Government action (UK and international) • Media, education, corporate action • Aiming efforts at target audiences and increasing awareness • Consistent, simple message, more than just information • If something happened • Types of appeal
<p>Sources of information Sources of information mainly come from communication with other people (influenced by family, interpersonal communication, what I've been told); the media (e.g. films, TV, news, would rather watch something else, media disinterest); school (e.g. learnt about it at school); personal experiences (e.g. seeing the effects); the government (e.g. what we are told by the government, government are doing things); and beliefs (e.g. influenced by religion). Local and national scientific research is also a salient source of information (e.g. scientists and research, UEA research). Also issues of trust in sources of information.</p>	<ul style="list-style-type: none"> • Communication with others • Media • School • Personal experiences • The government • Beliefs • Scientific research • Trust in information sources

c) Breakdown of the main efficacy categories

Main categories	Sub-categories
Feel able to do something Participants feelings of being able to do something: personally (e.g. feel able to make change, effort will make a difference, every bit counts); generally (e.g. everyone can do their bit, humans could slow it down, lots we can do). There are many reasons why they feel able (e.g. benefits me to do things, doesn't take much effort, government efforts have encouraged me, knowing what to do); people also talk about their intention to do more (e.g. could/should do more, think about what I can do) and willingness to do so (e.g. expressed willingness, willing to pay more, would still change if it cost me more).	<ul style="list-style-type: none"> • Personally able • People are able • Because... • Could do more • Willingness
I can't make a difference I can't make a difference (e.g. inevitability of climate change) characterised by a personal level of reference (e.g. feel unable to do anything/helpless, one personal can't make a difference, cynical/defeatist) and also a general one (e.g. people can't do anything, not sure anything can be done, we won't slow it down).	<ul style="list-style-type: none"> • Generic • Can't / don't do anything personally • People can't do anything
Barriers Beyond the generic barriers (e.g. barriers to change, personal barriers) we have: Personally don't want to change or can't be bothered (e.g. difficult to change/makes life harder, easier or prefer to drive, unwilling to change behaviour, do what I want); generally people don't want to change or can't be bothered (e.g. human nature not to change, people won't change unless they have to); doesn't affect me (e.g. not affecting me so do nothing, people won't change until they are affected); lifestyle preferences (convenience is a barrier, freedom of choice, waste of time doing anything); other people's/not my responsibility (e.g. not my responsibility, adults are the ones who can make a difference, more about industry than individual level); lack of government or international commitment (e.g. government aren't taking responsibility, international disagreement, targets too far ahead); won't change until everyone else does (no difference unless everyone makes an effort, no-one else is so I won't, people blame it on each other); don't know what to do/if I'll be able to make a difference (e.g. not sure my efforts really make a difference, don't know if anything can be done, people don't realise what they're doing); cost (cost is a barrier/personal, people won't pay more); and lack of alternatives (e.g. no alternatives, options aren't available).	<ul style="list-style-type: none"> • Generic • Don't want to / can't be bothered (personal) • Don't want to / can't be bothered (general) • Doesn't affect me • Lifestyle preferences • Other people's / not my responsibility • Lack of government commitment / international disagreement • Won't change unless everyone does • Don't know what to do / if it'll make a difference • Cost • Lack of alternatives
Personal actions There are actions that people take on a daily basis or once in a while at home, school and work (do small things on a daily basis, doing my bit, at home, token gestures). They also talk about general environmental behaviours (e.g. recycling, organic food). The main sub-categories of action are transport and travel (e.g. lift sharing, public transport, walking, bought a fuel-efficient car); energy use (e.g. changing energy supply, conserving energy, insulation, saving energy/turning off lights); purchasing (e.g. buy environmentally friendly products, where food and products come from); talking to others (e.g. setting a good example, letting others know) and what else people think they could do (e.g. voting, future/people will be doing more, do I need two cars?).	<ul style="list-style-type: none"> • Actions – where, how often, general • Transport / travel • Energy use • Purchasing • Talking to others • What else I could do
Think something should be done/what should be done People express that something should be done and that changes need to be made (e.g. can't take a chance/precautionary approach, do something now rather than later, get priorities right and do something, people should look after the world, we should have changed long ago). There is also some uncertainty as to what should be or if something should be done (e.g. don't know if anything can be done, need to make people aware of their choices) and a concern about international disagreement (e.g. disagreement over what to do, need a global effort). The main sub-categories for what should be done in a broad sense (not personal) are: media, NGO's and education (e.g. if people knew what they were doing..., school, should be more on TV, campaigning); Governmental action (e.g. environmental levies, government don't do enough, government should put in more money, grants for renewables, need local facilities, regulations); Energy (renewables/windpower, saving energy); technology (e.g. clean energy, find a fix, technological change is slow); transport and travel (e.g. bio diesel, public transport, stop using cars); and general environmental action (organic food, recycling).	<ul style="list-style-type: none"> • Something should be done • Uncertainty what/if something should be done • International effort • Media, NGO's and education • Governmental action • Energy • Technology • Transport and travel • General environmental action

Continued overleaf...

Appendix 7c) continued...

<p>Causes of climate change – natural, human, personal and other</p> <p>There are a range of human causes perceived by participants and also some uncertainty as to the cause (e.g. don't know what effect I'm having, lack of knowledge [causes and what to do]). Human causes can be grouped into the following sub categories: that generally, humans are causing or contributing to climate change (e.g. greenhouse effect, human causes, humans are making it happen quicker) through energy use and emissions (e.g. human causes/industry, energy use); transport and travel (e.g. air travel, travel, traffic, cars); culture and lifestyles (e.g. carbon dependency, consumer lifestyles, excess/greed, people always want more, the generation to blame); deforestation and pollution, etc. (e.g. deforestation/rainforest destruction, human causes/landfills + rubbish); development and population (e.g. human causes/massive population, urbanisation). Also that there are inequalities in the causes of climate change at a global level (e.g. developed vs. developing, USA biggest cause, inequality). There are also causes that people perceive at a personal level (e.g. conscious of using the car, my personal emissions, using energy at home). Finally causes of climate change that are not due to human activity and some confusion with other environmental issues (aerosols, chemicals, nuclear power, rubbish, ozone, chemicals).</p>	<ul style="list-style-type: none"> • Generic • Uncertainty • Energy use and emissions • Transport and travel • Culture and lifestyles • Deforestation and pollution, etc. • Development and population • Inequality in causes • Personal causes of climate change • Other causes of climate change • Confusion with other environmental issues
<p>Whose responsibility?</p> <p>Generally there is some comment that humans have an overall responsibility (e.g. human responsibility, humans should do something about it) but some feel that no-one is taking responsibility. Onus falls on: UK Government (e.g. government responsibility, government/laws and policies, local government, need laws and enforcement to change); other countries (e.g. some countries trying to do something, USA); European and global level responsibility (e.g. European responsibility, UN, western countries should take resp., whole world); Business, corporations, industry, NGO and scientists responsibility (e.g. companies, energy companies, industry rather than people, scientists responsibility); Individuals (e.g. everyone can do their bit, everyone's responsibility, individuals, people need to accept individual responsibility) and finally, personal level responsibility (e.g. I have a responsibility). Participants also talked about inequalities in the taking of responsibility in a global sense (e.g. equality, some have more responsibility than others, developed vs. developing), and their uncertainties about who should be responsible (e.g. don't know who should take responsibility).</p>	<ul style="list-style-type: none"> • People's responsibility (& not taking responsibility) • UK Government • Other countries • Business / corporations / industry / NGO's / scientists • Individuals • Personal • Inequalities in responsibility • Uncertainty who should be responsible
<p>What would increase personal efficacy? (overlaps with barriers)</p> <p>There are a number of things that would increase people's personal sense of efficacy: Government action (e.g. government should take change, grants for renewables, need global effort, need nation-wide effort to make a difference); more in the media (e.g. advertising, more in the news, should be more on TV); more information and education about climate change to raise awareness and make people aware of their choices (e.g. need practical info, need a strong message, people need to be told what to do, would do more if the issue was clearer, increasing efficacy/must apply to individual); more options and facilities (e.g. need alternatives, need local facilities, making it easy, would do more if it was easier, public transport); need to be given no choice so that people have to change (e.g. need laws and enforcement to change, people won't change unless they have to); Needing to be affected by climate change before changing (e.g. something drastic will have to happen before I do anything, won't do anything until it affects me, being scared enough to do something); needing to know that effort is worth it/will make a difference (e.g. if everyone did their bit it would make a difference, would change if I had proof that it would make a difference, won't change until we all do); knowing that it is popular to take action (e.g. needs to be fashionable, peer pressure).</p>	<ul style="list-style-type: none"> • Generic • Government action (plus global commitment) • Media • More information/education • Options and facilities • No choice • Need to be affected / see it happening • Need to know it's worth making the effort • Popularity

d) Imagery

Main categories	Distinct sub-categories
Causes of climate change People see climate change as being generally caused by humans (e.g. humans damaging the earth, human causes, development). In particular by energy consumption and the consequent gases and emissions (e.g. car exhausts, factories pumping out emissions, power stations, smoke stacks fumes, aeroplanes). They see the consuming culture and our lifestyles as being a cause of climate change (e.g. consumerism, pace of life, people always wanting more, unnecessary fossil fuel consumption wasting energy) and other human related causes (e.g. hole in ozone layer, deforestation, pollution). They also see a role for natural causes and animals (e.g. animals as a cause, climate fluctuations over time, mother nature, natural changes and cycles).	<ul style="list-style-type: none"> • Human causes general • Causes – energy consumption, gases, emissions • Causes – lifestyles and culture • Other human related causes • Natural causes
Solutions Some feeling that something should be done, but some wonder whether we will be able to do anything about climate change (e.g. people should look after the world, slow it down, will get worse before we do anything about it, will continue even if we do something about it). Participants talk about the solutions involving trying to stop or slow climate change down and wonder what the world will be like if we don't do anything. In particular they see the solutions concerning our use of energy (e.g. cutting emissions, energy alternatives, nuclear power, renewables, saving energy); transport and travel (e.g. electric cars, transport, public transport); science and technology (e.g. need for new technologies to cope); politics (e.g. international summits, USA); and some other things (e.g. becoming more like Germany, education).	<ul style="list-style-type: none"> • Doing something about climate change • Energy • Transport • Technology and science • Political efforts • Other things
Impacts of climate change Generic, e.g. big things, surprising, what goes up must come down, atmosphere. People regard different levels of impacts from the global to the local (e.g. Antarctic, developing countries, global examples, local/East Anglia, Norwich, worse in other places). They imagine the broad impacts of climate change to be: changing weather (e.g. extreme/freak/unusual weather, worse weather, less snow, more sun than in the past, red skies, rainfall); temperature change (extreme temperatures, gulf stream stopping, heatwaves, ice age); changing seasons (e.g. bad/worse summers, summer is earlier/later, wetter winters, garden [flowers out earlier/plants last longer]); sea level rise (big lake, future/underwater, loss of land, people drowning sea getting bigger, tidal waves, melting ice caps); flooding (e.g. flooded house, local flooding is likely); and coastal change (e.g. coastal defences, coastal erosions, loss of land, loss of homes). They also imagine the consequences of these changes encapsulating: deserts, drought and heat (e.g. burning, deserts and drought, drought/UK, fires, water shortage); agricultural effects and landscape change (e.g. agriculture/different crops, positive/grow different crops); impacts on animals and nature (e.g. changing animals/UK/insects, changing habitats, extinctions, polar bears starving); and human health (e.g. diseases, health/malaria, people suffering/dying).	<ul style="list-style-type: none"> • Generic • Where? • Changing weather • Temperature change • Changing seasons • Sea level rise • Flooding • Coastal change • Deserts, drought and heat • Agricultural effects and landscape change • Impacts on animals and nature • Human health
Personal impacts of climate change Some people do or don't make a personal connection with the impacts of climate change and imagine that personal effects might result (e.g. my lifetime, personal effects, won't happen to me). People imagine these effects in relation to their families (e.g. my children, what sort of world will my children live in?); their homes and the way they live (e.g. effects on buildings, holidays, jobs, where food comes from, insurance, housing); and the local environment (e.g. flooding, weather, not being able to go outside, hosepipe bans, smog).	<ul style="list-style-type: none"> • Generic • Family • Our homes and the way we live • Local environment
Wider social impacts Participants imagine that people's lives will be affected by climate change and that dealing with the issue will also bring social consequences (e.g. changing people's lives, everything will change, mass hysteria, will have a big impact on society in future). A strong feeling that the way we live will be different in future. People particularly imagine change in relation to economics (e.g. economic growth, tourism, unemployment); food and resources (e.g. food shortages, resources running out); population and housing (e.g. losing homes, population migration, population problems/overcrowding, will affect where we live); inequality and suffering (e.g. divide between rich and poor, people suffering/dying, survival); and social relationships (e.g. respect, riots).	<ul style="list-style-type: none"> • Generic • Economic • Food and resources • Population, housing • Inequality and suffering • Social relationships
Happening / not happening (present and future) People have different ideas about whether climate change is or isn't happening now, whether they see changes or not, whether it will or won't happen in the future (e.g. future projections, future issue vs. present). In more detail, climate change doesn't seem real (e.g. abstract, distant, consequences are removed, doesn't seem real, out of sight out of mind); is / isn't happening (e.g. can't see it happening, something is happening); won't be much change (e.g. a one off, lets just see what happens, future won't be dramatically different); will be change (e.g. serious in future, running away with us, things are building up, no sign of stopping, will suddenly hit us).	<ul style="list-style-type: none"> • Generic • Doesn't seem real/distant • Climate change is/isn't happening • Won't be much change / not concerned • Will be change / concerned

Continued overleaf...

Appendix 7d) continued...

<p>Confusions and uncertainties about climate change Generally there is some association and/or confusion with other environmental issues (e.g. hole in the sky, earth's core, natural disasters, chemicals, aerosols). There is also some uncertainty as to what will happen in terms of climate change in the future (e.g. don't know what would be happening without humans, what will the world look like? When will climate change become unmanageable?).</p>	<ul style="list-style-type: none"> • Association/confusion with other environmental issues • Don't know what will happen in the future re. climate change
<p>Sources of imagery People have various sources of imagery: The media (e.g. influenced by the media, media/films); talking to others (e.g. friends, influenced by other people); personal experience (e.g. comparison with the past, local weather changes, local/national flooding, plants last longer, seeing the changes); school/education/scientific information (e.g. books, statistics, school); and other sources (including art, their imaginations, the bible, the internet). Some people are unsure where their imagery has come from and/or find it difficult to imagine climate change (e.g. can't imagine it happening, difficult in imagining it, can't remember hearing anything).</p>	<ul style="list-style-type: none"> • Media • Talking to others • Personal experience • School/education/scientific information • Other sources of imagery • Difficult to imagine, not sure where imagery has come from
<p>Negativity about climate change People have a lot of generally negative thoughts about climate change now and in the future (e.g. climate change is getting worse, depressing, disturbing/distressing, fear, gloominess, hope it won't happen, if it happens it will be bad, scary, will get worse quickly). They express imaginations of 'the end of the world' in relation to climate change (e.g. Armageddon, chaos, crater, doom, massive, too little too late, we won't be able to cope); general negative impacts (e.g. extinctions, negative if it has local effects, negative image/health); and a feeling that humans won't be able to stop climate change (e.g. out of control, running away with us, we won't be able to stop it).</p>	<ul style="list-style-type: none"> • Generally negative/pessimistic • 'End of the world' • Negative impacts • Can't stop climate change
<p>Positive imagery People see there being various positive outcomes including the fact that people might be able to make climate change better, that efforts to deal with it are positive and that they want things to get better. Also weather and seasons (e.g. better English weather, more sun, warmer winters); agriculture and food (e.g. grow different crops, more exotic food); Energy (e.g. positive/wind turbines, saving energy/saving money).</p>	<ul style="list-style-type: none"> • Generic • Weather and seasons • Agriculture and food • Energy

Appendix 8 – Detailed breakdown of some selected categories

- a) General and personal concerns: Priorities in life / personal daily concerns**
- b) SALIENCE: Not important / don't think about it because...**
- c) EFFICACY: What would increase personal efficacy?**
- d) IMAGERY: Solutions**

a) General and personal concerns: Priorities in life / personal daily concerns

Priorities in life / personal daily concerns

<p>People's main priorities in life and personal / day-to-day concerns. These include concerns about family (e.g. children's safety), education, jobs and career (e.g. career, university), personal life (e.g. lifestyle, relationships, happiness), personal health & safety (e.g. security, stress) and money (e.g. cost of living, mortgage).</p> <ul style="list-style-type: none"> General <ul style="list-style-type: none"> SALIENCE/main concerns in life SALIENCE/worries [current] Family <ul style="list-style-type: none"> SALIENCE/childcare SALIENCE/children SALIENCE/doing the right thing SALIENCE/family SALIENCE/having children SALIENCE/my children/safety SALIENCE/my children/starting school SALIENCE/raising children SALIENCE/future/children's lives SALIENCE/future/families SALIENCE/future/having children makes you more aware of the future SALIENCE/future/my children Education, jobs and career <ul style="list-style-type: none"> SALIENCE/career SALIENCE/commuting SALIENCE/deciding what to do with life in the future SALIENCE/education [incl.unil] SALIENCE/education/school work SALIENCE/employment SALIENCE/job SALIENCE/opportunities SALIENCE/work (job) SALIENCE/future/career SALIENCE/future/job Personal life <ul style="list-style-type: none"> SALIENCE/CC/vs. lifestyle SALIENCE/busy life SALIENCE/death SALIENCE/entertainment SALIENCE/enjoying life SALIENCE/friends 	<p>"I think that depends on what class they get into. Like, you know...if they're lower class, I think that'll be bad. If you're wealthy, then...like obviously with house prices...that's how you're going to have a good, you know, easy...not having an easy start and having to really work hard. [pauses] So...I mean my kids will stay in lower class unless a miracle happens. You know. Which is bad. But then that miracle happen then I think they will be [pauses] you know...Yeah, I think it's all going to have to be money. You know, I think they're going to have to have money to sort of survive." (Sam, working class mum)</p> <p>"Drugs mainly, yeah...drugs. I mean, I worry about my little girl. I don't worry about drugs all the time...not on a daily basis, but...that's part of the reason I'm having all those problems with my neighbour at the moment so it's definitely something." (Theresa, working class mum)</p> <p>"Money. I worry about money...yeah...safety is another thing. I don't let my kids out...I know a lot of others do. My eldest is eight and I still don't let her out. Umm...I think it all depends where you live. I think you hear too much nowadays. And that's the trouble. Their lives are so precious and it's just not worth taking the chance sometimes. So..." (Sara, working class mum)</p> <p>"[On a more day-to-day, or personal basis what are your main worries and concerns?] Well, keeping my job. Keeping my wife happy [laughs], and keeping my baby happy basically. Yeah. Just ticking over." (Jim, young professional)</p> <p>"For myself...umm...career. I just want to you know, keep doing well in a career. Umm, happy personal life which is probably the most important thing. Umm, just to be comfortable. I suppose, like everyone. To try and increase like, personal wealth, although that is not the be-all and end-all, but I'm in a low paid job, so that is inevitably at the forefront of my mind. Umm...and to be healthy, I suppose. Same as everyone." (Simon, young professional)</p> <p>"[Facing your life on a day to day basis, what are the main kinds of concerns that you have got?] Getting cancer...yeah, getting cancer, because you seem to be able to get that from everything...umm...school work, yeah. Umm...school work definitely. That right up on top there. Then after that, money...and like friends and stuff." (Vicky, high school student)</p>
--	--

Continued overleaf...

Appendix 8a) continued...

<p>SALIENCE/happiness SALIENCE/holidays SALIENCE/ immediate future SALIENCE/ learning to drive SALIENCE/lifestyle SALIENCE/love/life SALIENCE/ need a car SALIENCE/ news SALIENCE/ nice car SALIENCE/pace of life SALIENCE/personal future/scary SALIENCE/personal social relationships SALIENCE/quality of life, now and future SALIENCE/relationships with other people SALIENCE/respect SALIENCE/responsibilities SALIENCE/time to do everything SALIENCE/travel SALIENCE/trust issues SALIENCE/uncertainty about ones future SALIENCE/what the future will be like SALIENCE/future/concerns SALIENCE/future/fears SALIENCE/future/lifestyle SALIENCE/future/morality SALIENCE/future/my lifetime SALIENCE/future/quality of life SALIENCE/future/social class SALIENCE/future/travel</p> <ul style="list-style-type: none">• Personal health and safety SALIENCE/health issues (some future) SALIENCE/health/cancer SALIENCE/health/fitness SALIENCE/health/stress SALIENCE/personal safety SALIENCE/security SALIENCE/future/health SALIENCE/future/safety• Money SALIENCE/home ownership SALIENCE/money/cost of living [getting by] SALIENCE/money/saving SALIENCE/future/money
--

“On a day to day basis, well all I am really worried about...is that I can...I can get a job...quite a nice job, that I enjoy doing, something where...I get paid a nice amount of money, so I don't always have to worry about can I afford this, can I not afford this...oh well, should I allow myself this. I just want to be able to have a job, with a good enough pay so that I can enjoy myself at this time of my life.” (Giovanni, high school student)

“If I'm honest it would just have to be my school work and what have you, really. And...just life. The future is the main thing, I suppose. Going to university is a worry. I don't know where I'm going to go and what have you. Umm...different relationships. You know, how I'm getting on with my girlfriend, how I'm getting on with my friends.” (Lee, high school student)

“Oh well, the immediate future. Kind of, exams and university and...career and that kind of thing, on a personal level. And then...yeah, people who are close to me I suppose.” (Kathryn, high school student)

“Well, money...job. I'm, I'm terrible, I just focus on...stuff to me and I don't really look at the bigger picture that much really. Oh, and relationships you know. Hopefully, having a good relationship and settling down with someone is a concern. And eventually, not yet but having children is definitely something that I'd hope for in the future. But...that's about as far as I'd go.” (Claire, young professional)

“I think...my health is quite a key one. Because I think everyone wants to be sort of, healthy and happy really don't they? Umm...I think ummm...well I suppose the biggest thing for me is that I hate the rat race so, the stress that comes with it.” (Ailsa, young professional)

“Ummmm...well money, yeah. Yeah definitely. Is there anything else? Yeah, just...money, security, money...you know. Yeah. Mmmmm.” (Vicky, working class mum)

“Yes well financially I do worry. But I try not to...how can I put it, I do...[pauses]... departmentalise things into little...I try and switch off...mainly for her benefit so I try not to let it interfere otherwise one would just get so depressed...it's a bit depressing because there's a...you're fighting...well I suppose there's a fine line of not being sent to court over the bills and that sort of thing, you know...and living a life...some sort of semblance of life, or standard of life, because at the moment...we are just...I try not to think about it” (Anne, working class mum)

“I think because we are running a business, it's finances, cash flow, and those sorts of things. They are major priorities I would say. Day-to-day. So yeah, I think financial and that sort of thing. That is my main concern in our life really because having a new business just consumes you. (Emma, young professional)

b) SALIENCE: Not important / don't think about it because...

Not important / don't think about it because...

There are many reasons for not finding climate change important and not thinking about it: lack of awareness and understanding personally and generally (e.g. haven't heard about it, people are ignorant); not finding it a priority or an appealing issue (e.g. boring, other short term demands, life's too short to be concerned; not a big issue for England); not feeling able to do anything (can't do anything about it so what's the point learning about it); a lack of interest by others (e.g. Government don't seem to be bothered, other people aren't concerned); lack of personal relevance (e.g. future issue so don't worry about it, not concerned / it's not personal); and reasons feeling no need to do anything (e.g. some say climate change doesn't exist, people are more important than climate change). (See also category 'can't relate to climate change')

• Lack of awareness and understanding (links to category 'Lack of knowledge/ uncertainty/confusion')

SALIENCE/CC/don't hear much about it

SALIENCE/CC/haven't heard about it (for a long time)

SALIENCE/CC/might not happen/be that bad

SALIENCE/CC/people are ignorant

SALIENCE/CC/people are not deliberately harming the world

SALIENCE/CC/people are not informed enough/aren't aware

SALIENCE/CC/people don't realise what they have got

SALIENCE/CC/people don't understand/know about it/what it is

SALIENCE/CC/people need to be more aware

• Not a priority / not an appealing issue

SALIENCE/CC/boring

SALIENCE/CC/concern in comparison to other issues

SALIENCE/CC/doesn't catch/hasn't caught my attention

SALIENCE/CC/don't have time to think/worry about it

SALIENCE/CC/desensitised

SALIENCE/CC/I am only here for 80 years/people don't live long enough

to notice change

SALIENCE/CC/interested in other things

SALIENCE/CC/life's too short to be concerned/live for the moment

SALIENCE/CC/more a future issue rather than present

SALIENCE/CC/no point in getting depressed about it

SALIENCE/CC/not a problem/big issue

SALIENCE/CC/not a priority

SALIENCE/CC/not much of a concern compared with other things

SALIENCE/CC/not topical/not a current/pressing issue

SALIENCE/CC/other short term demands

SALIENCE/CC/other things to talk/think/worry about

SALIENCE/CC/people have other priorities/get on with life + forget

about CC

SALIENCE/CC/politicians don't appeal

SALIENCE/CC/people won't notice it

SALIENCE/CC/people won't take notice until they are forced/something happens

"I don't think people, kind of...I don't think a lot of people know it's even going on, type thing. So they're not...deliberately harming the world. I'm sure if they knew stuff..." (Vicky, high school student)

"I'm not really into geography, and things like that [laughs]...I don't know too much about it, but I've heard the words. I don't understand it all." (Vicky, working class mum)

"I think you have more, well...I know it's not as important but the day to day you just have to get by don't you. It's when you stop and think about that, the climate and all that lot so...that's when you worry." (Sara, working class mum)

"I think it will be only once you look at like, like three of the hottest summers are in like, the 1990's, or, it'll only be things like that make you think, wow it's changing. Because people only live for about, you know, eighty years, so they're just going to think that it's always been like that. Perhaps." (Angela, high school student)

"I suppose it doesn't concern me very much at all. Because those sort of global issues haven't yet coincided with my own personal issues. So...for example, if in 50 years time...I'll be quite old...but if...what's happening in the global environment is impacting on me directly so that I can't...I don't know, so that I can't go out without wearing a mask over my face, ummm...or without getting sunburn or whatever, then, then I'll start to pay attention. Which is an extremely shortsighted view I accept that. Ummmm...but I suppose that is how most people see it." (Simon, young professional)

"It's not...not that pressing really...well, it is but I don't know...I suppose I think of it in the future and not now...so you don't have to worry about it kind of thing but...I don't think...it's not very...topical." (Yolander, high school student)

"...it's not something that we generally talk about. I think it's probably because we feel...you know we feel kind of quite powerless. There's nothing to...there's nothing that we can do about it." And: "...everyone just feels powerless and lots of people don't understand it. And...because it's not directly hurting us at the moment, where we are it's not really...yeah...can't feel the effects I suppose. It's difficult when it's going to...umm...affect future generations and not us." (Katharyn, high school student)

Continued overleaf...

Appendix 8b) continued...

• Feeling unable to do anything

SALIENCE/CC/can't do anything about it so what's the point learning about it SALIENCE/CC/don't discuss it because there's nothing we can do SALIENCE/CC/just get used to the changes

• Lack of interest by others

SALIENCE/CC/government don't do enough SALIENCE/CC/government don't seem to be bothered SALIENCE/CC/government not doing anything

SALIENCE/CC/government seem to have other priorities SALIENCE/CC/nothing is being done about it SALIENCE/CC/media disinterest/don't take it very seriously

SALIENCE/CC/other people aren't concerned (so I'm not)

• Lack of personal relevance

SALIENCE/CC/don't relate it to England/happens abroad not here SALIENCE/CC/future issue so don't have to worry about it SALIENCE/CC/hard to feel concerned

SALIENCE/CC/not concerned/it's not personal/not affecting me SALIENCE/CC/people think it doesn't affect them SALIENCE/CC/school kids are too carefree to care

SALIENCE/CC/short-term memory about CC issues SALIENCE/CC/something drastic has to happen before I'll be concerned SALIENCE/CC/will take notice/worry about it if/when it happens

SALIENCE/CC/won't become more important if nothing happens

• No need to do anything

SALIENCE/CC/have resources, might as well use them SALIENCE/CC/morality/people are more important than the environment

SALIENCE/CC/people don't believe it's happening/don't think it's going to happen

SALIENCE/CC/scepticism SALIENCE/CC/scepticism/adults are more sceptical than young people

SALIENCE/CC/some say CC doesn't exist SALIENCE/CC/things are changing for the better

SALIENCE/CC/what happens, happens

“How does a problem like climate change concern you when you think about it alongside your more personal concerns?” [pauses]...I don't think it does really. It comes back to this kind of fact that...you worry about immediate things that are happening now, and you set aside things that are 50, 100 years down the line. That may or may not be right. And you'll deal with them when they come up.” (Jim, young professional)

“I don't really think about it. Not as in global warming...as ummm...no, I don't, I don't even think about it. I don't think, well...no I don't. But...a lot of people don't care anyhow. So...you know.” (Margaret, working class mum)

“It does yeah. I mean, in a way it doesn't because...I just think well...people don't seem to be wanting to do anything about it, it's not going to affect me...if this is what everyone else thinks as well, I just think well...there's no worries about it. I suppose it does concern me but at the same time it doesn't, because I don't see anyone else bothering about it. That's the whole thing.” (Lee, high school student)

“So does climate change figure at all alongside the day-to-day things you worry about? Ummmm...maybe a bit as time goes on. But think you know, I don't...I don't really think about it really...because it don't really affect me ummm...I can do without the snow, and as I say, because the flooding don't affect me.” (Theresa, working class mum)

“I must admit, I don't...I don't like, think about it a lot. But ummm...I must admit, it doesn't sort of like worry me tremendously. Ummmm...you know, maybe that's stupid, but it's true. It doesn't...you don't think about it on a day to day basis. It may come up in the paper, and you think ooh Christ...if that does happen. But ummm...you always think are they telling the truth, do they really know what they are talking about or is it loads of gobbledegook.” (Mary, working class mum)

“I think probably, if something...if there was some really...oh I don't know...a massive flood coming or something...some big disaster happened or something, then that would make me sit up and look and listen and think oh crikey, this could actually affect me now, this is really kind of quite real...I think that sort of thing. And I think a lot of people would.” (Emma, young professional)

“...it's hard to feel...it's hard to feel concerned on a really personal level, because it doesn't impact on me at all really.” (Kate, young professional)

“And then of course you get the conflicting ideas. Like some scientists say something, and then somebody else will say no, that's absolutely not true. It's weird. Kind of knowing what to believe.” (Tanja, young professional)

“People want their luxuries, so...no I don't think we will. I think some people might get on their high horse, and you know, really want to...defend it. But again I think the majority of people will just carry on...wanting the best things out of life.” (Sam, working class mum)

c) EFFICACY: What would increase personal efficacy?

What would increase personal efficacy?

There are a number of things that would increase people's personal sense of efficacy: Government action (e.g. government should take charge, grants for renewables, need global effort, need nationwide effort to make a difference); more in the media (e.g. advertising, more in the news, should be more on TV); more information and education about climate change to raise awareness and make people aware of their choices (e.g. need practical info, need a strong message, people need to be told what to do, would do more if the issue was clearer, increasing efficacy/must apply to individual); more options and facilities (e.g. need alternatives, need local facilities, making it easy, would do more if it was easier, public transport); need to be given no choice so that people have to change (e.g. need laws and enforcement to change, people won't change unless they have to); Needing to be affected by climate change before changing (e.g. something drastic will have to happen before I do anything, won't do anything until it affects me, being scared enough to do something); needing to know that effort is worth it/will make a difference (e.g. if everyone did their bit it would make a difference, would change if I had proof that it would make a difference, won't change until we all do); knowing that it's popular to take action (e.g. needs to be fashionable, peer pressure).

- **Generic**
EFFICACY/CC/increasing efficacy

- **Government action (plus global commitment)**

EFFICACY/CC/government should promote CC
EFFICACY/CC/government should put in more money
EFFICACY/CC/government should set a good example
EFFICACY/CC/government should take charge
EFFICACY/CC/government/environment agency
EFFICACY/CC/government/green taxes
EFFICACY/CC/government/laws and policies
EFFICACY/CC/government/should work with the people
EFFICACY/CC/grants for renewables
EFFICACY/CC/need global effort to make a difference
EFFICACY/CC/need nation-wide effort to make a difference
EFFICACY/CC/USA/nothing will happen until they commit

- **Media**

EFFICACY/CC/advertising
EFFICACY/CC/increasing efficacy/more in the news
EFFICACY/CC/increasing efficacy/radio
EFFICACY/CC/media generally
EFFICACY/CC/media/news
EFFICACY/CC/media/TV
EFFICACY/CC/need more in the media
EFFICACY/CC/should be more on TV

“It's got to come from the government most probably at the beginning. But I just think everybody has got to do it, not just one person...it's no good one person, if the government starts it then everyone has got to take notice. If it was Joe Bloggs down the street, if I stood up and said right we've got to change something, they'd say oh well, you can naff off can't you. Yeah. It's got to be the government that starts it off. And if the government ain't going to do nothing then...we're not going to, no-ones going to change.” (Mary, working class mum)

“It's harder to do stuff without the governments help because of...you know, transport and...if there was better public transport cause you...you just can't get around, without cars these days if you live in Norfolk. Especially, because...a lot of people who go to this school, live really far away, and it would take about three hours to get here if they didn't come by car. And there aren't lots of trains going...so, there's nothing else for it. You have to drive. If it was better planned then it would be easier.” (Erica, high school student)

“I think it is down to the government and then down to the people. Because I think, like I do that if...if they can't be bothered then why should I, because it's not going to make any difference and that's the whole thing. If, if every single one person thought...hey, I might as well push for this and then there would be a difference, then...well, it's not going to work.” (Lee, high school student)

“I thought the energy saving ads were good. When they like would show like a man moving round and round on his little trolley...and it's like, well why don't you walk, and then it's well, wasting energy. I think that would be a good way, because it kind of...it makes it fun, so people are going to listen. If it puts...it puts a point across so I think that would be good.” (Angela, high school student)

“Maybe on the...as I say, on the news, maybe they could say you know...instead of just oh, this has happened, they could maybe say why and what we can do.” (Kathryn, high school student)

Continued overleaf...

Appendix 8c) continued...

• More information/education

EFFECTACY/CC/education
 EFFECTACY/CC/if people knew what they were doing...
 EFFECTACY/CC/increasing efficacy/aim efforts at adults
 EFFECTACY/CC/increasing efficacy/must apply to individual
 EFFECTACY/CC/monitoring personal carbon emissions
 EFFECTACY/CC/need more awareness
 EFFECTACY/CC/need more info
 EFFECTACY/CC/need practical info
 EFFECTACY/CC/need a strong message
 EFFECTACY/CC/need to be taught
 EFFECTACY/CC/need to catch people's attention
 EFFECTACY/CC/need to make people aware of their choices
 EFFECTACY/CC/people need to be told what to do
 EFFECTACY/CC/people need to know what to do
 EFFECTACY/CC/people will change if they're aware
 EFFECTACY/CC/people will go along with whatever
 EFFECTACY/CC/school
 EFFECTACY/CC/should be more at school
 EFFECTACY/CC/would do more if i knew about it
 EFFECTACY/CC/would do more if the issue was clearer

• Options and facilities

EFFECTACY/CC/need alternatives/availability of options to change
 EFFECTACY/CC/future, will be more options to do something
 EFFECTACY/CC/making it easy/would do more if it was made easier
 EFFECTACY/CC/need local facilities
 EFFECTACY/CC/need to be encouraged
 EFFECTACY/CC/park and ride
 EFFECTACY/CC/public transport
 EFFECTACY/CC/shops
 EFFECTACY/CC/would do more if it was made easy

• No choice

EFFECTACY/CC/can't force people
 EFFECTACY/CC/need laws and enforcement to change
 EFFECTACY/CC/needs to be no other option
 EFFECTACY/CC/people need to be forced
 EFFECTACY/CC/people won't change unless they have to

“[Do you feel that you could actually do anything personally to help the problem of climate change?] Yes...yes, if I knew what to do then I would...I'd probably do it. Definitely. Yeah.” (Sarah, working class mum)

“[Do you feel that you can do anything personally to lessen the effects of global warming?] I guess I probably could, but I don't know what those things would be.” (Claire, young professional)

“I don't really know enough. I don't think we know enough to...know what to do. I think that's where the...I think we are ignorant really. I don't know enough...about how to change it. And how to stop it, because I don't know enough about the whole...the whole environment anyway. I mean, global warming...I don't think we do know enough. Not enough to change it anyway. I think we know about parts of it, don't we...so...it's getting everyone to do it.” (Sara, working class mum)

“I would be doing more things to prevent this, and I would be speaking more about it if I could get some clarity on it...on the definitive of it. the cause and effect of it all. So that I could discuss it with the girls with some certainty. Because then there would be some tangible thing that you could say. And switching the lights off...you can make the same link because it's...it's better to talk about things in terms of changing the weather, otherwise it becomes tenuous in your own mind.” (Mark, young professional)

“Using public transport, yeah...I'd love to, but it's terrible. You know, if there was a...if I could hop on a nice clean bus or tram, and pay a reasonable price to do it then I'd enjoy it. I wouldn't do that, unless the whole system changed.” (Simon, young professional)

“I think that I would be so insignificant if it was just me doing it, that...you know, I wouldn't really do that much. I mean...if I saw that everyone was helping, then of course I would. But if I could see that no-one really cared then I would just...probably think to myself, well, I'm not really going to make that much difference..I am one in however many billion people in this world. And I don't think one person is going to make that much difference.” (Giovanni, high school student)

“But yeah, starting in schools I think...and...it doesn't have to be a programme. Advertising it...and even if it's just showing people a few things they can do, and that they can actually do something. It's not advertised at the moment. Like how I don't know where I can recycle plastics. It's amazing how little things can go on to affect the whole...climate. I mean if you think about it, they do. And so if you can make more people aware then that's how things will change.” (Tanja, young professional)

Continued overleaf...

Appendix 8c) continued...

<ul style="list-style-type: none">• Need to be affected / see it happening EFFICACY/CC/being scared enough to do something EFFICACY/CC/extreme event EFFICACY/CC/increasing efficacy/affected by CC EFFICACY/CC/people won't change until they are affected EFFICACY/CC/people won't change until we're in danger EFFICACY/CC/something drastic will have to happen before I do anything EFFICACY/CC/will go wrong before we do anything about it EFFICACY/CC/won't do anything until it affects me/until there's a world disaster• Need to know it's worth making the effort EFFICACY/CC/if everyone did their bit it would make a difference EFFICACY/CC/people need to feel that they can make a difference EFFICACY/CC/people won't change until they know for sure EFFICACY/CC/would change if I had proof that it would make a difference EFFICACY/CC/would do more if others were EFFICACY/CC/won't change until we all do• Popularity EFFICACY/CC/entertainment EFFICACY/CC/needs to be fashionable EFFICACY/CC/peer pressure	<p>“I think that's probably my main concern, is how it...it's all, all of it's down to how it's going to affect you. I mean, I've tried to be as honest as I can, and it is. I think I have been entirely. It is. If someone said to me, oh...whatever his name is down the road is going to have a serious problem with his crops because of the climate, I'd be like, yeah...and...yeah. It's not going to affect me is it, there's still another field for me to get my food from. And I'd feel really sorry for him. Obviously I'd be like, oh dear. And it would kind of sway me a bit but at the same time, unless it directly affected me then I don't think it would push me enough. It's human nature.” (Lee, high school student)</p> <p>“Ummm...[pauses]...probably...if something happened. If something in the weather...I mean, it's happening now, but if something more extreme happened that might umm...act...as a catalyst or something to make people get up and do stuff.” (Helen, high school student)</p> <p>“If...you know, if we had our homes flooded and...that would be awful...but they can't...you know they must say that we should do something to stop it... because at the end of the day...no-one's going to do anything.” (Theresa, working class mum)</p>
--	--

d) IMAGERY: Solutions

Solutions

Some feeling that something should be done, but some wonder whether we will be able to do anything about climate change (e.g. people should look after the world, slow it down, will get worse before we do anything about it, will continue even if we do something about it). Participants talk about the solutions for trying to stop or slow climate change down and wonder what the world will be like if we don't do anything. In particular they see the solutions concerning our use of energy (e.g. cutting emissions, energy alternatives, nuclear power, renewables, saving energy); transport and travel (e.g. electric cars, transport, public transport); science and technology (e.g. need for new technologies to cope); politics (e.g. international summits, USA); and some other things (e.g. becoming more like Germany, education).

• Doing something about climate change

IMAGERY/CC/earth is on loan to us

IMAGERY/CC/people should look after the world

IMAGERY/CC/people trying to stop it

IMAGERY/CC/slow it down

IMAGERY/CC/will get worse if we don't do anything about it

IMAGERY/CC/wonder what world will be like if we don't do anything

• Energy

IMAGERY/CC/future/cutting emissions

IMAGERY/CC/energy alternatives

IMAGERY/CC/nuclear power

IMAGERY/CC/oil companies

IMAGERY/CC/positive/renewables

IMAGERY/CC/positive/windturbines

IMAGERY/CC/renewables

IMAGERY/CC/renewables/solar

IMAGERY/CC/renewables/windpower

IMAGERY/CC/saving energy

IMAGERY/CC/saving energy/saving money

• Transport

IMAGERY/CC/electric cars/energy efficient cars

IMAGERY/CC/transport

IMAGERY/CC/public transport

IMAGERY/CC/travel

• Technology and science

IMAGERY/CC/future/less cars

IMAGERY/CC/need for new technologies to cope

IMAGERY/CC/petrol prices

IMAGERY/CC/scientific

IMAGERY/CC/scientists+research

IMAGERY/CC/technology/hydrogen cars

“I recall these pictures of wind turbines, these massive wind turbines. I saw some article where they did an artist's impression of what it would look like on that big island in Scotland where they are going to put them. I thought that was really cool. I think they look great.” (Erica, high school student)

“If all my electricity was automatically provided by wind turbines and light, you know, solar panels. Anything like that. I would like the council to be better and to do more recycling: I would also like to find out about cleaner ways of getting about, without sputtering out loads of chemicals in to the air.” (Karen, working class mum)

“I suppose we will be relying a lot on natural resources. Things like wind power and stuff, rather than fossil fuels which we have now.” (Yvette, young professional)

“They've got these, just fields and fields of these wind turbines. It's like, proper clean energy and there's like, hardly any pollution up there and the air is really nice and clean. It's all by the sea. It'd be quite nice to see them around.” (Giovanni, high school student)

“There must be ways and means of using different parts of land for, well, there's all the technology and everything. There must be something they can do.” (Margaret, working class mum)

“In New Zealand they have an awful lot of wind energy. Even around the cities, like in Wellington, on the hill-tops. They were amazing.” (Tanja, young professional)

“They should probably believe that they should look after this planet rather than try and destroy it.” (Yolander, high school student)

“It's quite refreshing to see people thinking kind of long-term really. They had that big summit didn't they, in Africa about all the environmental issues and everything.” (Ailsa, young professional)

IMAGERY/CC/technology/hydrogen cars

Continued overleaf...

Appendix 8d) continued...

<ul style="list-style-type: none">Political efforts IMAGERY/CC/international summits IMAGERY/CC/USA inactionOther things IMAGERY/CC/clean air IMAGERY/CC/environmentally friendly products IMAGERY/CC/future/more like Germany IMAGERY/CC/radical change IMAGERY/CC/save trees IMAGERY/CC/teacher training	<p>“I am hoping that international authorities might hopefully make use of more renewable resources like, solar energy and wind power.” (Jonny, high school student)</p> <p>“I saw in the paper the other day, I think it was in Sweden, or Norway or somewhere like that where there was a house, a circular house and it could turn to where the sun was. And the whole thing was solar panelled, and it was completely, it would energise itself and then it would sell electricity to the electricity companies. And I just thought that was mad, so I would imagine that housing would change.” (Emma, young professional)</p> <p>“They are already starting new technology, like new cars and things and I think if that happened then that would be alright.” (Kathryn, high school student)</p> <p>“You know, about environmentally friendly products, green cars and those sorts of things make me think about climate change.” (Mark, young professional)</p>
---	---

Appendix 9 – Participant profile for Kathryn (high school student)

A) Interview summary (one written, one table)

B) Q-sort summary

C) Focus group summary

D) Feedback from follow-up interview and overall profile summary

a) Interview summary #1

(NB. In the quotes, '...' refers to hesitation in speech, not missing text; the numbers in brackets are for my reference – they are the quotation numbers; my speech is bracketed [like this])

IMAGERY OF THE FUTURE: She imagines resource problems in the future with a bigger population. Development, overcrowding, technology and a world where people will have to do less (11:1).

"I think...there will be a lot of problems with resources and things, and...like fossil fuels, or whatever. I think there will be a lot of ummm...I think we've just, you know...there's...we'll run out or whatever [laughs]...ummm...the population maybe. Because lots of people are living longer and umm...yeah, there will be a lot more technology. Lots of people would have to do less physically. And lots of, well, development, less kind of, free land and things, as we build on it all. A lot more crowded and urban."

HOPES AND CONCERNS FOR FUTURE: She's mainly worried about general pollution issues and mentions the ozone layer. Overcrowding again, spread of disease and rubbish are also salient issues (11:2).

"I think the ozone layer, or whatever, is a bit of a worry [laughs]...umm...and...yeah, just in general, pollution. Whether it be mainly rivers and things. Ummm...I hope it wouldn't be too overcrowded and...spread of disease and stuff would be a worry. And all the rubbish, in the, sort of tip things. They have to make all the holes in the ground."

Personal hopes and concerns are focused on the immediate future (11:3).

"Oh well, the immediate future. Kind of, exams and university and...career and that kind of thing, on a personal level. And then...yeah, people who are close to me I suppose. Umm but, yeah..."

IMPORTANCE OF CLIMATE CHANGE: First heard of climate change at school, at about the age of 11 (11:10). Slightly confused when unfamiliar terminology is used – is familiar with the term global warming (11:35). In relation to other concerns in life, climate change doesn't really feature as a day-to-day issue – although she states that it does concern her and expresses concern in terms of future generations (11:4,36).

"I think I'd worry about it more if you see it on the news and read articles and things. It's not something I think about every...not the first thing I think about when I wake up in the mornings and things. But...yeah, it does concern me and...yeah, but I'm not sure how much that would affect me in like, my life time, but more kind of in future generations."

"[To what extent does it concern you compared to those other things?] Ummm...not as much as...not really, no."

She has talked about it but mainly in school...CC is not a regular topic of conversation for various reasons (11:11,17).

"[Has climate change ever been mentioned in conversation with anybody?] Not really...not out of science lessons no [laughs]...it's not something that we generally talk about. I

think it's probably because we feel...you know we feel kind of quite powerless. There's nothing to...there's nothing that we can do about it so it's not going to...it's a bit of a negative thing to talk about so it's not something..."

She feels that climate change is going to be inevitable in the future (11:16).

"Mmm...It is going to be inevitable I think...for a while to come. As I say. But...I suppose the damage is then done, but things can...because they are already starting new technology, like new cars and things and...I think if that happened then that would be all right. It wouldn't be so bad. But yeah, I think the change is inevitable."

Her thoughts on the moral dimension consider the selfishness of our society...(11:31).

"[Do you feel that there is a moral point of view?] Well, yeah, I think, as I said about the...the selfishness, I think. Of course there is going to be like, moral issues, as far as like, the damage is...concerned, and how...and like, if it's not going to affect us then why bother. But...I think it's the society we live in really...it's...yeah."

She feels that there are other reasons why it is not of great importance (11:30). This quote incorporates the fact that it's not enough of a high profile issue, that people feel powerless and don't understand it and that we can't feel the effects and therefore it seems not so important. Again the morality issue is important to her here.

"I don't think there's enough...as much coverage as there should be. I think...there's more focus on things that are really kind of not important in the news, compared to climate change. Maybe if that was brought in...you know, if you kind of weighed it up against other things. Umm...yeah, if and if...there's a big audience, it's got to apply...to individual people, rather than...because everyone just feels powerless and lots of people don't understand it. And...because it's not directly hurting us at the moment, where we are it's not really...yeah...can't feel the effects I suppose. It's difficult when it's going to...ummm...affect future generations and not us. I think it's difficult to kind of preserve the world for other people, because you know, people just...it's quite a selfish world sometimes."

MAIN CLIMATE CHANGE IMAGERY: Imagery about climate change in the present mainly coming from school, television and the media (11:8), images of melting ice caps and extreme weather (11:5).

"I suppose like the heat, and melting of all the ice caps and things you see on television. And the umm...animals losing their habitats and things. It's mainly the kind of, Antarctic I think of...that's what we were always taught at school, so...yeah, and just, really kind of extreme weather."

Also mentions Greenpeace adverts (11:9) and again later in the context of what information could help her learn about climate change, etc. (11:25).

"[What about adverts?] Yeah...like I say, at the beginning of films they sometimes have that Greenpeace one, with all the things that might happen. And that, I thought was really quite powerful because they were really disturbing images. Umm...so I thought that was really good. If you saw like, adverts, yeah."

She does mention that a positive aspect is warmer summers (11:6) but thinks that climate change is mainly negative (11:7).

"I think it's probably just what you are taught in school. That's the only time you are really taught about it. At school it's always, you know, it's bad...like, in science and things. This is what'll happen...we're not like, taught anything positive about it."

Hasn't really noticed local changes – apart from less snow nowadays (11:12). Seems to be influenced by personal communication with her grandfather.

"[Have you personally noticed any changes which might suggest that climate change is happening?] I don't...I think, it's quite difficult really, because...no...well when speaking to like...well I suppose I have spoken to like my Grandad and things. And he always says it was really hot in summer and like, frozen in winter. So I suppose comparing it to that, then yes, that...you know...but I can't remember like, when I was really little. I can't remember much...we haven't had snow for a while. But I mean that...I haven't personally. I think I'm a bit young to remember really."

With reference to climate change in the future (in 50 years time) she has images of rather catastrophic changes (11:29). An equality issue is raised here.

"Ummm...there was all that ummm, dangers about when the ice caps melt and stuff, that we will all kind of drown and things, and...ummm...I don't know. I think you'll see more extreme kind of weather. Because we're quite a developed country anyway, I think that we've got more...more power than those...third world countries without it. But yeah, I just think mainly the extreme weather and maybe flooding, or...yeah. And skin cancer or whatever, and the ozone layer and...yeah."

UNCERTAINTY / OPINION ABOUT CAUSES: Considers the cause to be mainly due to fuel consumption (11:13) and attributable to human causes (11:14).

"Ummm...mainly fuels I expect...like the ummm...like cars and general traffic. That's probably the main thing I think of really."

"I think mainly human activities. Because...I suppose when you compare it to...how long, like humans have been living, ummm...before we had like cars and other technology...I think if it was all down to nature, it wouldn't be such a big issue, because it's natural, and there's no-one to blame. But...I think if it's humans that are causing it then we can do something about it. So yeah...I think it's probably mainly, in my opinion, human."

WHO'S RESPONSIBILITY? Feels that everyone is responsible, yet personally feels quite powerless to do anything (11:17) – implies that responsibility for action should come from above because individuals can't make a difference.

"[Who do you think should take responsibility for doing something about climate change?] I think everybody really. It's not something...if you just made a difference like in your...like public transport for example, cutting down cars, just one family is not going to make a lot of difference. So...I think that's one of the reasons we don't really discuss it because there is nothing we can do. It would have to be kind of a...world, or global thing at least. And say European. I think the people in charge, would have to do something about it probably to help it?"

Doesn't feel that anyone is taking responsibility now, hasn't noticed any improvement in public transport for example (11:18).

WHAT WOULD INCREASE SALIENCE? Hearing more about it in the news as a number of the included quotes highlight (11:4,23,24,25). States that until we're all in danger, people won't think about it / do anything about it (11:15).

"[In future, do you think that people will continue to affect the climate?] I think they will until a certain point until we're all in danger and by that time it's nearly too late. And then they might start thinking about it. But before then, I think...it'll still...I think it'll continue to change until...something is really done about it."

Being more aware and feeling good that she's doing stuff to prevent it would make it seem more important (11:26).

"[Is there anything that could happen to make climate change more important to you?] Ummm...I just think being more aware of it. And if we felt good about...that we were doing stuff to prevent it then we might take more interest in it generally, because you tend to when you're doing good things and then it might not seem so bad."

On top of the media, if something actually happened (attributable to CC), that would also capture her attention (11:27,28,34). Emphasises the importance of personal impact.

"I think general, sort of news things would affect me, kind of. Obviously if it was close to home, then yeah. But I don't think it's really a case of like, where it is, if it's...yeah. Yeah, it probably would have more of an effect."

EFFICACY – PERSONAL BEHAVIOUR: She states that (in a previous quotation) that reasons for not talking about climate change include a feeling of powerlessness, felling that there is nothing 'we' can do about it and therefore it being a negative thing to talk about (11:11). Feels like one person or family can't really make a difference and again that there is nothing 'we' can do (11:17). Doesn't feel she can do anything personally (11:19,20), isn't really doing anything personally apart from using the bus (11:37), and has general feelings of voicelessness and powerlessness.

"[So do you feel that you can do anything personally to lessen the impacts of climate change if you wanted to?] Other than public transport, nothing really. Not really. I think it is going to have to be everybody, not just individuals. [Is there anything else stopping you from taking it further or...?] I suppose it's because we feel we don't really have much of a voice really. I mean...yeah there's things, but like when we are

at school, there's not really a lot, you know...we're not going to be taken seriously anyway. So...there's not an awful lot that I feel that I could do personally."

Expressed willingness to take on energy saving measures at home, because she felt that she could do that (11:21).

WHAT WOULD INCREASE SELF-EFFICACY AND IN GENERAL? Generally she states that until we are all in danger, no one will do anything about it (as earlier, 11:15). Also that technology is getting better so that it might not actually be that bad (11:16). Personally she feels that being more aware, and being told what to do would help her to do more (11:22).

"I think maybe, to be more aware. Because on the news it just says all the bad things that have happened as a result. But there's nothing saying that we can stop this by doing this, rather than...there's not really any kind of...if we just knew like the basics science of it, because...I mean, I do science, but we don't really cover global warming any more. And if we were told what we could do...and we were encouraged so that we felt that we would make a difference, then we would. Because you often think oh...like, I can't do anything."

Emphasises that she needs more input and instruction in order to change – through school and in the media (11:23) giving examples of how it could be done for different, but other, audiences, e.g. more on Newsround for children (11:24). Wanting more in the media goes back to comments above about what would make it more important (11:4). Also with reference to the Greenpeace advert (11:9,25)

"I don't know really, maybe on the...as I say, on the news, maybe they could say you know...instead of just oh, this has happened, they could maybe say why and what we can do. You know, generally. I think television is the best...the best for most people. And maybe school would be a help. Just in our assembly or whatever, it's not that long. But...that might make an impact on us."

Appendix 9a - Interview summary #2

Kathryn Rivers – High School	
General feelings about future; personal and wider concerns	Example quotations
<ul style="list-style-type: none"> Imagines resources running out, population problems because of people living longer, e.g. overcrowding, technology, people living more sedentary lives and more urban development Concerned about the ozone layer, overcrowding, spread of disease and waste Immediate concerns are short term future, exams, university, career and personal relationships 	<p>“...there will be a lot of problems with resources and things, and...like fossil fuels, or whatever. I think there will be a lot of ummm...there's...we'll run out or whatever. The population maybe. Because lots of people are living longer and umm...yeah, there will be a lot more technology. Lots of people would have to do less physically. And lots of, well, development, less kind of, free land and things, as we build on it all. A lot more crowded and urban.” (11:1)</p> <p>“The ozone layer, or whatever, is a bit of a worry...and...yeah, just in general, pollution. Whether it be mainly rivers and things. I hope it wouldn't be too overcrowded and...spread of disease and stuff would be a worry. And all the rubbish, in the, sort of tip things. They have to make all the holes in the ground.” (11:2)</p> <p>“Oh well, the immediate future. Kind of, exams and university and...career and that kind of thing, on a personal level. And then...people who are close to me I suppose.” (11:3)</p>
<ul style="list-style-type: none"> Generally concerned but doesn't think about it very often. Would do more if it were in the news Wonders how it might affect her, thinks it's more a future issue Not really concerned compared to personal issues Not taught anything positive, sees CC negatively First aware of climate change at secondary school Not mentioned in conversation because of feeling powerless Would become more important if she was more aware and if she felt good about doing things to prevent it Would become more important if climate change was in the news and closer to home Not enough coverage, more news focus on things that aren't important Must be relevant to people because they don't understand it and feel powerless. And because it is not affecting us, can't feel the effects. 	<p>“I think I'd worry about it more if you see it on the news and read articles and things. It's not something I think about every...the first thing I think about when I wake up in the mornings and things. But...yeah, it does concern me and...but I'm not sure how much that would affect me in like, my life time, but more kind of in future generations.” (11:4)</p> <p>“Is there anything that could happen to make climate change more important to you? Umm...I just think being more aware of it. And if we felt good about...that we were doing stuff to prevent it then we might take more interest in it generally, because you tend to when you're doing good things and then it might not seem so bad.” (11:26)</p> <p>“I think general, sort of news things would affect me, kind of. Obviously if it was close to home, then yeah. But I don't think it's really a case of like, where it is, if it's...yeah. Yeah, it probably would have more of an effect.” (11:28)</p> <p>“I don't think there's enough...as much coverage as there should be. I think...there's more focus on things that are really kind of not important in the news, compared to climate change. Maybe if that was brought in...you know, if you kind of weighed it up against other things.” (11:20)</p> <p>“There's a big audience, it's got to apply...to individual people, rather than...because everyone just feels powerless and lots of people don't understand it. And...because it's not directly hurting us at the moment, where we are it's not really...yeah..can't feel the effects I suppose. It's difficult when it's going to...umm...affect future generations and not us. I think it's difficult to kind of preserve the world for other people, because you know, people just...it's quite a selfish world sometimes.” (11:30)</p>

- Will have more of an impact on future generations
- Difficult to preserve the world, people in our society are selfish

Climate change efficacy

- Not talked about because of feeling powerless and that there is nothing 'we' can do
- Mainly caused by fuels, cars
- Caused by human activities rather than nature. And therefore humans can do something about it
- Will continue until we're in danger at which point people will start thinking about it. Climate will keep changing until something is done
- Climate change is inevitable, won't be so bad if something is done
- Everybody's responsibility although one family can't make a difference. Has to be a global effort
- Hasn't noticed an effort being made except in public transport but efforts are not really working
- Doesn't really feel able to do anything personally except use public transport, but thinks that everyone has to in order to make a difference. One person can't feel there's much she could do personally other than use the bus
- Doesn't feel she has a voice on the matter and doesn't feel there's much she could do personally other than use the bus
- Saves energy at home
- Could do more if she was more aware about the science of climate change and what she could do. Could also do with some encouragement
- Feels that people should be told what to do instead of simply what's happened on television (e.g. adverts) and at school
- People feel powerless, don't understand, can't feel effects of climate change and it's difficult to preserve the world for future generations (selfish world). Not going to affect people so they think, why bother

- "Of course there is going to be like, moral issues, as far as like, the damage is...concerned, and how...and like, if it's not going to affect us then why bother. But...I think it's the society we live in really..." (11:31)

- "...it's not something that we generally talk about. I think it's probably because we feel...you know we feel kind of quite powerless. There's nothing to...there's nothing that we can do about it so it's not going to...it's a bit of a negative thing to talk about." (11:11)
- "...mainly fuels I expect...like the...like cars and general traffic. That's probably the main thing I think of really." (11:13)
- "I think mainly human activities. Because...I suppose when you compare it to...how long, like humans have been living, ummm...before we had like cars and other technology...I think if it was all down to nature, it wouldn't be such a big issue, because it's natural, and there's no-one to blame. But...I think if it's humans that are causing it then we can do something about it. So yeah...I think it's probably mainly, in my opinion, human." (11:14)
- "I think they will until a certain point until we're all in danger and by that time it's nearly too late. And then they might start thinking about it. But before then, I think...it'll still...I think it'll continue to change until...something is really done about it." (11:15)
- "[Who do you think should take responsibility for doing something about climate change?] I think everybody really. It's not something...if you just made a difference like in your...like public transport for example, cutting down cars, just one family is not going to make a lot of difference. So...I think that's one of the reasons we don't really discuss it because there is nothing we can do. It would have to be kind of a...world, or global thing at least. And say European. I think the people in charge, would have to do something about it probably to help it." (11:17)
- "[Do you feel that you can actually do anything personally to lessen the impacts of climate change if you wanted to?] Other than public transport, nothing really. Not really. I think it is going to have to be everybody, not just one person." (11:19)
- "I suppose it's because we feel we don't really have much of a voice really. I mean...yeah there's things, but like when we are at school, there's not really a lot, you know...we're not going to be taken seriously anyway. So...there's not an awful lot that I feel that I could do personally." (11:20)
- "I think maybe, to be more aware. Because on the news it just says all the bad things that have happened as a result. But there's nothing saying that we can stop this by doing this, rather than...there's not really any kind of...if we just knew like the basic science of it, because...I do science, but we don't really cover global warming any more. And if we were told what we could do...and we were encouraged so that we felt that we would make a difference, then we would. Because you often think oh...like, I can't do anything." (11:22)
- "On the news, maybe they could say...instead of just oh, this has happened, they could maybe say why and what we can do. You know, generally. I think television is the best...the best for most people. And maybe school would be a help. Just in our assembly or whatever, it's not that long. But...that might make an impact on us." (11:23)

Climate change imagery	
• Heat, melting ice caps	“I suppose like the heat, and melting of all the ice caps and things you see on television. And the ummm...animals losing their habitats and things. It's mainly the kind of, Antarctic I think of...that's what we were always taught at school...and just, really kind of extreme weather.” (11:5)
• Loss of habitats	
• Extreme weather	
• Imagery influenced by school, TV and newspapers	“I have spoken to like my Grandad and things. And he always says it was really hot in summer and like, frozen in winter. So I suppose comparing it to that, then yes, that...but I can't remember like, when I was really little. I can't remember much...we haven't had snow for a while. But I mean that...I haven't personally. I think I'm a bit young to remember really.” (11:12)
• Warmer summers is only positive outcome	
• Hasn't noticed any changes, too young to remember	
• In family's memory, summers used to be hotter and winters colder	“At the beginning of films they sometimes have that Greenpeace one, with all the things that might happen. And that, I thought was really quite powerful because they were really disturbing images. Umm...so I thought that was really good. If you saw like, adverts.” (11:25)
• Less snow than in the past	“...dangers about when the ice caps melt and stuff, that we will all kind of drown and things, and...ummm...I don't know. I think you'll see more extreme kind of weather. I just think mainly the extreme weather and maybe flooding, or...yeah. And skin cancer or whatever, and the ozone layer.” (11:29)
• Adverts with images, e.g. Greenpeace	
• Ice caps melting, flooding, people drowning in the future, more extreme weather, skin cancer and the ozone layer	

Efficacy

- Not talked about because of feeling powerless and that there is nothing 'we' can do
- Mainly caused by fuels, cars. Caused by human activities rather than nature. And therefore humans can do something about it
- Will continue until we're in danger at which point people will start thinking about it. Climate will keep changing until something is done. Climate change is inevitable, won't be so bad if something is done
- Everybody's responsibility although one family can't make a difference. Has to be a global effort. Doesn't really feel able to do anything personally except use public transport, but thinks that everyone has to in order to make a difference. One person can't
- Hasn't noticed an effort being made except in public transport but efforts are not really working
- Doesn't feel she has a voice on the matter and doesn't feel there's much she could do personally other than use the bus. Saves energy at home
- Could do more if she was more aware about the science of climate change and what she could do. Could also do with some encouragement. Feels that people should be told what to do instead of simply what's happened on television (e.g. adverts) and at school
- People feel powerless, don't understand, can't feel effects of climate change and it's difficult to preserve the world for future generations (selfish world). Not going to affect people so they think, why bother

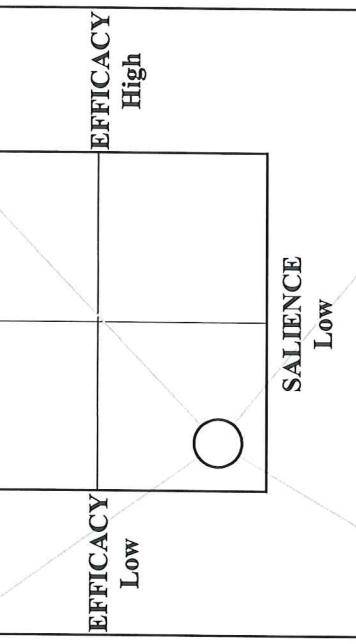
- [Who do you think should take responsibility for doing something about climate change?] I think everybody really. It's not something...if you just made a difference like in your...like public transport for example, cutting down cars, just one family is not going to make a lot of difference. So...I think that's one of the reasons we don't really discuss it because there is nothing we can do. It would have to be kind of a...world, or global thing at least. And say European. I think the people in charge, would have to do something about it probably to help it."
- [Do you feel that you can actually do anything personally to lessen the impacts of climate change if you wanted to?] Other than public transport, nothing really. Not really. I think it is going to have to be everybody, not just one person..."
- ...it's not something that we generally talk about. I think it's probably because we feel...you know we feel kind of quite powerless. There's nothing to...there's nothing that we can do about it so it's not going to...it's a bit of a negative thing to talk about."
- "Do you feel that you can actually do anything personally to lessen the impacts of climate change if you wanted to?] Other than public transport, nothing really. Not really. I think it is going to have to be everybody, not just one person..."
- ...it's not something that we generally talk about. I think it's probably because we feel...you know we feel kind of quite powerless. There's nothing to...there's nothing that we can do about it so it's not going to...it's a bit of a negative thing to talk about."

General and personal concerns, future outlook

- Imagines resources running out, population problems because of people living longer, e.g. overcrowding, technology, people living more sedentary lives and more urban development
- Concerned about the ozone layer, overcrowding, spread of disease and waste. Immediate concerns are short term future, exams, university, career and personal relationships
- ...there will be a lot of problems with resources and things, and...like fossil fuels, or whatever. I think there will be a lot of ummm...there's...we'll run out or whatever. The population maybe. Because lots of people are living longer and ummm...yeah, there will be a lot more technology. Lots of people would have to do less physically. And lots of, well, development, less kind of, free land and things, as we build on it all. A lot more crowded and urban."
- The ozone layer, or whatever, is a bit of a worry...and...yeah, just in general, pollution. Whether it be mainly rivers and things. I hope it wouldn't be too overcrowded and...spread of disease and stuff would be a worry. And all the rubbish, in the, sort of tip things. They have to make all the holes in the ground."
- "Oh well, the immediate future. Kind of, exams and university and...career and that kind of thing, on a personal level. And then...people who are close to me I suppose."

Imagery

- Heat, ice caps melting, flooding, people drowning in the future, more extreme weather, skin cancer and the ozone layer
- Loss of habitats
- Extreme weather
- Imagery influenced by school, TV and newspapers. Adverts with images, e.g. Greenpeace
- Warmer summers is only positive outcome. Less snow than in the past
- Hasn't noticed any changes, too young to remember
- In family's memory, summers used to be hotter and winters colder



Salience

- Wonders how it might affect her, thinks it's more a future issue
- Not really concerned compared to personal issues. Generally concerned but doesn't think about it very often. Would do more if it were in the news
- Not taught anything positive, sees CC negatively
- First aware of climate change at secondary school
- Not mentioned in conversation because of feeling powerless
- Would become more important if climate change was in the news and closer to home. Would become more important if she was more aware and if she felt good about doing things to prevent it
- Not enough coverage, more news focus on things that aren't important
- Must be relevant to people because they don't understand it and feel powerless
- Will have more of an impact on future generations
- Difficult to preserve the world, people in our society are selfish
- "I think I'd worry about it more if you see it on the news and read articles and things. It's not something I think about every...the first thing I think about when I wake up in the mornings and things. But...yeah, it does concern me and...but I'm not sure how much that would affect me in like, my life time, but more kind of in future generations."
- "[Is there anything that could make climate change more important to you?] Ummmm...I just think being more aware of it. And if we feel good about...that we were doing stuff to prevent it then we might take more interest in it generally, because you tend to when you're doing good things and then it might not seem so bad."
- "I don't think there's enough...as much coverage as there should be. I think...there's more focus on things that are really kind of not important in the news, compared to climate change. Maybe if that was brought in...you know, if you kind of weighed it up against other things."
- "There's a big audience, it's got to apply...to individual people, rather than...because everyone just feels powerless and lots of people don't understand it. And...because it's not directly hurting us at the moment, where we are it's not really...yeah...can't feel the effects I suppose. It's difficult when it's going to...umm...affect future generations and not us. I think it's difficult to kind of preserve the world for other people, because you know, people just...it's quite a selfish world sometimes."
- "Of course there is going to be like, moral issues, as far as like, the damage is...concerned, and how...and like, if it's not going to affect us then why bother. But...I think it's the society we live in really..."

Kathryn Rivers (High School)

Efficacy

- Heat, ice caps melting, flooding, people drowning in the future, more extreme weather, skin cancer and the ozone layer
- Loss of habitats
- Extreme weather
- Imagery influenced by school, TV and newspapers. Adverts with images, e.g. Greenpeace
- Warmer summers is only positive outcome. Less snow than in the past
- Hasn't noticed any changes, too young to remember
- In family's memory, summers used to be hotter and winters colder

- "I suppose like the heat, and melting of all the ice caps and things you see on television. And the ummm...animals losing their habitats and things. It's mainly the kind of, Antarctic I think of...that's what we were always taught at school...and just, really kind of extreme weather."
- "I have spoken to like my Grandad and things. And he always says it was really hot in summer and like, frozen in winter. So I suppose comparing it to that, then yes, that...but I can't remember like, when I was really little. I can't remember much...we haven't had snow for a while. But I mean that...I haven't personally. I think I'm a bit young to remember really."
- "At the beginning of films they sometimes have that Greenpeace one, with all the things that might happen. And that, I thought was really quite powerful because they were really disturbing images. Umm...so I thought that was really good. If you saw like, adverts."
- "...dangers about when the ice caps melt and stuff, that we will all kind of drown and things, and...umm...I don't know. I think you'll see more extreme kind of weather. I just think mainly the extreme weather and maybe flooding, or...yeah. And skin cancer or whatever. and the ozone layer."

Appendix 9b – Q-sort summary

Q Sort –KR

The following table summarises the most extreme images chosen by KR. The columns show (in order) which images were chosen most strongly as: making climate change seem important; making climate change seem unimportant; making participant feel able to do something about climate change; making participant feel that nothing they could do would make any difference.

In summary Kathryn's most important images focus on dramatic impact images of climate change – and the graph showing the dramatic change. Those ranked as making climate change seem relatively unimportant include some of the more ambiguous images. The ones that made KR feel able to do something show or symbolise largely everyday actions which can be taken by individuals. The ones that made her feel unable to do anything are a mixture of dramatic images and some ambiguous ones / pictures of secondary effects.

	Important	Not important	Able to do something	Unable to do anything
KR (high school student)	Graph Forest fire (Melting ice) (Flood in Bangl.) (Dried up lake) (Famine)	GWB Café (Wind turbines) (Irrigation) (Sunflowers) (Women at standpipe)	Light bulb Bike (Petrol station) (Thermostat) (Solar panels) (Tram)	Graph Famine (Smoke stacks) (Forest fire) (Refugees) (Mosquito)

Comments:

Picture	Comments from Salience sort	Comments from the efficacy sort
1. Power station	First thoughts are of pollution rather than long term climate change	Factories – too big a scale for me to contribute
2. Industrial smoke stacks	First thoughts are of pollution rather than long term climate change	Factories – too big a scale for me to contribute
3. Petrol station	First thoughts are of pollution rather than long term climate change	Yes, I can help by using unleaded fuel. This also reinforced the idea of public transport.
4. George Bush	I've put this in the -3 category because the government doesn't seem to be concerned with the issue	This is a difficult one. One thought was that I've no power within government, however I could write letters.
5. Aeroplane	Pollution isn't clearly visible so little effect	I did not feel that me not using a plane would make much difference
6. Fitting low energy lightbulb	This appears to be concerned directly with saving energy – I don't associate this much with climate.	Yes I could use energy efficient lights – the photo makes it look easy compared to other picture where I cannot change things
7. Graph of temp rise	This has a lot of impact as it shows actual quantitative data as 'proof'. It's very worrying.	Changes within global temperature, my effort would make no difference
8. Thermostat	This appears to be concerned directly with saving energy – I don't associate this much with climate.	This is an easy thing to do
9. Cyclist	Less pollution but this isn't realistic for most people	Although not always practical I could use my bike more
10. Solar panels on roof	This appears to be concerned directly with saving energy – I don't associate this much with climate.	This is not something relevant to my house. But the message I got was that every house can be more energy efficient.
11. Wind turbines	This appears to be concerned directly with saving energy – I don't associate this much with climate.	I have nothing to offer with this

12. Tram	Again, public transport decreases the amount of pollution	I already use public transport but I feel that this does make a difference
13. Forest fire	This is effective as it shows negative consequences. The animals make you feel more concern.	It must make a lot of damage and over heating to cause this – out of my control
14. Rainy weather	Although this is to do with the climate, I feel that we accept this sort of thing as typical British weather.	
15. Refugees	My first instinct was not to feel that this was a consequence of climate change.	Worldwide scale, not up to me
16. Mosquito biting	This shows the risk of increased malaria and other diseases if these creatures can survive over here.	Worldwide scale, not up to me
17. Building sea defences	I ran out of room with the important pictures – this shows that the changing climate affects sea levels.	Worldwide scale, not up to me
18. Eroding cliff	I ran out of room with the important pictures – this shows that the changing climate affects sea levels.	Worldwide scale, not up to me
19. Polar bear	I ran out of room with the important pictures – this shows that the changing climate affects sea levels. I think melting ice caps seem important as it's always emphasised at school.	Worldwide scale, not up to me, my contribution will make little difference
20. Melting ice	This shows that the changing climate affects sea levels. I think melting ice caps seem important as it's always emphasised at school.	Worldwide scale, not up to me, my contribution will make little difference
21. Floods in Bangladesh	This had an impact as it shows human suffering	Worldwide scale, not up to me, my contribution will make little difference
22. Irrigation	This seemed irrelevant in comparison to the others	I don't feel that this is relevant
23. Flooded house	This had an impact as it shows effects on humans. Also, the house looks like one from our areas of the world so we can relate to it more	I do not feel that I can help to prevent this
24. Sunflower field	I didn't see this as at all significant	I don't feel that this is relevant
25. Stormy sea	I ran out of room with the important pictures – this shows that the changing climate affects sea levels.	Worldwide scale, not up to me
26. Cartoon, getting warmer	Although the point is serious and is easy to understand, the consequences here are not portrayed as harshly as in others	When it's things that affect the climate globally, my contribution makes no difference.
27. Café	Insignificant	I don't feel that this is relevant
28. Beach	This is typical scene and although linked to hotter summers, it's not shocking	I don't feel that this is relevant
29. Dried up lake with dead fish	This is sad as it shows the results of overheating. Would have less impact without the fish.	I feel that I can't do anything
30. Women at standpipe	Is this based on water shortage? Unclear.	
31. Hungry children, famine	Shows the importance of climate change as other less fortunate people (children) suffer.	Global picture.
32. Dead tree, desert	Shows a desert area, although we are used to that from TV.	Global picture.

In the next section I talk about her input to the focus group and some of the meanings she expressed with regard to various pictures. Also what they mean for her personal engagement with the issue.

Focus group output – KR

Making climate change seem important (or not)

- Points out that the pictures which came out of the Q-sort as making people feel that climate change was an important issue overall were the ones showing the more destructive effects. Also states that those pictures which seemed to make people feel that climate change was more unimportant, show the effects of climate change that people don't mind so much. "So it kind of brings it home to you more that climate change is bad looking at the ones over here [points to 'important' pictures.]"
- Agrees with another participant that the ones which make it seem more unimportant are the rather more everyday pictures.
- She thinks "the ones that show people and animals have quite strong messages as well...because that kind of upsets you, because they are pictures of other people, and of animals. The polar bear I suppose...that was more effective than the picture of the ice caps melting because you can actually see it."
- The graph is off-putting for her on one hand but makes the issue seem important on the other. "I think most people, if they see a graph are just going to think that it's quite scientific. And because it's like, solid facts and you can't doubt them, sort of before 1999. And so if you look at the past pattern and you think that's true, then you sort of think the rest is."
- States that she feels a bit desensitised by the pictures of the famine, etc. "You always see this stuff on comic relief and stuff. And although you still care, you do get a bit more like, desensitised to it, to the effects...it's not using them for the first time."
- She states that in order to make people care about climate change, you need to make the pictures drastic and negative. "Because a lot of these are scenes which could happen anyway." Also states that she thinks it depends who you are appealing to as well "because if it was just East Anglia, then that would be a really good one [house falling off cliff], by saying about the coastline. But if it were someone in the Midlands, then that probably wouldn't affect them quite so much as something else." Later states that "you are not going to find a picture that will be good for everywhere, for different audiences you need different kind of styles of advertising."

Feeling able to do something about climate change (or not)

- Said that she thinks the ones which are overall the pictures that people picked as feeling able to do something about climate change were picked because of their simplicity. Mentions later that these pictures are also good because they show preventative things rather than trying to cure the effects.
- Talks about what would make it more likely that she would do something behaviourally...but the fact that even if she feels able to, she may not do it. "One of the main questions is...is it easy for me to do something every day. If it's easy then it's then a case of well, would you do it. Because I mean, all those things, we wouldn't necessarily do, but we think, yeah, it's easy to do. So they make you feel like you can do something even if you are actually doing do it. So you think you can in theory do it."
- States that the cartoon makes fun of climate change and suggests that it's not serious although it gets the point across that we will be affected. "It doesn't make me feel that it's serious."

- The malaria picture shows a good point but she thinks that the picture “isn’t obvious to everybody so not everyone gets the same message from it.”
- The picture of the aeroplane: “It’s not going to make any difference is it, the plane is still going to fly.”
- Wasn’t sure exactly what the G.W. Bush picture was supposed to show.

Outcome during a task to eliminate pictures from the set and end up with a selection which tell the most motivating story.

- Thinks that the pictures definitely need to be shown together. “That wouldn’t motivate me to go and get an energy saving light bulb, but if you saw that next to...like the one of the house, well you think, gosh this’ll happen if I don’t, kind of thing. You kind of associate them together. So they aren’t really giving a message by themselves I don’t think. You need to see the consequences of not...doing things.” Again later, she talks about needing more than one picture to emphasize “this is what you can do to prevent this kind of thing.”
- Points out that even if you think using the light bulbs and turning your heating down won’t make much of a difference, it’s still saving gas, etc. and cutting down the bills. “So even in a selfish way you would still be doing right by the environment. It’s not going to matter that America aren’t doing it as well.”
- Would take out of a motivating set the café picture.
- And the beach one – see these things often.
- Thinks that the tram picture is boring.
- Would take out the light bulb picture because “it doesn’t show the benefits at all does it. It doesn’t like, have the consequences or anything. I think you need two pictures.”
- Would keep in the picture of the dried up river with the dead fish in it, thinks it’s a good picture “because I think it’s like, with animals, it’s not their fault and you think this shouldn’t happen to them. If it’s like a scene of something bad happening you can’t always see it unless animals are dying or something.” Later points out that you need to see suffering because until you actually see it “you are less likely to respond.”
- Talking about the graph, states that she thinks it is worth doing things now because then the increase won’t be so extreme. “That’s only if everything carries on progressing as it is. Because before 1990 it’s all actual facts, because obviously it’s time gone by, so you can trust that. And then you kind of trust it a bit more because you think that they know what they’re talking about.”
- The picture of the smoke stacks makes you depressed rather than making you think to use energy saving light bulbs at home or anything.
- Not sure about the bike picture, doesn’t find it a very motivating picture “although it is something we could do.”
- Thinks the famine picture should be included.
- In a conversation about animal and local pictures being emotive she states that the set the group have arrived at are mostly pictures of people and animals being affected. And also that “the picture of the flooded house in England, people say that’s effective because it’s close to home.”

Summary after three principal fieldwork stages for KR:

The output of the interview suggests that KR is not particularly engaged either in terms of thinking that climate change is particularly important or doing anything about it. She really feels that she is powerless and voiceless to do anything about climate change. She doesn't really know what she can or should do. Having more access to information is important. So, low personal salience and efficacy, but a fairly high general salience. She doesn't see anything to be gained from being worried. During the following stages of research it emerges that resonant imagery is mostly local, and tends to include people or animals which she thinks is an important quality of pictures. During the focus group she confirms that she doesn't feel very empowered or engaged with the issue at all. She does seem struck by some of the images, particularly the drastic ones, but doesn't seem to be terribly moved towards engaging by any of them. Felt that they should definitely be presented together and that no single image would be motivating. Didn't have any comment about whether she'd been affected by participating.

Appendix 9d – summary of follow-up interview

[Thinking back to your thoughts and feelings before you did the interview, do you feel any different now having helped me out with my research?]

Well, yeah definitely because of the pictures you showed us. I mean, looking at them and having to do the tasks that you set us in the groups and...I mean, kind of the extent. I mean, some of the stuff I knew, but umm...some of the pictures and things made me realise more the extent of it and little things that I could do to help.

[Have you found yourself thinking and doing anything differently as a result of helping out?]

Yeah, just some little things like...some of the pictures showed things about like walking and using public transport and things which I did a lot anyway. But just simple things like electricity and water, and turning your heating off and things, if I could just put another jumper on instead and stuff like that. Just little things at home more than anything.

[Does the issue seems any more important to you or are you just more aware of it for example?]

Umm...well I'm definitely more aware of it. And yeah, I think it seems more important because you kind of remember the things you've seen and the things we've talked about and other people's points of view. So yeah I would say that it seems more important.

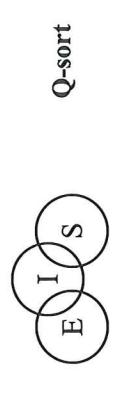
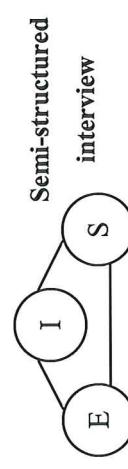
[Do you feel any more able to do anything about it than you did before?]

Yeah, I think so, yeah. The things I've mentioned.

[Is there anything else you'd like to mention?]

No, not really. But I think it did everyone good to have like a discussion and the way people saw things differently, when we had to put pictures in the order of how we felt about things. Like with the graph, I felt that was important but others said that it wasn't really. So, things like that, yeah.

Appendix 9e) Individual profile summary for Kathryn (High school student)

 <ul style="list-style-type: none"> Kathryn played a moderate role in the discussion group (there were other more and less active participants). In general she didn't know why some of the pictures were included. Kathryn notes that the pictures making climate change seem most important show the destructive effects of climate change and that those making it seem unimportant were the more everyday pictures. She states that she feels desensitised by the famine picture but moved by those with animals and suffering people in them because they are upsetting and you can actually see the effects. She comments on the graph making climate change seem important because it shows real facts and shows that it's worth doing something. She states in the group that pictures need to be drastic and negative, and probably local to make people care. She feels that the pictures making people feel able to do something about climate change were chosen because of their simplicity. She notes that even if she felt able to do something she might not do it, but if things are easy to do she'd be more likely to. She feels that the actions shown in the pictures wouldn't really make much difference because the USA won't change, but that they are still worth doing. Kathryn states that the pictures have more impact when they are presented together. She feels that there needs to be some pictures with suffering people or animals so that one can actually see it happening, otherwise people are less likely to respond. She also feels that there needs to be a 'close to home' picture. Didn't comment in the focus group on whether she'd been affected by participating. In a follow-up interview Kathryn felt that both her senses of salience and efficacy had increased since participating, partly because the process had enabled her to understand the links within the issue and its relevance to herself. The discussion process resulted in her feeling more aware of the issue and she stated that she is taking actions on an everyday basis. 	<p>Focus group discussion & follow-up interview</p>
 <ul style="list-style-type: none"> Climate change important: The graph because of the worrying 'proof' shown by the image, and dramatic impact images of climate change (forest fire, melting ice, flood in Bangladesh, dried up lake with dead fish and the famine) because of the importance of rising sea levels (learnt at school) and the negative impacts on animals and humans in the other pictures. These are pictures of current consequences, adding seriousness. Without the animals, the pictures wouldn't make climate change seem so important to her; they make her feel sympathy and empathy. Climate change unimportant: Images at the negative end of both factors in chapter six (cafe, irrigation, sunflowers) or in the more ambiguous middle ground (GWB, women at standpipe, wind turbines). The picture of George Bush makes climate change seem unimportant to Kathryn because it represents that Governments don't seem concerned. She feels that the other pictures are insignificant or isn't sure why they are relevant. Feel able to do something about climate change: Similar to those presented by factors one and two in chapter six (light bulb, cyclist, thermostat, solar panels and tram) because they are easy things that she can do, that make a difference (solar panels could become more widespread). Kathryn also ranks the petrol station highly because she can use public transport / unleaded petrol. Feel unable to do anything about climate change: The graph, famine, smoke, stacks, forest fire, refugees and mosquito pictures because they are worldwide and large scale images making her feel that her efforts would not make a difference; out of her control, not up to her to solve. 	<p>Q-sort</p>
 <ul style="list-style-type: none"> Kathryn imagines the future involving population and resource problems, and people living a different way of life. Her personal concerns relate to her immediate future. Climate change doesn't compare: it is not an important issue to her because it isn't a high profile issue, she doesn't understand it, it isn't immediate, she can't feel the effects and she feels powerless to do anything about it. She expresses some concern for future generations. She feels that climate change would become more important if it were prominent in the news, taught in schools, if people were in danger or if it affected her personally. She also notes that being more aware, knowing and feeling able to do things to prevent it would make the issue more important to her. Imagery is large scale; she mainly imagines climate change in a global sense, e.g. ice caps melting, people drowning, extreme weather. Kathryn's imagery is mostly influenced by what she has picked up at school and in the media. She doesn't perceive any local climate changes. She regards the issue as being negative. When she thinks about climate change in the future, she expresses catastrophic imagery. Kathryn attributes climate change to human activity and feels that everyone is responsible for doing something about it. However, she feels that as individuals people are powerless to do anything about climate change. She feels that the responsibility for action must come from above. She needs to be encouraged and told what she can do in order to feel that she can do anything about climate change. 	<p>Semi-structured interview</p> <p><i>Kathryn thinks about climate change in a global sense; for her it is a distant and far away issue. In the Q-sort, she chooses the most global and dramatic images as making climate change seem most important to her however these also make her feel unable to do anything about climate change; she certainly doesn't connect them with taking actions. She feels that the images need to be presented in combination and that some local imagery as part of this would make people care more about climate change. Overall, the issue is not important to her because of its scale and distance, and because she feels powerless to do anything about it. Her low sense of efficacy is apparently connected with her feelings about the salience of climate change. She feels that in general climate change may be an important issue, for example when considering future generations but at a personal level it is not. She doesn't feel able to do anything about climate change as represented by the positive images she chose in the efficacy Q sort, her related comments and contributions to the focus group. The interview, Q-sort and focus group discussion reveal that Kathryn feels there needs to be more commitment from Governments and particularly the USA. 10 months later, Kathryn feels that climate change is more important to her and that she feels more able to do things about it (and is doing them) than she did initially.</i></p>

Appendix 10 – Imagery categorisation

- a) The scientific basis (present changes & future projections)**
- b) Consultation with climate change experts and summary of various image qualities following expert consultation**
- c) Imagery employed in climate change campaigns by Greenpeace and Friends of the Earth**
- d) Overall image classification (with details)**

a) Imagery – the scientific basis (present changes & future projections)

Category	Examples
Causes	<p>Natural fluctuations and changes, human activity causing climate change: Combustion of fossil fuels; Population size, structure; Economic growth; Agriculture; Technological changes; Land-use changes; Lifestyle patterns; Governance structures.</p>
Consequences	<p>A warming world, seasonal change: Increase in global surface temperature, variable globally over regions. Higher maximum temperatures. Increase in N hemisphere hot days, heat waves and hot summers. Increase in UK freeze-free season length and decrease in cold days. Lengthened growing season. Decrease in area of snow cover and ice extent. Thawing of permafrost, retreat of non-polar glaciers. Thinning of arctic sea-ice and decrease in extent, melting ice caps; Pole-ward and upward elevation shift in plant, insect, bird and fish ranges. Earlier flowering, breeding and migration patterns; Increased frequency and severity of drought in summer; Increased frequency of coral reef bleaching.</p> <p>Precipitation change, floods and droughts: Decrease in precipitation in some regions, e.g. N and W Africa; Continental precipitation increase; increase in heavy / intense precipitation events in the Northern Hemisphere; average precipitation increase; increased flood, landslide, soil erosion, avalanche, mudslides; increased risk of floods and drought; water shortages; drier summers; decreased crop yields / agricultural productivity; risk of forest fire; wetter UK winters.</p> <p>An increase in global mean sea level: Sea level rise mainly due to thermal expansion; increased coastal erosion and damage to coastal infrastructure and ecosystems; coastal inundation and flooding of low-lying areas.</p> <p>More extremes: More frequent and intense El Nino events; increase in climate variability and extreme events; increase in tropical cyclone peak wind and rain intensities; increased intensity of mid-latitude storms; increase in storm surges UK.</p>
Secondary consequences	<p>Effects on human health, animals and ecosystems: Increase in heat related deaths (older people and urban poor) and decrease in cold related deaths; heat stress in livestock and wildlife; shift in tourist destinations; increased risk of damage to crops; increased electric cooling demand, decrease in heating energy demand; extended range of some pest and disease vectors; pressure on governments, private flood insurance systems and disaster relief; increased risk to human life as a result of extreme events, disease epidemics, heat stress, water-based pathogens and disease vectors, water and air quality, food and water availability and quality; increased threat to human health particularly in lower income populations in tropical/subtropical countries; food security risks; risks to terrestrial, freshwater and marine ecosystems; effects on socio-economic systems; increase in vulnerability; effects on ecological productivity and biodiversity including extinctions (fire, drought, pest invasion, storms, bleaching...); changes in agricultural yields.</p>
Mitigation & adaptation	<p>Technological advance, energy efficiency, sea and flood defences, etc.: Technological advances towards more efficient use of energy in appliances, land use, etc.; conservation and sequestration of carbon; development of environmentally sound technologies; different patterns of energy resource development; maintenance and development of sea and flood defences UK; planned retreat and coastal management; transport alternatives to the car and car-sharing; Saving energy and increasing efficiency.</p>

b) Categories summarising consultation with climate change experts

Category of image	Detail within category	
Weather	Everyday weather Windy / stormy Forecast of the future Wetter weather Storms Weather extremes Past weather change	Strong wind and hurricanes Rain / strong rain Less snow Changing weather Freak weather Heat waves 'Mild Greyness'
Seasonal change	Summer drought Winter flood Hotter, drier summers Wetter/damp winters Grey winters Merging seasons Effects of seasonal change (e.g. tourism, landscape, etc.)	Warming up Norfolk becoming drier Heavier rainfall in autumn / winter Changing summers Fewer frosts
Drought / water shortage	Desertification Standpipes in the streets (Norfolk) Environmental refugees (abroad) Water supply problems / shortage Intense heat Increasing demand for water (e.g. leisure, agriculture) Effects on agriculture (irrigation, different crops)	Empty reservoirs Parched land Migration in Africa Hot dry summers
Floods / excess water	River water levels (+/-) Environmental refugees Local (Norfolk)	Global (e.g. Bangladesh) Coastal flooding
Population	Population migration	Population increase
Sea level rise	Melting ice sheets / ice caps Local Loss of low-lying islands, e.g. Maldives	Sea defences Higher sea levels
Agriculture	Agricultural change Different crops, e.g. sunflowers, maize	Changing the landscape Soil erosion
Other countries	Tourism Migration Environmental conflicts	Refugees Third world Loss of low lying islands
Renewables	Solar power – solar panels Nuclear power?	Wind power, wind turbines
Causes	Traffic Power stations Deforestation Flights abroad Energy consumption	Air pollution Industrial revolution Progress and development Natural cycles More need for air conditioning
Tourism	Norfolk + and - Changing destinations Some destinations too hot for holidays	Flights abroad No more skiing
Landscape	Fields of sunflowers Wind turbines Tree growth Development Building design (e.g. white houses) Agricultural change – different crops	Changing countryside Deforestation Desertification Soil erosion Summer drought on landscape

Continued overleaf...

Appendix 10b continued...

Lifestyle, leisure	Swimming pools Outdoor sports Beach holidays locally Sitting on beaches People friendly cities Community living Modes of transport will change Air conditioning	Café culture Energy efficient homes Energy efficient cars Flights abroad becoming less Sleeping with mosquito nets Building design and construction Food hygiene, more refrigeration Low carbon use
Coastal	Coastal erosion Norfolk beaches more popular Local	Sea defences Coastal ecosystems
Effects on fauna/flora	Changing species Cockroaches Malaria Coral bleaching	Distressed animals Effects on wildlife Hedgerow death Different types of trees / plants
Health	Sitting on beaches Allergies Malaria Heat stress Bugs, enabling them to breed, etc. Meningitis	Sunburn Skin cancer Traffic fumes Asthma Food hygiene
Solutions	Technical fixes Result of changes, e.g. cleaner air	Drastic mitigative changes Low carbon use
Other	People suffering, distressed people Earthquakes Politics – USA Stability of the world – more dangerous	Impersonal Scary Disparity between rich and poor Future generations (children's lives)

Continued overleaf...

Appendix 10b continued...

Summary of various image qualities following expert consultation

Content and requirement of image
<ul style="list-style-type: none">• Impact images (but moving away from images that people have become desensitised to)• Dramatic images• Images with people in them; a human angle. Sometimes pictures of people or animals suffering (e.g. heat stressed people and animals, asthmatic person, etc.) but these can also be difficult to relate to.• Images that people can relate themselves to; connecting to personal experience, easy to imagine and related to images that already exist in people's minds. Images demonstrating the impact of climate change on individual lives. Something recognisable. People relate to the weather and what it has been like in the past, they associate immediate personal experiences, and their experiences of weather may be a factor influencing their interpretations of climate change. People talk about climate change in an immediate sense but it is long term. Also, climate change is seen as being impersonal and having global effects so that it's not worth worrying about, so it needs to be brought closer.• Images demonstrating some kind of temporal or spatial variation.• Comedy images.• Realistic images.• Graphical images showing the change over time and predicted into the future.• Making abstract ideas more concrete; people have ambiguous conceptions of climate change and find it hard to conceive what it actually means.• Images must be representative as well as scientifically plausible, based on the UKCIP02 and IPCC projections.• Secondary consequences of climate change impacts as well as the primary ones, e.g. environmental refugees as a result of drought / flooding.• Generally images of the climate becoming less stable, the world becoming more dangerous and less attractive to live in.• Positive images of climate change are important, e.g. people playing outdoor sports, sitting on local beaches and outside cafés.• Multimedia experiences. If simply using static image, the quality and size is important. As near to photo quality as possible will have more resonance. Image must be striking and appealing rather than dull to look at.• How to express gradual change? Showing variations on a similar scene to show change over time. Basing pictures on real examples, real landscapes and visualising changes over a longer timescale.• Images must be distinct because people think of climate change generally and link it with air pollution, waste, ozone issue, etc.• Concern for future generations.• Expressing peoples feelings of difficulty or unwillingness to change.• Confusion about issue.• Political situation is important, for example the stance of the USA.• The potential effects of socio-economic changes as a result of mitigation policy.• Subtle changes are as important as drastic ones, for instance landscape change. However these are not very striking visually or 'picture-worthy'.• Moral arguments are important to people, e.g. the US level of energy use and lack of responsibility being taken.

c) Summary of imagery employed in climate change campaigns by Greenpeace and Friends of the Earth

Image description	Examples of image provoking quotations in text
Droughts	“We’re already seeing the results”
Melting ice caps	“Risk major ecological and economic disaster”
Storms	“Stop oil companies wrecking our planet”
Floods, e.g. Mozambique	“Catastrophic effects of global warming”
Dying coral reefs	“Gamble with the lives of millions”
Hurricanes in South America	“Defend the atmosphere from industrial pollution”
Storms in the UK	“Climate alarm”
Agriculture destroyed	“It’s not too late”
Forest fires in Indonesia	“Preventing climate catastrophe by breaking our addiction to oil, coal and gas”
Catastrophic climate change	“Solar power in London homes”
People washed away	“Clean energy solutions”
Poor people suffering most	“Tell your friends”
People losing everything	“Take it personally”
Freak weather events will become more frequent	“The US must play ball with the rest of the world to ward off the deadly threat of global warming”
Causes of climate change are CO ₂ and polluting gases	“If we don’t take drastic action we’ll pass the ‘safe’ limits of climate change in just 40 years, allowing our weather to spiral out of control”
Environmental campaigning / activism	“Don’t buy ESSO – the number one global warming villain”

d) Overall image classification (with details)

Causes	Consequences / Impacts	Adaptation & mitigation
GHG emissions from power production and industry (Oil drilling, fossil fuel burning for energy; power station cooling towers; Industrial emissions; smoke stacks, industrial revolution, development; etc.)	Temperature increase (Rate of change; Warmer weather UK generally and in Europe, milder winters, hotter summers, 'too hot' in the UK, 'better' summers in UK; Dramatic temperature change; Heat waves, more hot days and more high temperature extremes; Milder winters and fewer cold days and frosts, longer frost-free season; Melting ice caps and glacial retreat, Arctic retreat / thinning of Arctic sea ice, less snow in Northern hemisphere; Shift in tourist destinations – less skiing, too hot in southern Europe, Mediterranean, etc., more local tourism – people sunbathing and swimming off Norfolk beaches in summer, warmer UK coastal waters; Change in crops and irrigation practices, risk of pests and damage to crops; longer growing season; Effects on animals – species migration pole-wards, extinctions, heat stress, loss of habitat – polar bears, penguins, new species in UK / more cockroaches, mosquitoes, etc.; Health - milder winters and less cold related mortality / Malaria and other diseases and health problems in UK and abroad, e.g. heat stress; food hygiene; different building design; different leisure patterns – café culture, outdoor sports, outdoor swimming pools; Changing energy use – more use of air con, less heating, etc.)	Renewable energy / energy alternatives (Solar panels, wind power, nuclear, bio-fuels, petrol prices; technology generally; future power supply being different, etc.)
GHG emissions from transport and energy use (Air pollution, car emissions / exhausts, travel by plane and foreign holidays, traffic and fumes, smog, petrol stations; wasting energy in lighting, heating, air con, etc.)	Drought (Increased risk of drought; water shortage, more demand for water, other effects on water sources such as reduction in quality as well as quantity of freshwater; desertification; drought in other / developing countries; famine and starvation, thirsty and suffering people, environmental refugees, population migration; drought in UK, standpipes in UK streets; parched land; empty reservoirs; effect on crops and agriculture, more irrigation required, decreased crop yields, food production and security problems / shortage / hunger; forest fires here and abroad; no rain; hosepipe bans; people dying; decreased hydro-power in drought prone regions, etc.)	Transport (New technology; efficient cars, hybrid / hydrogen fuelled cars; fewer cars, public transport – train, bus, tram; bikes, petrol prices; walking instead of driving; car sharing; children's lifestyle being different; cleaner air health and fitness, etc.)
	Changing weather and seasons (Summer drought in UK and abroad; higher and more frequent extreme temperatures; drier summers, hotter summers more frequent with an increase in maximum temperatures, bad / 'worse' summers, 'better' summers; warmer weather and more heat waves; people on local beaches; fewer frosts and cold days; cold winters become rare, milder winters – and less cold related mortality; change in length of seasons, longer growing seasons, e.g. flowers out earlier, lasting longer, wider crop growth window; more extreme seasons; more wetter weather, more intense rainfall in the northern hemisphere; wetter winters and winter flood, heavy rainfall in winter; grey weather; increased Asian monsoon precipitation variability – inc in flood and drought magnitude; changing landscape, agricultural change; local tourism and beaches, changing tourist destinations; summer forest fires here and abroad; more extreme weather events; erratic / dramatic / unpredictable weather, more unusual weather; more sun, less sun; more rain in northern Europe, less in the south, heavier rainfall, less rain; storms – increase in intensity, increase in tropical cyclone wind and precipitation intensities; less snow; 'better' weather (UK), 'worse' weather; cloudiness; colder; fog and mist, etc.)	Other technical fixes (Change in building design, e.g. white buildings, more energy efficient buildings; change in industrial practices; continued maintenance and building of sea and flood defences and infrastructure; managed retreat, etc.)

Continued overleaf...

Appendix 10d continued...

<p>Flooding (Increase in global precipitation and more intense precipitation events mean increased risk of flooding; higher river levels; landslide, soil erosion etc; flooded homes and streets locally and UK generally; coastal inundation; flooding in other / developing countries; recharge of aquifers; homeless people; flood protection, insurance problems, damage relief; losing homes to floodplains; building of flood protection; sanitation problems, increased risk of disease epidemics, people dying, refugees; danger, etc.)</p>	<p>Energy use (Saving energy at home by turning off lights, energy efficient light bulbs, etc.; in businesses; change in industrial practices; reduced need for heating; more need for air conditioning; children's lifestyle being different, etc.)</p>
<p>Sea level rise (Melting ice caps, melting glaciers, arctic ice reduction; loss of low-lying islands, coastal inundation and loss of land UK and abroad; penguins, polar bears; loss of land leading to overcrowding, migration, refugees and population problems; coastal erosion, sea defences maintained and newly built, etc.)</p>	<p>Political situation (International summits, political meetings; USA situation; economic effects including cost of adaptation and mitigation; cost to insurance industry; increase in global food prices, etc.)</p>
<p>Agriculture and landscape (Different crops in UK, e.g. sunflowers, vineyards, maize, bio-fuels, wind turbines; changes in agricultural yields may increase or decrease depending on amount of CC and region; drier soil – more irrigation; desertification; food production and security problems; more or different food available; growing season lengthens; flooding of agricultural land and coastal inundation; development and buildings, building design; soil erosion, landslides; sea defence construction and coastal management, managed retreat, e.g. expansion of salt marshes; forestry, etc.)</p>	
<p>Coastal (Sea defences, maintenance and new; stormy sea at sea walls; increased intensity of storms – damage to coastal ecosystems; coastal / cliff erosion; storm/cyclone coastal erosion and damage to buildings and infrastructure; coastal inundation and loss of habitats locally in the UK and abroad, e.g. salt marshes, and damage to coastal ecosystems, e.g. coral reefs, mangroves; warming of UK coastal waters, people sunbathing and swimming off Norfolk beaches, local tourism; insurance and losing homes to cliff erosion; population migration and refugees, etc.)</p>	
<p>Health and human suffering (Change in disease vectors, e.g. malaria and diseases from water-bourne pathogens; sunburn, skin cancer; more fitness from cycling, etc.; asthma; allergies; heat stress; food hygiene, and also food availability and quality may be compromised, plus increase in global food prices; more illness; less cold related mortality, reduced cold stress; new diseases; cataracts; sanitation problems; people dying, hunger, famine, disease epidemics, reduction in quality and quantity of fresh water; disaster relief; threat to human health mostly lower income populations and in tropical/subtropical countries; loss of life in floods and storms; refugees, etc.)</p>	
<p>Effects on flora and fauna (Changing species; diseases and pests, e.g. malaria, cockroaches; effects on terrestrial and freshwater ecosystems, habitats, e.g. wetlands, etc.; alteration of ecological biodiversity and productivity, increased risk of some species extinctions, e.g. by coral bleaching, drought, fire, storms, pest invasion; distressed animals in the heat; effects on fish, bird, insect and other populations, e.g. cockroaches, mosquitoes, polar bears, penguins, etc.; loss of habitats and effects on wildlife in UK and abroad; length of growing season, etc.)</p>	
<p>Lifestyle, leisure, tourism (Tourism patterns change – southern Europe becoming too hot, etc. – holidays locally; outdoor swimming pools, outdoor sports; sitting and sunbathing on local beaches rather than abroad / swimming off Norfolk beaches; expensive flights; café culture; energy use, e.g. efficient homes and cars, more use of air conditioning; property and infrastructure losses due to storm damage, higher temperatures, flooding, etc.)</p>	

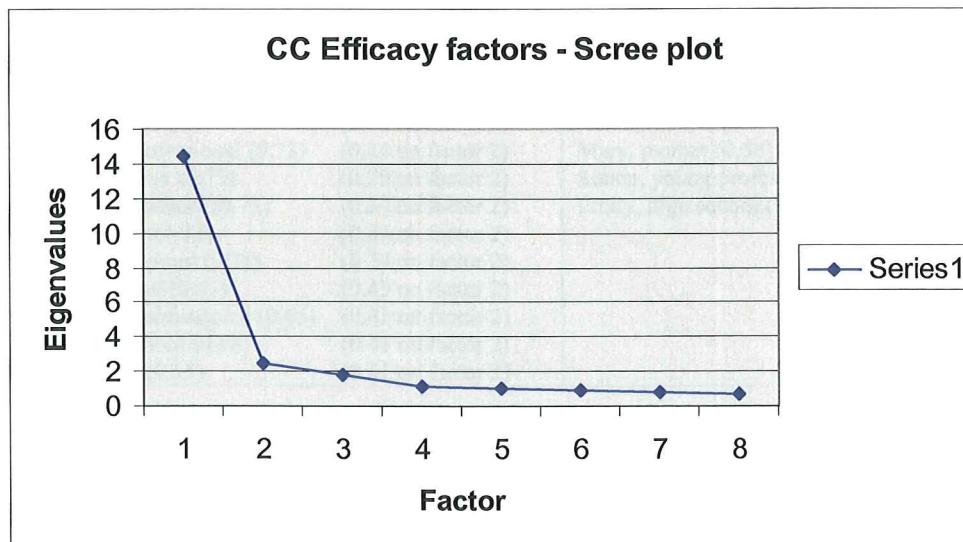
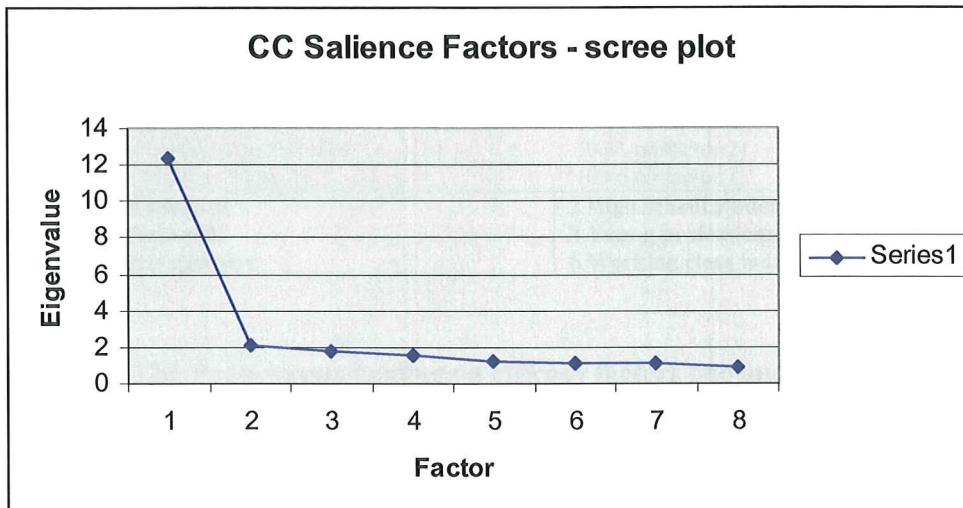
Appendix 11 - Variations on the Q-sort instructions

Number of sort	Variations on the instruction (I feel that...)
1 (salience)	...these pictures do represent what climate change means to me*
1	...these pictures make climate change seem more important to me personally**
1	...these pictures make climate change seem important to me***
2 (efficacy)	...these pictures make me feel inclined to something about climate change*
2	...these pictures make me feel that I can do something personally about climate change**
2	...these pictures make me feel that I must do something personally about climate change**
2	...these pictures make me feel able to do something personally about climate change***
(*piloted in first phase **piloted in second phase ***piloted in final phase)	

Appendix 12 – Results material from the Q-sorts

- a) Scree plots depicting the factor outputs from both Q-sorts
- b) Participants loading on salience factors one and two
- b) Participants loading on efficacy factors one and two
- c) Factor arrays for all factors (salience and efficacy)
- d) Most extremely ranked images for all factors (salience and efficacy)

Appendix 12 a) Scree plots depicting the factor outputs from both Q-sorts



Appendix 12b) Participants loading on salience factors one and two

Salience Factor one	Salience Factor two
<i>% of variance explained: 32%</i>	<i>% of variance explained: 22%</i>
Jonny, high school (0.78) (0.07 on factor 2) Paul, young professional (0.77) (0.05 on factor 2) Karen, mother (0.76) (0.27 on factor 2) Yolander, high school (0.75) (0.37 on factor 2) Kathryn, high school (0.74) (0.35 on factor 2) Angela, high school (0.70) (0.30 on factor 2) Kate, young professional (0.66) (0.15 on factor 2) Vicky R, high school (0.64) (0.32 on factor 2) Emily, high school (0.62) (0.36 on factor 2) Lee, high school (0.60) (0.23 on factor 2) Tanja, young professional (0.58) (0.24 on factor 2) Mary, mother (0.57) (0.06 on factor 2) Ailsa, young professional (0.57) (0.26 on factor 2) Vicky G, mother (0.56) (0.31 on factor 2)	Sara, mother (0.83) (0.01 on factor 1) Kerry, mother (0.79) (0.36 on factor 1) Mark, young professional (0.76) (0.25 on factor 1) Yvette, young professional (0.73) (0.31 on factor 1) Anne, mother (0.71) (0.04 on factor 1) Theresa, mother (0.59) (0.41 on factor 1)
Split Helen, high school (0.60 on factor 1) (0.49 on factor 2) Emma, young professional (0.54 on factor 1) (0.47 on factor 2) Margaret, mother (0.53 on factor 1) (0.47 on factor 2) Erica, high school (0.52 on factor 1) (0.61 on factor 2) Sarah, mother (0.52 on factor 1) (0.46 on factor 2)	
9 High school students 5 Young professionals 5 Working class mothers	2 High school students 3 Young professionals 6 Working class mothers

Appendix 12c) Participants loading on efficacy factors one and two

Efficacy Factor one	Efficacy Factor two
<i>% of variance explained: 38%</i>	<i>% of variance explained: 25%</i>
Kerry, mother (0.87) (-0.14 on factor 2) Erica, high school (0.83) (0.25 on factor 2) Claire, young professional (0.82) (0.36 on factor 2) Sara, mother (0.81) (0.32 on factor 2) Jonny, high school (0.81) (0.17 on factor 2) Anne, mother (0.80) (0.28 on factor 2) Paul, young professional (0.78) (0.24 on factor 2) Margaret, mother (0.75) (0.29 on factor 2) Kathryn, high school (0.73) (0.37 on factor 2) Yvette, mother (0.72) (0.34 on factor 2) Angela, high school (0.71) (0.34 on factor 2) Lee, high school (0.67) (0.45 on factor 2) Mark, young professional (0.65) (0.41 on factor 2) Helen, high school (0.58) (0.41 on factor 2) Sarah, mother (0.55) (0.41 on factor 2)	Vicky R, high school (0.77) (0.16 on factor 1) Ailsa, young professional (0.72) (0.23 on factor 1) Kate, young professional (0.70) (0.33 on factor 1) Vicky G, mother (0.68) (-0.15 on factor 1) Yolander, high school (0.65) (0.39 on factor 1) Karen, mother (0.63) (0.21 on factor 1) Mary, mother (0.58) (0.40 on factor 1) Simon, young professional (0.57) (0.40 on factor 1) Emily, high school (0.50) (0.45 on factor 1)
Split Tanja, young professional (0.56 on factor 1) (0.58 on factor 2) Emma, young professional (0.51 on factor 1) (0.65 on factor 2) Theresa, mother (0.48 on factor 1) (0.57 on factor 2)	
6 High school students 6 Young professionals 6 Working class mothers	3 High school students 5 Young professionals 4 Working class mothers

Appendix 12d) Factor arrays for all factors (salience and efficacy)

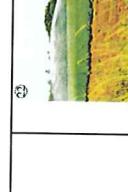
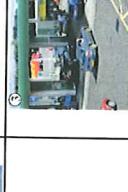
Image	Salience factors		Efficacy factors	
	1	2	1	2
1 Power station	0	2	-1	0
2 Industrial smoke stacks	1	3	-3	-2
3 Petrol station	-1	2	1	1
4 George Bush	-2	-1	-2	0
5 Aeroplane	-2	-1	1	0
6 Fitting low energy light bulb	0	1	3	3
7 Graph showing temperature rise	2	1	0	-3
8 Thermostat	-1	0	3	3
9 Cyclist	-1	0	2	2
10 House with solar panels	0	1	2	2
11 Wind turbines	0	2	2	2
12 Tram	-3	-2	2	2
13 Forest fire	1	0	-1	0
14 Rainy high street	-2	-2	0	0
15 Refugees	2	-1	-2	1
16 Mosquito biting	0	-1	0	-1
17 Building sea defences	0	0	0	1
18 Eroding cliff	1	1	-1	0
19 Polar bear	1	0	0	-2
20 Melting ice	1	0	-1	-1
21 Flood in Bangladesh	3	1	-3	1
22 Irrigation	-1	-2	1	1
23 Flooded house	2	1	-1	-2
24 Sunflower field UK	-2	-2	1	0
25 Storm at coast	1	0	-2	-1
26 Cartoon – no winter	0	-1	1	-1
27 Café	-3	-3	1	-1
28 Beach	-1	-3	0	-3
29 Dried up lake with dead fish	2	2	-1	-2
30 Women at standpipe	-1	-1	0	0
31 Starving children, famine	3	3	-2	1
32 Dead tree, desert	0	0	0	-1

Appendix 12e) Most extremely ranked images for all factors (salience and efficacy)

Salience factor one	Salience factor two	Efficacy factor one	Efficacy factor two
HIGH <ul style="list-style-type: none"> • Starving children, famine • Flood in Bangladesh • Dried up lake with dead fish • Graph showing temp. rise • Flooded house • Refugees 	HIGH <ul style="list-style-type: none"> • Industrial smoke stacks • Starving children, famine • Wind turbines • Dried up lake with dead fish • Petrol station • Power station 	HIGH <ul style="list-style-type: none"> • Thermostat • Fitting low-energy light bulb • Cyclist • House with solar panels • Wind turbines • Tram 	HIGH <ul style="list-style-type: none"> • Fitting low energy light bulb • Thermostat • Cyclist • House with solar panels • Wind turbines • Tram
LOW <ul style="list-style-type: none"> • Aeroplane • Rainy high street • George Bush • Sunflower field UK • Tram • Café 	LOW <ul style="list-style-type: none"> • Tram • Rainy high street • Irrigation • Sunflower field UK • Beach • Café 	LOW <ul style="list-style-type: none"> • George Bush • Storm at coast • Refugees • Starving children, famine • Industrial smoke stacks • Flood in Bangladesh 	LOW <ul style="list-style-type: none"> • Flooded house • Polar bear • Dried up lake with dead fish • Industrial smoke stacks • Beach • Graph showing temp. rise

Appendix 13 – Model Q-sort (see following page)

Salience factor one

Most disagree	-3	-2	-1	0	+1	+2	+3	Most agree
								
								
								
								
								
								
								
								

Appendix 14 – Quotes illustrating motivating factors (aside from imagery)

• **Being given the opportunity to act**

Erica: "If it was made easy for us. Yeah. Like not even in terms of pictures. But like when you are actually given the bulbs, the light bulbs and stuff, you just do it."

Yolander: "Yeah because you are more likely to use them if you have them."

Angela: "I think that if everyone is given the opportunity to do something, then they will. It's like, in my village we have been given these sort of recycling bins. And most people stick to it. I mean at first, you moan about it but then you get used to it and it's doing something good for the environment, but people don't like feeling like, oh it's a hassle to do the right thing and oh, energy saving light bulbs cost so much more each and oh, I have got a family to feed, you know there are other priorities. But I think that if people have an incentive, then people will do the right thing. Like in other countries, they have really good recycling schemes and like, public transport is really good and popular."

Erica: "Yeah, I think that public transport is important. But as far as the government is investing in it, well it's quite rubbish and it's really expensive."

Emily: "It's £6 from where I live and that's only half an hour from the city on the train."

Angela: "I mean, it's expensive, it's rubbishy, it's really inefficient and not many people take it. Whereas if they improved it then people would take it. I do use it, I have got no choice now but I know that when I get rich enough to have a car, I don't think there will be much reason for me to use public transport. Because it's crowded, it's dirty, it smells and it's unreliable."

(High school students)

• **Other Government action and commitment**

Emily: "I think that what basically motivates me is if it was coming from the Government. If it was like the recycling bins. And if it's like, everyone has to do it, you know if it's just me having an energy saving light bulb then you just think well that's not going to help. If they just stopped making the other sort, then I'd think, yeah, great. Because I'd think that everyone was going to do it and that we would actually be making a difference. But if you're riding your bike to work, and you're surrounded by thousands of cars, you think well, great. Whereas if the Government introduced these charges to pay five pounds to have your car in the city, then I would feel better about it because I'd think that it was going to catch on. And that eventually it would make a difference."

Helen: "I think it's a Government initiative as well. I mean, they probably do but I mean, I'm not really motivated, well I am but I'm not really prepared to go out of my way for the environment. So like, if the Government took more initiatives, like by having a national walk to school day and national environmental week when we could all try and do things then that would be good. We probably even have it but we don't know when it is. I think they kind of need to work more at motivating people, and especially the younger generation, like younger than us because they are the future." (High school students)

Theresa: "You could do a bit to help but if nobody else is doing it then..."

Mary: "It's got to come from the Government. You can change, but they have got to start the change."

Theresa: "Yeah, they have got to start pulling down the factories that produce all this."

Mary: "Yeah, the Government has got to stop, has got to tell them they can't use certain chemicals and that this has to happen. To stop putting so much into the atmosphere." (Working class mothers)

• **If America (and others) committed to doing something about climate change**

Tanja: "And the likes of George Bush as well. I mean, what policies have they got? Have they got any? Because it's such a huge country."

Mark: "Well there isn't much is there? The Government plays down the research because the economic impacts of dealing with it would be so great."

Tanja: "And I wonder what they think about like, energy resources ending and all that kind of thing. I mean, do they not think about that?"

Claire: "That's where Bush comes in again for me. Someone in a position of power. I just think well why aren't they doing something if they can see predictions like that?" (Young professionals)

Continued overleaf...

• **If obvious climate changes were to start happening in the UK**

Vicky: "It's the same with anything though isn't it? It's always going to go on. And then until it actually does happen, then you don't change."

Mary: "And then that's exactly what they are going to say about this. Oh well, don't worry about me Jack, I'll be dead by the time it happens so why should I worry? People have stopped caring."

Anne: "That's inevitable, that sort of attitude, you always get that, and it's sad."

Mary: "But I mean, if you got flooded then it would be affecting you. You would know what it, you know..."

Vicky: "You would know what it would feel like."

Anne: "Especially if you'd been flooded for the third time in a year or something."

Mary: "Yeah, having all your possessions ruined. Your house ruined, your carpets ruined. That's personal, so you are going to appreciate that more. You can watch it on TV and see someone..."

Vicky: "Yeah, if it's on TV, you forget about it. You just see it and then forget."

Karen: "Oh definitely yeah, you know, and I have got a daughter with Asthma. And I mean, fortunately it isn't that serious but the fact that you see that people are affected by asthma, the increase and that – it's worrying."

Kerry: "Yeah, you think about what's in the air and stuff."

Karen: "Yeah, I mean, what's in the air to cause it? It's worrying, it's really worrying. You know, and if you think as well about people living near power stations and things like that, how that affects their health. I think that if you can get it across to people just how all these things, I mean ok, it's affecting the climate, but how it's affecting us as individuals health wise or financially, because obviously if someone's house is flooded then the insurance is going to go up and all that sort of thing." (Working class mothers)

• **Being constantly reminded about climate change and having more information, particularly from the government**

Angela: "It might be interesting to show people like, captions of these kinds of things and see if sort of, videos have more effect on people, than just seeing pictures, or hearing people like you could see the people there, and speak to them maybe. Maybe if you heard what they had to say because, do they know what's going on? Or do they not really know that it's global warming." (High school student)

Mary: "It also needs to be more in the news and in your face."

Anne: "And generally more from the Government."

Theresa: "Don't just have one bit for a while and then nothing either. It has got to be consistent. You need that bit more to remind people. You need it there once a day for some people. They see it on the tele and think, well that don't affect me. But the more they see it the more they will be aware, and think that that do affect me, and what I do does affect what's happening out there. Something has got to change. But there will always be that percentage of people who ignore it, who say that don't affect me, I'm not going to bother about it. And it needs to be positive as well." (Working class mothers)

• **More activities in schools, celebrity promotion and campaign days**

Mark: "I think the big thing is to make it sort of, I don't know. As long as it's fashionable, and trendy..."

Tanja: "And green..."

Mark: "Yeah, I mean, if assisting in that way was cool, was with it and was trendy, then it would work."

Claire: "Like if you had David Beckham on a bike or something."

Tanja: "And Victoria turning down the thermostat." (Young professionals)

Helen: "And maybe if like, people and high up people who are investigating things about global warming got like a representative. I don't know, is it like David Bellamy, is he kind of like that? He's very environmental isn't he? But then he's not really, no offence to him, but he's not really going to appeal to like, the younger generations. And as we are the future, it's kind of us who need to be impressed to make things happen. So I mean like, just hypothetically, you could get someone like David Beckham to represent and say, like on an advert, or through the media, whatever way to say, look this is happening and we can change this by doing this. Then people might take more notice."

Emily: "Yeah, it should be made like red nose day or something, shouldn't it? Like a big televised thing when all these schools go and recycle stuff of whatever. And then everyone will want to do it."

Erica: "I mean it hardly seems like an issue at all at the moment."

Emily: "I think it needs to become, the whole energy saving idea has got to become more accepted in society as well. I think that people have got to; everyone has got to change for it to really make a difference. And probably not just in this country, but everywhere."

Helen: "Yeah, it's a bit of a taboo isn't it really?"

Emily: "Yeah but from like, red nose day and children in need at this school, lots of schools have fundraising events and stuff like that. But I have never ever done any fundraising for anything like climate or any kind of awareness type thing. I think if it came like from a big organised thing then lots of people would do it."

Erica: "I think that people are starting to do stuff. Like Eco-schools and stuff. But it needs a push. I don't think our age are very targeted. We are not part of school that much any more. And we are not part of a company either, which might have to be responsible. So there's not really much power that we have got personally because we don't have our own houses, and not all of us have our own cars or anything like that so we are quite powerless where these things are concerned. I think we should be targeted better." (High school students)

Appendix 15 – Questions used in follow-up interviews

Think back to how you felt before you did the interview; do you feel that your feelings about climate change have changed at all as a result of helping me with my research?

In what way / can you explain how?

Prompts and elaboration:

- **Have you found yourself thinking or doing anything differently as a result of helping me with my research?**
 - *Do you find yourself making any efforts that you didn't before?*
 - *Have you found yourself talking to others about climate change?*
- **Does climate change seem any more important to you now?**
 - *Are you noticing or aware of anything that you associate with climate change now, but may not have done in the past?*
- **Do you feel any more able to do anything about it?**