

# Exploring why individuals acquire the motivation to mitigate climate change

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## **ABSTRACT**

Human motivation is a complex and multi-faceted aspect of individual behaviour. In the context of climate change, people can be motivated to change their lifestyles markedly to protect the planet and its resources, or seem not to care, or worry, how they impact on the planet; the reasons behind this difference are poorly understood.

This study explores the internalised motivation to mitigate climate change, based on a sample of adults who perceive that they are highly motivated to reduce carbon dioxide emissions. An internal nature to a motivation produces long-term behavioural change that is not reliant on external incentives, and provides a greater satisfaction for an individual. The external rewards for taking action in the climate context are slow coming and intangible so the internal nature, backed by external coercion, is critical in responding to climate change. The three key aims of the research are to identify the common characteristics of individuals with an internalised motivation, the defining characteristics that predispose individuals to have a substantial internal nature and the contributors to the development of internalised motivation. The research is based on grounded theory, with the direction for each stage evolving from the results of the preceding stage. A complementary combination of exploratory and non-exploratory approaches and quantitative and qualitative analytical techniques is used.

The research draws on previous work on models of motivation, notably from the fields of sociology and psychology. The findings confirm the validity of aspects of these models, although the particular characteristics of the climate issue do result in a shift of emphasis. It is found that there are five defining characteristics of individuals

who have internalised motivation. These defining characteristics are three ethics, a sense of value, a sense of responsibility, a sense of belonging, and two capacities, an ability to make connections and an ability to self-reflect on behaviour. A sense of value, especially self-value, is the underlying contributor of internalised motivation and the other four defining characteristics are driven primarily by a feeling of competence, a strong family background, knowledge regarding the climate issue and setting local and tangible goals to improve behaviour, respectively. The ability to connect with nature in a sensual manner when visiting particular places in the natural environment is unique to individuals who have internalised motivation. The return, which is invariably the drive for human motivation, is not found to be fundamental in this climate context. It is based on achieving short-term and local changes, and lessens in importance once internalisation starts to take place.

From a policy viewpoint, developing a high level of motivation to reduce emissions in a broader range of individuals requires encouraging, regular and sensual contact with nature, nurturing the belief that individuals make a difference and, last but not least, reasserting a values stance in society.

I dedicate this thesis to my three children, Pippa, Chris and Danny, who are part of the future generations that will have to live with the impacts of the actions, and inactions, of people today.

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# CHAPTER ONE

## INTRODUCTION

### 1.1 Introduction

Climates have changed for centuries as a natural part of the evolution of Planet Earth, yet there is increasing scientific evidence and certainty that anthropogenic activities are responsible for the current warming of the Earth's atmosphere. The 2007 International Panel on Climate Change Working Group I report stated that it is 90-99% likely that most of the 0.5°C increase in global temperature over the past 50 years is due to man-made emissions of greenhouse gases (Solomon *et al.*, 2007). This warming is predicted to have adverse effects on the majority of species on the planet and lead to more severe weather patterns and events.

There is an inconsistent response by society in taking action to address the climate issue, and a difficulty in engaging individuals to change behaviours that exacerbate the situation; not least as the issue is seen as a distant and unrelated threat to many of them personally (Lorenzoni *et al.*, 2006). The variable response on the part of individuals may be compounded by the top-down approach commonly employed by policy makers. This is because it removes the apparent need for autonomous behaviour, or a sense of responsibility, to act by individuals. Environmental action is more likely to occur when the cause of a problem is clear and individuals have the power to achieve the solution (Blake, 2001). A crucial part of encouraging more active involvement, at the level of the individual, is an appreciation of the contextual factors that trigger, increase and maintain the motivation to take action. The aim of this thesis is to improve the understanding of why individuals acquire the motivation to act to mitigate climate change.

This chapter is divided into three sections, following the Introduction. The challenge, science and characteristics of climate change are discussed in the next section, and the responsibility that both society and individuals have to respond to the climate issue is discussed in the third section, along with the ability to recognise the need to respond. The thesis is summarised in the final section, where its purpose, key research questions and definitions of key terms in relation to climate change and human motivation are given and the remaining nine chapters of the thesis are outlined.

## **1.2 The challenge of climate change**

Responding to climate change is one of the biggest challenges facing humanity today. This is because climate change is unprecedented in so many respects. There is now strong agreement internationally that the average global atmospheric temperature is increasing at a rate not previously recorded, and will continue at an average of 0.1°C per decade even if atmospheric gaseous concentrations are held constant at year 2000 levels (Solomon *et al.*, 2007).

The scientific evidence regarding the threat posed by climate change is robust enough to warrant international action, according to the International Panel on Climate Change (henceforward referred to as IPCC). “Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level” and “Eleven of the last twelve years (1995–2006) rank among the 12 warmest years in the instrumental record of global surface temperature (since 1850)” (Solomon *et al.*, 2007, p 5).

The 2007 IPCC Assessment concludes that there is at least a 90% chance that the global average overall effect of human activities since 1750 has been one of warming. The main source of the increased atmospheric concentration over that period of carbon dioxide, one of the greenhouse gases held responsible, is from fossil fuel use (Solomon *et al.*, 2007). Water vapour, carbon dioxide, nitrous oxide, methane and ozone are the primary greenhouse gases in the Earth's atmosphere; the Kyoto Protocol also deals with the greenhouse gases sulphur hexafluoride, hydrofluorocarbons and perfluorocarbons.<sup>1</sup> “Both past and future anthropogenic carbon dioxide emissions will continue to contribute to warming and sea level rise for more than a millennium, due to the timescales required for removal of this gas from the atmosphere” (Solomon *et al.*, 2007, p 11).

The magnitude of the climate change challenge is unprecedented as it has the potential to affect all of humanity and all other living species. The 2007 IPCC Assessment concludes that the impacts of the changes to the global climate will adversely affect many of the planet's interrelated systems (Parry *et al.*, 2007). For example, the changes will impact on forest systems (e.g. products), agriculture (e.g. growing seasons), biodiversity (up to 30% loss once a 2.5°C increase is reached), food and fresh water resources and human health (e.g. malnutrition, heat-related and diseases). These impacts will result in human disasters affecting millions of people due to the increased extreme weather events, such as flooding, droughts and hurricanes. The 2007 IPCC Assessment proposes that a four pronged approach of technological advancement, scientific research, adaptation and mitigation is needed to address the climatic changes worldwide (Parry *et al.*, 2007). Ultimately, the type and the extent of

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1. [www.ipcc.ch/pdf/glossary/ar4-wg1.pdf](http://www.ipcc.ch/pdf/glossary/ar4-wg1.pdf) 02/07/08



the response that humanity makes will dictate how climate change manifests throughout this century and further into the future.

### **1.2.1 The dimensions of climate change**

Three specific dimensions of the climate problem render an effective response problematic for the global population, at all levels of society. First, climate change is far reaching in spatial terms, both geographically and socially. Its impacts range from the global level involving, for example, the weather systems that affect the whole planet (Houghton *et al.*, 2001), to the local level, such as a reduction in sediment supply to a specific beach (van der Weide *et al.*, 2001). The impacts of climate change also affect all levels of society (Jepma and Munasinghe, 1998) from an individual person to whole populations and international communities. The extent to which people experience the impacts varies. For example, people in low-lying islands and atolls live with the threat of rising sea levels affecting their livelihoods on an almost daily basis (Overton and Schveyens, 1999; Wong, 2003), whilst people living in major urban areas perceive such a threat as distant and non-personal (Lorenzoni *et al.*, 2006).

The spatial vastness of climate change makes responding to the issue less tangible and manageable for many people. There can be a geographic mismatch between the cause and effect of changes to the climate (Parks and Roberts, 2006; Aldy, 2006) for example, the carbon emissions from vehicles in industrialised countries contribute to the rate at which glaciers in the Arctic are melting. The spatial mismatch can result in people feeling indifferent, or a sense of irrelevance, regarding the need to respond.

The climate issue can also be perceived as too big to deal with, so that whatever

efforts are made will have little, or no, difference to the long term impacts. This perception can result in a sense of global helplessness (Pelletier *et al.*, 1999).

Bringing the global issue to the local level may be of value in engaging people to take mitigative action, yet the link between local natural environments and, for example, carbon emissions reduction is not necessarily well-established in people's minds.

Since the Industrial Revolution and widespread urbanisation, many Western cultures have undermined the connection with nature as part of the gradual moving away from contact with the natural environment (Mayer and Frantz 2004). In the United Kingdom, for example, over 80% of the population live in urban areas (Royal Commission report 2007<sup>2</sup>). Evans and McCoy (1998) estimated that people spend at least 90% of their time within buildings, with little understanding of the impact of the built environment. There is, however, an increasing awareness of the value of having green spaces within urban settings (Kaplan, 1993; Chiesura, 2004). Studies, such as by Jim and Chen (2003) in Guangzhou city and Ryan (2005) in Chicago, provide evidence of the value of green spaces for people to regain their sense of well-being. There is also evidence of the value of green spaces in suburban areas. For example, Kearney (2006) found that having opportunities to visit nearby green outdoor spaces has positive effects on the amount of social contact in residential areas and Sullivan *et al.* (2004) found that the presence of trees and grass is positively related to the use of outdoor spaces. Local green spaces have the potential to link the issue of carbon emissions and the natural environment because they create opportunities for mitigative action, such as planting trees and so reiterate the local nature of action to address a global issue. It is possible that the separation from nature or the limited

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2. [www.rcep.org.uk/urban/report/urban-environment.pdf](http://www.rcep.org.uk/urban/report/urban-environment.pdf)

awareness of the association between the natural environment and carbon emissions partly explains the slowness in response to take mitigative action, although the nature of these relationships is not well understood.

The second dimension, temporal, is intrinsic to climate; most notably the insidious onset and progressive nature of this particular global issue (Moser and Dilling, 2004). The relativity of life events (Lusanna and Pauri, 2006) can mean that, for example, the short term changes go unnoticed and are not fully appreciated as the day-to-day living conditions and experiences, especially in industrialised countries, change very little. There is also limited understanding of how the time lag and feedback mechanisms inherent in the global climate system will be affected by the changes in atmospheric gaseous concentrations. Exactly how climate change will manifest in the future, and what the implications of action, or inaction, by humans in this early part of the twenty-first century, are uncertain.

It may be difficult for individuals to be motivated to take action and address an issue that may not have benefits until much later, as people generally want immediate and guaranteed returns for their efforts. For example, Idson and Higgins (2000) found that their sample of university students regarded gaining a return as the primary aim of taking actions irrespective of whether or not the return was positive. In instances such as a financial reward for the completion of a particular task, the return is straightforward. For an individual motivated to mitigate climate change, however, there is no guarantee that there will be a return. If there is a return, it is unclear what it will be, where it will occur or when.

The third dimension, the uncertainty regarding the climate science, provides an opportunity for people to 'wait and see' rather than taking action. Science, by its very nature, is precise and based on accuracy, validity and reliability (Greenfield, 1996); yet there are limited historical records on which to base the science of climate change. With regard to modelling efforts, the 2007 IPCC Assessment highlights uncertainties in local forcings and cloud feedbacks, which create difficulties in producing reliable climate predictions (Solomon *et al.*, 2007). Uncertainty can give rise to innovation, creative solutions and be a trigger for change, yet it can lead to a sense of insecurity concerning the future and an increased desire to focus on the present (Laming, 2004). Uncertainty can also generate a sense of fear, anxiety and an inability to know how to act (Lowe *et al.*, 2006), resulting in the loss of motivation by individuals to manage their own behaviour (Bauman, 2001).

### **1.3 Responding to climate change**

All of humanity has a responsibility to take action against climate change. There are two aspects to this responsibility. The human species makes decisions regarding the allocation and utilisation of the Earth's resources and sustainable use necessitates reaction to the climate threat, and humanity has an ethical responsibility, or obligation, to care for and protect the natural environment. When individuals feel a sense of being at one with nature, a stewardship role is instilled (Rogers, 2000) whereby humans feel a responsibility to uphold a sense of value towards resource and species sustainability and to act accordingly. Hence, it is the responsibility of the global community to take action to address climate change based on current technological and scientific understanding of the climate issue (Des Jardins, 1997; Pojman, 2001).

Industrialised countries need to take the lead in action against climate change, because they have been the major contributors to the present problem. The majority of greenhouse gases emissions come from industrialised countries (Depledge and Lamb, 2005) following the change in the utilisation of technology and land resources as a result of the Industrial Revolution. The increased emissions are due to the importance placed on production, consumption, wealth and status in these countries, and the lack of regard for limited resources, such as forestry, and for the amount of waste that is generated from the lifestyles of their populations (Galbraith, 1958; Hudson, 2005).

In the United Kingdom, the need to take action at a national level is recognised (Hulme and Turnpenny, 2004). The government has taken a leading role in mitigating climate change by pledging to meet the collective European Union carbon reduction target of 12.5% and by introducing the 2008 Climate Change Act, which stipulates reductions of at least 34% by 2020 and 80% by 2050.<sup>3</sup> The public and private sectors of industry must change their practices as they are one of the major greenhouse gas emitters in the United Kingdom (Begg *et al.*, 2005), accounting for 77% of the total carbon dioxide emissions in the United Kingdom in 2005.<sup>4</sup> Although the government emphasises the need for action at the individual level, it has not acted consistently to promote it, rather focusing on international cooperation and business buy-in.<sup>5</sup>

In the United Kingdom, as elsewhere, there is tremendous scope for developing action on the part of the individual, yet some believe that the government has created a nanny state with its top-down approach and mitigation strategies having a detrimental effect on the rate of individual response. For example, Sawyer (1996), Padfield (2004)

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3. [www.decc.gov.uk/en/content/cms/legislation/cc\\_act08/cc\\_act\\_08.aspx](http://www.decc.gov.uk/en/content/cms/legislation/cc_act08/cc_act_08.aspx) 04/05/10

4. [www.defra.gov.uk/environment/statistics/globalatmos/gagccukem.htm](http://www.defra.gov.uk/environment/statistics/globalatmos/gagccukem.htm) 12/02/07

5. [www.defra.gov.uk/environment/climatechange/uk/progress/index.htm](http://www.defra.gov.uk/environment/climatechange/uk/progress/index.htm) 27/06/07

and Jochelson (2006) consider that legislation intrudes on people's freedom of choice and Walker *et al.* (2007) found that government initiatives continue to offer limited opportunity for local participation and empowerment. The top-down approach is compounded by the focus on mitigation policies. Mitigation policies can only have a long-term effect on atmospheric temperatures (Jepma and Munasinghe, 1998) and people prefer short-term gains, even at the expense of long-term benefits (Bauman, 2001). The danger is that individuals feel disengaged from responding to climate change whilst they wait passively for direction from the government.

It is evident that there is a high level of awareness and concern amongst individuals regarding the issue of climate change (see Table 1.1); yet a gap exists between the concern and taking action to address the situation (Elliott *et al.*, 1993, 1999; Bord *et al.*, 2000; Barr, 2004). For example, the percentage of people recycling household waste in the United Kingdom over the 2005/6 period was only just over 20 per cent.<sup>6</sup> Hence, Blake's (2001) view that "...the level of environmental concern itself stimulates people to act" (p 174) is not substantiated when people in the United Kingdom are considered. Taking mitigative action to address climate change is still a low priority behind more immediate social and personal issues, such as health, family and security (Poortinga and Pidgeon, 2003; Norton and Leaman, 2004). Jensen (2004) sums the situation up as follows, "Concern about environmental problems has never been greater; but, at the same time, there is an increasing action-paralysis...that manifests itself in introverted, narcissistic activities" (p 405). An example of this behaviour is disposing items in landfills rather than recycling them.

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6. [www.defra.gov.uk/environment/statistics/waste/kf/wrkf16.htm](http://www.defra.gov.uk/environment/statistics/waste/kf/wrkf16.htm) 28/08/07

Table 1.1: Public survey results for the United Kingdom, 2001 and 2006<sup>7</sup>, as a percentage of totals.

	<b>United Kingdom (2001)</b>	<b>United Kingdom (2006)</b>
Concern regarding climate change	80%	83%
Believe climate change is happening	85%	81%

The individual is a fundamental part of society and has a major role to play in mitigating climate change. All societies are made up of individuals, who are integral to them rather than being separate from them (Elias, 1991). People, on an individual level, choose how they behave, the type of lifestyle they follow and, if they are in positions of authority, are able to influence the behaviour of others. Collectively, individuals influence public policies (Moser, 2006) and choose whether or not to service companies and products linked with sustainable practices (Gilg and Barr, 2006; Harrison, 2006). The activities and decisions of individuals at all levels affect the overall output of greenhouse gas emissions (Bulkeley and Kern, 2006) and, hence, the rate of atmospheric temperature increases. Thus, climate change requires societal engagement at the individual level, where people can take self-initiated action and can influence mitigative policies, strategies and action being taken at all levels of society.

### **1.3.1 Taking action**

Research has generally failed to tackle what determines environmental action at an individual level (Greenberg and Schneider, 1997). For example, Moser and Dilling

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7. [www.defra.gov.uk/environment/statistics/pubatt/index.htm](http://www.defra.gov.uk/environment/statistics/pubatt/index.htm) 28/08/07

(2004) found that engaging people in mitigating climate change presented barriers due to the complexity and uncertainty of the issue, the delayed effects of the change and the difficulties in communicating the science. Understanding the determinants of action at an individual level has the potential to facilitate the development of policies and strategies to address environmental issues, such as climate change.

More specifically, there is a gap in the understanding of why individuals acquire the motivation to mitigate climate change. There are a multitude of factors and trade offs that influence how, and why, an individual is motivated to act in a particular way.

Each person makes compromises in their behaviour regularly. This is due to an activity, or issue, having a higher priority at a particular time in their life than another (Klinger, 1975). This compromise impacts on their ability to behave in the way they want to. It is unclear, in the context of mitigating climate change, whether or not the influences behind why individuals are motivated to take action do follow a discernible pattern. This lack of understanding is addressed in the first part of this study.

Choosing to take action without external incentives or coercion requires an inherent, internal nature to a motivation, and gives a sense of self-determination regarding the actions being taken. In the climate context, there is tremendous value in the internal nature of the motivation to act, because the returns are slow coming and intangible, such as a reduction in atmospheric concentrations of greenhouse gases or the rate of average global temperature increase. An internal nature produces long-term behavioural change that is not reliant on external incentives and provides a greater satisfaction for an individual. There is limited understanding of the internal nature and



self-determination of motivation to mitigate climate change; this aspect is central to the thesis and is primarily addressed in the second part of this study.

It is axiomatic that a high level of motivation results in a person taking more action than a low level, or lack, of motivation. The dynamic quality of human motivation suggests that changes to a person's motivational level are likely and will involve a number of influencing components. It is possible to measure motivation level, either in subjective terms by an individual stating how motivated he or she is to undertake a particular activity or in a more objective manner, by monitoring the amount of activities that a person undertakes via or direct observation or third party reporting. There is a lack of understanding concerning the mechanisms that result in an increase in motivation to a high level, in the context of climate change mitigation, and this is addressed in the third, and last, part of this study.

#### **1.4 Goal of the research, key definitions and structure of the thesis**

The purpose of this thesis is to gain an understanding into why individuals acquire the motivation to mitigate climate change by exploring the characteristics of internalised motivation and the mechanisms that develop that motivation.

Global climate change is an example of horizon science whereby a problem is conceptualised at an entirely new, and much larger, level of abstraction beyond core knowledge and the limits of understanding (Rosa and Dietz, 1998). The research is underpinned by a weak social constructionist view that humans exist in socially constructed worlds, contented in the belief that they can claim to have knowledge and understanding in everyday contexts as well as regarding science and technology

(Irwin, 1997). Hence, the research is, in part, reproduced via analysis using existing understanding (Denzin and Lincoln, 2003) and, in part, produced in an evolving manner via interview (Gadamer, 1975). The perceptions and prejudices of research participants cannot be isolated as they are integral to their being, thinking and understanding, and shape their actions or inactions (Gallagher, 1992); it is only via dialogue about what is not understood that people can test their perceptions and prejudices (Bernstein, 1983). From an ontological viewpoint, the research is based in relativism, whereby realities are local and specifically constructed rather than based on more global representations (Denzin and Lincoln, 2003). Hence, the meaning evolves via seeking and accepting the views of the sample of motivated individuals, allowing them to define the research agenda via grounded theory and accepting that the interpretation is not independent of the researcher and that the conclusions are not predetermined.

There are three key questions that this research addresses, as follows:

- 1) Are there common characteristics of individuals who are motivated to mitigate climate change?
- 2) Can the defining characteristics of the internal nature, the self-determination, underpinning the motivation of individuals to mitigate climate change be identified?
- 3) How does motivation to take mitigative action develop?

Two commonly used definitions for the term climate change are used in this study. In the general discussions, the term refers to the International Panel on Climate Change definition, which states climate change as "...any change in climate over time,

whether due to natural variability or as a result of human activity” (Solomon *et al.*, 2007, p 2). The specific references to individual motivation to take action on climate change imply the definition used by the United Nations Framework Convention on Climate Change, “a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere, and that is in addition to natural climate variability over comparable time periods” (Blobel and Meyer-Ohlendorf, 2006, p 16).

From Chapter Two, motivation to mitigate climate change is generally referred to in the specific context of undertaking activities to reduce carbon dioxide emissions (henceforward referred to as carbon emissions). This explicit context was chosen because, as stated in the 2007 IPCC Assessment, “carbon dioxide is the most important anthropogenic greenhouse gas...” and “the global atmospheric concentration of carbon dioxide has increased from a pre-industrial value of about 280 ppm to 379 ppm<sup>3</sup> in 2005. The atmospheric concentration of carbon dioxide in 2005 exceeds by far the natural range over the last 650,000 years (180 to 300 ppm) as determined from ice cores.” (Solomon *et al.*, 2007, p 2). The main sources of carbon dioxide since pre-industrial period are fossil fuel use and land use changes, both of which are prevalent in supporting industrialised lifestyles (Clark and York, 2005). To date the mitigative initiatives introduced by the governments of the United Kingdom and of other industrialised countries have focused on carbon emissions specifically. The broader context of climate change mitigation is reintroduced in the final chapter.

Table 1.2 summarises the terms used in this study that are related to human motivation, and provides a brief definition of each.

Table 1.2: Definitions of motivational terms used in the study (adapted from Kirkpatrick, 1983).

<b>Term</b>	<b>Definition</b>
Motivation	The power, force or incentive that initiates action
Characteristic	A feature, quality or nature
Defining characteristic	An essential predisposing characteristic
Trigger	Anything that starts a train of actions
Driver	Something that drives, or steers, a process
Facilitator	Makes easy or easier
Product	A result
Ethic	A principle that governs moral conduct
Capacity	Character in which one does something

Following this introduction, Chapter Two contains a discussion of the relevant themes regarding the first two research questions. Concern over climate change, a relatively new issue, should be seen in the context of more general attitudes and behaviour towards the environment, where there is a considerable body of literature. The discussions cover the broad topics of perceptions of nature and society, environmental concern and behaviour, the impact of contact with nature, the gap that exists between how people intend to behave and how they actually do behave and factors that influence that gap, such as the perception of risk, trust, responsibility, altruism, control and habitual behaviour. The second half of the chapter details the theoretical understanding of the concept of human motivation in general terms and then applied to the climate context, including the importance of research at an individual level, the differences between sociological and psychological based research and the need for an

in-depth explorative approach in this context rather than the application of existing models.

In Chapter Three, an overview of the theoretical and methodological approaches and design of the research is described whereby the conceptualisation from the discussions in Chapters One and Two is operationalised. The methods for the three research phases, consisting of seven stages that address the three research questions, are presented in detail and summarised in a table. The first three stages include the selection process for the initial sample of individuals, an email survey to identify individuals with an internal nature to their motivation based on an existing motivational model by Deci and Ryan (1985) and in-depth interviews that explore whether or not specific dimensions of climate change, and/or societal responses to the climate issue, impact on the motivation to take mitigative action. The methods for stages four, five, six and seven are based around three surveys, which were used to determine whether or not there are other defining characteristics of individuals who have internalised motivation, the significance of the defining characteristics that are proposed and the clarification of other contributors to the development of internalised and habitual motivation.

The analysis and discussion of the results of the first three stages are presented in Chapters Four and Five. In Chapter Four, the findings that relate to the three climate change dimensions discussed earlier in this chapter are detailed, along with the important conclusions from the email survey and the characteristics that are common to individuals who have a substantial internal nature to their motivation. Chapter Five extends the understanding of these characteristics by discussing the literature related

to them in the context of climate change mitigation. This discussion serves to address the second research question, to propose a number of defining characteristics of individuals who have internalised motivation to reduce carbon emissions, to discuss the relationship between the previously identified common characteristics and these defining characteristics, and to identify which aspects of the common characteristics need pursuing in the subsequent stages. A comparison between the findings of the study so far and the motivational model by Deci and Ryan (1985) is also presented.

The analysis and discussion of the results of stages four, five and six are presented in Chapters Six and Seven. The defining characteristics of individuals who have internalised motivation are confirmed, examined critically and their significance in motivation is established in Chapter Six, as well as an in-depth analysis of the fifth defining characteristic which is central to the actual and intended behaviour of individuals. One particular aspect of internalised motivation, contact with the natural environment, is discussed in Chapter Seven.

In Chapter Eight, the results of the final stage of the research are presented. A detailed discussion regarding the contributors to the development of internalised and habitual motivation is also presented, by bringing together the findings from Chapters Four, Five, Six, Seven and Eight. A final comparison between the research findings and the motivational model by Deci and Ryan (1985) is also presented.

The final chapter, Chapter Nine, draws the study to its logical conclusion by presenting a summary of the research design, the major findings, limitations of the research and further research needs.

## **CHAPTER TWO**

### **RESEARCH THEMES**

#### **2.1 Introduction**

Concern over climate change, a relatively new issue, should be seen in the context of more general attitudes and behaviour towards the environment, where there is a considerable body of literature spanning the disciplines of economics, politics, sociology and psychology. There are, however, particular dimensions of the climate issue, as discussed in Chapter One, that might distinguish motivation to act to reduce carbon emissions; namely, spatiality, temporality and uncertainty. Although public concern regarding the environment has been consistent since the 1970s, a substantial gap remains between the intentions that people have to change the way that they behave and the actions they actually take. The key concerns of this research are to draw out the reasons why some people are more motivated to take action than others and to identify the factors that lead to the development of such motivation. The more prominent theories, models and current understandings that are relevant to environmental motivation within various disciplines, notably sociology and psychology, are discussed in this chapter; economic and political research tends to focus on decision-making rather than motivation *per se* and is not reviewed in depth. The aim of the discussion is to define the conceptual framework that provides the basis for the research.

This chapter consists of four sections, following this Introduction. Initially, the evolving relationship between people and the natural environment is considered, covering the emergence of sustainable development as an issue, feelings towards green spaces and, finally, the relationship between environmental concern and

behaviour. This discussion is followed by an examination of factors that influence the actual-intention gap, the gap between how a person intends to act towards the environment and their actual behaviour. The factors that are considered include risk perception, trust, responsibility, altruism, control and habitual behaviour. The fourth section details the theoretical understanding of the concept of human motivation in general terms and then applied to the climate context and the chapter ends with concluding remarks.

## **2.2. Perceptions of nature and society**

The concept of sustainable development, feelings that people have towards green spaces and the relationship between environmental concern and behaviour are discussed in this section. The term environmental concern is generally used throughout the study rather than the broader topic of environmental attitude, on the basis that people who have concern (as opposed to people who do not, or who have another, less committed attitude) are the primary interest of the research.

### **2.2.1 Sustainable development and environmental concern**

The role that nature plays in development issues started to be acknowledged in the early 1970s, based on the concept of limits to growth and the fact that physical environments can influence, and be influenced by, human societies and behaviour (Buttel, 1997). Traditional sociologists, such as Marx and Durkheim, had tended not to recognise the importance of environmental problems and ecological constraints, believing, instead, that social facts can be explained only by other social facts (Buttel, 1987; Lidskog, 2001). An approach acknowledging environmental issues was needed to bridge the gap between society and nature, to play a pivotal role in debates over the



environment and to inform policy with more scientific interdisciplinary dialogue and expertise from outside academia (Carolan, 2006). Two schools of thought emerged, with the underlying difference being in the extent to which modern, capitalist society is influential (Lever-Tracy, 2008). The ecological modernization school was founded on the belief that productivity is increasingly based on ecological criteria (Mol and Sonnenfeld, 2000), with capitalism perceived as neither essential to the process nor acting as a core limiting factor (Mol and Spaargaren, 2000; see also Huber, 1985). The second school of thought, eco-Marxism, was based on the view that the ever increasing forces of capitalist based productivity tend to destroy the natural and finite conditions of production (Buttel *et al.*, 2002). It was, thus, recognised that biophysical as well as purely social variables affect social structure and social change and a desire to study the relationship between humans and their surrounding environments became established (Proshansky *et al.*, 1976; Stokols and Altman, 1987; Gifford, 2007), although the precise role and definition of the new direction was not clear (Bonnes and Secchiaroli, 1995).

The approach to environmental problems continued to change with the development of the concept of sustainability, first introduced during the United Nations Stockholm conference on environment in 1972 (Redclift, 1987). The concept gained prominence in the World Conservation Strategy of 1980 and became the organising principle of modern environmentalism via the so-called Brundtland Report of 1987, which gave prominence to the notion of sustainable development (Sachs, 1997). The establishment of the IPCC in 1988 served to redefine related issues, for example, shifting the focus of the Brundtland Commission statement that industrialised countries halve energy consumption over the next 40 or 50 years to one of a need to

halve carbon emissions world-wide (see Hinchliffe, 1996; Hulme, 2009). During the 1992 Rio Summit, the term sustainable development was commonly used regarding the need to consider constraints on development and a shift in relations between society and the environment (WCED, 1987; UNCED, 1992). The environment started to be perceived not as a commons, but as a global resource that must be sustained and that had an economic value.

Two factors facilitated the change in economic and political opinion within the industrialised world regarding environmental problems and sustainable development; namely, the economic boom of the 1980s (Bodansky, 1996) and the extensive media coverage of environmental disasters such as oil spills, nuclear plant accidents and the excessively warm northern hemisphere summer of 1988 (Worchester, 1997). During the 1980s, concern regarding environmental quality was generally perceived as occurring only when more basic needs had been satisfied and people did not have to choose between their own survival and that of nature (Macnaghten and Urry, 1998; Huber, 2001). Such a perception is consistent with Inglehart's (1977) post-materialist theory, whereby people achieve happiness via personal growth and healthy natural surroundings rather than via materialism and consumption. Environmental concern can also be considered as a core value within societies in general and not limited only to affluent industrialised nations (Kempton et al., 1995). Brechin and Kempton (1994) argued that environmental concern is a complicated phenomenon emerging from multiple sources in rich and poor nations alike, such as the incorporation of environmental concern within institutional processes integral to human progress and development and the diffusion of environmental values via the dissemination of scientific findings and media coverage of environmental problems. Ungar (1992) and

Mazur and Lee (1993) argued that environmental claims are most likely to be honoured - and accelerate demands in the political arena - when they piggyback on actual world events, as such social scares hold potential importance for solving prospective social problems that revolve around new technologies. Understanding whether or not relative affluence, a perception of having basic needs met and/or media coverage of environmental events influence mitigative action in the climate context is important, particularly in an industrialised country such as the UK where material status and being informed are core constructs.

There was also a proliferation of research and theories regarding how and why contemporary economic growth could be environmentally friendly and environmental regulation can be growth friendly. Work by Dunlap, Catton and Schnaiberg, for example, demonstrated how environmental degradation and destruction in modern industrial capitalist societies are anchored in a conception of the materialism of industrialised society (for example, Catton and Dunlap, 1978; Schnaiberg, 1994). The new environmental paradigm scale developed by Dunlap and van Liere (1978, 1984) endorsed an environmental worldview by arguing against the anti-environmental thrust of the dominant social paradigm, which focuses on growth, prosperity and abundance at the cost of protection and quality of the environment (Pirages and Ehrlich, 1974) and recognising the limits of the human exemptionalism paradigm, which claims that humans are such a uniquely superior species that they are exempt from environmental forces (Catton and Dunlap, 1978). The new environmental (subsequently renamed ecological) paradigm scale measures environmental beliefs and the degree to which people adhere to the dominant social paradigm or the new ecological paradigm and became established as a measure of an ecological worldview

(Dunlap *et al.*, 2000), alongside other worldviews, such as risk perception (Douglas and Wildavsky, 1982; Thompson *et al.*, 1990), the public perception regarding the characteristics and severity of a risk. The new ecological paradigm model defines attitudes towards the environment, but does not address in depth the motivation for environmental action at an individual level, which is the main focus of this study.

One of the main methods used to motivate and engage people in resolving environmental problems is the transfer of information, primarily via the media, based on the assumption that public apathy can be overcome with dissemination of the right message (see, for example, DoE, 1994). Research by Burgess (1990), Wilson (1992) and Macnaghten and Urry (1998) indicates that the media has become an integral part of the cultural process via which the environment is understood, and environmental non-governmental organisations, such as Greenpeace, have become skilled at using the media to pass on their messages (see also Smith, 2005; Carvalho and Burgess, 2005). In the 1990s, there was still a belief that by simply improving communications to people regarding information on climate change, individuals will change their behaviour and engage willingly (Burgess *et al.*, 1998), concurring the earlier research by Nevitte and Kanji (1995, 1997) whereby people who have a greater understanding and knowledge regarding an environmental issue are more likely to act (all things being equal).

There is little indication, however, that knowledge leads directly to environmental behaviour. Engaging people via knowledge transfer is fundamentally dependent on how individuals understand the information provided and interpret the relevant issues; see, for example, Eden *et al.* (2008). Irwin and Wynne (1996) and Sturgis and Allum

(2004) argued that basing information transfer on a model of sound scientific understanding is inadequate, by demonstrating that interpretations of science by the public are affected by contextual factors, such as societal values and personal experience (see also Habermas, 1984, 1987; Lidskog, 1996; Eden, 2006; Moser, 2006; Patt, 2007). The conventional approaches of science, such as the deficit model, whereby science is perceived to be superior to the thinking of lay people so excluding the public from participating in scientific debates (Wynne, 1991; Gross, 1994; Eden, 1998), are not adequate to address the uncertainties and complexities inherent in environmental changes (Funtowicz and Ravetz, 1993). Yet, as Eden (1996) points out, there is no straightforward solution to the acceptance of lay interpretations, local knowledges and other non-scientific contributions within academic and policy debates.

Addressing the issue of motivation, empirical evidence shows that the environment is conceptualised differently by different people; dependent on who is being asked and what the respondent is trying to achieve (Harrison *et al.*, 1987; Burgess *et al.*, 1988; Mohai and Bryant, 1992; Burningham and O'Brien, 1994; Macnaghten, 1995; see also Saunders (1988) for similar findings in health promotion). Burningham and O'Brien (1994), for example, describe an area of woodland that is part of a development proposal as being attractive and worth preserving by objectors of the proposal and as overgrown and neglected by the developers. They argue that, in different contexts, different dimensions are prioritised and valued in different ways. Individuals are likely to be most concerned with the environment that is local and directly affecting their everyday lives and leisure activities (Poortinga and Pidgeon, 2003; Macnaghten, 2003; see also Moser and Dilling, 2004). The frameworks for

understanding global environmental concepts, such as the notion of protecting natural resources worldwide, must be localised in the specific contexts of action in which the goals, values and motives occur, such as recycling at home (Overton and Scheyvens, 1999). Hence, it is important that research is undertaken as part of a valuation process constituted within individual perceptions and local social contexts.

The importance of localisation also arises in the difficulty that people experience in linking their actions in everyday life to the seemingly global and long-term issue of climate change. For example, Hawthorne and Alabaster (1999) concluded that people do not perceive climate change as a threat because they do not understand the consequences of their actions, Lorenzoni *et al.* (2006) found that climate change is perceived as a distant and unrelated threat and Whitmarsh (2008) describes the intangibility and low relevance of the climate issue as a risk to people (see also Bord *et al.*, 1998; DEFRA, 2002; Norton and Leaman, 2004). Macnaghten (2003) suggests that institutions must nurture the concern that people have towards themselves, their families and local communities, via their personal everyday experiences, activities and interest in the environment, as a way of connecting to global environmental issues. It is important, in the context of this study and for policy development, to understand whether or not having the ability to link local actions and their impacts on the global climate issue is influential in motivation to take mitigative action.

### **2.2.2 Feelings for green spaces**

Having examined the development of environmental concern, one must also consider the way in which people feel towards green spaces and the influence that contact with the natural environment has on developing that concern. Previous research has found

that natural environments are a crucial part of people's lives. It is believed that people throughout history have enjoyed being in such environments (Knopf, 1987; Frumkin, 2001; Kyle *et al.*, 2004), even though there is little empirical evidence from before the 1960s regarding such perceptions (Kaplan *et al.*, 1998). Substantial research in the past 40 years has shown that people enjoy being in natural environments, and often have an inherent need for contact with such places (Wilson, 1984) and identify them as among their favourite places (Korpela, 1992). Contact, as much as on a daily basis, leads to an appreciation and value of the richness and diversity within the natural environment and, in the opinion of Pyle (2003), to an inherent concern and need to conserve. A wide variety of literature shows that direct and positive contact with nature is beneficial to physical, cognitive and emotional well-being (Kellert and Wilson, 1994).

Having contact with nature during childhood positively influences environmental attitudes and behaviour. For example, Ewert *et al.* (2005) concluded that spending time in the outdoors as children has a huge influence on adult attitudes, and cited studies by Tanner (1980), Peterson and Hungerford (1981), van Liere and Noe (1981), Palmer (1993), Bixler (1997), Corcoran (1999), Sward (1999), and Bixler *et al.* (2002), who all conclude that having direct outdoor experiences in childhood, either alone or shared with family and/or friends, is the most influential factor in developing positive environmental attitudes. Chawla (1999) found that childhood experiences were cited as the foundation of positive relationships with natural environments; although later factors, such as work opportunities, were also found to be influential. Other studies indicate that childhood outdoor experiences can be associated with attachments to natural areas in adulthood (Harrison *et al.*, 1987), an intrinsic

appreciation of such places (Kong *et al.*, 1999) and a sense of emotional affinity with nature (Kals *et al.*, 1999). Understanding the impact that childhood contact with nature has on mitigative climate-related attitudes and behaviour as an adult is important in the development of nature-based education programmes for children.

When people have positive encounters with nature, they can gain a sense of well-being by either experiencing a sense of peace and tranquillity or by alleviating negative thoughts and feelings (Korpela, 1989, 1992; Renema *et al.*, 1999). Two models were developed to explain the beneficial impacts. Kaplan and Kaplan (1989) and Kaplan (1995) developed the attention restorative theory, which is based on lessening the feelings of fatigue and apathy and restoring the capacity to concentrate and be attentive; Ulrich (1983) and Ulrich *et al.* (1991) developed a second model, the stress reduction framework, whereby feeling stressed threatens the well-being of an individual and visiting nature reduces the stress. Studies undertaken more recently concur with these two models; for example, Rappe *et al.* (2006), O'Brien (2006) and Curtis *et al.* (2007) found that one of the fundamental benefits of visiting places that offer peacefulness and quiet is to recover from mental tiredness and stresses and regain a sense of well-being. Such research has policy implications for Western societies that are founded on materialism and consumption, as people often only associate their sense of well-being with the need to have more material goods (Maitney, 2002).

There is evidence that people gain a sense of well-being by becoming attached to a specific place in the natural environment; achieving a sense of well-being in this manner promotes the desire for a person to protect that place in environmental terms



(Hartig *et al.*, 2001). Kals *et al.* (1999) concluded that having such an emotional attachment also promotes a desire to protect the natural environment in general. Proshansky (1978), Altman and Low (1992), Struthers (2000) and Jorgenson and Stedman (2001) found that identifying with a place in the natural environment results in people gaining a deeper awareness of how they, as individuals, are defined and a greater understanding of their own identity in relation to nature. The mechanism by which a person develops a place attachment can differ. For example, Relph (1976) found that becoming attached to a place occurs over time and as a result of developing strong relationships with the people in that location, whereas Tuan (1979) argued that people can identify with a place in which they have not specifically spent time. More recently, Stedman (2003) proposed that physical attributes, such as landscape type, are important contributors in establishing such an attachment, as did Tyrväinen *et al.* (2007), who concluded that the tranquillity and natural beauty of a place facilitates the development of an attachment and a protective nature towards the natural environment. It is of value to ascertain whether or not having a place attachment is of importance to individuals who undertake mitigative action in the climate context in order to inform science policy, particularly if the process follows Tuan's argument.

As was discussed in the previous chapter, the literature reveals that having access to green areas locally is important (see page 13). Green areas are recognised as improving the quality of the living environment (Tyrväinen *et al.*, 2005), and there is an increasing awareness of the benefits of spending time in local green spaces in urban (Kaplan, 1993; Chiesura, 2004) and suburban settings (Sullivan *et al.*, 2004; Kearney, 2006). The features that people describe as most beneficial include the silence (Gobster, 2001), the beauty (Renema, *et al.*, 1999; Chiesura, 2004) and the

sense of freedom (Klijn *et al.*, 2000); Matsuoka and Kaplan (2008) found, in their study involving 23 countries, remarkable similarities concerning the types of human needs that are satisfied by having contact with local green spaces and the importance of such places in people's lives and well-being.

The distance people live from green spaces plays a role in how often they visit such places. For example, Coles and Bussey (2000) found that areas of urban woodland are highly valued in the UK providing that they are five to ten minutes walk from home; see also DeVries and Goossen (2002) and Gidlof-Gunnarsson and Ohrstrom (2007) for European studies. Turner, Bateman and colleagues have extensively studied the value of environmental public goods and the impact of distance decay, based on the contingent valuation method (for example, Bateman *et al.*, 1995, 2006); their work does not, however, relate directly to the motivational element of behaviour research. It is urgent, due to urbanisation continuing to threaten the availability of nature, that further studies are undertaken concerning the value of green spaces (van den Berg *et al.* 2007; Matsuoka and Kaplan, 2008). In the wider context of global climate change, this would improve understanding regarding the role that local green spaces might play in developing motivation to take individual mitigative action.

Rather than experiencing a sense of well-being when they visit the natural environment, some people experience a feeling of being at one with nature or a sense of connection, especially evoked by landscapes with water (Coeterier *et al.*, 1997). Gebser (1985) described this connection as a magic union, and Hoffman (1999) as a sense of rapture or great harmony. Connecting with nature is linked with the concept of biophilia, the instinctive bond between humans and other living organisms and

ecosystems (see, for example, Fromm, 1964; Wilson, 1984). The general argument for biophilia is that because the human species evolved in a natural environment, we inherently have a readiness to interact positively with certain aspects of nature (Bell *et al.*, 1995) in a reciprocal relationship between humanity and nature (Kemal and Gaskell, 1993; Cooper, 2000). Ratcliffe (2005) developed this argument by stating that “being at one with nature is not the same as feeling...at home in a familiar environment” (p 49), suggesting that it is possible to feel connected to nature in a number of places. Hence, it is not the place *per se* that is important, more the individual’s ability to connect.

In the literature, connecting with nature is positively associated with environmental concern and with behaviour that protects the environment (henceforward referred to as environmental behaviour). Ecologists and ecopsychologists have argued that feeling at one with nature is a crucial factor in harbouring a favourable attitude towards the natural environment (Mayer and Frantz, 2004). For example, in 1949, Leopold wrote:

“We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect” (p 17).

When the concept of self is extended to include nature, people are less likely to destroy nature as it would represent a self-destruction (Roszak, 1995; Fisher, 2002; Mayer and Frantz, 2004). Mayer and Frantz (2004) designed a scale to measure observed time spent outdoors, and concluded that “connection to nature is an important predictor of ecological behaviour” (p 510). This conclusion supports the earlier proposal by Maitney (2002) that environmentally-friendly behavioural changes

will be more long term if founded on experiences of connectedness with the environment rather than solely a response to externally imposed regulations and incentives. Ascertaining whether or not individuals who undertake mitigative action, in the climate context, experience a connection when in contact with nature is important in order to inform science policy and is a key consideration of the investigations in this study.

### **2.2.3 Environmental concern and behaviour**

Even though people relate to the natural environment in different ways, public concern regarding the environment has been persistent since the 1970s (see, for example, Burgess *et al.*, 1991; Bell, 1994; Macnaghten *et al.*, 1995; Barr, 2004; Bickerstaff, 2004; Carvalho and Burgess, 2005), though concern for environmental problems fell behind that of unemployment, the economy, health and wealth in the 1990s (O’Riordan, 1995). Around the turn of the century, a survey found that a substantial portion of the British public was concerned about climate change, although less so than issues such as rainforests and biodiversity loss (DEFRA, 2002), and a recent MORI report revealed that public concern and interest in climate change remains high in the UK (MORI, 2008). The MORI report found, however, that people do not consider individual action to be a normal part of their everyday lives nor believe that others are willing to make big sacrifices to protect the environment. The development of environmental concern does not necessarily lead to positive action with respect to the environment.

Some models and empirical evidence suggest that environmental knowledge and concern does predict environmental action. For example, the rationalist environmental

behaviour models developed in the early 1970s assumed that educating people about environmental issues would automatically result in a greater awareness and concern and, in turn, to changes in lifestyles and increased level of environmental behaviour (Kollmuss and Agyeman, 2002). Sia *et al.*, (1985) and Uzzell (1994) concluded that environmental knowledge and concern is a predictor of environmental behaviour, assuming there is a desire and ability to act (see also Blake, 2001). The UK government based their 1995 'Going for Green' and 1998 'Are You Doing Your Bit' campaigns on the assumption that knowledge leads to enlightened behaviour and many non-governmental organisations have based their communication strategies and campaigns on a similar premise (Owens, 2000). Environmental concern has been shown to predict activities that are perceived to be relatively easy to perform and of least inconvenience, for example, recycling (Asch and Shore, 1975; Humphrey *et al.*, 1977; MORI, 2008; Whitmarsh, 2009).

Other research, however, indicates that there does not appear to be a simple, or consistent, relationship between environmental concern and action (Elliott *et al.*, 1993, 1999; Harrison and Burgess, 1994; Dunlap *et al.*, 2000, Barr, 2004), as participation in environmentally-friendly behaviour rarely reflects the strength of the commitment expressed by individuals (Dunlap and van Liere, 1978, 1984; Stern *et al.*, 1995; Schultz and Zelezny, 1999; Aoyagi-Usui *et al.*, 2003). Further studies by, for example, Axelrod and Lehman (1993), Gardner and Stern (1996) and, more recently, Lorenzoni *et al.* (2007) highlight a range of variables and relationships integral to the knowledge-to-behaviour sequence. Eden (1993, 1998) showed that, although there is little evidence that providing scientific information to change attitudes leads to environmental action directly, knowledge dissemination regarding responsibilities,

values and a sense of connection to local communities is likely to facilitate such action, whilst Brand (1997) suggested that personal attributes, situational contexts and external incentives play a more important role than environmental concern.

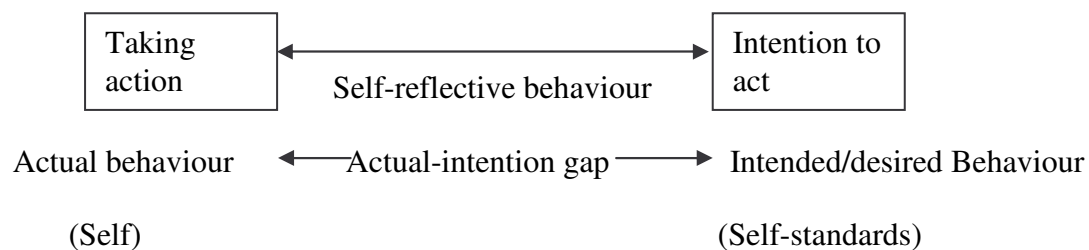
Kaiser *et al.* (1999), Costarelli and Colloca (2004) and Montada *et al.* (2007) separately suggest that the reason for studies failing to establish that environmental attitude is a powerful predictor of ecological behaviour is rooted in deficiencies in study design and methods; for example, not considering the lack of a unified concept of attitude (Kaiser *et al.*, 1999) or not including the variable, willingness for continued commitment, as a predictor of environmental action (Montada *et al.*, 2007). Maitney (2002) considers three possibilities regarding the relationship between environmental concern and action. First, that people deal with their awareness and concern with an unconscious reaction of denial by maintaining, or increasing, consumptive behaviours and materialism (see also Stoll-Kleemann *et al.*, 2001). Second, a change in consumptive behaviours occurs, which includes more environmentally friendly purchases within an acceptable level of convenience and without much sacrifice of lifestyle (refer to MORI, 2008). A third response is to experience a heightened sense of right and wrong, often with a feeling of connectedness within ecological and social processes and a belief that each person must take responsibility for changing their lifestyles (see also Sachs, 1997). People who experience this heightened awareness have a sense of being one of many drops in the ocean that, when added together, make a difference and may attempt to stimulate understanding and a change in behaviour of others. The differences in opinion regarding environmental concern and action underline the need for further research.

A disconnect between awareness, concern and behavioural response is consistent with the widely-reported gap between intended and actual behaviour (see Silvia and Duval, 2001); also known as the ‘attitude-behaviour relationship’ (Cottrell and Graefe, 1997), ‘value-action gap’ (Burgess *et al.*, 1998; Blake, 2001), ‘intention-behaviour discrepancy’ (Fishbach *et al.*, 2006), or ‘environmental values-behaviour gap’ (Kennedy *et al.*, 2009). Research into the actual-intention gap informs our understanding of the various influences that may explain an individual’s decision to act in a way that seems incongruous with his or her stated values for the environment (Kennedy *et al.*, 2009). In a complex context, such as carbon emissions reduction, addressing the gap is best understood as an ongoing process of change rather than a one-off event (Turner, 2006), whereby both the determinants of verbal intentions for an action and the actual reported or observed behaviour should be examined, though not necessarily simultaneously (Burgess *et al.*, 1998).

According to Wall (1995), improving the understanding of how concern translates into behaviour is more important than recording either the level of concern or the level of engagement. Figure 2.1 illustrates a schematic of the link between intended behaviour (self-standards) and actual behaviour (self), defined by the actual-intention gap in-between. The gap is fluid in nature. Its size is dependent on the context-specific goals that are set, on which of the two behaviours these goals influence and on the type and array of self-standards towards which a person strives. Two types of self-standards have been described in the literature. Markus and Nurius (1986) developed the idea of possible self, whereby a person strives to be the best they perceive they could be, suggesting a dynamic future oriented process. Higgins (1987) presented a similar idea, termed ideal self, which reflects the attributes a person would

ideally like to have; he also described ought self, which reflects the attributes a person believes they ought to have. Setting goals that aim to achieve the intended behaviour via changes in actual behaviour is a crucial part of minimising the gap (Silvia and O'Brien, 2004; Fishbach *et al.*, 2006). In this thesis, the dynamic processes that influence, and ideally reduce, the actual-intention gap in individuals who are reportedly undertaking activities to reduce carbon emissions are a key concern.

Figure 2.1: The actual–intention gap and factors affecting it (adapted from Silvia and Duval, 2001).



A process known as self-reflective behaviour is used to address the gap, whereby an individual consciously looks at their behaviour and changes it accordingly rather than simply being aware of the actions they take (Silvia and Duval, 2001). This reflection draws attention to the gap between the actual and the intended behaviours, which then influences subsequent actions (Barr *et al.*, 2001; Vallacher *et al.*, 2002). When individuals attribute the cause of the discrepancy to the self-standards that they maintain, the change in behaviour focuses on the self-standards to reduce the gap; whereas, when they attribute the discrepancy to themselves, the focus is on changing the actual behaviour by setting tangible and achievable sub-goals on activities in daily living (Taylor and Pham, 1996; Gollwitzer and Brandstätter, 1997). Fazio and Zanna (1981) and Rajecki (1982) discuss how having direct experience decreases the



discrepancy between intended and actual behaviour and Cross and Markus (1994) and Stein *et al.* (1998) linked the motivational effect to concepts of competency and the most aspired behaviour.

### 2.3 Factors that influence the actual-intention gap

There is an extensive literature regarding the barriers that individuals erect to resist engaging in environmental behaviour and a representative selection of typical examples are summarised in Table 2.1. As discussed above, it is also important to gain an understanding regarding the factors that enable individuals to overcome such barriers and achieve a reduction in the gap between their intentions and their actions. This section addresses three particular factors that influence that gap: risk perception and trust, responsibility, altruism and control, and habitual behaviour.

Table 2.1: Examples of barriers constraining individuals to undertake environmental behaviour.

<b>Examples of barriers to environmental behaviour</b>	<b>Examples of researcher, or team, that cite each particular barrier</b>
lack of time/money, other life priorities	Poortinga and Pidgeon, 2003; Tindall <i>et al.</i> , 2003; Kennedy <i>et al.</i> , 2009.
lack of knowledge/ignorance	Pyle, 2000; Maitney, 2002; Lowe <i>et al.</i> , 2006.
lack of willingness to sacrifice lifestyle, inconvenience	Diekmann and Preisendörfer, 1992; Glover <i>et al.</i> , 2005; Lorenzoni <i>et al.</i> , 2005.
helplessness/makes no difference	Hinchliffe, 1996; Macnaghten, 2003; Semenza <i>et al.</i> , 2008.
lack of resource accessibility	Brand, 1997; Kaiser, 1998; Lorenzoni <i>et al.</i> , 2007.
Limited/lack of action by other people	Harrison and Burgess, 1994; Irwin, 1997; Brouwer, <i>et al.</i> , 2008.

### **2.3.1 Risk perception and trust**

Many different elements affect individuals' perception of risk (Kasperson *et al.*, 1988; Pidgeon *et al.*, 2003) and the risk-society literature, such as Giddens (1991), Beck (1992) and Mol and Spaagaren (1993), contributes to our understanding of individual experiences of, and responses to, environmental risks. These elements are based on previous experiences of risks, how the information on the source of a risk is communicated and the psychological mechanisms for processing uncertainty (Renn, 2004). Direct experience of environmental risks can be highly influential (for example, Weinstein, 1989; Baldassare and Katz, 1992; Fazio and Zanna 1981) and have a positive influence on behaviour (Kollmuss and Agyeman, 2002; Maitney, 2002), as it enables people to have a more realistic perception of such experience (Thompson and Mungay, 1991). People, however, do not necessarily invest in mitigative measures even if they have had direct experience; see, for example, Thieken *et al.* (2006), Siegrist and Gutscher (2008) and Whitmarsh (2008) for studies relating to flooding experiences. The concept of risk means different things to different people and interpretations are context specific (Macnaghten and Urry, 1998; Lorenzoni *et al.*, 2005).

The nature, seriousness, and the consequences of most environmental problems are uncertain and unfamiliar to people, as the real risk is inexplicable in everyday living (Habermas, 1987). People must rely on informed, intellectual judgements regarding the size of risks, the opportunities and the economic costs for controlling them (Slovic, 1987; Fischhoff, 1990) and it is not unusual for individuals and communities to perceive the assessment of risks differently to that of expert opinion (Elliott *et al.*, 1999). People choose what to fear and how to fear it to sustain their preferred pattern

of social relations and will downplay certain risks and emphasise others as a means of maintaining and controlling the social groups within which they act (Douglas and Wildavsky, 1982; Douglas, 1986, 1992), by emphasising, for example, the economic factors and their sense of community (Thompson *et al.*, 1990). Much of the psychosocial literature indicates that social support (kinship and friendship networks) and community participation are key factors influencing the stresses and the coping response to perceived risks (see, for example, Perry, 1983; Sorensen *et al.*, 1987; Eyles *et al.*, 1990; Taylor *et al.*, 1991; Elliott *et al.*, 1993). The relative uncertainty of the scientific predictions regarding environmental risks such as climate change, at least in the short term, opens up the possibility for individuals of perceiving risks as negligible by ignoring experts' advice (Lidskog, 1993; Burgess *et al.*, 1998), or believing that they are ignorant, even if they have received a great deal of information, in order to maintain their social relations and identity (Michael, 1996). Hence, what is perceived regarding environmental risks, particularly in a case such as climate change, tends to be a product of social interpretation rather than as a result of reality itself (Lidskog, 1996).

The successful treatment of environmental issues seems to necessitate authoritative and clear definitions of risk and threat yet scientific statements often struggle to achieve public legitimacy because, for example, it is unclear for how long that particular advice is going to be viable (Irwin, 1997). Dissemination of the science relies on intermediary links, such as the media, social movements, business interests, governments and regulatory bodies (Jamison, 1993) and on the social processes through which that information is transmitted and processed (Jasonoff *et al.*, 2002). These links can have their own agendas and present the science in a manner that best

fits their purpose by, for example, amplifying or reducing the perception of risk (Lidskog, 1996; Kasperson and Kasperson, 1996) or indicating a political preference to wait and see rather than take action (Sterman and Sweeney, 2007).

The incompleteness of the scientific knowledge and understanding has contributed to a lack of confidence in the relevant institutions and a lack of credibility in, and cynicism towards, the information that they impart (Wildavsky and Dake, 1990; Harrison and Burgess, 1994; Hulme, 2009). Public trust and confidence in decision-makers and regulatory processes lie at the heart of the changing relationship between science and society (Wong and Zhao, 2001; Anex and Focht, 2002). A lack of trust in the commitment made by authorities, institutions and governments to behave in a more environmentally friendly manner serves to reinforce the desire by people to question the information that they are given (Burgess *et al.*, 1998; Lorenzoni *et al.*, 2007) and heighten the sense of perceived powerlessness accentuated by media coverage of environmental disasters around the world (Macnaghten and Urry, 1998) and the feeling that global forces, divorced from individual wants and needs, are dictating future direction (Ekins, 1992; Yearley, 1996). The lack of confidence impacts on the extent to which people feel they have the ability to influence decisions.

### **2.3.2 Responsibility, altruism and control**

Accepting responsibility for causing environmental problems and changing their everyday behaviours to reduce further impacts can enable individuals to overcome their ambivalence and lack of trust regarding such issues (Sachs, 1997; Macnaghten and Urry, 1998). As Agenda 21 recognises, to deal with the phenomenon of global environmental change, it is necessary to devise the right strategies to foster a sense of

responsibility and involve people in the search for solutions (Hawthorne and Alabaster, 1999). Hines *et al.*, (1986-87) and Barr *et al.* (2001) incorporated a sense of responsibility in their models of environmental behaviour. Empirical evidence indicates that a sense of responsibility is fundamental to environmental behaviour (though not necessarily the sole basis). For example, Hopper and Nielsen (1991) demonstrated that individuals who felt morally obliged to act are much more likely to recycle regularly than people who displace responsibility and blame others for the problem. Eden's (1993) Leeds-based work on perceptions of environmental responsibility suggests that individuals' feelings of responsibility are seated in deeply held values which in part determine their individual practices. Thøgersen (1996) found that people tend to classify environmental behaviours such as recycling as within their moral domain, i.e. what is right and wrong, rather than as a matter of personal costs and benefits.

A sense of responsibility has been found to be integral to the positive relationship between altruistic values and environmental behaviour (Stern *et al.*, 1993, 1995; Schultz and Zelezny, 1999). Such a relationship was first expressed by Heberlein (1975) and based on the presumption that because environmental quality is a public good, altruistic motives are necessary for an individual to contribute to it in an effective way (Stern, 2000). Thøgersen (1996) suggested that Schwartz's (1977) model of altruistic behaviour offers a good starting point for understanding recycling behaviour; subsequently, Stern *et al.* (1999) developed a value-belief norm theory of environmentalism that links Schwartz's model, value theory, and the new environmental paradigm (Dunlap and van Liere, 1978; see also Kennedy *et al.*, 2009). Vining *et al.* (1992) found that altruistic behaviour was perceived as the most

important reason for recycling in the four Illinois communities they studied and, more recently, studies by O'Brien (2006) and Slimak and Dietz (2006) incorporated ethical and social aspects and found that certain values, such as altruism, were related to environmental behaviour more than other values. Abrahamse *et al* (2009) studied car use from the perspective of altruistic values in motivation to reduce usage for commuting to work, but there is a need to examine the relevance of this theoretical framework in other areas of environmental behaviour.

A sense of control has also been found to influence environmental behaviour. For example, Eden (1993) argues that a sense of control over the outcome of actions partly determines the practices of individuals and Hawthorne and Alabaster (1999) found that individuals who take part in environmental activities have a significantly greater belief that they are in control, compared to those who do not. Rotter (1954, 1966) used the term locus of control to describe an individual's perception of their ability to bring about change through their own behaviour; individuals with a high internal locus of control believe that events result primarily from their own behaviour and actions and individuals with a high external locus of control believe that powerful others such as God, government, fate, or chance primarily determine events. Hines *et al.* (1986-87) found that an internal locus of control is likely to be related to environmentally responsible behaviour and Thøgersen (2004) concluded that, based on his work with cognitive dissonance theory, inconsistencies towards environmental behaviours such as when one person regularly recycles yet uses the car every day, cause little discomfort if the main control focus of each behaviour is associated with external factors, such as inactivity by governments and institutions to change their practices.

The concept of control has been used as a component in theoretical models. Miller and Seligman (1975), for example, developed a theory of learned helplessness based on the psychological condition whereby a human being has learned to believe that they have no control over a situation and that whatever action is taken will be futile. Previous studies based on this theory have focused on specific health related contexts. Pelletier *et al.* (1999), however, concluded that a sense of helplessness regarding environmental behaviour can lead to feelings of being scared, overwhelmed and apathetic and have suggested that the climate change context provides a second application for the model by Miller and Seligman.

Ajzen and Madden (1986) incorporated an element related to perceived control in their theory of planned behaviour. In the mid-1970s, Fishbein and Ajzen (1975) developed the theory of reasoned action, whereby the attitude of an individual concerning the outcome of a particular behaviour combines with the subjective norms regarding the behaviour, to produce a reasoned action. Ajzen and Madden (1986) extended this theory by incorporating the perceived control that an individual has over behaviour or ability to act. This could be affected by, for example, available resources, determining a person's perception that a behaviour is easy or difficult to perform. If a particular behaviour is perceived to be too difficult, a person may simply not undertake it.

The models developed by Fishbach and Ajzen (1975) and Ajzen and Madden (1986) have been applied in studies researching recycling behaviours. For example, Barr (2007) based his study on Fishbach and Ajzen's theory, concluding that people with strong environmental values, citizenship values and knowledge regarding the waste

problem are more likely to be willing to, and reportedly did, reduce their waste. Tonglet *et al.* (2004) based their study on Ajzen and Madden's theory and proposed that recycling behaviour is likely to be influenced by environmental and community concern and to be inhibited by perceptions of inconvenience and lack of time and knowledge. do Valle (2005) merged the theory of planned behaviour and Schwartz's (1977) altruistic behaviour with two broader models from environmental psychology, the model of environmental behaviour (Grob, 1995) and model of environmental concern (Stern *et al.*, 1995). do Valle found that personal psychological features affect behaviour more than general ecological attitudes and that the theory of planned behaviour is useful in modelling recycling behaviour, but is not increased in robustness when coupled with altruistic theory. The main focus of the models developed by Fishbach and Ajzen (1975) and Ajzen and Madden (1986) is the gap that exists between the behaviour a person intends to demonstrate and the actual action they take.

It is important to extend the understanding of how responsibility, altruism and control influence individual motivation in the context of carbon emissions reduction, and also in relation to the climate change dimensions: spatiality, temporality and uncertainty. Is it the case that, as Macnaghten and Urry (1998) found, most people accept some personal responsibility to improve the environment yet argue that they can only create change at a very local level through individual action? More recently, the MORI 2008 report indicated that people see their responsibility mainly in relation to small steps such as recycling, rather than making significant lifestyles changes.



### 2.3.3 Habitual behaviour

Habits, such as using the car to get milk from the local shops or only looking at air travel websites when planning a weekend away, can make changing lifestyles difficult. Habitual behaviour, or unconscious motivation, describes learned, goal-directed acts that become automatic responses in specific situations (Triandis, 1977, 1980; Verplanken *et al.*, 1998) and involve only minimal sporadic thought (James, 1890; Klöckner and Matthies, 2004). It is guided by automated cognitive shortcuts involving past practices, rather than being preceded by decision processes based on attitudes and intentions (Aarts and Dijksterhuis, 2000; Thøgersen, 2006).

Existing research is inconclusive regarding whether or not habitual behaviour is directly proportional to the frequency of performance. Ouellette and Wood (1998) and Aarts and Dijksterhuis (2000) found that past behaviour was most pronounced for behaviours that are executed daily or weekly in a stable context. Aarts *et al.* (1998) argued that if a similar, if not identical, behaviour is a repetitive action and performed many times, that it can become habitual, or automatic; for example, using a car to travel to work. Conversely, other work indicates that habits do not simply result from undertaking an activity frequently. For example, Ajzen (1991, 2002) pointed out that frequency is a necessary, rather than sufficient, condition for developing a habit. Others supported Ajzen's view by arguing that habits should be considered as a mental construct involving features of automaticity, such as lack of awareness and mental efficiency (Verplanken, 2006) and other factors, such as context (Wood *et al.*, 2002), behavioural inertia (Conner and Armitage, 1998) and knowing what to do and feeling competent (Bargh and Gollwitzer, 1994). In the context of the current research, it is important to ascertain whether or not simply performing activities to

reduce carbon emissions on a frequent basis is enough to ensure that mitigative habits are established.

Habits can be hard to break and can generate a feeling of inertia towards changing behaviour. For example, attempting to alter previously socially-acceptable activities, such as leaving appliances on standby, can result in two responses. First, people ignore new information that is relevant to changing their habit (Verplanken *et al.*, 1997), especially if they have strong initial views, as this influences the way that subsequent information is interpreted and creates a resistance to change (Slovic, 1987). If the new information is consistent with one's initial beliefs, it appears reliable and informative; if it is contrary, then it tends to be dismissed as unreliable, erroneous or unrepresentative (Festinger, 1957; Nisbett and Ross, 1980).

The second response is that people do not persist enough in practicing the new behaviour, even when there is a willingness to change (Kollmuss and Argyeman, 2002). According to oscillation theory (Reed, 1978), changing deep-rooted habits can often be a painful experience and requires the discovery of new frames of reference. Based on their Glaswegian study, Knussen and Yule (2008) suggest that participants who failed to establish regular recycling had the habit of treating recyclables as rubbish. Maitney (2002) suggests that a strong internalised motivation, when an activity is undertaken for the satisfaction of the activity itself and reflects an inherent value and belief that undertaking an activity is worthwhile, is more likely to provide the level of effort and resilience that is required to break a habit, compared to an externalised motivation when an activity is undertaken in response to externally imposed regulations and incentives. Maitney proposes that behavioural change

founded on inner beliefs and convictions is more likely to last because the change is generated from a conceptualisation of being part of the wider context and, thus, actions have consequences that impinge on the individual. It is important, therefore, to study individuals who have reportedly changed their behaviour to a more environmentally-friendly lifestyle, particularly those who have internalised motivation, to understand the mechanisms and personal attributes that enable a person to overcome the inertia and resistance inherent in the change process.

The perception that self-determination is central to changing established behaviour and instilling long term motivation and environmentally-friendly lifestyles has been collaborated by evidence regarding the benefits of motivation with an internal nature, when compared to solely externally focused motivation. Examples of these studies are listed in Table 2.2, along with the main benefits that were identified. More recently, Sheldon and Houser-Marko (2001) found that participants with a self-determined motivation enter an upward spiral of positive change, which promotes intentions to carry on taking environmental action, and Osbaldiston and Sheldon (2003) proposed that "...interventions that encourage internalised motivations should be more effective in producing long-term behavioural change" (p 356). Hence, the benefits of motivation with an internal nature are well documented. The concept of individual motivation is discussed in detail in the next section; first, motivation in general, and, second, motivation specific to the climate context.

Table 2.2: The benefits when a person has a motivation with an internal nature.

<b>Researcher, or researching team</b>	<b>The benefits when a person has a motivation with an internal nature</b>
Koch (1961)	Higher performance
Krivonos (1978)	More favourable attitude towards the task
Amsel (1990)	Greater persistence to succeed, even when faced with opposition
Deci and Ryan (1991)	Greater interest, excitement and confidence
Koestner and Zuckermann (1994)	Greater persistence to succeed, even when faced with opposition
Ryan <i>et al.</i> (1995)	Heightened sense of well-being
Sheldon and Elliott (1998)	Enhanced performance and persistence

## **2.4 The concept of individual motivation**

### **2.4.1 The theory of motivation**

Human motivation is the power, or the driving force, which enables humans to take action and is related to the processes that give that action energy and direction (Young, 1961; Gilbert *et al.*, 1998). It is used to resolve an extensive range of situations from, for example, where to go shopping (Cox *et al.*, 2005) to decisions concerning national security (Oreskes, 2003). The trigger to the motivation releases an internal source of energy that switches on a “programme of action (innate or modified by experience) specified within the individual” (Laming, 2004, p 3). It is generally accepted that the triggers, or drivers, of motivation are specific to a particular task or context (Pelletier *et al.*, 2004).

The understanding of human motivation has changed over the centuries, as detailed by Weiner (1992). Up until the 1960s, motivation was thought of as a generic process applicable to all contexts. For example, in the 1600s Descartes viewed the concept as a free will to act. In the mid 1800s, Darwin considered motivation as an instinct and Freud dominated the first half of the twentieth century with his theory that humans were mechanistic with no conscious awareness. By the 1950s, motivation was understood to be a cognitive process. The overriding principle for cognitive theorists, such as Rotter (1954), Festinger (1957) and Atkinson (1957), was that humans are completely rational, knowledgeable and able to make decisions. By the mid 1960s, the idea of a generalised theory of motivation was replaced by the realisation that humans are driven by specific factors in different contexts and that, in fact, they prefer not to be in an equilibrium state – instead preferring to push themselves to extreme limits (Weiner, 1992).

Since the mid 1960s, a number of theories have been developed to explain the concept of motivation in specific contexts. Unlike earlier theories that tried to explain the full range of motivation, these theories limit their explanation to particular motivational forces that influence specific behaviours and can vary markedly from one context to another (Noels *et al.*, 2003; Pelletier *et al.*, 2004; Vallerand, 1997). Table 2.3 lists various theories that emerged in the 1960s and 1970s to replace the more generic ones. Two of the first theories that were developed, Vroom's (1964) expectancy value theory and Atkinson's (1964) achievement motivation theory, contain two core components that rely on each other; namely, the belief that an activity is of value for it to be pursued and that when a goal is set, it will be achieved.

Table 2.3: List of various motivational theories that emerged in 1960s and 1970s.

- \* Expectancy value theory (Vroom, 1964)
- \* Achievement motivation theory (Atkinson, 1964)
- \* Motive acquisition theory (McClelland, 1965)
- \* Goal-setting theory (Locke, 1968)
- \* Attribution theory (Weiner, 1972)
- \* Cognitive evaluation theory (Deci, 1975)
- \* Learned helplessness theory (Miller and Seligman, 1975)
- \* Theory of reasoned action (Fishbein and Ajzen, 1975)
- \* Self-efficacy theory (Bandura, 1977)
- \* Self-schemas (Markus, 1977)

Two other theories developed in the 1960s focused on the role that getting a return plays in motivation. McClelland (1965) proposes in his motive acquisition theory that people who are high achievers focus on the satisfaction of completing the challenge rather than gaining the return. In contrast, Locke's (1968) goal-setting theory is based on the fact that people work towards reaching an end point, which is invariably the satisfaction of the return for their efforts, by setting and achieving a series of sub goals. More recently, research by Idson and Higgins (2000) chimes with Locke's supposition, as they conclude that the primary aim of human motivation is to get a return via a positive or a negative feedback mechanism. Setting goals gives people the potential to bridge the actual-intention gap (Gibbons, 1983; Fishbach and Shah, 2006); refer to Figure 2.1, page 43. Setting goals can motivate individuals to "...exert effort and be persistent in reaching them" (Ferguson, 2000, p 231), especially if they

are set at a moderately difficult level (Lawrence and Nohria, 2002; Carver and Scheier, 1998). Motivational theories that focus on goal setting, such as developed by Locke (1968), Carver and Scheier (1981), Bandura (1986), Dweck and Leggett (1988), Locke and Latham (1990) and Emmons (1991), propose that individuals use goals to monitor, evaluate and change behaviour. Thøgersen (2004) further argues that unless concerns for the environment are associated directly with specific environmentally-related activities and goals, the behaviour remains unchanged.

When an activity is undertaken or behaviour changed, there is a delay before the return is realised. This delay is known as delayed gratification (Bembenutty, 1999; Metcalfe and Mischel, 1999; Öner-Özkan, 2004; Bembenutty and Karabenick, 2004). It can vary from a few seconds in a spontaneous activity, such as giving someone a hug, to a period of weeks or months when, for example, a person plays in a sporting league or learns a language. Examples of longer time periods for a return include a number of years when a person is gaining an educational qualification and past a person's death when writing a will (Trommsdorff, 1983). How an individual perceives the return is fundamental to the motivation to act (Gonzalez and Zimbardo, 1985) and Bauman (2001) suggests that waiting for the return is becoming less attractive:

“...people tend to prefer short-term satisfactions because little in the world is truly durable and few objectives may be relied on to outlive the effort needed to fulfil them...” (p 157).

Other studies concur with these suggestions by Bauman that people want instant returns. For example, Hastie and Dawes (2001) and Stuphorn (2005) both concluded that when people choose short-term gains it is often at the cost of long-term benefits. Similarly, Kalenscher *et al.* (2005) found that people do not choose what they value

highly, if a lesser reward is available more immediately. As the return is perceived by many as the fundamental purpose of an individual's motivation, it is crucial to examine the relevance of gaining a return from mitigative action in the climate context, especially as there are no guarantees to undertaking such action.

Another example listed in Table 2.3, the cognitive evaluation theory (Deci, 1975), forms the basis of the self-determination theory developed by Deci and Ryan (1985). Deci and Ryan's work is well established in the motivational literature and incorporates intrinsic, extrinsic and amotivation types of motivation along a spectrum. Amotivation depicts someone who has no motivation. The spectrum consists of six motivational states ranging from intrinsic to amotivation, with four extrinsic motivations in-between, two of which are internal in nature and two of which are external in nature. A parallel can be drawn between the intrinsic and extrinsic motivational states described by Deci and Ryan (1985) and Rotter's (1954, 1966) internal and external loci of control (see page 49) whereby, for example, individuals with an intrinsic motivational state and an internal locus of control believe that changes occur due to their own purposeful, self-determined behaviour and actions.

Deci and Ryan's (1985) self-determination theory formed the basis of the integrated motivational sequence developed by Vallerand (1997) and tested by Grouzet *et al.* (2004) in a leisure activity context, the academic motivation scale (Vallerand *et al.*, 1992) in an educational context, and the motivation towards the environment scale (Pelletier *et al.*, 1998). Pelletier *et al.* (1998) developed a scale that measures environmental behaviour and concluded that self-determined motivation predicts a higher level of activities undertaken. Other contextual research using the self-



determination theory includes political motivation (Losier *et al.*, 2001), language learning (Noels *et al.*, 2003), sports (Hagger *et al.*, 2003), eating behaviours (Pelletier *et al.*, 2004) and parenting (Knafo and Assor, 2007). The continued application of the self-determination theory in academic studies reflects the value and importance others place on Deci and Ryan's work.

Since the 1980s, an array of theories regarding motivation has continued to be developed in a wide range of contexts. For example, recent publications on individual motivation include studies on eating disorders (Hill 2006; Martinez *et al.*, 2007), gambling (Wood and Griffiths, 2007), general well-being (Patrick *et al.*, 2007), parental control (Knafo and Assor, 2007), pain management (Hadjistavropoulos and Shymkiw, 2007), personal creativity (Sheldon and Deci, 2000; Chen *et al.*, 2006), sporting activities (Vansteenkiste and Deci, 2003) and education (Niemic *et al.*, 2006; Chong 2007).

#### **2.4.2 Motivation in the climate context**

It is clear from past work that motivation studies regarding climate change mitigation do need to be context-specific. Moreover, the context of climate change demands due consideration of the complexities of the issue highlighted in the previous chapter: the dimensions of spatiality, temporality and uncertainty. The discussions in this present chapter indicate that certain factors affecting motivation in relation to the environment have the potential to affect motivation to take mitigative action in a similar fashion. For example, having a responsibility towards protecting the environment, established social networks and a sense of control over activities and their outcome are likely to have a positive impact on an individual behaviour. Other factors, however, such as the

dissemination of information concerning the science and perception of the risks may differ in their influence between the two motivations because, due to the unprecedented changes occurring within the global climate system, it is difficult to provide legitimate, authoritative scientific statements and clear definitions of the risk and threat. It is unclear, at this stage, how the three dimensions of climate change influence motivation in this context, which, axiomatically is a key concern of the study.

Much of the existing literature regarding addressing action on climate change has focused on the institutional and collective action of society (see, for example, Rosa and Dietz, 1998; Gifford, 2007). It is equally important, though, to consider the small-scale environmental behaviour that individuals at all levels of societies undertake (Kennedy *et al.*, 2009). Even though sustainable development must focus at the institutional level (Sandilands, 1993) *and* the individual level (Blake, 2001), much of the needed changes will occur (or not) at the level of the individual (Heller and Monahan, 1977; Gifford, 2007). In their worldview survey, Dunlap *et al.* (1993) found that individual citizens, along with community groups, were frequently seen as being primarily responsible for protecting the environment and capable of solving environmental problems effectively and Jacobs (1999) argues that theories of individualisation and globalisation point to the need to engage more closely with everyday life struggles and realities of individual people as the starting point for any future collective action. See also the recent study by Lorenzoni *et al.* (2007), in which the respondents accepted that individuals have a crucial role to play in environmental action such as climate change mitigation. As Hammond (1999) put it:

“One thing is certain: it is up to us ‘ordinary’ citizens to lead the way. Almost without exception, governments at all levels have failed to protect us and our world from the toxins we produce and disseminate so thoughtlessly” (p 204).

Sociological based literature, by its very nature, focuses on society and institutions and provides an understanding of infrastructural and institutional requirements necessary to engage individuals and groups in specific behaviour. More recently, there has been an emphasis on research regarding environmental-related issues; examples include factors that influence a person’s environmental behaviour, such as lack of action by governments and business or the free rider effect (Lorenzoni *et al.*, 2007), and attitudes in specific environmental contexts, such as energy conservation (Owens and Driffill, 2008). One of the more widely known sociological models, the new environmental (or ecological) paradigm scale (Dunlap *et al.*, 2000; see also Dunlap and van Liere, 1978) is used, primarily, as a measure of ecological beliefs.

There is a degree of overlap in the literature between sociological and psychological based research. This is unsurprising considering that individuals live within society and internal mental processes *and* external societal situations affect most human behaviours. There are similarities in the approaches of the two disciplines, including a focus on dynamic processes rather than constant states (Pelletier *et al.*, 1996), a potential methodological limitation of reliance on self-reporting behaviour (Corral-Verdugo, 1997) and, since the late 1980s, an agreement that information is not the key determinant of behaviour change (Geller, 1992). Examples of studies involving both disciplines include Fietkau and Kessel (1981), who used sociological and

psychological variables in their model to explain environmental behaviour or the lack of it, Barr and Gilg (2006), who promoted the value of an approach based on a socio-psychological understanding of recycling behaviour (see also do Valle, 2005) and Lindenberg and Steg (2007), who urged environmental psychologists to consider the goal-framing theory that was developed from a sociological perspective.

Research at the individual level arguably lends itself to a more psychologically-based approach. Oskamp (2000) believes that psychology research must lead the way in helping people adopt sustainable patterns of living; do Valle (2005) found that personal psychological features affect behaviour more than general ecological attitudes. There are a vast number of theoretical models that have been developed regarding the mental processes and characteristics that influence human motivation, as discussed earlier in this chapter. The self-determination theory by Deci and Ryan (1985), which has been used extensively in motivational studies for over 20 years, is based on a spectrum of intrinsic and extrinsic types of motivational states.

Even though the concept of climate change is relatively new and research has tended to focus on the broader aspects of environmental behaviour and sustainable development, there are an increasing number of studies regarding activities that are related to reducing carbon emissions. For example, Bastianoni *et al.* (2004) investigated consumer responsibility for emissions based on the footprint principle, Joireman *et al.* (2004) examined whether or not people prefer to commute to work by car or public transport and found that people who are motivated to use public transport believe that cars harm the environment, Smith *et al.* (2006) addressed policy and technological constraints of implementing greenhouse gas mitigation in the

agricultural industry and Harris (2006) examined environmental behaviour in China, such as buying green products and car usage, concluding that selfishness commonly dictated peoples decisions.

Notwithstanding this work, there remains a lack of comprehensive understanding of the complexities surrounding individual behaviour, particularly in the context of reducing carbon emissions. This lack indicates the need for more in-depth qualitative and explorative approaches (Hallin, 1995) and a grounded theory approach rather than applying a current environmental model or combination of models (do Valle, 2005). Full use can be made of conclusions drawn from research in analogous areas and one model in particular provides a valuable basis for the conceptual framework developed in this study. The model by Deci and Ryan is most relevant as it uniquely singles out an extrinsic type of motivation with an internalised, self-determined nature. Such a motivation type is of fundamental importance in this study because the purpose of undertaking activities to reduce carbon emissions is essentially external, namely, to slow the rate of global atmospheric temperatures, whilst motivation that is self-determined in nature is critical in achieving the voluntary, long term behavioural changes that are required to address the climate issue effectively. The conceptual framework adopted, including the benefits of the self-determination theory in which this study is grounded initially, is discussed in the next chapter.

## **2.5 Concluding remarks**

It is clear from past work that motivation studies regarding climate change mitigation need to be context-specific and that there is potential for similarities between the contributors to motivation in relation to the environment in general and that of

undertaking mitigative action. Although current understanding of how to engage people to reduce carbon emissions is limited, it does suggest that achieving a motivation that has an internal nature will be more effective, and of more value in the long-term, than motivation with solely an external focus. The self-determination theory developed by the psychologists Deci and Ryan (1985) is a well established motivational model and specifically describes an extrinsic type of motivation with an internal nature. A sample group who have a reportedly strong internalised motivation in the climate context is selected for this research. By studying the mental characteristics of such participants, it is possible to improve the understanding of the personal traits and the processes that enable such behaviour and of the type of people that have reportedly overcome the barriers to mitigative action that previous research has identified and minimised the gap between intention and actual behaviour in carbon emissions reduction, the first and second aims of this research. Improving understanding of how concern translates into behaviour in the climate context and, in particular, the associated actual-intention gap is critical in promoting individuals to engage in mitigation. Study of the defining characteristics and the mechanisms for their development should throw light on what underpins motivation to reduce carbon emissions as well as what drives motivation to a high level, the third aim of this research.

Chapter Three describes the conceptual framework and research methodology and details the methods for all seven stages of the research.

## **CHAPTER THREE**

### **RESEARCH FRAMEWORK AND DESIGN**

#### **3.1 Introduction**

The conceptual framework and research methodology are presented in this chapter, along with the detailed methods for all seven stages of the research. The process of selecting the methodology enables the research conceptualisation, created by reviewing the relevant literature, to be operationalised. The application of the methodology is achieved by expressing the issues related to the research topic as questions within a series of surveys and interviews.

The formation of the conceptual framework for the initial stages of the research, which is detailed in the following section, was based on the discussions in Chapter Two pertaining to the more prominent theories, models and current understandings regarding environmental motivation. In essence, the framework uses an established psychological model, the self-determination theory (Deci and Ryan, 1985), to examine a new context, carbon emissions reduction.

The research methodology is detailed in the third section. This is based on grounded theory (Glaser and Strauss, 1967; Strauss and Corbin, 1990), exploratory and non-exploratory approaches and a complementary combination of quantitative and qualitative techniques of data collection. Grounded theory makes it possible to examine the internal nature of a motivation in a topic that is immensely complex, far-reaching in both time and space, and, up until now, has been poorly understood. Following Babbie (2001), the term exploratory approach is used to describe the approach taken in this study in areas where little is understood and, in particular,

where relevant variables for determining why individuals acquire motivation to reduce carbon emissions need identifying; this approach is a source of grounded theory. A non-exploratory approach is used to test the findings of previous research and the exploratory results of this work and in developing the theoretical framework.

In the fourth section, the methods used for the first phase of the research involving stages one, two and three are explained, based on an email survey and in-depth interviews. These stages address the first research question, as follows:

Are there common characteristics of individuals who are motivated to mitigate climate change?

The research design for the second phase of the research, involving stages four, five and six, is detailed in the fifth section of this chapter. Quantitative techniques, in the form of three surveys, were introduced to complement the qualitative analysis in the two preceding stages and to test out the findings with a public group. These stages address the second key research question, which is as follows:

Can the defining characteristics of the internal nature, the self-determination, underpinning the motivation of individuals to mitigate climate change be identified?

The research design for the final stage of research is described in the sixth section. This stage employed a one-on-one focused interview technique to concentrate on the time when a change in motivation level was noted, so addressing the third key research question,

How does motivation to take mitigative action develop?



The two software packages that are used for the analysis, namely, the Statistical Package for Social Scientists for the quantitative data and the NVivo software package for the qualitative data, are introduced in the penultimate section. The chapter ends with concluding remarks.

### **3.2 The conceptual framework for the research**

This study is grounded in the self-determination theory advanced by Deci and Ryan (1985) for three reasons. First, the structure of the self-determination theory, which differentiates between intrinsic and extrinsic types of motivation, provides the internal dimension that should prove critical in responding to the climate threat. This model is the only existing motivational model that differentiates between extrinsic and intrinsic motivations and describes an extrinsic type of motivation that incorporates an external and an internal nature simultaneously. Second, the self-determination theory has been used to examine motivation for over 20 years and is well established in motivational literature. Third, previous findings in respect of understanding environmental behaviour based on self-determination theory provide a strong foundation for the current study, as discussed in Chapter Two (see page 59). The model has not, however, been applied in the climate change context in any depth up until now. Whether or not it is applicable is an open question that this study will address.

Deci and Ryan (1985) identified three types of motivation in their self-determination theory: intrinsic, extrinsic and amotivation. Amotivation depicts someone who has no motivation. An intrinsic motivation indicates that a person is undertaking an activity for the pure enjoyment or satisfaction of the activity itself and reflects an inherent value and belief that undertaking an activity is worthwhile. The third type is an

extrinsic motivation, indicating that a person is undertaking an activity in order to attain a particular external outcome. The outcome can be positive, such as a financial reward, or negative, such as a feeling of guilt. Hence, a person can be motivated because they intrinsically value an activity or because there is a strong external coercion or incentive. Initially, it was assumed by researchers that a person would be motivated by either an intrinsic or an extrinsic motivation at any one time. Krivonos (1978), however, found that, for example, being a manager in manufacturing companies showed evidence of an internal nature, or self-determination, to the extrinsic motivation. Ferguson (2000) supports this view, stating: “Events external to the individual, such as reward, and processes internal to the individual, like incentive motivation, are different but often closely related” (p 12). The motivational model developed by Deci and Ryan (1985) is based on the realisation that intrinsic motivation can only have an internal nature, whereas extrinsic motivation can have an internal and/or an external nature.

The self-determination theory is based on a spectrum, or continuum, of six motivational states integrating intrinsic and extrinsic motivations, as illustrated in Figure 3.1. Refer to Table 3.1 for descriptions of the motivational states. The spectrum is arranged in motivational states that decrease from left to right in the degree to which the motivations are autonomous and self-determined (Ryan and Deci, 2000a). At the left hand end of the spectrum is intrinsic motivation, when an activity is undertaken for the enjoyment or satisfaction of doing so and at the other end is amotivation, a lack of motivation. The four states in-between are extrinsic motivations, two of which are internal in nature and two of which are external in nature. An extrinsic motivation indicates that a person is undertaking an activity in

Figure 3.1: The six motivational states of the self-determination theory developed by Deci and Ryan (1985) (adapted from Deci and Ryan, 1985).

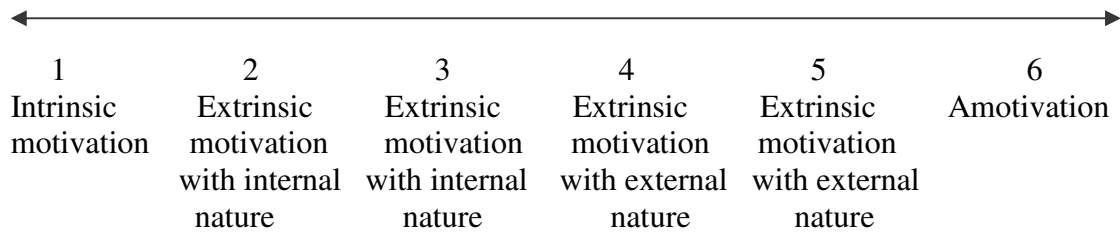


Table 3.1: The motivational states in the self-determination theory, excluding amotivation (adapted from Deci and Ryan, 1985).

Numbers refer to states in Figure 3.1.

<b>Self-determination state</b>	<b>Term</b>	<b>Feeling (theory)</b>	<b>Feeling (applied)</b>
5. Very little self-determination, extrinsic	External regulation	Because it is the rule, I have to	I have to comply with the law
4. A little	Introjected regulation	Because I would feel guilty if I did not	People expect me to comply
3. Much	Identified regulation	Because it is important to me	Because I want to comply
2. Full	Integrated regulation	Because it is fun, I enjoy it	Complying is very rewarding
1. Intrinsic	Internalisation	Inherent	I control emissions

order to attain a particular external outcome, which is either internal in nature and self-determined, such as a feeling of satisfaction after receiving acknowledgment from others, or external in nature, such as an employment promotion. The outcome can be positive, such as a feeling of contentment or a financial reward, or negative, such as a feeling of guilt or a non-compliance penalty.

Deci and Ryan identified three key characteristics of their theory. First, they proposed that individuals, whose extrinsic motivation has an internal nature, associate a value with the activity they are undertaking, and, hence, a volition or self-determination to act (Deci and Ryan, 1985). Second, they identified three components (that they termed basic psychological needs) that positively affect the level of the internal nature specifically, and, thus, the enjoyment of activities and the self-regulation of behaviours. The three components are autonomy, whereby individuals freely choose to pursue the activity concerned, competence, whereby individuals master the activity and relatedness, whereby individuals have approval and support from significant people in their lives, such as a manager, a parent, a teacher or team mates; this approval and support is required to have a strong internal component to their motivation (Deci and Ryan, 1985). Third, in later work, the two researchers found that even though the amount of motivation between individuals performing the same task can be similar, the nature and focus of that motivation can be markedly different (Ryan and Deci, 2000a). More recently, Gagné and Deci (2005) have identified that as the internal nature strengthens, the external factors are required less and less as part of the internalisation process of the motivation.

The two types of extrinsic motivation with an internal nature, identified and integrated regulation, are of most interest in this study. Here, identified regulation of a particular behaviour is when it becomes self-orientated and internalised due to its perceived value and importance, and integrated regulation is when the behaviour becomes and assimilated into an individual's existence and the external incentives are replaced by self-determination (Ryan and Deci, 2000b). The characteristics of the self-determination theory are revisited at relevant points throughout the thesis, as the

results from each stage of the research are interpreted. Other models derived from the sociological and psychological literature discussed in Chapter Two are also brought in where relevant.

### **3.3 Research methodology and structure**

Grounded theory is an approach that systemically derives theories from the collection and analysis of data by identifying patterns and common categories (Babbie, 2001).

Pidgeon and Henwood (2004) define this approach as a "...core set of analytical strategies for generating theory" (p 629), whilst Gibbs (2002) sees the central focus of the approach as "...inductively generating novel theoretical ideas or hypotheses from the data as opposed to testing theories specified beforehand" (p 165). The aim is to formulate a theory through a process of conceptualization rather than the more traditional model of research, whereby the researcher chooses and applies an existing theoretical framework.

American sociologists, Glaser and Strauss developed and published their grounded theory methodology in the 1960s (Glaser and Strauss, 1967). (The approach is also referred to as the constant comparative method). Following the original publication, Glaser and Strauss disagreed on further interpretations of grounded theory, which resulted in a split in the theory in the late 1980s. Strauss teamed up with Juliet Corbin and in 1990 they developed a new interpretation of grounded theory (Strauss and Corbin, 1990), which Glaser argued against, defending the original ideas (Glaser, 1992). The main differences and similarities in the understanding of grounded theory are summarised in Table 3.2.

Table 3.2: Summary of the grounded theory approach to data collection and analysis (adapted from Glaser and Strauss, 1967, Strauss and Corbin 1990, 1998 and Glaser 1992).

Common to both interpretations:

- writing and sorting theoretical memos, drawing diagrams and developing open-coded schemes to capture the detail, variation and complexity of observations and other material obtained and explore emerging concepts and links to each other, developing, refining and keeping track of the concepts and theory as they materialise;
- constantly comparing data instances, cases and categories for conceptual similarities and differences, by using theoretical sampling (*=sampling on the basis of emerging concepts, with aim being to explore dimensional range or varied conditions along which properties of concepts vary*) until no new or further relevant insights are being reached (= theoretical saturation);
- collection, coding and analysis of the data from one part of the research ascertain the type of data that is needed for the next part.

Glaserian interpretation:

- emphasizes induction or emergence, within a frame of repeated steps involving data sampling, data analysis and theory development with no taping interviews, doing a pre research literature review, developing hypotheses at the outset or discussing the research before it is written up;
- literature used in sorting stage (of memos) and treated as more data to code and compare with what has already been coded and generated, rather than an understanding on which to base the coding.

Straussian interpretation:

- based on validation criteria and a systematical approach, involving theoretical coding, whereby literature is used to link emerging concepts to existing theory all the way through, with techniques to force analysis from descriptive to more theoretical levels, such as writing definitions of core categories and building conceptual models;
- using three types of coding techniques, in a specific order – open, axial and selective coding.

Common to both interpretations of grounded theory is the use of memos and diagrams to facilitate the development of the emerging theory. Written memos are conceptual and analytical thoughts recorded during transcript reading and reflection; diagrams are illustrations of the main relationships and processes, which are useful in reviewing the developing contextualisation altogether (Charmaz, 1995; Miles and Huberman, 1994). Using memos and diagrams facilitates the flow of ideas as they emerge from the data.

Theoretical saturation (see Table 3.2) is a second aspect of grounded theory that both Glaser and Strauss view as central to the process. Theoretical saturation is when a network of categories and connections is created within the data to the point when all new information fits within the existing network and a saturation point is reached (Morse, 1995; Flick, 1998). Glaser and Strauss both place great importance on the interplay between data collection and data analysis in achieving theoretical saturation, as this interplay allows elaboration of questioning as emerging insights develop and dictate the direction of questioning until nothing new is being said regarding the concepts (Glaser and Strauss, 1967).

Strauss and Corbin (1990) used specific terms to describe the three steps of the process used to code the data until theoretical saturation is reached. Initially, open coding is used whereby questions are asked, comparisons made and categories selected for the words, phrases and paragraphs within the text to develop initial themes and identify lines of interest for the next stages of fieldwork. Second, axial coding then develops relationships and connections between the categories and reassembles them into labelled groups of sub-categories, along with filling in the gaps via further fieldwork and reviewing the literature and existing fieldwork for specific

issues and information until the point of saturation is reached. Finally, selective coding, which involves an extensive process of cross-referencing between many aspects of the research, discovers a small number of themes that are central to research, culminating in the identification of the one central phenomenon of the research thesis, or argument.

One of the main differences between the two interpretations is related to when academic literature is involved in the approach (see Table 3.2). Glaser (1992) advocates not carrying out a literature review in the early stages of the research process, as it gives preconceptions regarding what to look for and the researcher becomes influenced by existing concepts and models. The influence, according to Glaser, limits the generation of concepts that emerge naturally via the making and sorting of written memos and diagrams. Instead, Glaser suggests that academic literature should be accessed during the sorting of the memos and used in the context of more data to code. In contrast, Strauss and Corbin (1990) propose that reviews of the literature should take place throughout the approach, including prior to the initial data collection and analysis. Using the literature in this way enables the researcher to link emerging ideas to existing theories, define core categories and develop the conceptual models.

A number of researchers have based their work on the interpretation by Strauss and Corbin. For example, Charmaz (1990) suggests that researchers must use their disciplinary knowledge and theoretical understanding in order to discover and generate the appropriate insights, questions and theories. Miles and Huberman (1994) believe that novice researchers, in particular, may be unable to identify the most



important or relevant issues if they do not develop specific questions early on regarding aspects of the topic that are of particular interest, based on existing literature. Similarly, Cutliffe (2000) and Hardy and Bryman (2004) promote the importance of basing the research questions in background and disciplinary knowledge to ensure that studies are not repeated and that current understanding is extended.

This study follows the interpretation by Strauss and Corbin (1990) initially by including the use of literature in the early stages, as evidenced by the discussion in the previous chapter and throughout the research. Other techniques that Strauss and Corbin incorporate in their approach are also included in the study. For example, the in-depth interviews are recorded and analysed using a qualitative software package alongside the academic literature. Such techniques help the data guide the theorising rather than limit it (Layder, 1993) and achieve what Charmaz (1990) called a “...delicate balance between possessing a grounding in the discipline and pushing it further” (p 1165). Hypothesis testing is largely confined to models developed during this research. There has been limited prior research regarding the specific characteristics of individuals who are motivated to reduce carbon emissions *per se*. Work on the characteristics of individuals motivated to act on other environmental issues has informed this research, however, and provides a basis for the models and hypotheses examined here.

Identifying the central theme, or underlying characteristic, of the motivation, however, more specifically follows the approach by Glaser (1978), whereby this

theme emerges as part of the extensive analytical process and cross-referencing of data without the need for social science theory and concepts.

A multi-stage approach was used in this study and the format and key characteristics for the three phases of the research, comprising seven stages, are detailed in Table 3.3. Quantitative and qualitative instruments of measurement were required, to provide, in a complementary fashion, standardized comparisons accounting for differences and a depth of information regarding why individuals followed certain behaviours, respectively (Silverman, 2005). The standardized quantitative approach compensates the possible lack of impartiality of qualitative analysis, whilst the qualitative approach of probing into everyday social world overcomes the abstracted measurement of variables that is necessary in quantitative analysis (Denzin and Lincoln, 2005). The first stage of this study involved the selection of individuals via a letter of introduction and an invitation to take part in the research. A quantitative method was used in the second stage to achieve a standardization of the responses during the initial enquiries, and again in the fourth and sixth stages for testing out relevant sections of the analysis. Qualitative techniques were used in the third, fifth and seventh stages. These enabled a greater depth of exploration into particular aspects of the research and the perusal of specific lines of enquiry. Using this combination of qualitative and quantitative methods results in the potential for a richer, more comprehensive collection of data and material, and creates, it is intended, conclusions that are more robust and extensive, than if one or the other method had been used alone.

Table 3.3: The seven stages of the research (continued overleaf).

<b>Research phase/ question</b> (see page 20)	<b>Research stage</b>	<b>Description of stage</b>	<b>Sample source</b>	<b>Method</b>	<b>Initial sample size and response rate (%)</b>	<b>Final sample size for analysis</b>	<b>Main chapter(s) covering results</b>
One	One	Individuals who perceive that they are motivated to reduce carbon emissions are selected, initially via a gatekeeper, with others recommended by association	Employees of East Anglia-based companies and organisations that have pledged to reduce carbon emissions, and their contacts in south England	Purposive and snowball sampling	62 (83%)	51	Four
One	Two	The significance of demographic and climate-related variables regarding motivation is examined and individuals who have internalised motivation are selected using an existing model	Participants from stage 1 who volunteered to participate	Written quantitative style email survey	51 (100%)	51	Four
One	Three	The common characteristics of individuals who have internalised motivation are identified, examined based on the literature and the defining characteristics of the motivation are proposed	Participants from stage 2 who have a self-reported high motivation to reduce carbon emissions and a substantial internal nature to the motivation	In-depth interview (qualitative, one-to-one, in person)	25 (100%)	25	Four and Five

<b>Research phase/ question</b> (see page 20)	<b>Research stage</b>	<b>Description of stage</b>	<b>Sample source</b>	<b>Method</b>	<b>Initial sample size and response rate (%)</b>	<b>Final sample size for analysis</b>	<b>Main chapter(s) covering results</b>
Two	Four	Specific aspects of the characteristics of individuals who have internalised motivation are measured	As above	Written quantitative style email survey	25 (80%)	20	Six and Seven
Two	Five	The proposed defining characteristics are confirmed and other specific aspects regarding the characteristics are examined	As above	Written qualitative style email survey	20 (100%)	20	Six and Seven
Two	Six	Specific aspects of the characteristics of individuals who have internalised motivation are tested with a public group	Adults listed in BT Norwich and North Norfolk 2007 Phone Book	Written quantitative style postal survey	550 (28%)	82	Six and Seven
Three	Seven	The contributors to the development of internalised motivation are examined	Participants for stages 3-5 who recall specific time when motivation increased to current level	Focused interview (qualitative, one-to-one, telephone)	10 (100%)	10	Eight

The study incorporates exploratory and non-exploratory approaches. An exploratory approach, which equates to inductive in terms of reasoning, investigates a group, activity, or area about which little is understood, with the intention to provide new insights into a particular topic based on analysis of data collected during the research. The conceptual framework in an exploratory study retains flexibility in its design and research questions and develops as the research progresses (Marshall and Rossman, 1999; Babbie, 2001). As certain questions are answered, others appear, and the proposed methods are revised as a greater understanding of the complexities emerge by incorporating a review of relevant literature and creating datasets. Both Patton (1990) and Stebbins (1997) suggest that conducting exploratory research requires approaching the search for data with flexibility and open-mindedness.

The exploratory approach is intermingled with a non-exploratory approach, equating to a deductive reasoning, which is based on existing theories and models that were used to clarify results from earlier stages of the research. Exploratory research is only able to propose answers and suggest methods for further research as it involves samples that are not necessarily representative of a larger population. By introducing methods that are based on a non-exploratory approach, such as validation and cross-referencing, the emerging results can be grounded in the existing understanding and theory that has informed this research.

To ensure that the conclusions to the research are robust, the choice of research techniques was considered carefully. Historically, quantitative methods have been used to research environmental issues. Until the early 1990s, the main interest in such work was from natural scientists with a vast array of mathematical equations and

models and quantitative data (Jaeger *et al.*, 1993). Using a quantitative approach maximizes objectivity and standardization and reduces the chance of prejudice and bias (Vlahos, 1984; Sarantakos, 1993). The role of qualitative techniques is becoming more appreciated in environmental research. Qualitative methods enable a more in-depth examination of a particular topic. The nature of qualitative research means it is likely that the examination of specific topics becomes increasingly focused as variables that are worth pursuing are identified (Babbie, 2001), and the probing changes direction accordingly as the research progresses (Strauss and Corbin, 1997). Researchers use in-depth interviewing extensively in qualitative research (Marshall and Rossman, 1999) as this method is of great value in understanding the reasons and perceptions behind individual behaviours (Fielding, 1993). The style of such interviews is often more like a flowing conversation than a set of strictly structured question-responses (Lofland and Lofland, 1984), which enables the interviewer to cover a range of topics quickly and ascertain their relative significance. The interviewees are encouraged to talk freely in long and uninhibited responses from open-ended questions and appropriate probing, resulting in large amounts of data (Finch, 1993) that can be followed-up and clarified immediately; although this process is reliant on the cooperation and openness of the interviewee (Marshall and Rossman, 1999; Robson, 1997).

In this study, data analysis was based around two computer software packages, one for the quantitative data and one for the qualitative data. The descriptive statistics and associations were performed using the Statistical Package for Social Scientists (SPSS) version 12 and the qualitative analysis and interpretation was completed using the NVivo version 2.0 (1999-2002 copyright). NVivo, which is based on the grounded

theory approach, is one of a number of software packages available for qualitative research analysis, which includes NUD\*IST6 and ATLAS. All these packages manage the data and provide a structured format/process and guidelines that facilitate the manual analysis. Details of the SPSS and NVivo routines are provided in subsequent sections of this chapter.

There is an ethical obligation in any research to protect the participants by ensuring that no harm comes to them and that the process is open and honest concerning the intended use of the research and any material collected (Rubin and Rubin, 1993; Babbie, 2001; De Vaus, 2002; Silverman, 2005). The primary ethical consideration in this study was informed consent, as the empirical evidence was collected via surveys and interviews completed by the participants (De Vaus, 2002; Silverman, 2005). The participants were encouraged to ask any questions related to the research at any time, they understood that their participation was on a voluntary basis and that they could decline to answer any question or discontinue their involvement at any point if they wished, without explanation. All participants have been given pseudonyms in this study, in the interests of confidentiality.

The participants were informed regarding the research purpose, expected benefits and process at the beginning of each stage in which they were involved. Introductory letters outlining the purpose and expected benefits were sent to individuals who were invited to participate in the research. Relevant information was provided with the email and written surveys and returning a completed survey indicated consent by each individual. Before the start of each in-depth interview, details of the research team, the expected benefits of the research and how the conclusions of the interviews were

to be disseminated were discussed. The opportunity was also taken at this time to answer any questions that the interviewees had regarding any aspects of the research overall; after which, the interviewee signed a consent form and the recording of the interview began. Finally, consent for the focused interviews was obtained on the tape recording before the interview commenced. Refer to the Appendices section for details of the information sheets and consent form.

The confidentiality of the participants was ensured throughout the process. The completed surveys were stored in a locked cabinet until discarded and filed in an alphabetical system and without using any names or links to workplaces. The information stored on the tapes and in notes made during the interviews remained confidential, private and anonymous. Any personal or company names and references were not transcribed and the individual employment title or role mentioned if only relevant to the research. Only the author listened to the tape recordings of interviews during the transcribing process and then the recorded material was deleted. Although it is standard ethical practice to consider any 'potential hazards', this study contained minimal concerns in this regard.

### **3.4 Research design - phase one.**

The three phases of the research, which comprise seven stages, are summarised in Table 3.3 (page 78). The main purpose of this first phase, which involves the initial participant selection, an email survey and in-depth interviews, is to identify whether or not there are characteristics that are common to individuals who are motivated to mitigate climate change.



### **3.4.1 Stage one: participant selection**

The primary aim of the initial selection process for this study is to identify a sample of individuals who perceive that they are motivated to reduce carbon emissions. The nature and focus of a motivation can be markedly different, even though the amount of motivation between individuals performing the same task can be similar (Ryan and Deci, 2000). So it was important to make the selection process as robust and valid as possible in consistently selecting individuals with the perception of being motivated to reduce carbon emissions, whilst also ensuring that the process attracted a sufficient number of individuals to achieve the research aims. Hence, a non-random sampling technique, known as purposive sampling (Silverman, 2005) was used whereby the sample unit is selected based on the selector's judgement regarding which individuals will be most useful for that particular study (Babbie, 2001). This technique is driven by specific concepts rather than by a concern for representativeness (Miles and Huberman, 1994).

Using purposive sampling, a gatekeeper selected individuals working for companies and organisations that are associated with programmes aimed at reducing carbon emissions. The gatekeeper was the Assistant Director of the Carbon Reduction Project, CRed project, based at the University of East Anglia ([www.cred-uk.org](http://www.cred-uk.org)) where the author lived. (The author acknowledges the limitation of only studying one comparatively homogenous region of the country). The companies and organisations involved were, at the time, either registered with the CRed project and/or were members of the East Anglia Business Environment Club (EABEC, [www.eabec.com](http://www.eabec.com)), so it was expected that they would have employees who are motivated to take mitigative action as this aspect is one of the core strategies. The gatekeeper chose

individuals he was familiar with and whom he expected would be favourable to participation in the research; there was no specific consideration regarding their employment title or role. Selecting individuals in this manner, however, could result in their responses during the research being informed by their employment and a responsibility to take a particular stance, rather than their own beliefs. An Introductory Letter was sent to them, accompanied by a letter of encouragement to participate from the gatekeeper; refer to Appendix A. In the Introductory Letter, it was emphasised that the research focus was on motivation across an individual's lifestyle, rather than only at work, to ensure that people did not unnecessarily exclude themselves from taking part and to reduce the possible effect of the selection process mentioned above. This sampling technique resulted in an initial sample of individuals that was then extended by using a second sampling technique.

The second sampling process used is snowball sampling (Taylor and Brogham, 1998), a non-random method of collecting information (Faugier and Sargeant, 1997) whereby the researcher identifies a small number of subjects with the required characteristics who in turn identify others. The process is common practice in qualitative research and aims to increase the sample size by accessing like-minded individuals (Silverman, 2005). The individuals who had been approached initially were asked to recommend other people who they thought would be interested in taking part, irrespective of whether they themselves agreed to take part or not in the study. These new contacts did not need to work for organisations within the CRed project or the EABEC. This sampling technique is especially useful when the members of a particular target population are difficult to locate (Babbie, 2001) and when the researcher has little idea of the size or extent of a population, or there simply

are no records of population size. The process of individuals recommending other people is designed to attract as large a sample size as possible and was repeated until no further names were proposed. The sample can then be thinned out to a more specific target group as the research progresses.

Even though the selection process was non-random, it is possible to interpret the findings as representative of a specific species (Sarantakos, 1993). In this case, the species is individuals living within the East Anglia region of the United Kingdom, aged between 20 and 69 and who are voluntarily taking action to reduce carbon emissions. Using a second sample group as a control was not indicated at this stage, because the focus is on finding common characteristics of individuals who are motivated to reduce carbon emissions rather than comparing characteristics with another group.

### **3.4.2 Stage two: the email survey**

The main aim of the second stage of the research was to identify, from within the initial sample, a sample of individuals who specifically have an extrinsic motivation to reduce carbon emissions with an internal nature. A quantitative instrument based on the self-determination theory developed by Deci and Ryan (1985) was used as part of an email survey, to identify such a sample. As discussed earlier in this Chapter, two of the six motivational types identified in the model by Deci and Ryan, identified regulation and integrated regulation, have an external/internal mix. The internal nature of these motivation types is of most interest in this study. Numerical scores for each of the six motivational states were collected, and the individuals with the highest scores in the two relevant categories were selected.

The survey, consisting of 18 questions divided into three sections, was sent individually to each of the 53 participants via email. The survey used three answer formats: closed questions with Yes/No and multiple choice options, Likert-scale questions that needed ranking and open ended short answer questions. The survey design was straightforward and relatively short, so there was no need to change the order of the questions to overcome the possibility of response sets (Sarantakos, 1993). Six individuals had previously piloted the survey in order to protect the research against errors, such as ambiguous questions or questions that people cannot answer. Refer to Appendix B for a copy of the full survey. To encourage a high response rate, non-respondents were contacted up to three times over a six-week period after they had received the survey and a copy of the survey was included on each occasion. All 53 questionnaires were completed and returned, two of which were discounted due to being incomplete.

Sections One and Three of the survey were designed to fulfil the aim of investigating whether or not there were significant relationships between motivation, specific demographic variables and other aspects related to the motivation. Section One contains questions concerning demographic characteristics such as age, gender and having children. Section Three contains questions relating to four aspects: employment type and level of employment responsibility in personnel and budgetary terms, the main focus underpinning an individual's motivation to reduce carbon emissions, the level and status of the motivation and length of time at the current level and the type of activities that people are involved in at work specifically related to reducing carbon emissions. The opportunity was taken to investigate possible relations between the motivation to reduce carbon emissions and these variables, as well as to obtain several general characteristics of the sample overall.

Section Two of the survey contains the question that was used to select the sample of individuals who were invited to participate further in the research. The question addresses the particular type of motivation that the individuals perceive themselves to have when they undertake activities to reduce carbon emissions. The survey question contains 18 statements that were placed in a simple random order, and which the respondents ranked using a 5 point Likert scale ranging from 1 = not at all (strongly disagree) to 5 = very much (strongly agree). Three statements were compiled for each of the six categories of motivation type defined by Deci and Ryan (1985). Each statement was modified to the context of carbon emission reduction by using material from Deci and Ryan (1985, 1991), Pelletier *et al.* (1998, 2004), Xiang *et al.* (2005) and Miller and Brickman (2004), with a review on the style of studies in other contexts by McAuley *et al.* (1989), Vallerand *et al.* (1992), Li *et al.* (2005) and Green-Demers *et al.* (1998).

It was important to establish that the 18 statements within the question were both valid and reliable in the context of the research. The validity of the self-determination continuum incorporating six categories has been supported by several previous studies (Guttman, 1954; Pelletier *et al.*, 2004), whereby positive correlations have been displayed with adjacent regulatory types on the continuum and negative correlations with distant ones (Ryan and Connell, 1989; Vallerand, 1997). To ensure an adequate level of both validity and reliability regarding the modification of the theory to the climate context, several academic individuals reviewed the series of 18 statements. These individuals were experienced in either motivational aspects of psychology or the human dimensions of climate change or were familiar with the application of the self-determination theory specifically. The individuals all offered feedback on the

statements provided, which were then modified accordingly and returned to them until unanimous agreement was reached. Table 3.4 lists the 18 statements in the simple random order that they were written in the survey question.

A scoring system was developed to select individuals who have a substantial internal nature to their motivation to reduce carbon emissions. Each of the 18 statements carried equal weighting and the scoring was directly related to the Likert scale, whereby each statement was given a score between one and five. Two of the six categories (identified regulation and integrated regulation) represent a motivation type that is extrinsic with an internal nature and the statements that indicate these two types of motivation are marked in Table 3.4 with an asterisk. Hence, the maximum score of 30 would indicate that an individual strongly agreed with all the statements related to this dual type of motivation and these individuals would be invited to partake in the next stage of research. A maximum score for any of the other three categories of motivational states was acceptable as long as it coincided with a maximum for the two required categories. The amotivation category was retained in the survey to cross-reference the results for consistency and used to discount respondents who scored above 1 for this category. It was felt that a person demonstrating more than a minimal lack of motivation would not be an appropriate candidate for a study exploring why people are motivated.

The analytical process involved the use of the SPSS software package. The answers to all the survey questions were numerically coded and entered into the SPSS package; for example, Yes = 1 and No = 0 and High = 1, Med = 2, Low = 3. The scores for

Table 3.4: The 18 statements used to measure motivation type for the survey respondents.

The sentences with an asterisk (\*) indicate external motivation with internal nature

- \*1) I believe that reducing carbon emissions will help slow the rate of climate change
- \*2) Reducing carbon emissions is a crucial part of the long term survival of species on the Earth
- 3) I can't see how my specific efforts to reduce carbon emissions are helping to slow down the rate of climate change
- 4) I can't really see what I am personally getting out of reducing carbon emissions
- \*5) It is a good idea to try to control carbon emissions
- 6) I am involved in projects to reduce carbon emissions as part of a team decision, or following instruction from, for example, a manager
- \*7) As a human being, I have a responsibility to care and protect the Earth
- 8) It is challenging to try and establish innovative ways to reduce carbon emissions
- 9) I don't know why I am bothering with reducing carbon emissions
- 10) My involvement in reducing carbon emissions in the workplace is driven by a commercial incentive and/or financial gain
- 11) I want to be involved in reducing carbon emissions so I can receive recognition and praise from others
- \*12) Reducing the greenhouse gas effect and the rate of atmospheric temperature rise, is essential to addressing the issue of climate change and associated problems, like droughts, famine, poverty and floods
- \*13) I believe reducing carbon emissions is a good thing I can do to help slow the rate of climate change
- 14) It is fun to be involved in projects related to reducing carbon emissions
- 15) I have to reduce carbon emissions otherwise I would feel anxious and under pressure for not participating
- 16) I would feel guilty/ashamed if I was not involved in reducing carbon emissions to help slow the rate of climate change
- 17) Reducing carbon emissions is the "right thing to do"
- 18) It is satisfying to see strategies and practises be employed in the workplace that reduce carbon emissions

questions that used Likert ranking were transposed into the SPSS spreadsheet as equivalent values ranging from a score of 1 to a score of 5. The data was then analysed using the descriptive statistics (frequencies and mean) and association (crosstabulation and correlation coefficient) computations.

The individuals who were selected for the next stage of the research, the in-depth interviews, met two criteria. First, their responses to the survey indicated that they had a substantial internal nature to their motivation to mitigate climate change. Second, they subjectively stated that their motivation was at a high level.

### **3.4.3 Stage three: the in-depth interviews**

In-depth interviews are the key instrument of, and the main qualitative contribution to, the data collection for this study, and comprise the third stage of the research. There were four aims to carrying out the one-to-one in-depth interviews. The primary aim was to identify the specific characteristics, if any, which are common to individuals who undertake activities to reduce carbon emissions. The second aim was to explore the perceptions that the motivated individuals have regarding climate change and how those perceptions impact on their motivation. The third aim was to identify the cause(s) of the increase in motivation to the perceived high level. The final aim of the interviews is to ascertain whether or not the motivational model developed by Deci and Ryan (1985), the self-determination theory, provides an adequate framework for the individual motivation to reduce carbon emissions, in the context of climate change. There has been limited prior research regarding the specific characteristics of individuals who are motivated to reduce carbon emissions *per se*, so work on the characteristics of individuals motivated to act on other environmental issues has



informed this research and provides a basis for the models and hypotheses examined here. Pilot interviews were used to test out the interview process and modify the questions and interview manner accordingly; the results from the pilots were not included in the analysis of the results from the subsequently completed interviews because it was considered that changes in the questions and interview approach rendered them largely incompatible.

A semi-structured format was used for the in-depth interviews. This format is based on an interview guide, which consists of a framework of relevant topics and key questions used to guide the exploration accordingly, rather than a rigid set of predetermined questions. This means a similar set of issues can be explored in each interview whilst the flexibility and freedom to change direction is maintained and specific lines of interest, and new ideas, are pursued as their relevance to the research becomes apparent. Refer to the interview guides in Appendix E for details of the changes that were introduced throughout the series of interviews. The order of the questions in each interview followed the direction and responses made by the individual rather than the specific order in the guide. A few straightforward questions were asked initially to develop a rapport and level of trust that facilitated an open discussion (Lofland and Lofland, 1984; Rubin and Rubin, 1995).

Each interview started with a description of climate change, why the research was taking place and the main objectives of the interview; at this point, the interviewee was specifically asked, in an open question, about their understanding and knowledge regarding climate change or they volunteered the information as part of the general discussion, which was probed as indicated in the context of this stage of the research.

The conclusions of the email survey and the review of the research themes (see Chapter Two) shaped the six specific topic areas that were discussed in the initial interviews. The topics were the three climate dimensions (spatiality, temporality and uncertainty), the impact of resistance on taking action to reduce carbon emissions, the level of action being taken by British society, gender and climate change, the role of science and technology and ways to facilitate motivation. The spatial aspect considered both the local-global concept and the wide-ranging impact in society i.e. affecting all levels from the individual to whole countries and international institutions, and the responsibility for taking action. The temporal aspect was considered in relation to upbringing, an increase in motivation and the proposed return for action taken. The ambiguity aspect focused on the different responses to the climate issue, especially the global political arenas and the range of scientific predictions.

The structure of the interviews was adapted as the series of interviews progressed. Minor adjustments were made to the interview guide each time according to the specific experiences and responses that each interviewee made in the email survey. The overall structure was modified on two occasions to accommodate new lines of thinking (after the seventh and 17th interviews; see Appendix E). The first change added questions around the impacts of religion, contentment, awareness of other cultures, sense of humour, attitude towards waste, core philosophies, material needs and status, the type of role that individuals play and a greater emphasis on exploring responsibility to take action. The second change focused on travelling, altruism, consumption, perception of time, value, freedom in life and social networks.

Particular lines of questioning remained consistent throughout the whole series of interviews so that a benchmark of certain data could be established across all the interviews. There were four questions that were considered central and included in all interviews, as follows:

- 1) What do you intend your efforts to reduce carbon emissions will achieve?
- 2) How does the fact that the major returns for your efforts will be after you die affect your motivation?
- 3) If you were the only person making efforts to reduce carbon emissions would you continue?
- 4) Who do you believe is responsible for reducing carbon emissions?

As the interviews progressed, it became apparent that questions regarding the barriers to taking mitigative action and the level of resistance that had been overcome to take action resulted in negative discussions concerning why people do not act. The negative discussion distracted the interview away from the focus of investigating the factors that influence individuals who do take action. Hence, this section was dropped from the guide. Also, only one of the three climate dimensions, the temporal dimension, seemed to be consistently influential to an individual's motivation, so the other two were removed from the guide and only discussed if brought up by the interviewee.

Twenty-five one-to-one interviews were conducted at either the participants' workplace or on site at the University of East Anglia, depending on the preference of each participant. They took place between January and March 2006 and lasted a maximum of 90 minutes. The interviewees were informed that the interview was

being audio-recorded when they were invited to take part, and each one signed a consent form before starting (see Appendix D). Each interview was fully transcribed the same day to facilitate the interviewer in recalling particular reactions to questions and any other observations made.

The interviewees were sent an information sheet (Appendix C) a few days before the interview took place. This was done for two reasons. First, researchers have a moral obligation to give an explanation of the subject and purposes of any study (Patton 1990). Second, such explanations may help the participants understand specific questions in the interview by placing them in a broader context. Providing such information could result in possible framing, or unnecessary bias, as it may focus the interviewees on what they should answer. This was taken into account in the analysis and with the validity checks discussed in the next section.

### **3.5 Research design – phase two**

The purpose of the analysis for phase two of the research (see Table 3.3, page 78) is three fold. First, to confirm whether or not the five characteristics that were proposed in Chapter Five are defining characteristics of individuals who have internalised motivation. Second, to extend the understanding related to particular aspects of the remaining characteristics of the motivated sample and, third, to identify whether or not these aspects play a role in enhancing internalised motivation to reduce carbon emissions.

A quantitative style written survey was sent to the motivated individuals in the fourth stage and a slightly modified version was sent to a public group of adults from a

specified population within the East Anglia region of the United Kingdom in the sixth stage. The two quantitatively-designed surveys incorporate questions that were based on earlier results and existing theoretical models. An email survey with a qualitative approach was sent to the motivated sample in the fifth stage. The email survey was used to test out particular aspects from the discussions in Chapter Five and to confirm the results of the interview and survey analysis.

### **3.5.1 Stage four: the survey for the motivated individuals**

The sample that was selected for the fourth stage consisted of the motivated individuals who had participated in the in-depth interviews. Five individuals chose to discontinue their involvement in the research at this point due to constraints on their time, which meant the written survey was sent to 20 individuals. Although there was a difference in the motivation orientation amongst the sample, as discussed in earlier chapters, it was unnecessary to split the sample further at this stage. Consistency of the sample characteristics was deemed beneficial to maintain the robustness of subsequent findings.

The written survey that the motivated individuals completed consists of 29 questions that are divided into five sections, based on the following five themes that emerged from the earlier analysis:

- places of residence and work;
- contact with the natural environment;
- individual behaviour related to reducing carbon emissions;
- meeting human needs; and,
- valuing the natural environment.

The focus of the first section of the survey concerns where people choose to live and work. The close association that people have with natural environments is well documented, as is the evidence that individuals who generally view the natural environment favourably are likely to act in appropriate ways towards it (Barr, 2004; Steel 1996). The findings from this study confirm that the motivated individuals have had regular and ongoing contact with the natural environment and have positive attitudes towards the natural environment. There is, however, little understanding of the relationship between, first, where a person lives/works and their motivation to reduce carbon emissions and, second, where a person lives/works and their favourite types of natural environment. An appreciation of such relationships may have implications for future urban and infrastructural developments.

There are four other questions in the first section of the survey. The first two questions relate to demographics, i.e. gender and age. The last two generate information on the overall attitudes of respondents towards the natural environment regarding their appreciation of, and desire to protect, these environments and whether or not having contact with such environments is important to their general well-being. The results of these questions define the broad characteristics of the sample.

Section two of the survey centres on two aspects that relate to having direct contact with the natural environment, i.e. physically visiting it. For the purposes of this study, the natural environment is defined as all non built-up areas of any size that contain natural features, such as parks, forests, back gardens, green spaces within urban areas, mountains, inland waterways and the coastal regions, and a visit is defined as a purposeful trip to any type of natural environment. Such visits include short breaks

from work, but not times when a person is simply passing through. Defining the visits in this way meant that the data collected would reflect contact that individuals have with the natural environment because they actively choose to visit.

The first aspect regarding contact with the natural environment that was considered in the survey is the type of environment that individuals most prefer to visit. As discussed in Chapter Five, there is a limited understanding in the literature regarding whether or not the features of a particular natural environment, or any feelings that an individual experiences there, influence motivation to protect the environment, specifically, to reduce carbon emissions. The survey respondents were asked to identify the three favourite types of natural environment that they visit. Asking for three choices provided data on more types of natural environments, so the analysis could be more extensive. The respondents were then asked questions regarding five aspects:

- the main feature of their most favourite type of natural environment;
- the feelings they experience, or are trying to alleviate, when visiting there;
- the importance of the feelings that they experience to their general well-being;
- whether or not these feelings are experienced in any other ways; and,
- whether or not the features and feelings experienced were different at the other two favourite types of natural environment, and if so, in what way.

These questions served two purposes. First, to ascertain if there are any trends amongst the motivated individuals in this regard and, second, to collect data for analysis with a tool designed to measure the frequency and type of activities that individuals are undertaking to reduce carbon emissions, the Activity Level measure.

The second aspect considers the frequency of physical contact with the natural environment throughout a person's lifetime; as a child, teenager and an adult. This aspect is addressed in order to extend the understanding of the relationship between such contact and environmental behaviour, by exploring whether or not physical contact at a particular time in a person's life influences the level of activity that person currently undertakes to reduce carbon emissions. This relationship also needs to be considered in the context that, perhaps, a child has a more restricted choice regarding how often he or she visits the natural environment than an adult. The survey respondents were asked to indicate the number of times they visited the natural environment, on average, during the three age periods: child, teenager and adult (see Appendix F, Q15). The next question in the survey relates to the amount of contact that is, or has been, due to work-related activities, i.e. contact that is due to an external factor. Such information enables a distinction to be made between pleasure and work-related visits so that any trends related to the distinction could be identified.

Section three of the survey contains questions that measure two aspects of carbon emissions. First, the type and amount of activities to reduce carbon emissions that individuals are currently undertaking, and, second, the total amount of carbon emissions that individuals produce, based on their consumption in daily living.

One of the conclusions from the interview analysis presented in the previous chapter is that there is a difference in the actual amount and type of activities that the motivated individuals are undertaking, even though they all perceive that they have a high level of motivation. The scores for the two quantitative tools incorporated in this stage of the research provide data on how many activities these individuals are undertaking and their total carbon emissions, which gives an indication of whether or



not they are achieving their aims of carbon emissions reduction and of their actual-intention gap, relative to the other individuals in the sample.

Lists of activities to collect data on the amount and type of specific environmental behaviours being undertaken have been developed in previous literature. For example, Barr *et al.* (2001) listed activities for waste behaviour and Kalinowski *et al.* (2006) considered the economic self-interest of recycling. The range of environmental activities detailed in these particular studies, however, were too limited for the purposes of this current study. Hence, a self-reporting quantitative tool labelled the Activity Level measure was specifically designed for this survey.

The Activity Level measure consists of two lists of everyday activities that contribute to reducing the total amount of carbon emitted into the atmosphere and records the frequency, on average, that individuals undertake each activity. The two lists of activities were designed to cater for respondents from a wide cross-section of lifestyles and ages. The first list contains 12 different activities, such as turning lights off, using public transport and purchasing local food products. The respondents ranked the frequency that they undertake each activity using a 5-point Likert scale, from never to always. The second list for the Activity Level measure consists of five one-off decisions, or occasional events relating to reducing carbon emissions, such as switching to a green energy supplier, which were answered with a Yes or No. The two lists are detailed in Appendix F, Q 17 and 18.

The two lists of activities were prepared by asking an elite group of 20 individuals to rank their most commonly undertaken activities to reduce carbon emissions. For the

first list, each person ranked all the activities they undertake from a longer list of possible activities, adding other activities that were not included. In the ranking, 1 represented the activity they do most commonly, 2 represents the next most common, and so on. The process for selecting the items on this second list involved asking the same elite group of people to detail one-off, or occasional, activities that they undertake, which are related to reducing carbon emissions, along with an indication, on a 3-point scale, of their perceived difficulty to undertake each activity. The lists include all the activities that were cited by the motivated individuals during the interviews (refer to Chapter Five) and other relevant examples found in the literature. The most commonly cited activities (cumulative score) were selected to create the two lists.

The individual score for the Activity Level measure was calculated as a total score from all the activities listed. The score for each activity in the first list was based on the categories for frequency of undertaking activity, i.e. never = 0, rarely = 1, sometimes = 2, often = 3 and always = 4. Each of the one-off activities was allocated a score of either 2 or 3, depending on the perceived level of difficulty that the elite group had indicated during the process of designing the measure. The two scores were then added together.

A second quantitative tool, the Carbon Emissions measure, was developed to supplement the Activity Level measure. This instrument collects reported data regarding domestic energy use, car use, and air travel and calculates the total carbon emissions for individuals. The calculations for the Carbon Emissions measure were

based on an existing carbon calculator<sup>8</sup> to ensure standardisation. Introducing a second measure increased the validity and reliability of the results from this stage of the research. External validity was further explored by cross-referencing the survey responses with the responses in the in-depth interviews.

There is a possible bias from the subjectivity of self-reporting that must be noted, in that the respondents may be tempted to state higher scores for the Activity Level measure and lower levels for the Carbon Emissions measure. This is because these individuals are aware that they should be undertaking more activities or producing less carbon emissions than people who do not perceive to be so motivated.

The final two questions in the third section of the survey are regarding the types of activities to reduce carbon emissions that individuals find the most satisfying, and most aspire to achieve. The survey question regarding the activities that the motivated individuals most aspire to, was modified from the possible selves questionnaire (Markus and Nurius, 1986). This questionnaire incorporated the ideas of knowing oneself and being able to identify the most, and the least liked aspects of oneself. Only the most liked aspect is used in this study and is linked to a person's self-reflective behaviour and desire to improve their behaviours as much as possible. The survey question was based on this particular model because it emphasises the capacity to change in the future, which is of particular relevance to this research. The survey question was designed to identify the highest aspirations that the motivated individuals have to reduce carbon emissions and the type of goals that they set to achieve these aspirations, regarding tangibility and achievability.

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8. [www.bp.com/extendedsectiongenericarticle.do?categoryId=9015627&contentId=7029058](http://www.bp.com/extendedsectiongenericarticle.do?categoryId=9015627&contentId=7029058) 20/08/06

The questions in section four of the survey focused on aspects of human needs. The respondents were asked to rank ten statements, using a 5-point Likert scale, regarding the satisfying of needs in life from, for example, having shelter, food, water and money to aiming to achieve their full potential and that of others. The statements were modified from Maslow's (1943, 1954) and used to test whether or not there is a discernible pattern common to the motivated individuals regarding the types of needs associated with the perception of having all that is needed in life. Maslow's model was chosen because needs of particular interest in this study, such as freedom and belonging, are differentiated in the model, and, hence, it is possible to distinguish between them in the results. The model by Maslow also incorporates all aspects of the United Nations definition of basic human needs, which is deemed to be an acceptable benchmark in this study. The United Nations understanding of the basic human needs includes the provision of adequate food, safe drinking water, sanitation facilities, health, shelter, education and information, income, employment, personal freedom and access to services.<sup>9</sup> The ten statements used for the question regarding human needs are listed in Appendix F, Q22.

To understand the ways people perceive that their needs are met, the survey respondents were also asked to define what they understand as their essential human needs and the amount of income that they believe they need to ensure they have those needs met. Income is one of the easiest ways to quantify the concept of meeting ones own needs, as meeting ones needs can be conceptualised in income terms as access to resources', which represent needs they consider that they require. Hence, a

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9. [www.un.org/esa/socdev/poverty/documents/boep\\_02\\_1996\\_EN.txt](http://www.un.org/esa/socdev/poverty/documents/boep_02_1996_EN.txt) 05/06/07

comparison can be made between individuals in the motivated sample regarding their economic perceptions related to meeting needs.

In section five of the survey, the questions focus on collecting quantitative data to measure the proposed defining characteristics of individuals who have an internalised motivation, using a 5-point Likert scale. The first question addresses the idea that developing an attachment to a particular place impacts on environmental behaviour. The second survey question is based on eight statements that comprise parts of the quantitative measures for the proposed defining characteristics. These measures are discussed in more detail in the next section.

The final question in the survey investigates the source of the value that respondents place on the natural environment. Previous studies indicate that experiences in natural environments as a child is likely to be one of the more influential sources (see page 34). The list of possible sources used in the survey question, from which respondents list the three most influential, was collated from the various causes identified by the motivated individuals during their interviews, and further examples from relevant literature, such as Harrison *et al.* (1987) and Chawla (1999). Several of the causes were linked specifically to the concept of value, such as valuing others, whilst others involved other influences, such as childhood outdoor experiences. The possible sources that were included in the survey question are listed in Appendix F, Q28.

### **3.5.1.1 Measures for the proposed defining characteristics**

Quantitative measures were developed for four of the five proposed defining characteristics of individuals who have internalised motivation to reduce carbon

emissions: a sense of value, a sense of responsibility, a sense of belonging and an ability to make connections. These four measures complement the findings from the interview analysis and provide the opportunity to test out the proposals regarding these characteristics with a public group, so increasing the robustness of the research overall.

The four quantitative measures for the other four proposed defining characteristic were labelled the Value measure, Responsibility measure, Belonging measure and Connections measure, respectively. Each of the four measures consists of three statements, which were selected by the following process. A list of statements that could apply to each of the four measures was made. The choice of statements for the list was based on material from the analysis of the in-depth interviews and from relevant literature as discussed in Chapter Five. To test for reliability, an elite group of 20 colleagues and friends were asked to link each statement with one of the four concepts – value, belonging, responsibility and connections. (Such a group was chosen because the individuals were easily accessible and had differing levels of knowledge regarding climate change mitigation). Five of the 12 statements were already incorporated into other questions within the survey. The remaining statements were placed in a random order in one question in section five of both surveys. The statements that comprise each measure are listed in Table 3.5.

For each of the four measures, the survey respondents ranked the sentences with a score between one and five using a 5-point Likert scale, whereby one equals strongly agree and five equals strongly disagree. The scores were entered on the spreadsheet in

reverse, i.e. a score of one was recorded as five, to facilitate the subsequent correlation analysis. Correlations were performed between each of the measures and the Activity Level measure and compared for the two samples.

Table 3.5: The statements used to measure four of the proposed defining characteristics.

Value measure:

- I appreciate, and want to protect, the natural environment
- I am valued in my life generally, and have a sound reputation
- I have a strong sense of self-value or worth

Responsibility measure:

- I am responsible for part of the problem of climate change
- I am responsible for part of the solution to climate change
- It is my duty, as a member of the human race, to take actions to reduce carbon emissions

Belonging measure:

- I am part of, and loved by, my family and have good relationships with my friends and colleagues
- I feel I belong to, am integrated in, and accepted by, society in general
- My favourite place in the natural environment relates to something in my past, or to a part of my identity

Connections measure:

- Individual actions to reduce carbon emissions, such as turning lights off, make a difference to addressing climate change
- Buying products from overseas contributes to carbon emissions in the atmosphere
- Understanding the climate change issues helps me take action aimed at reducing its effects

The data from the Activity Level and Carbon Emissions measures was used to test the fifth characteristic, the ability to self-reflect on one's behaviour. When the individual scores for the two measures are compared with the sample range for these measures, it is possible to gauge the effectiveness of their capacity to self-reflective and achieve their intended behaviour of minimal carbon emissions and gain an indication, in broad terms, of the extent of the actual-intention gap for each respondent.

### **3.5.2 Stage five: the email survey**

As a result of the analysis based on the written survey in stage four of the research, an email survey was then sent to the motivated individuals. The main purpose of the survey was to confirm the defining characteristics of individuals who have internalised motivation to reduce carbon emissions.

The email survey consists of five questions. In the first question, the motivated individuals were asked to select from a list of possible options the characteristics that they felt were *not* a key part of their motivation to reduce carbon emissions. The aim of this process was to identify those characteristics that play key roles in the internal nature of their motivation by eliminating others. The list, which is shown in Table 3.6, includes eight of the nine characteristics found common to these individuals as a result of the interview analysis. Contact with the natural environment was incorporated in the characteristic regarding the ability to make connections, as the natural environment was one of the aspects with which the interviewees described making a connection. The respondents were then asked whether or not any one of the options listed in Table 3.6 is the most influential factor in their motivation and, if so, why that option is so important.



Table 3.6: A list of possible defining characteristics of individuals who have internalised motivation.

- Having all you need (in material and/or non-material terms)
- A sense of responsibility (towards looking after the natural environment)
- A feeling of belonging (within family, community, workplace etc)
- A sense of freedom (in life in general)
- An ability to make connections (with the natural environment and/or ability to link actions and consequences in life)
- A sense of value (for self, others, environment and/or what we have in material terms)
- A feeling of competence (to undertake mundane activities repetitively)
- An ability to reflect on and strive to improve one's behaviour (specific to activities to reduce carbon emissions)

As a result of an interesting finding in the written survey analysis, the motivated individuals were also asked in the email survey whether they would prefer more local areas of natural environment near to where they live and/or work, or an easier and quicker access to larger landscapes further away, such as the coast, national parks, or mountains. There is an increasing awareness in the literature, as discussed in Chapter Two (see page 36), regarding the value of having local natural environments within urban settings and the positive influence of such places on people's sense of well-being. The final question in the email survey focuses on how the motivated individuals perceive they fit into society as representatives of individuals who take action to reduce carbon emissions. The interview analysis indicates that these individuals do not see themselves as leaders in society, but prefer to lead by example and trust that others follow. The purpose of the email question is to clarify whether or

not the interviewees do see themselves as role models, whereby they demonstrate in their daily lives how they think people should behave and, if so, in what manner.

### **3.5.3 Stage six: the survey for the public group**

The sixth stage of the research consists of a written survey that was completed by a public group of adults from the East Anglia region of the United Kingdom. There were two purposes for using this survey. The first purpose was to collect data regarding the four quantitative measures, each of which relate to one of the proposed defining characteristics of individuals who have internalised motivation, and compare the results for these four measures with the results from the sample of motivated individuals. The second purpose was to compare and contrast the results from both surveys regarding the following five topics: places of residence and work, contact with the natural environment, individual behaviour related to reducing carbon emissions, meeting human needs and valuing the natural environment.

There were two possible sources from which to select the public group: the electoral register and British Telecom Phone Book. It was decided that the Phone Book would offer the more representative population overall, although both the sources had a potential to bias the results. For example, a sample from the Phone Book generates a higher average age range compared to the sample of motivated individuals and excludes those people who just use mobile phones, whilst the electoral register provides a difference in the employment typology. As the typical response rates from public groups are generally around ten per cent, a sample size of 550 was initially selected with an option for a further 275 or 550 if required to achieve the goal of four times the number of responses from the survey completed by the motivated sample. In

November 2006, 550 surveys were posted to addresses randomly selected from the 2007 British Telecom Phone Book covering Norwich and North Norfolk. The 550 individuals were chosen by selecting a specific page in the telephone book, and then a specific entry on that page, using a table of random sampling numbers.

Introducing a group from the general public at this stage increases the robustness of the study overall (Babbie, 2001). The results and conclusions so far have been obtained using a biased sample of adults, all of whom are motivated to reduce carbon emissions. The public group was selected from a specified population with similar characteristics to the motivated individuals; namely, adults aged 20 to 69 who are in full-time employment and live in a predominantly rural area with one of two large urban centres and numerous smaller ones. There was no prior knowledge concerning the attitude that individuals within the public group have towards the natural environment, or the level of motivation, if any, that they have to carbon emissions reduction. Testing the results with a public group provides an opportunity to further the understanding in these specific aspects and determine how much the motivated individuals differ from people in the wider population.

The written survey, which has 26 questions divided into five sections, has a similar format to the survey that was completed by the motivated individuals (described in Section 3.5.1, page 96), with four modifications. First, only one favourite type of natural environment was asked for, because little additional information was gained by asking the motivated individuals for more than one. Second, as a result of this, the question concerning feelings at other type of places was removed. Third, the two questions on aspirations to reduce carbon emissions were removed, as there was no

prior evidence indicating that individuals in the public group have either taken specific actions to reduce carbon emissions or had aspirations to do so. Finally, the wording of the question regarding the source of value was changed so that only people who place a value on the natural environment answer the question, as there was no prior evidence that the individuals in the public group placed such a value.

### **3.6 Research design – phase three**

The purpose of this third, and final, phase of research (see Table 3.3, page 78) is to examine the mechanisms behind an increase in internalised motivation and to present all the contributors to the development of this motivation.

#### **3.6.1 Stage seven: the focused interviews**

This final stage employed a one-on-one focused interview technique to concentrate on the time when the change in motivation level was noted by the selected individuals.

Merton (1956) developed the concept of focused interviews, whereby a set of interview questions are developed based around a timeline specific to when a change occurred. Three main lines of enquiry were pursued during the interviews: the personal circumstances around the time of an increase in motivation, the specific factors that triggered and/or facilitated the increase and the impact of this increase on the nature of motivation and characteristics of the individuals. The same semi-structured format was used during the interviews that had been used earlier in the study; see page 92 for details. The flexibility of this format, a framework of key questions based around the three lines of enquiry, was used to guide the direction of the probing and enabled the interviewer to pursue lines of questioning that appeared

of particular interest in the context of this final stage. The interview guide for the focused interviews is given in Appendix K.

Five variables were used to select a subset of four individuals from the motivated sample, who were invited to participate in the focused interviews. Table 3.7 summarises these five, based on the following rationale. As the interview focuses on the time when an increase in motivation occurred, having an ability to recall such a time is important. Using the Activity Level and Carbon Emissions measures means that the individuals selected will have a relatively narrow actual-intention gap and, hence, a behaviour that reflects a high motivation in quantitative terms. The fourth

Table 3.7: The variables, including definitions and parameters, which were used to select the individuals for the seventh stage of the research.

<b>Variable</b>	<b>Definition</b>	<b>Parameter</b>
Increase in motivation	A memorable time when motivation increased to a high level	Motivation time at high level < 25 years
Activity Level measure	Score more than average value for sample	>43 <sup>10</sup>
Carbon Emissions measure	Score less than average value for sample	<11373 lbs CO <sub>2</sub> /yr
Carry on	Would carry on doing activities to reduce carbon emissions even if they were the only one	Yes
Behaviour automatic	Taking actions to reduce carbon emissions are instinctive and perceived as normal way of life.	Reference to behaving in such a way during interview

<sup>10</sup> score based on the frequency of undertaking activities and on perceived difficulty, see page 101

variable listed in Table 3.7, Carry on, reflects a persistence and commitment to undertaking activities to reduce carbon emissions and an intention to overcome the external pressure not to act. The final variable, that activities are undertaken automatically, indicates the value that individuals place on such activities and indicates that activities are being undertaken on a regular and ongoing basis. As a result of the analysis from the first four interviews a further six interviews were undertaken using the same focused format and the subsequent discussions regarding the interview analysis is based on these ten individuals, termed the selected individuals. All the interviews took place during February 2007.

### **3.7 Analysis of the quantitative and qualitative data**

The quantitative analysis of the surveys was based on the SPSS software computer package and makes use of descriptive statistics, such as frequencies and mean values, and association analysis, for example, the correlation coefficient. Quantitative techniques are used to select the most appropriate sample of individuals initially and then to test out and substantiate the findings from the qualitative analysis and from relevant aspects of the qualitative survey data that were quantified, using the SPSS format. The first method was to run a series of analyses using the Activity Level measure to collect quantitative data for four of the five proposed defining characteristics. The second method was to compare the survey results between the two samples in the following respects: places of residence and/or work, meeting human needs, valuing the natural environment, individual behaviour to reduce carbon emissions and contact with the natural environment. There are possible sources of bias, error and uncertainty in the quantitative techniques. Perhaps the main source of concern, as the robustness of the resulting analysis is only equivalent to the data that

the analysis is based on, is the sample size. While statistical significance levels take account of this factor, it is noted where conclusions might be unduly affected by the sample size. The testing and substantiating of various findings using a non-exploratory approach, informed by existing models, is a vital part of validating the research process.

The qualitative techniques were used to gain more detail concerning events or behaviours of individuals. The main analysis consisted of organising the interview texts into common and associated themes using three coding techniques and use of the NVivo qualitative software package. Written memos were made after each interview and during the transcribing as a way of consolidating the thought processes and clarifying the preliminary framework of pertinent topics, which evolved into an extensive network of analysis and interrelating concepts. The processes of line-by-line coding of the interview transcripts and case-by-case comparison were employed throughout the analysis. In line with the grounded theory approach, provisional explanations of the data were treated with scepticism until all the data was collected and the analytical procedures had been followed through to their logical conclusions (Strauss and Corbin, 1990).

Open coding is the most basic type of coding technique and involves slotting sections of text with similar meanings into groups with a common category code (Gibbs, 2002). This process is crucial for identifying trends and patterns within interview material and is central to ensuring that the final analysis is robust, as the conclusions evolve from the development of the codes and the resulting network of interrelated concepts and coding groupings. Pieces of the transcribed texts from the interviews

were read to identify the core word or phrase and a file, known as a node, was labelled with an appropriately related name into which these pieces of text were slotted.

Further pieces of text were either slotted into an existing node or under a new one as indicated and a number of free nodes (i.e. not linked) resulted. As new pieces of text were slotted into nodes, all the pieces already associated with that node were displayed so that the range and variation in expressions and opinions could start to be appreciated and significant relationships and the differences could be identified case-by-case.

In the second coding technique, known as axial coding, the labelled free nodes were grouped into a network of categories, the relationships between these categories explored and connections were developed and refined between them (Gibbs, 2002). A network of connected nodes was established, with sets of related nodes within an overall tree-like structure of branches in-between nodes at a number of levels. Each node has a causal influence on the next within the node set where it is located and nodes may be relevant to more than one connecting node and/or node set. As the axial coding progressed, underlying ideas emerged as the relationships between nodes and node sets were established. A much smaller number of nodes were identified that represent the underlying factors behind the resultant effects of the motivation and, hence, establish the defining characteristics of individuals who have internalised motivation.

The third stage of the qualitative analysis involved a technique known as selective coding, in which a core category from the number of axial codings is identified as the central theme of the thesis to which all other categories relate. The central theme is



the underlying characteristic that is recurrent in the interview data, interlinked with all the other categories and explains the main differences in the behaviour, specifically, to undertake activities to reduce carbon emissions. The process was extensive and, at times, problematic as more than one characteristic initially appeared to underlie the others. Clarification involved detailed cross-referencing across data collected from the various stages and followed the method suggested by Glaser (1978) whereby the central theme emerged from the extensive analytical process and without the need for theory, rather than Strauss and Corbin (1990).

The use of coding software is, in itself, no guarantee that all central theses will be identified and it is necessary to complement this approach with other techniques. For example, a vigorous process of cross-referencing and cross-matching of the qualitative data took place once the quantitative analysis of the three surveys from phase two of the research was complete (see Table 3.3, page 78). This led to new avenues of enquiry and options for connections between nodes and was an important part of completing the process. The new categories extended the earlier results into more extensive networks of node sets and the use of further techniques enabled a greater depth in the analysis. Complex Boolean, proximity and matrix searching techniques (Gibb, 2002) were incorporated into the analysis, for example, to enable terms to be reviewed in the context in which they were used and the most relevant sections of surrounding text analysed.

A number of efforts were made to ensure that the research conclusions were as robust as possible. For example, pilot interviews were undertaken to ensure that the most relevant questions were being asked and that the probing was effective. Reliability

was achieved by ensuring that the core questions were asked at the same place during each interview, that the formal input from the interviewer was standardized throughout the series of interviews and that, after each interview, the researcher wrote memos regarding the process and feelings on the day. Extra notes or impressions were added in the side margins during transcriptions in an attempt to reduce the impact of researcher biases, beliefs and assumptions and standardise the process. The interviewees, for example, could give socially acceptable answers in order to avoid negative judgement or they may not fully appreciate the reasons behind why they behave in particular ways and simply rely on trite justification that they think sounds plausible. Modification of the interview guide and semi-structured format was an essential part of ensuring that the relevant issues related to the research topic were pursued. The NVivo software package was used to reduce the possible threat from bias interpretation and the ignoring of negative cases (Gibbs 2002). Colleagues who were familiar with using the NVivo software coded a random selection of text sections for comparison and discussed any discrepancies and the interview analysis was modified as indicated to improve the consistency and reliability of the results.

Constant validity checking was performed to look for inconsistencies within the emerging patterns and alternative explanations as to why findings did not fit the coding system or theory. These anomalies are often the mechanisms to identifying new intricacies in the developing concepts and explanations (Bernard, 1994). Validity checks were undertaken by assessing the frequency of words or phrases within, and across, transcripts and checking between the survey responses and interview material using the technique of triangulation (Polkinghorne, 1994; Hanson *et al.*, 2005).

### **3.8 Concluding remarks**

The aims of this chapter were to present the conceptual and methodological frameworks for the research overall and to detail the methods for the three phases of research, comprising seven stages in total.

The study is multi-disciplinary in nature and based on grounded theory, involving a combination of exploratory and non-exploratory approaches and of quantitative and qualitative analytical techniques, in the form of surveys and interviews. This combination enables the motivation, which is poorly understood and of value when engaging people to take action, to be investigated with a flexibility to probe into new lines of enquiry as they emerge, whilst grounding the results in existing understanding and theories, so a more vigorous and standardized dataset is produced. The SPSS and NVivo software programmes are used to analyse the quantitative and qualitative data respectively.

The seven stages of research are as follows. The first stage is the process of participant selection, using purposive and snowball sampling to facilitate the access of a target group that is difficult to locate. The second stage involves an email survey to identify individuals with a substantial internal nature to their motivation to reduce carbon emissions, based on the self-determination theory developed by Deci and Ryan (1985), and to collect demographic data and general information regarding their motivation. The third stage consists of in-depth interviews to identify the characteristics that are common to individuals with such an internal nature to their motivation, and to collect data regarding the impact of perceptions of climate change on, and the causes of an increase in, their motivation level. The fourth, fifth and sixth

stages are based around three surveys that examine specific aspects of these common characteristics and confirm the proposed defining characteristics of the internalised motivation, which are then tested with the public group. The final stage, which examines the contributors to the development of the internalised motivation, consists of focused interviews regarding the time when motivation increases to its present level.

The results and analysis of research stages two to seven are presented in the following five chapters. The results from the first email survey are in the next chapter, along with the characteristics found to be common to individuals who have a substantial internal nature to their motivation. An extended discussion of these common characteristics and the subsequent proposal of the defining characteristics of these individuals is presented in Chapter Five. The results from the surveys in phase two of the research, which involve the motivated and public groups and the confirmation of the defining characteristics, are presented in Chapters Six and Seven. Chapter Seven focuses solely on contact with the natural environment. The results of the interviews that explored the time when motivation increases to its present level are presented in Chapter Eight and the overall findings of the research are presented in the concluding chapter, Chapter Nine.

## **CHAPTER FOUR**

### **THE CHARACTERISTICS OF INDIVIDUALS WHO HAVE INTERNALISED MOTIVATION**

#### **4.1 Introduction**

This chapter has three aims, all of which address the first key research question:

Are there common characteristics of individuals who are motivated to mitigate climate change?

The first aim is to identify whether or not any one of a number of context-specific or non context-specific variables is significant in the motivation to reduce carbon emissions. The second aim is to select individuals who have internalised motivation by using a modified version of the self-determination theory developed by Deci and Ryan (1985), as discussed in Chapter Three. The third aim is to identify the characteristics, if any, which are common to individuals who have this type of motivation.

There are three key findings presented in this chapter as a result the analysis of the first three stages of research. First, there are nine characteristics common to individuals who have internalised motivation to reduce carbon emissions. Second, these individuals overcome the possible barriers of uncertainty and intergenerational return by bringing the global climate issue to a local and tangible level. Third, once the motivation is perceived to have reached a high level, it is maintained at that level.

The results from stages two and three of the research are presented in this chapter. All seven stages of the research are outlined in Table 3.3 (page 78) and full details of the methods for the stages covered in this chapter are given in Chapter Three (from page

83). The results from the email survey are presented in the second section, including a classification of the levels of internalised motivation and a discussion regarding the consistent responses. The results of the in-depth interviews are presented in the third section including interviewee perceptions regarding the three dimensions of climate change as discussed in Chapter One and possible causes of an increase in motivation. The nine characteristics found to be common to individuals who have internalised motivation to reduce carbon emissions are presented in the penultimate section and these characteristics are discussed in detail in Chapter Five.

#### **4.2 Results from the email survey**

The results from 51 completed email surveys are presented in this section. They show that 53% of the survey respondents have a substantial internal nature to their motivation, 79% perceive that they have a high level of motivation and that once the motivation has increased to a high level it is maintained at that level. The age, gender and geographical location characteristics of the sample are presented, then the nature of the motivation within the sample and, finally, the relevance of the analysis results that have a significant consistent response.

The survey results can be used to define the gender and age characteristics of the sample of adults who are motivated to reduce carbon emissions. Refer to Table 4.1 for a summary of the statistics. Twenty five per cent of the sample was female, and the ages of the individuals range from 20 to 69. The mean age is 41, although the most represented decade is 50-59. There is no evidence on the basis of this small sample to suggest that motivation is dependent on age or gender. Given the skewed regional distribution of the sample detailed in Table 4.2, it is not possible to establish whether

or not motivation varies by region. A majority of the sample live in predominantly rural regions, however, with relatively local access to the natural environment compared to people who live in urban areas, which introduces an element of bias into the sample. The effect of this is likely to mean that any impacts on motivation due to contact with the natural environment would be greater than in the wider population. While this might limit the ability to draw conclusions from this process, it does not undermine the validity of the conclusions that can be drawn.

Table 4.1: Analysis results for two demographic variables, age (years) and gender, as percentage of total.

<b>Type/description of variable</b>	<b>Statistic</b>
	(n = 51)
Mean age	41
Modal age range	50 – 59 35% of total sample
Percentage of females	25%

Table 4.2: Analysis results for the geographical location (county) of the survey participants.

<b>County of residence</b>	<b>Statistic</b>
	(n = 51)
Norfolk	55%
Cambridgeshire	19%
Worcestershire	18%
Others (Suffolk, Essex, London, Shropshire)	8%

The survey results reflect the fact that the sample is characterised by a high percentage of individuals whose motivation to reduce carbon emissions has an internal nature, as desired. This fact is illustrated in Table 4.3, which shows the

distribution of individuals who have an extrinsic motivation with an internal nature and a score of 30 indicates a motivation with the highest degree of internal nature possible. Refer to page 89 for details of the scoring system. For the purposes of this study, the individuals who scored 30 are described as having a motivation with a *substantial* internal nature. As the statistics in Table 4.3 reveal, 83% of respondents have a score of 28, and above, out of 30, which signifies the sample characteristic of having a motivation with an internal nature.

Table 4.3: A classification (Likert scores) of internalised motivation.

<b>Score for a extrinsic motivation with an internal nature</b> (max = 30)	<b>Percentage of total respondents</b> (n = 51)	<b>Extent of internal nature to the motivation</b>
30	53%	Substantial
28-29	30%	Moderate
<28	17%	Lesser

Further analysis supports the sample characterisation regarding the extent of the internal nature of the motivation found in the sample. As Table 4.4 shows, all the statistics that were calculated for extrinsic motivation with an internal nature have values in the upper quartile with one exception, the value for the lowest score. The consistent response in the results towards the upper end indicates the sample characteristic of having a high percentage of individuals with a moderate or substantial internal nature to their motivation. This finding reflects positively on the process of selection used by the gatekeeper, and the results serve as a baseline for future comparative research with other groups of individuals.



Table 4.4: Statistics relating to the classification (Likert scores) of internalised motivation and percentage of total.

<b>Type/description of variables</b>	<b>Statistic</b> (n = 51)
Mean	28.4
Mode	30
Lowest score	18
Second lowest score	22
Score 28+ (out of 30)	83%
Score below upper quartile	0.04%

#### **4.2.1 Results with consistent responses**

The survey results showed evidence, in consistency of responses, for three features on the part of the motivated individuals. These are the only significant results from the 16 statistical association analyses performed, based on the survey responses, regarding motivation with an internal nature and other variables such as age, progeny, employment title, and budgetary responsibility at work. The statistics that relate to these three features are presented in Table 4.5 and discussed below.

One significant feature of the sample is the main interest, or focus, of the actions to reduce carbon emissions that each individual takes. The aim of this question was to gain an understanding into the extent of the concern that the individuals have, and whose interest the motivation is focused towards. At this stage of the study, the possible responses for the question were generic in nature to ascertain a preliminary understanding regarding the focus of an individual's actions. The nine possible answers listed in the survey question range from local concepts, such as oneself and

Table 4.5: Percentage analysis for the three features with a consistent response from survey results.

<b>Type/description of variable</b>	<b>Statistic</b> (n = 51)
Modal category of main focus of motivation	69% stated 'all living organisms'
Have overcome high level of resistance	45%
Perceived high level of motivation	78%
High level for 0-9 years	79% of individuals with perceived high level; 62% of total sample
High level for 10 + years	46% of individuals with perceived high level; 36% of total sample

family, to more global ones, such as the world human population and all living organisms. A clear majority (69%) stated that the main interest for their motivation is to help all living organisms. This suggests that a majority of this sample has a consideration towards other species and, perhaps, an inclusive rather than separatist approach to the role of humans on the planet. The second most common response was world human population (8%) and the other seven responses were all lower than 8%. As 90% of the respondents whose main interest is all living organisms have a substantial internal nature to their motivation, aspects related to the focus of efforts, such as the return for taking action, are pursued in the in-depth interviews.

The second feature with a consistent response from the sample is the level of resistance that has been overcome by the respondents to achieve the actions they are taking. There were three levels of resistance to choose from, low, medium and high. Nearly half of the respondents (45%) felt they had overcome a high level of resistance to achieve their goals of reducing carbon emissions. The sources of this resistance were numerous and included other people, the practices of various organisations and

the availability of, and access to, resources to facilitate their efforts. Overcoming such resistance reflects a determination and resilience to effect change. The abilities of individuals to overcome resistance are explored further during the in-depth interviews.

The third feature is the number of years that the survey respondents perceive that they have had a high level of motivation. The results in Table 4.5 show that for 79% of the individuals who perceive that they have a high level of motivation (62% of the sample), the change has occurred in the past decade. There is a weak and not significant correlation between time at a high motivation level and age ( $r = .21$  at  $p = .13$ ), which discounts the possibility that the change in level occurs at a particular age in a person's life. The results also indicate that once the motivation has increased to a high level subjectively, it is maintained at that level. It is crucial to ascertain early in the study what caused the increase in motivation for these individuals and whether or not it is an external incentive, such as financial reward or acknowledgement. Hence, identifying the cause is a key area of questioning in the in-depth interviews that follow in the next stage of the research.

#### **4.2.2 Conclusions of the email survey**

The main conclusions of the email survey can be summarised as follows:

- 1) 53% survey respondents (27 individuals) have an extrinsic motivation to reduce carbon emissions with a substantial internal nature;
- 2) the main interest for taking action for 69% of the respondents 'all living organisms' (90% of whom have a substantial internal nature to their extrinsic motivation), with 8% making up the next most common group;

3) 45% of the survey respondents perceive that they had overcome a high level of resistance, from various sources, to take action to reduce carbon emissions;

4) 79% of the respondents who perceive that they have a high level of motivation (62% of the total sample), the change has occurred in the past decade;

and,

5) once the motivation has increased to a high level subjectively, it is maintained at that level.

As a result of the survey analysis, two criteria were chosen with which the selection of individuals for the next (third) stage of the research was made. The first criterion is having a self-reported high level of motivation and the second is scoring a maximum of 30 for the two categories of motivation type that represent an external motivation with a substantial internal nature. The second measure is more objective than the first, although it is also based on self-reporting. Just over half (53%) of the survey respondents met the two criteria. The 27 selected individuals, two of whom discontinued their involvement due to their time constraints, were invited to participate in one-to-one in-depth interviews, the focus of the next section in this chapter.

For the rest of the thesis, these individuals, who all have an extrinsic motivation with a substantial internal nature, are referred to either as the motivated individuals or, in text requiring more specific terminology, individuals who have internalised motivation.

### **4.3 Results from the in-depth interviews**

This section presents a discussion based around three aims for conducting the in-depth interviews. Twenty five one-to-one interviews were carried out over a three month period at the beginning of 2006. The key characteristics of the 25 motivated individuals are presented in Table 4.6, using pseudonyms. The individuals are aged between 20 and 69 and in full-time employment in a professional capacity, such as a manager, educator or advisor, with an environmentally focused role either specifically or as part of their remit. It is possible that the interview responses are more informed by the role that the individuals have in their workplace rather than their own views and that their motivation is in the context of employment responsibilities that require them to take a certain stance, rather than corresponding to their own beliefs. While this possibility might influence the analysis, it is considered as part of the discussion and does not undermine the validity of the conclusions that are drawn.

#### **4.3.1 Perceptions of climate change**

The first aim of the in-depth interviews was to explore the perceptions and understanding that the motivated individuals have regarding climate change and how such perceptions and understanding impact on their motivation. The general areas of questioning that brought about these responses include the following: defining climate change, level of awareness and understanding of the physical impacts, the influence of the conflicting political and scientific predictions on motivation, the geographical mismatch, societal impacts and the delay in the return for taking action.

Table 4.6: Key characteristics of the 25 motivated individuals.

<b>Pseudonym and gender (F/M)</b>	<b>Age (decade)</b>	<b>County of residence</b>	<b>Employment title/type</b>
Adrian (M)	50	Norfolk	Managing director (environmental)
Ben (M)	40	Worcestershire	Sustainability officer
Colin (M)	60	Norfolk	Sustainable business adviser
Craig (M)	30	Norfolk	Environmental officer
Dan (M)	20	Cambridgeshire	Trainee manager (sustainability)
David (M)	60	Norfolk	Eco-technology director/consultant
Derek (M)	60	Norfolk	Business advisor/ manager
Eric (M)	50	Norfolk	Travel agent director
Graham (M)	30	Cambridgeshire	Sustainability manager
Giles (M)	50	Norfolk	Head of education institution
Helen (F)	40	Norfolk	Bed + Breakfast owner
Jane (F)	30	Worcestershire	Sustainability officer
Janette (F)	20	London	Sustainability consultant
Kim (F)	40	Norfolk	Environmental education services manager
Liam (M)	40	Norfolk	Environmental manager
Mike (M)	40	Norfolk	Sustainability manager
Nancy (M)	20	Norfolk	Environmental officer
Norton (M)	40	Cambridgeshire	Sustainable transport manager
Olivia (F)	40	Norfolk	Solicitor (environmental law)
Patrick (M)	50	Norfolk	Sustainability company owner
Pippa (F)	30	Worcestershire	Sustainability officer
Sandy (F)	40	Suffolk	Bed + Breakfast owner
Ross (M)	50	Norfolk	Sustainability manager
Tony (M)	50	Norfolk	Sustainability company director
William (M)	40	Cardiff	Environmental advisor non-governmental organisation

There is a high level of awareness and interest shown by the motivated individuals regarding how climate change is impacting on their natural surroundings. Twenty three individuals, for example, are aware that weather patterns are becoming more extreme and that the seasons have been changing over recent years. Lorenzoni *et al.* (2006) also found that chaotic weather and changing seasons are foremost in people's minds in the UK when they consider the impacts of global warming, a term synonymous with anthropogenic-induced climate change. As Jane describes:

*Jane: ...how the village green in my home town has turned from a lush green during the summer to a brown colour – it horrified me when I first saw it. It was awful, there was a whole series of hot winters and summers – it really felt like everything was wrong.*

The motivated individuals also described an awareness regarding changes in birdlife patterns and behaviour. For example, 23 of them either enjoy listening to the birdlife around them or go bird watching as one of their favourite pastimes, and the entire group described examples of the changes that they have noticed, such as nesting habits in wetlands and coastal areas or, as Colin explains, what is happening in their own garden:

*Colin: There are clear indications that things are changing. You know, I go from my own experiences in the UK ...you just don't see as many birds as you used to. I often sit watching the birds in my garden and have noticed over the past few years how few sparrows there are and robins seem to be around in summer and autumn. I remember how it was a real special sight to see a robin in the middle of winter – you'd never see them at other times.*

Although such awareness and interest is not a predictor of environmental behaviour (Harrison and Burgess, 1994; Bord *et al.*, 2000), the level of awareness regarding changes in their natural surroundings is indicative of the importance of such issues for the motivated individuals, and confirms that, for them, climate change is happening around them, and now.

As discussed in Chapter One, climate change has three unique dimensions: uncertainty, spatiality and temporality. Previous studies have found that uncertainty in scientific predictions opens up the possibility for people to ignore advice and minimise the perceived risks (Douglas and Wildavsky, 1982; Lidskog, 1993; Burgess *et al.*, 1998), claim ignorance in order to maintain their social identity (Michael, 1996) or take a wait and see stance (Serman and Sweeney, 2007). Twenty one of the motivated individuals perceive that the international scientific and political conflicts in opinion and the level of uncertainty surrounding the climate issue in general do not influence their motivation. The option of ignoring the advice is available to the individuals in this study. As Tony explains, however, a point is reached whereby there is a belief that taking mitigative action makes a difference and is the right way to behave, irrespective of the ambiguity surrounding the issue:

*Tony: I think the uncertainty is very disturbing as it is one of the biggest issues that all of us should be concerned about, um ...it doesn't alter my belief that it is basically true and we need to be doing something about it ...it just gives people like George Bush an excuse not to act. I see the uncertainty and conflicts in opinion as just tinkering with the detail ...the principle is there, the detail is incidental, by the way.*



Hence, uncertainty surrounding the climate issue is of little consequence for the majority of these individuals.

None of the motivated individuals has any direct experience of the environmental risks involved, which, as Maitney (2002) found, can have a positive influence in behaviour. Instead, the sample relies on informed, intellectual information, based on judgements regarding the opportunities and economic costs of controlling the risks (Slovic, 1987; Fischhoff, 1990). Although these individuals do not trust all the sources of information available, which, in previous studies is associated with not taking action (see, for example, Macnaghten and Urry, 1998; Burgess *et al.*, 1998; Lorenzoni *et al.*, 2007; Hulme, 2009), as Liam explains, this lack of trust has little impact on the motivation to respond one way or the other:

*Liam: It's difficult to trust much of what is in the media because the politicians, agencies or environmental groups invariably have their own agendas about what they are saying. Knowing that though doesn't affect my efforts, I tend to just ignore what they say and get on with what I'm doing. For me, there is a problem and how I live can help the problem, so I just get on with it.*

This lack of reliance on direct experience or external guarantees reiterates, perhaps, that believing actions make a difference is influential in taking mitigative action.

The vast majority of the motivated sample (19) is aware that events linked to the spatial dimension, such as flooding or droughts in other parts of the world, result in the climate issue being more in the forefront of their minds. Nancy, for example, describes how this enhanced focus serves to reconfirm her beliefs and concerns

towards the climate issue and acts as a reminder to reflect on whether or not she needs to change how she is responding:

*Nancy: When I become aware of the recent disasters, which are occurring around the world, I become distraught over how little people are doing to help others, fellow human beings. Seeing how other people have to live when I used to travel internationally had a similar effect on me. It makes me more motivated to do more to change my lifestyle.*

The other six individuals perceive that such reminders make little, or no, impact to their motivation. It is unclear, at this stage, why motivation is not always affected by the spatial dimension and this is explored in subsequent chapters.

A common perception that was identified by 22 of the motivated individuals is that climate-related disasters reported by the media are an immobiliser to others taking action, because the reports are often sensationalised. Although Ross explains that the shock tactics used by the media actually decrease the level of action by others, Ungar (1992) and Mazur and Lee (1993) had earlier argued that social scares due to actual world events potentially accelerate efforts to solve the problems.

*Ross: Scare tactics don't work... people are scared but because they don't link that to their own behaviour and they feel it is all out of their control, they do nothing.*

Sandy proposes one reason that may explain the contrast with these previous findings; as was discussed in Chapter One, the climate issue is unparalleled in many respects (see page 10):

*Sandy: People are left feeling that they have no control over the enormity of the issue ...and think that any efforts would make little, or no, difference.*

The perception that individual efforts make little difference chimes with the conclusions of studies by, for example, Miller and Seligman (1975) and Pelletier *et al.* (1999), whereby a lack of action results from a feeling that addressing an issue is beyond a person's control (see page 50). Specific to the climate issue, Moser (2006) found that individuals who believed that solving such a global issue was beyond their control had the desire to dissociate with the unpleasant emotions experienced. The heightened awareness of the unprecedented scale of the climate issue is likely to explain why, in this particular context, the media coverage acts as an immobiliser to taking action.

The motivated individuals propose that to engage other people in responding to climate change, it is important to break down the climate change concept to a local level, such as concepts of energy savings, efficient appliances and recycling rather than referring to the need to address climate change *per se*. Derek, for example, compared the issue of addressing climate change to the Grand Canyon:

*Derek: Understanding climate change is simply a matter of connecting at the right level. It's like relating to the Grand Canyon, for instance. The Grand Canyon is too large...its, its impossible to comprehend!...but the small canyons are wonderful, and of a size that a person can relate to.*

Previous work suggests that addressing environmental issues at a local level can be central to overcoming the barriers to taking action (see page 33). Lorenzoni *et al.* (2007) consider that at the local level, issues are more visible, tangible and offer more

opportunities for a resolution. Whitmarsh (2008) found that victims of air pollution have higher pro-environmental values and are significantly more likely to take action. Whitmarsh, however, did not find the same to be the case for flood victims, indicating that, here as elsewhere, there are factors other than experiencing environmental issues directly that are influential in taking mitigative action. The present results indicate that having an ability to translate the global issue to the local level is fundamental in addressing the climate context and this matter is discussed in greater depth in subsequent chapters.

The third climate change dimension, temporal, is intrinsic to climate change in all three time senses, the past, present and future. Climates have been changing as part of natural evolution for centuries. The current rate of global atmospheric temperature increase is unprecedented and anthropogenic activities are held primarily responsible. The scientific predictions regarding the impact of an ongoing atmospheric temperature increase indicate that the climatic changes will be felt for many decades into the future, which has implications for the return that can be expected from the motivation to take action. In previous studies, such as Idson and Higgins (2000), gaining a return for ones efforts was found to be the primary reason for taking action. Hence, the unique intergenerational timeframe for the return, or gratification, in this climate context could be perceived as a barrier to motivated action.

The interview analysis concludes that the return for the individuals who are motivated to reduce carbon emissions manifests in at least two ways. There is the short-term return whereby actions make a local and immediate difference; for example, installing loft insulation improves energy efficiency. All the motivated individuals described

this instantaneous return for their efforts, as well as one of the following two possible returns. First, as Patrick explains, taking action makes a difference to the individuals personally and gives them an inner sense of peace so they can live with themselves more easily and they are not particularly concerned what others think regarding their actions:

*Patrick: My actions allow me to feel that I have done what I can ...that I feel okay about the process and my impact on the planet ...I stand up for what I believe in ...and I feel good about being able to reuse things, it's something I can do whether others are doing it or not.*

Second, there is a sense of working towards something bigger by contributing to addressing the global atmospheric temperature increase, i.e. the greater whole. Giles describes that he feels more encouraged when he knows that others are also partaking and making efforts to reduce emissions, even though he does continue anyway:

*Giles: That is what I feel, you know, that my efforts are part of something bigger. If 100 people turn lights and phone chargers off and stuff like that, they would probably chat to 20 of their friends and ... as an individual I can only do so much and it's the multiple bits that are really important and that's what helps me keep doing my bit.*

The fourth manifestation of gaining a return for taking action to reduce carbon emissions is when an individual considers that all three processes above occur concurrently.

With each of the four manifestations above, however, the analysis found that the return is not the most important reason for the motivated individuals to reduce carbon emissions. As Mike and Graham explain, these individuals do what is right for their

way of life and to achieve a sense of happiness and self-satisfaction; the return is perceived of little relevance for why they act the way they do:

Mike: *...whether the benefits of my actions are now or much later has very little bearing on my efforts. This simply feels right for me.*

Graham: *The reason for taking action...it's more about a question of my own self-respect and well-being...than thinking about what I get as a result.*

There is a limited understanding at present as to why the return has such little meaning in the context of carbon emission reduction and this is explored further in the next stages of this study. There are two possible reasons that are apparent at this point. First, that the interviewees are high achievers in general and, in line with the theory developed by McClelland (1965), they focus more on the challenge than on the end result. It is also possible that due their self-reflective behaviour the individuals continue to strive and improve the ways that they behave, with little focus on the finished product. The opinion by the motivated sample that the return is of little importance contrasts markedly with evidence from the literature that a return is one of the main influencing factors in the vast majority of other motivations (see Chapter Two, page 57).

The second aspect related to the return is how the motivated individuals want their actions to be perceived by others in society. In the workplace, being a leader is generally implicit in the roles that these individuals have; examples include environmental manager, environmental educator, and owner of a Bed and Breakfast facility. As Liam reveals, however, there is no desire to be seen as a leader in the wider population:

Liam: *To lean over someone's fence and say hey, what you're doing...it doesn't quite work. To interfere in somebody's life is not necessarily acceptable – at work it's different, it's ok to go up to somebody and say that should not be there.*

These inconclusive results regarding how the motivated individuals want their actions to be perceived by others suggest that the return this particular motivation is part of the wider issues of where and how these individuals perceive that they fit into society and the theoretical concepts underlying this. These aspects are discussed in more depth in subsequent chapters.

#### **4.3.2 An increase in motivation**

The second aim of the interviews was to identify the cause(s) of the increase in motivation to the perceived high level. It is crucial at this early stage in the research to ascertain whether or not an external incentive, such as financial reward or acknowledgement, is primarily responsible. For example, in the case of a new employment opportunity it is possible to argue that the motivation to take action increases as a result of being paid to behave in a particular manner.

The motivated individuals identified one of the six categories shown in Table 4.7 as being responsible for the perceived increase in their motivation; four of them claimed there had been no specific increase, and were categorised accordingly. They all gave a single response to the following open question: You stated that your motivation increased  $x$  years ago – what happened then? Multiple coding was not possible at this stage as all respondents chose to give a single answer; none of them volunteered

Table 4.7: The distribution of responses regarding the reasons associated with motivation increasing to a high level (individual responses).

<b>Reason associated with increase in motivation level</b>	<b>Number of individuals</b> (n = 25)
Helping others to take action	3
Seeing impact of lack of action	1
Being aware of having skills that can help/knowing what to do	5
New employment opportunity (not associated with remuneration)	7
Having children	4
Remuneration for employment	1
High level all life/no increase	4

multiple reasons even though the open question format gave them the opportunity of a free reply. Giving only one reason may simply reflect the most memorable event for each individual at the time of the increase in motivation and, hence, misrepresent other reasons or it may be that a single reason is responsible for triggering other changes as motivation increases. The changes that occur with such an increase are explored more specifically in Chapter Eight. The most common reason cited is that the change occurred around the time that the individuals started their current employment. Adrian, Colin and Pippa describe the specific event that led to the perceived increase, associated with a realisation of having relevant skills, having children and a new employment opportunity, respectively:

*Adrian: I was sorting out the best eco-based heat pump system to put into a house I was renovating and realised that I seemed to know more about*



*the technology than the people selling the products ...and was able to explain the technology effectively to potential customers ...and realised that I had the skills that could help make a difference in reducing energy consumption.*

*Colin: It is personal to me. When my first child arrived, it became personal for me, my motivation to do as much as I could increased markedly as I realised that how I behaved now could affect future generations of my family.*

*Pippa: My motivation increased when I changed jobs. I was interested a bit beforehand, but in my new position I became much more engrossed in it and surrounded by people that were also working in the same field.*

A very important conclusion can be drawn at this stage. Namely, only one of the motivated individuals associates their increase in motivation with being remunerated for their efforts, i.e. that their motivation was driven primarily by the fact they are paid to reduce carbon emissions. This conclusion is encouraging, in that it suggests that there are other, more prevalent, factors that influence the motivation and indicates that there is relevance and value in gaining an understanding regarding the characteristics of individuals who have internalised motivation in the climate context. Further research, with a specific focus on the time around when the increase in motivation took place, is the essence of the third key research question in this study, once the significance of the internal nature has been ascertained.

#### **4.4 The characteristics of the motivated individuals**

The third aim of the in-depth interviews, and the final stage of this first phase of the research, is to identify whether or not there are characteristics that are common to the

motivated individuals. Refer to Chapter Three (page 91) for detail of the methods that were used to identify them. The initial patterns that emerged from the first stage of the qualitative analysis included categories, or nodes, such as spending time in nature, treat others well, need to compromise, dislike for waste, action versus inaction, being part of a community, rural versus urban, non religious and seeing/hearing birdlife. Nine axial codes, or categories, were identified at this stage, as the uppermost connected nodes in the node tree. Each category represents a characteristic of the motivated individuals, i.e. individuals who perceive they have a high motivation to reduce carbon emissions and have a substantial internal nature to their motivation. The nine common characteristics of these individuals are listed in Table 4.8, in no particular order of importance, and are discussed in depth in the next chapter.

Table 4.8: The nine characteristics common to the motivated individuals.

- Act in a responsible manner
- Ability to link actions and the consequences
- Feel competent when undertaking activities
- Feel a sense of independence in climate-related decisions and actions
- Have strong social networks
- Have all that is needed
- Value things in life
- Have regular contact with the natural environment
- Reflect on and strive to improve one's behaviour

#### **4.5 Concluding remarks**

Even though there is a range of typologies within the sample of 25 individuals, the following points are drawn in conclusion. The uncertainty dimension, and conflicting opinions, surrounding climate change does not impact on motivation to reduce carbon emissions, when the motivation has a substantial internal nature. The spatiality dimension, such as flooding in other countries, acts as a reminder for individuals with this type of motivation to reflect on their behaviour regarding the actions they are taking. The motivated individuals suggest that the geographic mismatch leads many others to take no action because people feel helpless against such a global issue and that the ability to address the climate issue at the local level and identify specific actions that can be undertaken is central to overcoming the barriers to taking action.

It is also concluded that the long term return for taking action is of relatively little importance to the motivated sample. The return most commonly manifests as the local short-term impact of achieving tangible actions such as insulation and recycling, which overcomes the possible barriers of uncertainty and intergenerational return. The individuals propose that to engage other people in addressing climate change the issue needs to be broken down and understood at the local level. Questions remain regarding how these individuals want to be perceived in society, which are explored further in the next phase of research.

It was found that the length of time that the motivated individuals have had a perceived high level of motivation ranges from one year to all of their life. The increase is not age-related, or due to the remuneration from a employment even though the most commonly cited reason for the increase is a change in employment.

Most crucially, in the context of this study, is that once the motivation is perceived to have reached a high level, it is maintained at that level. Further work is needed to resolve why the increase occurs, which is the focus of the third key research question and the results are presented in Chapter Eight.

## **CHAPTER FIVE**

### **EXAMINING CHARACTERISTICS OF INDIVIDUALS WHO HAVE INTERNALISED MOTIVATION**

#### **5.1 Introduction**

The purpose of this chapter is two-fold. First, the nine characteristics that were identified in Chapter Four as common to the motivated individuals are discussed. Refer to Table 4.8 (page 141). Questions remain regarding whether or not the nine characteristics represent the defining characteristics that predispose individuals to have an internal nature and this matter is also examined in this chapter, as part of addressing the second key question:

Can the defining characteristics of the internal nature underpinning the motivation of individuals to mitigate climate change be identified?

Behaving in an environmentally-friendly way is of primary importance to the sample of motivated individuals. These individuals value the actions that they take to protect the natural environment and believe that their actions make a valuable contribution to the climate issue. As discussed in Chapter Four, however, there is a range of typologies within the motivated sample that indicates a perception of having a high level of motivation yet does not necessarily indicate a particular level, or type, of behaviour regarding carbon emissions reduction. These aspects are explored further in this chapter.

Each of the nine characteristics common to the motivated individuals is discussed in the subsequent sections of this chapter, and five defining, or essential, characteristics

are proposed. Examining the literature and interview analysis together informed the direction and format of the methods for the next phase of the research by identifying the key issues and type of data required. The literature review includes the consideration of models and theories that would contribute to the development of quantitative-based tools to further the understanding of this particular motivation. Full details of the methods for the next phase of data collection are given in Chapter Three, page 95.

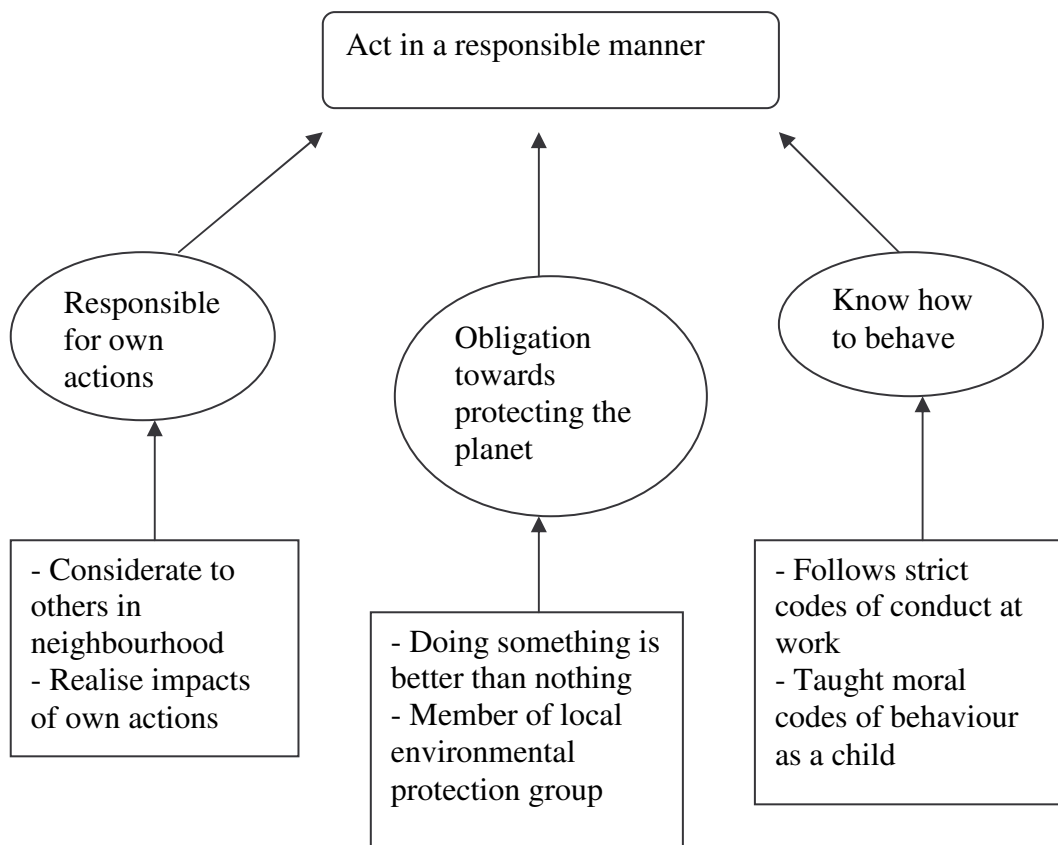
The discussion in the penultimate section of this chapter includes a summary of how the nine common characteristics map onto the five defining characteristics and a comparison of the results from this study with the interpretation by Deci and Ryan (1985) in their motivational model. Three of the nine common characteristics are associated with the self-determination theory developed by Deci and Ryan that was used to select the individuals who took part in the interviews. Deci and Ryan identified three components (which they termed basic psychological needs) that positively affect the level of the internal nature of motivation specifically: namely competence, autonomy and relatedness. The three characteristics of the motivated individuals that are associated with these three needs are: feel competent when undertaking activities, feel a sense of independence in climate-related decisions and actions and have strong social networks, respectively. The chapter ends with concluding remarks.

## **5.2 Act in a responsible manner**

As highlighted in Chapter One, there is an individual responsibility at all levels of society to take action to address climate change. Individuals are an integral part of

society. How individuals choose to behave and the type of lifestyle they choose to follow influences the overall impact that society makes towards addressing climate change. The responsibility to take action can manifest itself as an obligation to care and protect the planet in a stewardship role (Rogers, 2000) and/or a capability to take action because of the current scientific and technological intellectual understanding humans have in their status (Des Jardins, 1997). The former concept of responsibility (obligation) acts as a driver of motivation, whilst the latter concept acts as a driver and/or a product of motivation. The way in which the characteristic of acting in a responsible manner evolved from the analysis is schematically shown in Figure 5.1.

Figure 5.1: Examples from the interview analysis of how the characteristic ‘act in a responsible manner’ evolved.



The interview analysis revealed that the word *responsibility* was used, in the context of addressing climate change, by all of the 25 individuals during their interviews. This word was also the third most frequently used word throughout the whole set of interviews. Table 5.1 shows the numerical values for the most frequently used words throughout the interviews, indicating the relative position of the word responsibility. The frequency stated in the right hand column of the table excludes word use in interviewee questions and interviewee responses immediately following such questions. The high frequency of this particular word suggests that concepts associated with the responsibility to address climate change are of importance in the lives of the motivated individuals.

Table 5.1: The words (number of references) with the highest frequency of use, in the interview material, that are important in the context of the research.

<b>Word</b>	<b>Number of interviews that include word</b> (n = 25)	<b>Number of paragraphs from all interviews that include the word</b>
Happy	21	79
Family	23	87
Value	25	72
Outdoors	25	70
Responsibility	25	77

The motivated individuals all stated during their interviews that they felt that they have an obligatory sense of responsibility to take care of the planet, i.e. that they *should* take action. Craig, for example, describes a desire to care for the natural



environment, and its resources, in a sustainable way, and to pass the planet, in its entirety, on to the future generations, in a stewardship type of role:

*Craig: We have a duty of care towards the environment and future generations, so it's essential we uphold that duty and only use the resources we need.*

A sense also prevailed during the interviews that these individuals care very strongly for, and place a high value on, their natural surroundings, as Derek explains:

*Derek: We recently found an injured animal in the local park and took it to the local rescue centre ...then went back and cleaned up the rubbish near where we'd found it.*

As discussed in Chapter Two, previous studies conclude that having a sense of responsibility plays a role in environmental behaviour (see page 47) and the present results complement this understanding, in the context of carbon emissions reduction to mitigate climate change.

The interviewees perceive a different primary reason underlying the responsibility towards the natural environment. For example, Mike relates the action to being a societal responsibility, chiming with Sandilands (1993) and Gifford (2007):

*Mike: Everyone is responsible, because we all have a collective responsibility towards the planet and taking action.*

Pippa, however, considers that the responsibility to act is at the individual level correspondingly to the opinion of Hammond (1999) and Kennedy *et al.* (2009).

*Pippa: I don't see any personal excuse from taking responsibility for what we all do. We are all responsible ...everyone of us living on this planet ...to do something.*

Adrian highlights the sense of value that is associated with the responsibility to act:

*Adrian: It is always important to look after the things we value and care about ...and our natural surroundings are no different; we have a responsibility to look after them.*

It is unclear at this stage whether or not the specific reason underlying the obligation to act is relevant in the climate context. Previous work supports the suggestion emerging from the present analysis that having a sense of responsibility *per se* is important in achieving a narrow action-intention gap, rather than necessarily the specific focus of that responsibility.

The sense of responsibility that an individual feels can be influenced by positive or negative factors. Positive factors, for example, include a financial reward or a feeling of contentment and negative ones include a non-compliance penalty or a feeling of guilt. Twenty three of the interviewees, including Ross, perceive that the responsibility they feel towards taking action is influenced by positive factors and has the effect of making them want to take more action to address the issue:

*Ross: The more efforts I take to recycle and consume less, the more aware I am of being responsible to do so, and to do more.*

The other two interviewees associate their sense of responsibility with an avoidance of the shame they would feel if they took no action, as Jane describes:

*Jane: I don't want to be a part of making it worse – that would make me feel awful.*

Hence, the vast majority of the motivated individuals in this study are influenced by the positive factors of the responsibility to reduce carbon emissions rather than the negative ones; this chimes with the work by Burgess *et al.* (1998), who found that

making people feel good about actions, such as turning off lights and recycling cans, is more effective than, for example, promoting a sense of guilt.

Kim illustrates that taking responsibility has positively influenced motivation to undertake action in schools, which corresponds with another conclusion by Burgess *et al.* (1998); namely, that when people are allowed to get involved out of their own free will and take ownership of their actions, rather than being forced to act via legislation and regulation, they have a more positive experience:

*Kim: I like how the schools haven't been forced into environmental work – they have been encouraged to act accordingly by having the gaps in possibility filled and the barriers removed, so creating a free open flow of activity and response. It has meant that the teachers and children have made the choice and taken the responsibility to act, and so are doing it for themselves because they understand it as the right way to behave, so feel more positive about their efforts, because they are doing what they want.*

During the interviews, 24 of the motivated individuals identified their sense of responsibility towards reducing carbon emissions was that they were taught to be responsible when they were children, as Sandy describes, by their parents and other people that they had close contact with, such as family members and friends of their parents:

*Sandy: We had together parents who taught us to be very responsible, you know, if we wanted something we had to work for it, when I was old enough to earn money I had to pay my way at home so went and spoke to a family friend who gave me a job cleaning*

All these people instilled in the motivated individuals, the importance and the value of being responsible for oneself, one's actions and the consequences of those actions.

The motivated individuals choose to take responsibility for their actions similar to the way that they approach life in general, not just in relation to climate change. For example, they described, during the interviews, how they manage their finances within their means, are punctual to commitments and try to learn from their mistakes. Another example of their sense of responsibility in this wider context is their attitude towards religion. For example, 23 of the 25 interviewees said that they are atheists and Mike describes why this is the case:

*Mike: I'm a complete atheist because I'm not really into this external influence, you know, reliant on another being or whatever because, when push comes to shove, the choice is down to you what you do in your life.*

The other two interviewees were not specific in their replies regarding their religious preferences. Hence, having a sense of responsibility for one's actions is important in all aspects of life for the sample of motivated individuals.

The interview analysis revealed an inconclusive response concerning the degree of altruism, or desire to help others, required to take mitigative action. Eleven of the motivated individuals made comments similar to Colin:

*Colin: I can be altruistic at times...not sure how much that affects my efforts though.*

The rest of the sample was either not sure or suggested that other people might have a better idea than they would. Altruistic motives have previously been found to be necessary for individuals to contribute in an effective way, because environmental

quality is a public good (Stern, 2000; Kalinowski *et al.*, 2006). The inconclusive response in this study regarding the role that altruism plays in motivation indicates, perhaps, that these individuals perceive the climate issue to be personal as well as a public concern.

As a result of the interview analysis, it is proposed that having a sense of responsibility is one of the defining characteristics of individuals who have internalised motivation in this climate context. This sense manifests itself as an obligation to act towards reducing carbon emissions. This proposal raises the question of whether or not the sense of responsibility is a characteristic of individuals in the wider population; a question which is pursued in the next phase of research.

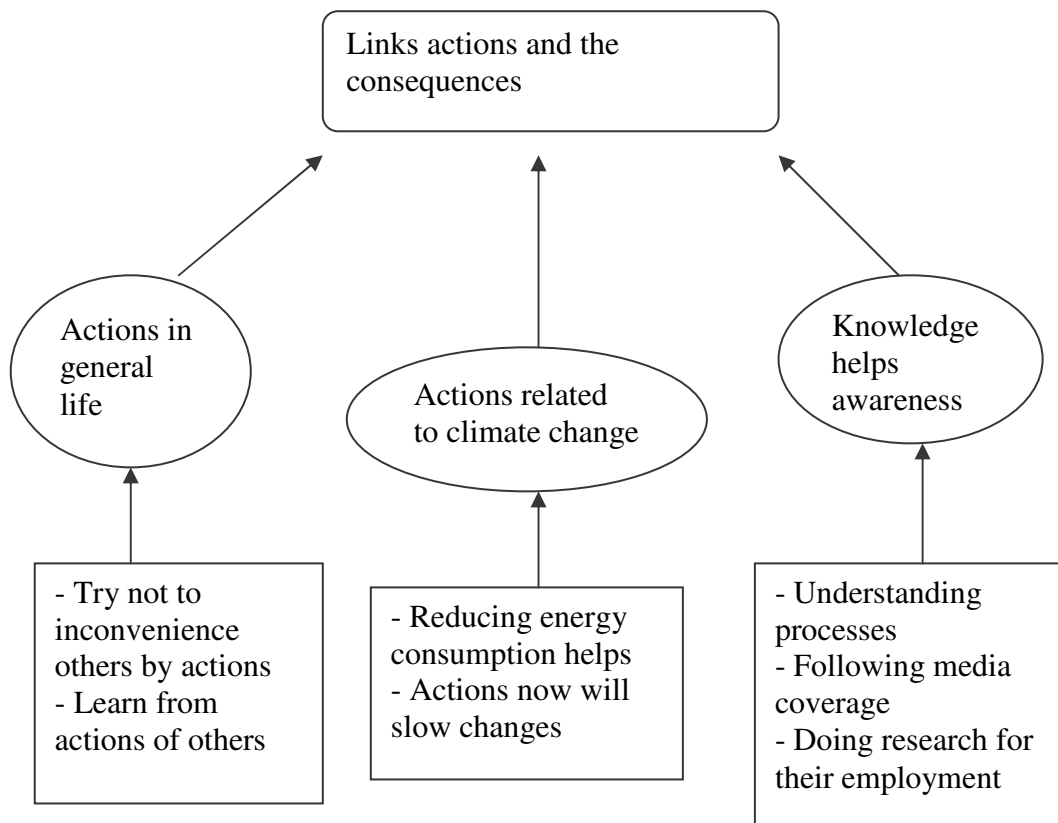
Factors other than a feeling of responsibility have been found to play a role in environmental behaviour. For example, in her Leeds-based study, Eden (1993) concluded that a feeling of responsibility partly determines individual practices, though the translation of this feeling into consistent action is complex and dependent on other factors, such as social context. Hinchliffe (1996) found that a responsibility towards future generations did not necessarily translate into taking action due to the scepticism that the claims of climatic problems may not be substantiated. Hence, it is important at this stage to consider the role that other factors play in the context of carbon emissions reduction, as well as a feeling of being responsible.

### **5.3 Linking actions and the consequences**

The discussions in Chapter Four indicate that the motivated individuals make links between actions and consequences. All the interviewees described the same

underlying connection as the fundamental reason behind their motivation to address climate change; namely, that by undertaking activities to reduce carbon emissions now, the average rate of atmospheric temperature increase will slow in the future. The manner in which this second characteristic, the ability to link actions and consequences, evolved from the interview analysis is schematically shown in Figure 5.2.

Figure 5.2: Examples from the interview analysis of how the characteristic ‘linking actions and the consequences’ evolved.



The interviewees describe an ability to make broad connections regarding the spatial and temporal dimensions of climate change; Liam and Craig provide examples of this:

*Liam: I've noticed how the seasons are changing around Norfolk and this makes me want to do as much as I can to slow the warming down.*

Craig: *I always think about the carbon emissions involved when I buy products that are made abroad.*

Although such descriptions during the interviews referred to different aspects of life, for example, at work or at home, the overriding theme is one of understanding the connection between local and global and between present and future. Kim and Derek describe this sense of connection in a more generalised approach to life, not specifically regarding climate change:

Kim: *What happens in school should be a microcosm of what we want to see in society, and we need teachers to step back and ask do I like what I see?*

Derek: *I just see life as one great big wheel...it goes round and round...and everything is connected to everything else in big feedback loops.*

It is unclear whether or not the specific context in which individuals describe their ability is relevant to taking mitigative action; the analysis indicates that having an ability to link actions and consequences *per se* seems important in achieving a narrow action-intention gap, in a similar manner to having a sense of responsibility (refer to the previous section).

It is evident from the interview analysis that the motivated individuals are knowledgeable regarding the science of climate change and the solutions available both at work and at home. The interviewees were asked specifically what they understood by the term climate change and how they perceived the local versus global dimension (see Appendix E); many also discussed aspects of their understanding of climate change during the general dialogue. All the individuals comprehend the main

sources of carbon dioxide, as the major contributing gas to the enhanced greenhouse effect, the impacts they make as individuals by emitting carbon emissions as part of their lifestyle and believe that having such understanding facilitates their ability to make connections between the concept of climate change and taking action to slow down the impacts of climate change, as Tony and Janette explain:

*Tony: Earth climate is changing as a result of global warming which is caused by an increased use in energy and carbon dioxide being released and affecting the make up of the atmosphere and causing more turbulent weather and generally warmer weather. My focus is mainly three-fold...reducing how much we use our vehicles, how much we use the heating in our home and recycling what we can.*

*Janette: I know that, for me, understanding that how much energy I use affects what's in the atmosphere and how warm the planet will get in the future means I make efforts to use less.*

There is little indication that knowledge itself directly leads to environmental behaviour (refer to page 31). For new information to be perceived as reliable and informative it needs to be consistent with the existing beliefs held by individuals; otherwise such information is dismissed as erroneous (Nisbett and Ross, 1980) and can generate a sense of inertia towards changing behaviour. It is unclear from the interview analysis exactly how knowledge concerning climate science and possible solutions influences mitigative behaviour and the impact of such knowledge is explored further in Chapter Eight.

As a result of the interview analysis, it was found that having the ability to bring the global climate problem to a local level regarding their day-to-day behaviour is



influential in the motivation to reduce carbon emissions; for example, Ross and Helen describe their efforts in setting local and immediate goals in everyday living:

Ross: *It's so easy, and often cheaper, to recycle stuff and help the planet at the same time. I have boxes for everything, at home and at work.*

Helen: *If we go anywhere, we always go by public transport ...I don't feel the need to have to have a car and know just how important not having one is to help protect our environment.*

This finding chimes with the earlier discussions regarding the need to overcome the spatial dimension of climate change in order to engage individuals. The interviewees understand and believe that their actions at the micro level make a difference to the global issue at the macro level. Twenty one of them, including Graham and Derek, construe their actions as being the individual parts contributing to the whole:

Graham: *Every little bit helps...it's like each pebble is needed to make up a beach, or the man who makes a difference to one starfish by throwing it back in the sea – everyone just doing their bit.*

Derek: *It's a tiny, tiny drop in the ocean, what I do – but many drops make a bucketful, don't they...*

Linking the local and global aspects is reflected in previous models concerning environmental behaviour. Maitney (2002) proposed three ways that people address the gap between concern and action (see page 41), one of which is having a sense of making a difference in a similar fashion to how Derek perceives his actions. Overton and Scheyvens' (1999) concluded that frameworks for understanding global environmental concepts must be localised in the specific contexts of action in which the goals, values and motives are located. The extent to which the interviewees

associate their local actions and the global impact is likely to explain the difference in opinion within the sample regarding the spatial dimension of the climate issue.

Twenty three of the motivated individuals, including Craig and Janette, believe that unless people can make the connections between their actions and the consequences of those actions in the context of climate change, they are unlikely to make the necessary changes to their lifestyles however concerned or aware they are of the issues surrounding climate change:

*Craig: People say yes there's a problem and I'm very concerned, but it's nothing to do with me and the government needs to do more...*

*Janette: I listen every day as parents drop their children off at school talking about the latest disaster around the world and how tragic it is and watch them hop back into their fuel guzzling 4x4s and speed off down the road. They don't seem to have a clue...*

The implication from this result is that having concern may lead to environmental action, and yet may not, and this is reflected in previous work as was discussed in Chapter Two (see page 39). The present result reiterates that there are factors other than environmental concern that are more influential in taking mitigative action, such as the ability to make connections; this is significant, perhaps, for policy development to engage people in carbon emissions reduction.

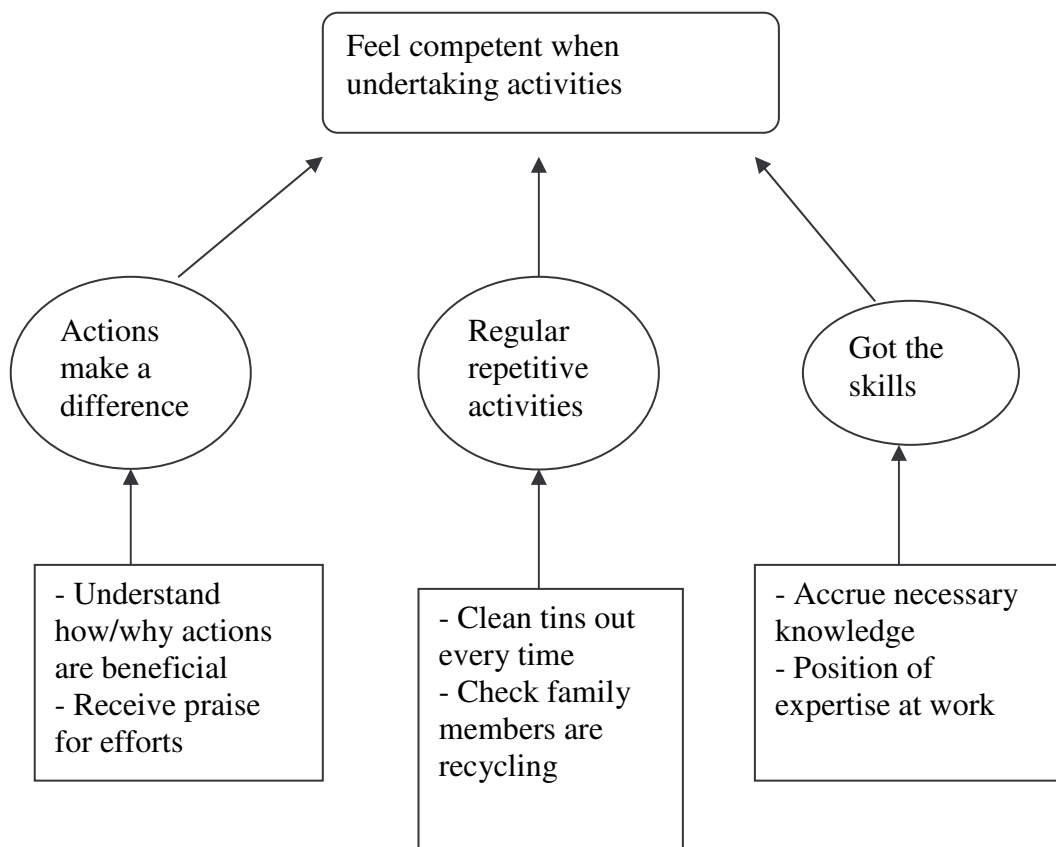
As a result of the interview analysis, it is proposed that having the ability to make connections is one of the defining characteristics of individuals who have internalised motivation in this climate context. These individuals make connections between actions and consequences in the way they approach life in general, not just in relation

to climate change. The proposal regarding this second defining characteristic raises the question of whether or not the ability to make connections is a characteristic of individuals in the wider population; a question which is pursued in the next phase of research.

#### 5.4 Feel competent when undertaking activities

The third characteristic of the motivated group is having a strong sense of competence regarding the activities that they undertake to reduce carbon emissions. The manner in which this characteristic evolved from the interview analysis is schematically shown in Figure 5.3. The feeling of competence can be associated with the belief these

Figure 5.3: Examples from the interview analysis of how the characteristic ‘feel competent when undertaking activities’ evolved.



individuals have that their actions make a difference to the global climate issue. They have brought the global problem to a local level and can see solutions and undertake actions that they believe make a difference.

The motivated individuals described during the interviews that their feeling of competence in the climate change context is due to having the ability to introduce and maintain the activities to reduce carbon emissions in their everyday lives. As Giles and Janette describe, most of the activities they undertake are simple repetitive actions and not complex in nature:

*Giles: I just make sure I recycle the rubbish in the right bins, switch off lights and other appliances rather than leaving them on standby.*

*Janette: I'm a stickler for making sure all our computers and chargers are off ...and always think about putting an extra jumper on instead of turning the heating up.*

The feeling of competence in the context of this study concerns whether or not individuals believe that they are undertaking a sufficient number of activities to reduce carbon emissions and on a regular enough basis to make a difference, rather than believing that they have mastered the skill to undertake each particular activity adequately. Ross comments on his ability to introduce and maintain activities in his daily living and Pippa explains the importance of undertaking activities:

*Ross: Doing the activities effectively is not difficult...it's more about remembering to do them on a daily basis...though now so many of them are part of the way I live, I don't even think about the fact I'm doing them.*

*Pippa: It's better to at least be doing something, than doing nothing because you're not sure how best to do it. Anything is better than nothing.*

The analysis found that there are two work-related situations when the feeling of competence plays a role in influencing motivation to reduce carbon emissions. Olivia highlights the first situation, in which up-to-date policies and strategies need to be developed in areas of professional expertise:

*Olivia: Environmental law requires vast knowledge about the latest regulations and a certain level of competency necessary to apply them appropriately to a number of concerns.*

The second situation is when climate-related information is shared in a way that empowers others to take the necessary action. For example, in his role as environmental educator, Ben accrues information and focuses on teaching others, so these people can make informed choices and take action themselves:

*Ben: I present in monthly meetings some of the up-to-date possibilities that schools can focus on, in terms of energy, waste and transport and then they share good practice and their ideas and introduce new material...then they go away and develop plans which fit their specific schools.*

Previous studies found that feeling competent is important when educating others in the contexts of health promotion (Jensen, 1997; Simonsen-Rehn *et al.*, 2006) and economics (Stark *et al.*, 1998). This study adds to that understanding by providing empirical evidence regarding the importance of competence when educating others in the context of carbon emissions reduction. In both of these two work-related situations, the feeling of competence develops once an individual is in the position and carrying out the responsibilities of the employment.

Thus, it is indicated that in this climate context a feeling of competency acts as a facilitator of how they behave due to an ability to undertake mundane acts repetitively. This indication raises a question regarding the specific mechanisms through which this facilitation is achieved. This question is addressed in the final phase of research that explores the changes that take place to affect a perceived increase in motivation to a high level and the results are presented in Chapter Eight.

### **5.5 Feel a sense of independence in climate-related decisions and actions**

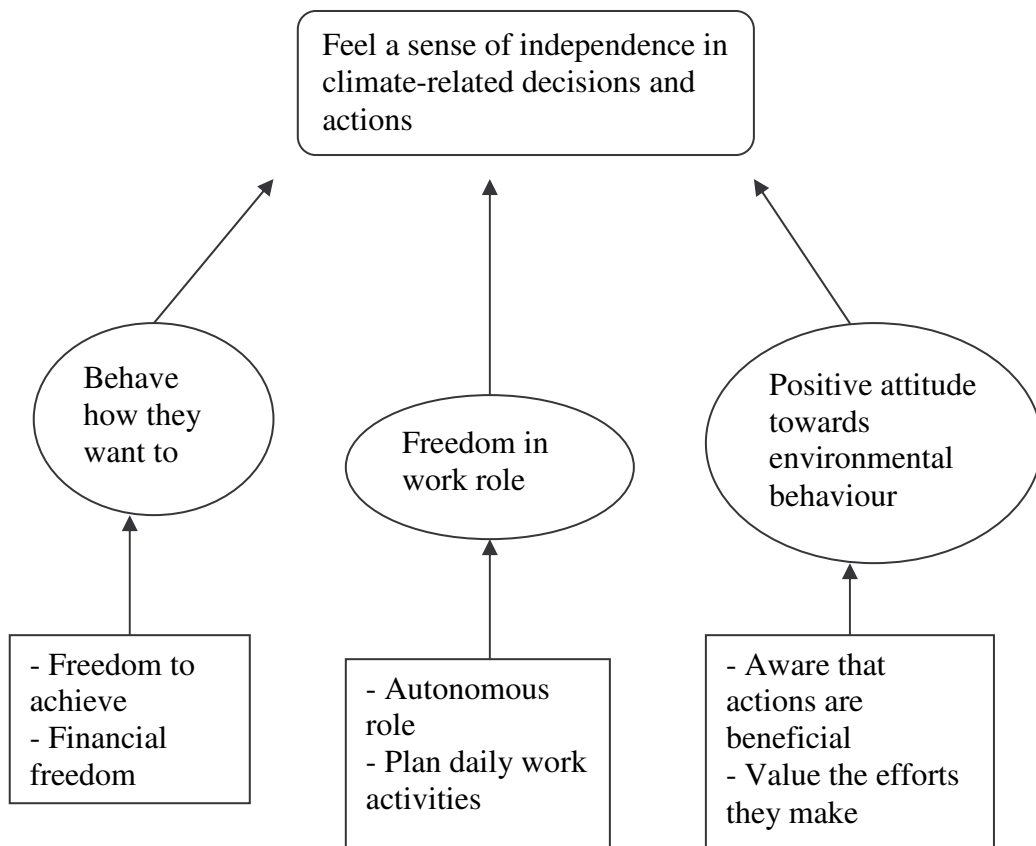
The manner in which the next characteristic of the motivated sample, feeling a sense of independence in climate-related decisions and actions, evolved in the interview analysis is schematically shown in Figure 5.4. Feeling independent when making decisions can be interpreted as governing oneself or feeling autonomous and the term freedom is used as a synonym for autonomy in this study.

Findings derived from the interview analysis support conclusions from earlier studies regarding the positive association between independent, self-determined environmental behaviour and having environmental attitudes. Previously, Green-Demers *et al.* (1997) and Seguin *et al.* (1999) identified the importance of independence and self-determination in promoting and sustaining environmentally friendly behaviour. Also, Villacorta *et al.* (2003) concluded that having environmental autonomy and self-regulation is significantly related to maintaining positive environmental attitudes over time. The reflections by Ross and Eric indicate that this association exists both in the workplace and at home, implying that the process, in this context, is internalised rather than reliant on external influences:

Ross: *The role I have gives me the autonomy to ensure all efforts are made by the staff to follow the recycling guidelines and initiatives.*

Eric: *It is easy to do all the necessary things at home, because I am in charge there.*

Figure 5.4: Examples from the interview analysis of how the characteristic ‘feel a sense of independence in climate-related decisions and actions’ evolved.



The interview analysis revealed that the motivated individuals feel that they have a sense of independence regarding their current role in the workplace. For example, those individuals who work within companies have roles that imply a certain degree of autonomy, such as environmental manager or environmental lawyer. Those individuals who have decided to work for themselves demonstrate their independence by the nature of that decision; Sandy and Helen describe ways in which they are

actively marketing and developing the environmental aspects of their businesses, which they perceive as their core ethos:

*Sandy: As you will see when we wander around, there are a number of signs in the guest rooms to encourage people to turn off the lights and to not leave taps running.*

*Helen: We always recommend, at the time of booking, that local transport is used to get here and to explore the local area.*

A second consideration regarding independence in the workplace is whether or not people need to be in control of the activities they undertake to reduce carbon emissions. This consideration is based on the work by Ajzen and Madden (1986), who proposed that having control over behaviour, or the ability to act, is one of three crucial factors in their theory of planned behaviour. Examples of existing models and studies that incorporate the concept of control were discussed in Chapter Two (see page 49). The interview analysis reveals that the motivated individuals have mixed opinions regarding whether or not it is necessary to have control over taking actions to reduce carbon emissions. 15 of them believe Yes, control is necessary; 10 believe No. This split is reflected in the comments by Graham and Adrian. Hence, inconclusive evidence was found in this study regarding the need to have control over mitigative activities.

*Graham: ... being in control of how they behave and act is crucial and means people can focus on achievable local actions, especially at home.*

*Adrian: ... you do not need to be in control of the actions... just need to believe in them.*



The equivocal nature of these results is reflected in previous work. Tonglet *et al.* (2004), incorporating a number of additional variables such as past experience in their work based on Ajzen and Madden's theory, did find that control correlated strongly with recycling attitudes. do Valle (2005), merging the theory of planned behaviour with three other models regarding recycling behaviour, found that those individuals with a higher sense of control had a higher intention to recycle but there were, however, four other variables that have direct influence on that control, including environmental attitudes, which correlated negatively with recycling behaviour. Hawthorne and Alabaster (1999) concluded that individuals who take part in environmental activities have a significantly higher belief that they are in control, compared to those who do not take part. Having a belief, though, is different from having a need to be in control. The present results indicate that there are factors other than a sense of control that are more influential in taking mitigative action, such as, for example, a belief that the activities make a difference. Having said that, the results suggest that, for some individuals, control does play a significant role.

The analysis next considered whether or not the freedom to choose is important for the motivated individuals in the wider context of life in general. Freedom can be associated with a state of mind as well as the practical reality of life. The interview analysis revealed that 14 of the sample described that they have a sense of freedom in their lives that they have felt for as long as they can remember, whilst a further nine individuals considered that they have a moderate degree of freedom within their current lifestyle. The feeling of freedom is expressed differently by individuals; for example, Janette and Colin describe this feeling in a holistic manner associated with a

state of mind, whereas Ben and Giles link their sense of freedom to a particular aspect that, perhaps, gives the individual a sense of control and security in that regard:

Janette: *The freedom I feel is more about how I develop my own philosophies and approach to life.*

Colin: *I am very lucky because I have the freedom to do what I want most of the time, even with a wife and three children at home.*

Ben: *I have a lot of financial freedom...*

Giles: *My car gives me so much freedom and independence...and the ability to do whatever I want to when I want to...*

Irrespective of the manner in which the sense of freedom manifests, there was a unanimous perception by these individuals that this sense is not directly associated with their motivation to reduce carbon emissions.

The final aspect that was considered in the interview analysis is whether or not a sense of freedom influences the feeling of well-being; the results indicate that there is a positive association. For example, the analysis revealed that the motivated individuals with the greatest sense of freedom describe themselves as being very contented in life and 19 of the sample agreed that the sense of freedom they have experienced throughout their lives positively affects their well-being. This finding chimes with previous work by Sen (1982), who concluded that a sense of freedom is crucial to well-being and specifically to entitlements to capital, education and the like.

In summary, there were three different types of freedom that were considered in this section: freedom to perform, control and sense of freedom. It is evident from the results presented that the motivated individuals generally perceive that they have the

freedom to perform work practices as they wish, even though they do not necessarily have the control over which particular activities they have to perform. These individuals also feel that they have a sense of freedom in their lives and that this sense is not directly associated with their motivation to reduce carbon emissions. There is an indication that having a sense of freedom generates a feeling of contentment and well-being within these individuals and the effect of feeling this sense of general well-being is explored in subsequent chapters.

### **5.6 Have strong social networks**

Having strong social networks is the fifth characteristic of the motivated sample. The manner in which this characteristic evolved from the interview analysis is schematically shown in Figure 5.5. In quantitative terms, the word family was the most frequently used noun throughout the 25 interviews (refer to Table 5.1, page 147). Further analysis revealed that family members and friends play a central role in the lives of the interviewees, expressed at times as a sharing, energetic type of celebratory social experience, as Derek and Helen portray:

*Derek: One of my greatest joys in life is socialising with my friends - good food, good wine and good company.*

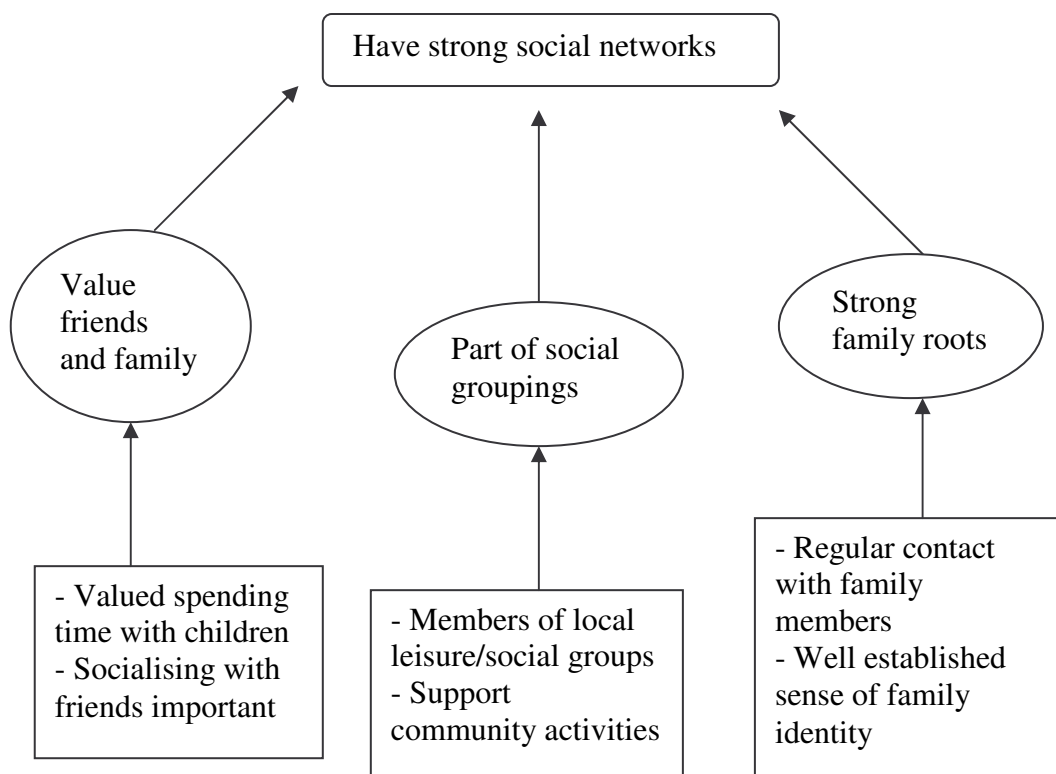
*Helen: The bit of my life that I enjoy the most is actually sitting down and eating food with the people I love...and sharing good conversation and laughter.*

At other points, as depicted by Mike and Sandy, a valuing of familiar people in their lives is expressed in, perhaps, a closer, more intimate manner emphasising the family bonds:

Mike: *For me the family entity is a huge thing, and a close and secure extended family ...along with my close friends.*

Sandy: *The most enjoyable and valued activity for me is spending time with my kids...*

Figure 5.5: Examples from the interview analysis of how the characteristic 'have strong social networks' evolved.



The motivated individuals get a sense of enjoyment from the interactions they have with family members and friends, and a feeling of being part of a strong, well-established social network. During the interviews, the individuals explain how they gain strength and a capacity to achieve more from the knowledge that they are part of a social network that positively influences their lives. Eighteen of them include their local community, leisure and social groups and their colleagues at work in their social

network. Adrian, for example, conveys a strong desire of wanting to give back to his local community:

*Adrian: Every year the village near us have a couple of fairs and I always do the signs to advertise them and run a stall or two. I remember spending many a happy time when I was younger at such events.*

This desire is strengthened by their ability to make connections with their social surroundings, as discussed earlier in this chapter.

There was no suggestion from the motivated individuals that the interaction with people in their social network is linked to needing approval or support from them, or that the individuals need these networks to follow their environmental behaviour or vindicate their environmental actions, as Ross and Liam reflect:

*Ross: It's always nice to have people seeing my point of view ...but, at the end of the day, I'll carry on doing what I do whether people agree with it or not...*

*Liam: I often talk about my efforts to have a small footprint with my friends and family. Some laugh ...others seem to wish they could do the same...doesn't really affect what I do though...*

The interview analysis, however, found one factor that was common to all the individuals concerning how they relate to people; namely, as Mike and Patrick describe, their strong family connections:

*Mike: We have a close family unit and keep in touch with each other pretty much, though we're spread around...and have kept contact since we were kids.*

Patrick: *We're all reasonably close and make more efforts as we get older to meet up regularly...it's always good to know they're there.*

The interviewees may not fully appreciate the positive influence of the approval and support they do get from such people (as they have had it for most, if not all, of their lives), and may not associate the need to have a strong family background with being motivated to reduce carbon emissions. They may simply not be fully aware what motivates them to reduce carbon emissions. Much of the psychosocial literature indicates that there is a crucial role played by social interactions, community participation and friendship networks in influencing action to protect the natural environment; see Douglas and Wildavsky (1982), Taylor *et al.* (1991), Elliott *et al.* (1993) and related studies (see page 46). Results from the study by Elliott *et al.* (1993), for example, reveal that frequent contact with neighbours, belonging to community groups, having a number of close friends and community involvement in local issues in the past all positively influence the response by individuals. Hence, it can be concluded that having a strong family background and social network are important and the way that the motivated individuals relate to people could play a part in the motivation to reduce carbon emissions.

The literature supports an association between relating to people and the sense of belonging, which has been interpreted in a number of ways. For example, Maslow (1968) incorporated people relations as part of his understanding of the concept of belongingness; he proposed that belongingness involved the giving and receiving of love and affection that was only possible once a sense of well-being had been achieved. Hagerty *et al.* (1992), on the other hand, viewed the process the other way

round whereby a sense of belonging was perceived to be an integral part of the wider concept of relatedness, which was an important element of well-being. Acton and Malathum (2000) based their study on Maslow's (1968) needs hierarchy model and found a sense of belonging promotes well-being, which, in turn, supported earlier findings by Hagerty and Patusky (1995) that deficits in the sense of belonging decreases a person's well-being. In other studies, the concept of belongingness was interpreted more extensively. Baumeister and Leary (1995), for example, incorporated a range of social networks in their understanding, which included family, friends, the local community and the workplace, Struthers *et al.* (2003) viewed the sense of belonging as the dynamic connection between all relationships, human and non-human and Gailliot and Baumeister (2007) indicated that belongingness facilitated a person's self-esteem. Even though the interpretation concerning these two concepts varies markedly, it is clear from the literature that relating to people and a sense of belonging are closely associated.

As a result of the interview analysis, it was found that the motivated individuals exhibit a feeling of belonging that embraces many aspects of life. Ross and Sandy express this feeling in social contexts, whilst Liam and Olivia express the physical context of merging and co-existing with nature:

Ross: *I feel an important part of my workplace in the role that I have.*

Sandy: *We have a strong sense of community here, which makes us feel that we belong.*

Liam: *I feel part of Nature when I am in it...*

Olivia: *I most enjoy sitting in my garden – I get a great sense of being exactly where I want to be...and fitting in completely.*

The differences between how the feelings are expressed may reflect how and/or where each individual feels the greatest sense of belonging and unity, or reflect the specific type of surroundings in which he or she feels most comfortable. These relationships symbolise the importance that these individuals place on their social *and* natural surroundings. As well as the literature regarding a sense of belonging to people, there is a considerable amount of literature regarding belonging to, and feeling an identity with, nature (refer to Section 2.2.2, page 33). Due to the evidence that there is an established connection between people and nature, it is pertinent in the context of this study to examine this relationship further in the next phase of the research.

Finally, the motivated individuals perceive that their feeling of freedom in life generally is based on their established sense of belonging. Helen and Derek indicate an awareness and appreciation of the support they get from people, which helps that sense of freedom flourish and enable them to pursue their aspirations:

*Helen: Being my own boss gives me immense freedom, though I do rely on the support of my husband and children as I have to work long hours to get all aspects of the business working as I want them.*

*Derek: I fit in well with the other managers and they have agreed to let me run with my ideas about developing the environmental aspects of the company.*

As discussed in the previous section, the motivated individuals who have the greatest sense of freedom describe themselves as being very contented in life, which indicates that there is an association between the sense of freedom and the feeling of well-being. Acton and Malathum (2000) found that having a sense of belonging also positively influences the feeling of well-being. It is unclear in the context of the



motivation to reduce carbon emissions whether or not a similar relationship exists between belonging and well-being and, if so, whether or not the influence is direct or indirect via, for example, the sense of freedom. The relationship between a sense of belonging and well-being in the climate context is explored in subsequent chapters. In summary, it is proposed that having a sense of belonging is one of the defining characteristics of individuals who have internalised motivation in this climate context. It is indicated by the results presented in this section that having a strong family background and social network are important in establishing this sense of belonging. This proposal raises the question of whether or not the sense of belonging is a characteristic of individuals in the wider population; a question which is pursued in the next phase of research.

### **5.7 Have all that is needed**

The sixth characteristic of the sample of motivated individuals is that they perceive they have all that they need in life and have an associated feeling of happiness, as Sandy and Olivia explain:

*Sandy: I have a very contented and happy life...and all I need really...my home, my husband and the girls.*

*Olivia: I don't worry about having a status - I have all I need and am happy.*

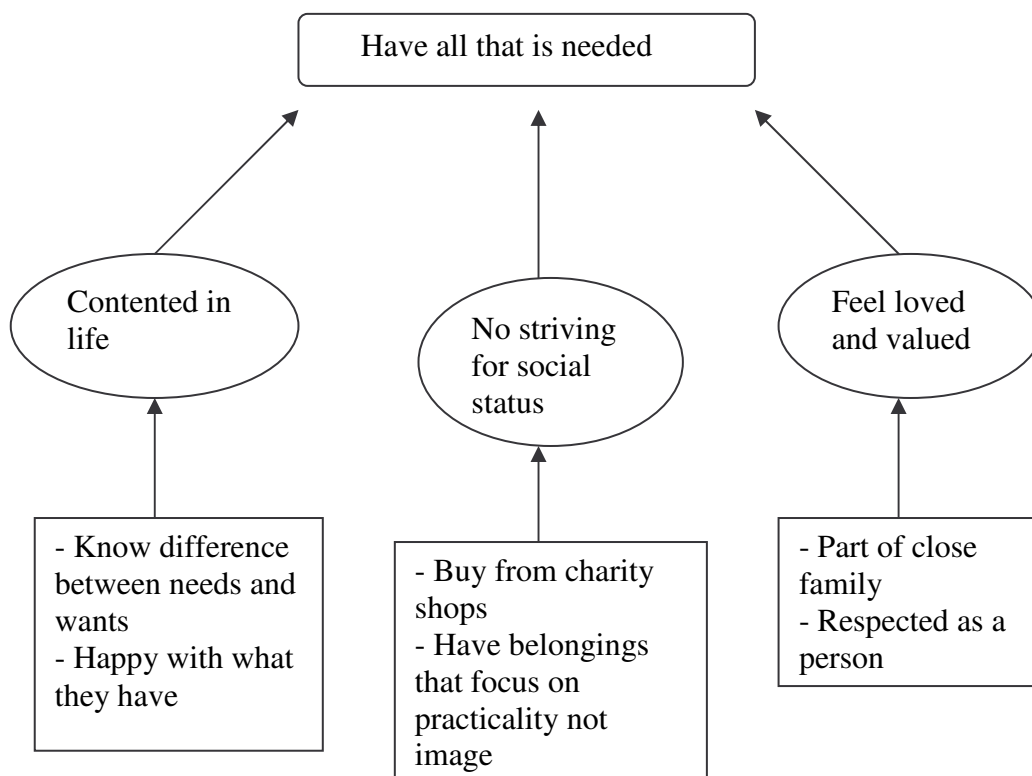
Even though Craig and William describe their perception of having all that they need in a different way, the perception itself indicates a capacity to appreciate life in general and suggests, perhaps, the notion of being satisfied with what one has, rather than trying to have all one wants:

Craig: *Having a comfortable life and the freedom to enjoy that life ...and the satisfaction of not really wanting anything else.*

William: *I think really understanding that contentment doesn't come from material things... I don't have to go to an exotic place to be really happy and appreciate the amazing things on earth – they are here.*

The manner in which this characteristic evolved from the interview analysis is schematically shown in Figure 5.6.

Figure 5.6: Examples from the interview analysis of how the characteristic 'have all that is needed' evolved.



Previous studies have concluded that a perception of contentment and having all one needs enables people to consider other aspects of life. For example, Macnaghten and Urry (1998) and Huber (2001) suggest that this is because people do not have to

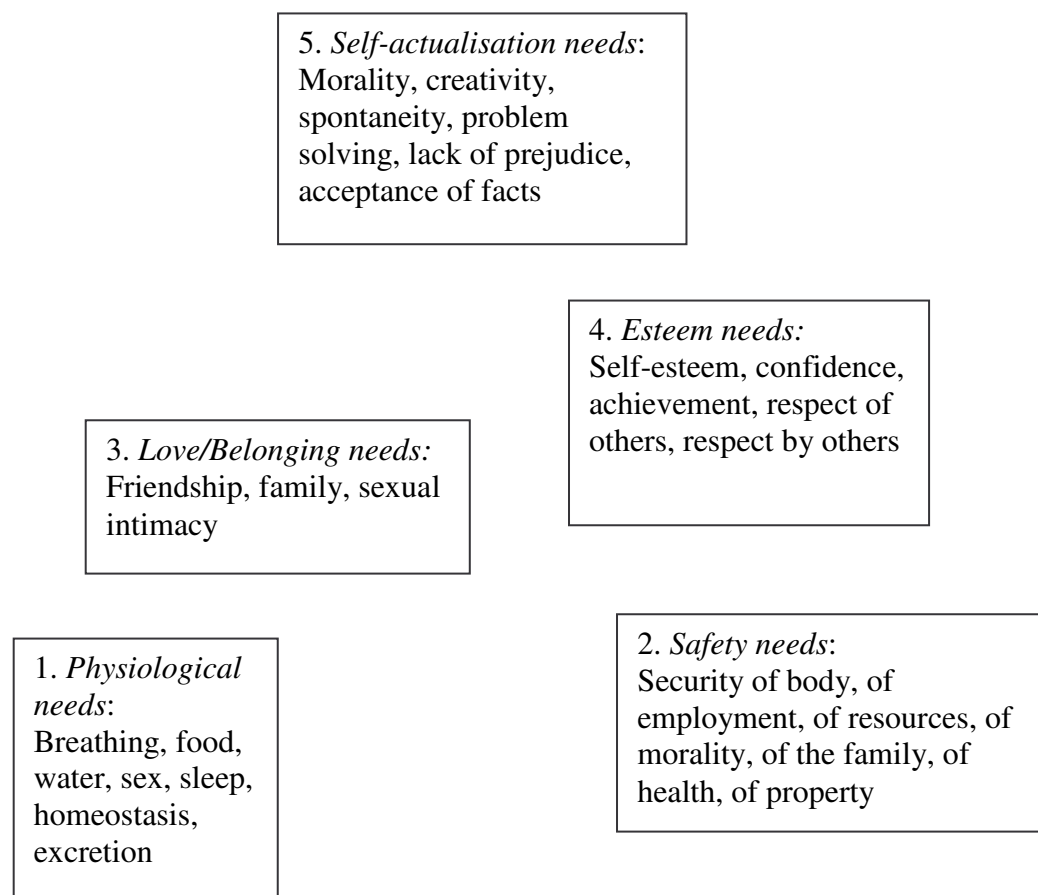
choose between their own survival and that of nature and, more recently, Chokor (2004) found that people worry whether or not they have enough money for food and a roof over their head before considerations, such as contributing to Hardin's (1968) common good. The findings from this study, whereby individuals who actively care for the natural environment, specifically reducing carbon emissions, perceive that they have all that they need in their lives, supports the conclusions of these previous studies. As Olivia explains, the capacity to be content and consider other aspects of life is associated with a generalised belief:

*Olivia: ...knowing the difference between needs and wants is so important in feeling happy in life ...and crucial for me in my life as it means I am much more aware of what's going on around me and ready to help in any way I can.*

The psychologist Maslow (1943) developed a model of human needs, the hierarchy of needs, which is well established in the literature. Maslow proposed that humans have wants and desires, which influence behaviour when they are not satisfied. In his pyramidal shaped model (see Figure 5.7), the higher needs, for example, in boxes four and five only come into focus once all the needs lower down in the pyramid, for example, in boxes one, two and three, are mainly, or entirely, met (Maslow, 1943, 1954). The higher up the levels a person progresses, the more mental, physical and spiritual wellness they demonstrate. This hierarchical concept was maintained in two other models that are based on Maslow's work. Alderfer (1969) created the ERG theory, which modified Maslow's theory into three levels, existence (physiological and safety needs), relatedness (love and social) and growth (self-actualisation and self-esteem). He proposed that a person doubles their efforts at a lower level with the

intention of achieving a higher one that they had not managed to achieve. Inglehart (1996) developed Maslow's model into a post-materialism concept, whereby people who have experienced material affluence focus more on empowerment, personal freedom and maintaining a healthy natural surroundings rather than, as was assumed by neoclassical economists, achieving happiness with higher, or stabilised, levels of consumption.

Figure 5.7: Maslow's Hierarchy of Needs, with the more primitive needs at the base (adapted from Maslow, 1943, 1954).



There has been criticism of Maslow's model regarding the possible oversimplification of a complex process and whether or not such an ordered process exists at all (Wabha and Bridwell, 1976). Other hierarchical models, such as developed by Miller *et al.*, (1960), Wicklund and Gollwitzer (1982) and Vallacher and Wegner (1985, 1987), are

based on the link between meeting needs and achieving goals. Two other theorists, Max-Neef (1991) and Rosenberg (2003), developed non-hierarchical frameworks that distinguish between human needs and the strategies to meet them in a simultaneous and complementary manner of needs satisfaction. These models all describe how people have a number of goals that they are pursuing at any one time. The goals do not have equal priority and are conflicting, which means a person can achieve a higher level goal before a low level one (Fishbach and Dhar, 2005).

It was unclear from the interview analysis whether or not the motivated individuals perceived that similar types of needs carry equal importance in their lives. In order to explore the importance of different needs, responses from the surveys in stages four and six supplemented the findings so far, based on a modified version of Maslow's (1943) model. Refer to Section 3.5 (page 95) for details of the methods. The survey respondents were asked to score ten statements on a 5-point Likert scale indicating the extent to which they agreed with them, and the results were compared with a public group. As a result of the survey analysis, it was found that there is no discernible pattern, or trend, common to the motivated individuals, or between the two samples, in respect of the types of needs that are associated with the perception of having all that is needed in life.

There was an indication, however, from the survey analysis that individuals in the twenty-first century perceive the importance of needs differently to the time when Maslow (1943) developed his original model. For example, the motivated individuals do not place as great an importance on the level of safety, security and stability in life as the importance of, for example, being valued, being knowledgeable or having a

sound reputation. Maslow placed safety and security at a low level on his hierarchy indicating that a sense of safety needs to be achieved before an individual can consider meeting needs, such as value, knowledge and reputation. The change in the importance of particular needs reflects, perhaps, that having a safe and ordered life is not necessarily a normal part of daily living for people nowadays.

A further examination of the interview material revealed that it is important for those motivated individuals who undertake the highest frequency of activities to reduce carbon emissions to achieve a balance between a sense of security and a sense of freedom. Previous research exploring the relationship between freedom and security has tended to focus at the national and international levels (see Lavenex, 2001; Globerman and Shapiro, 2003; Lee, 2003) although Sheller (2004) studied the role of the automobile in providing freedom or security for people. The value of achieving a balance was identified, however, many decades ago in separate studies by Keynes (1930) and Hicks (1959), who combined freedom and security in the concept of well-being. More recently, Wickham (2006) found that individuals are able to achieve a balance between a feeling of freedom and the sense of security to enjoy that freedom.

The motivated individuals described that their sense of freedom is generally more prominent in their lives and enhanced, crucially, by the knowledge that their actions are based on a secure foundation, as Helen explains:

*Helen: We worked together, with hours and hours of discussions, to develop a solid base for our business and were able to explore calculated risks and speculate in aspects of the business that we had not imagined and, two years later, we are now reaping the rewards of those risks.*

As discussed in Section 5.5 (page 161), having a sense of freedom is of importance for these individuals. It is evident, however, from the analysis in the section here that these individuals require a sense of security to enable that freedom to be effectual in their lives.

In summary, there is no evidence of a discernible pattern or trend common to the motivated individuals regarding the types of needs associated with the perception of having all that is needed in life.

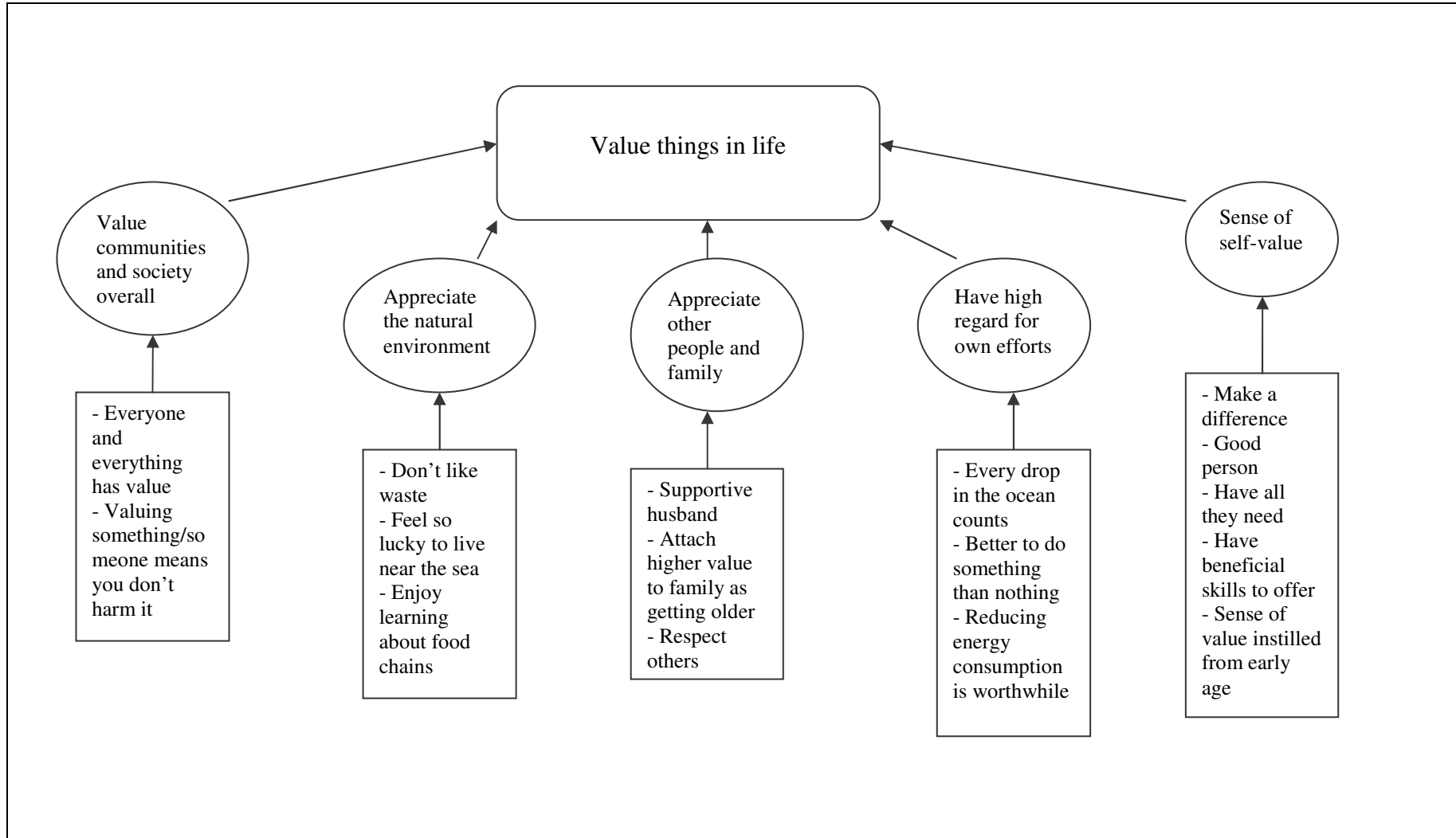
### **5.8 Value things in life**

The interview analysis revealed an association between having all that is needed and this next characteristic, valuing things in life. For example, the motivated individuals feel that their needs are met not so much in quantitative, material terms but more because they value the people in their lives and their natural environs, as the schematic diagram in Figure 5.8 illustrates. All of the individuals described how having a sense of value was instilled in them from an early age. Adrian describes having a widespread appreciation, whilst Patrick and Helen describe a specific aspect on which they place their value:

*Adrian: Part of having pride in ourselves is looking after what we value, and having pride in things around us...and making the best of what we've been given...like Mother Nature.*

*Patrick: I attach a higher value to family as I get older...used to take it for granted.*

Figure 5.8: Examples from the interview analysis of how the characteristic ‘value things in life’ evolved.





Helen: *I really enjoy going into the woods out the back of our property...and go most days. I'm very lucky to have them so near to where we live.*

Such descriptions and the extensiveness of Figure 5.8 compared to the other schematic diagrams in this chapter suggest, perhaps, that a sense of value is fundamental to most, if not all, aspects of these individuals' lives.

Two other aspects regarding a sense of value were discussed during the interviews, the notion of well-being and reducing carbon emissions. Nineteen of the motivated individuals, including Olivia and Mike, described that their sense of well-being is because they appreciate their own existence and all of them believe that by taking action to reduce carbon emissions they have something to offer that is of value and that makes a positive difference to addressing the climate issue, as Graham and Ross highlight:

Olivia: *I don't worry about having a status in terms of owning things as I value who I am, what I do have and am happy.*

Mike: *We need to be able to value a planet that gives us life in the first place and supports human survival totally and gives me a sense of well-being.*

Graham: *The world has a value to me and climate change is diminishing that value, and I know what I do helps.*

Ross: *The changes that you have to make are really simple, well worthwhile and definitely make a difference.*

The sense of value in themselves and their actions came across, during the interviews, as fundamental in the lives of these individuals.

In summary, it is proposed that having a sense of value is one of the defining characteristics of individuals who have internalised motivation to reduce carbon emissions. As discussed above, there are a number of ways that the motivated individuals value and/or place value in their lives. It is unclear at this stage whether or not one particular way is more influential than others and this is explored in the final phase of research.

### **5.9 Have regular contact with the natural environment**

The findings of the interview analysis indicate that ongoing and regular contact with natural environments plays a considerable role in the lives of the motivated individuals. For example, as children, Olivia and Mike visited the countryside regularly and played outdoors as part of their daily living.

*Olivia: I spent most of my childhood outside in the garden and the woodlands nearby.*

*Mike: I invariably met up with my friends by the river and we went off and played ambush games in the trees for hours.*

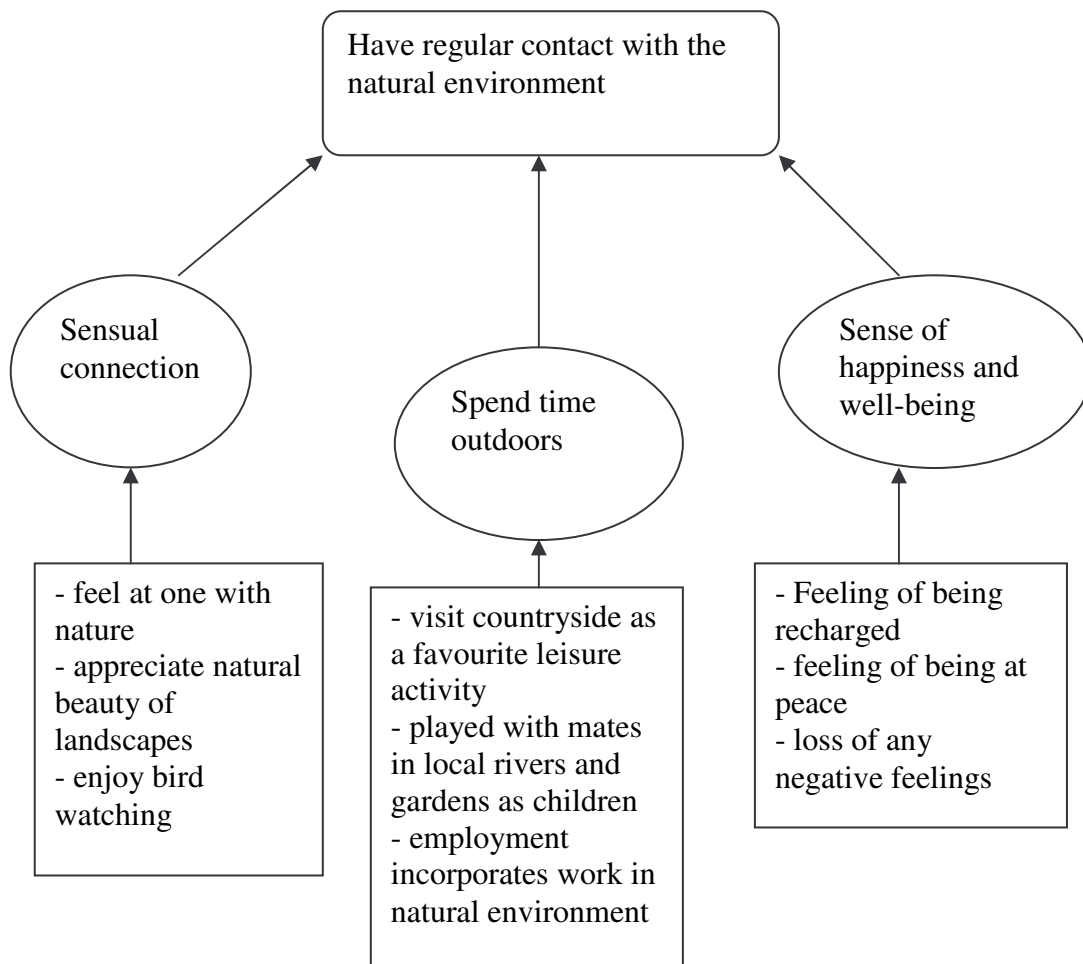
As adults, Dan and Craig choose to visit the natural environment in their leisure activities and miss the experience when other life priorities dominate.

*Dan: My favourite place is the mountains near where I grew up. If not, there's plenty of other places around here where we take our bikes and explore.*

*Craig: We go walking most weekends, a long hike 15 miles or so, and I find I'm much nearly as relaxed when I go back to work on a Monday if we haven't managed to get out one of the days over the weekend.*

Thirteen of these individuals have chosen employments and career directions that incorporate outdoor work in the natural environment. The findings also indicate that having contact by physically visiting such places plays a more influential role in their behaviour than, say, their interest in the climate and changing weather patterns that was discussed in Chapter Four (see page 130). The manner in which this characteristic evolved from the interview analysis is schematically shown in Figure 5.9.

Figure 5.9: Examples from the interview analysis of how the characteristic 'have regular contact with the natural environment' evolved.



There is little research regarding the impact of contact with the natural environment as a child, or at any age, on taking action to reduce carbon emissions in later life. This is perhaps because this aspect of research is relatively recent and climate change

mitigation is not necessarily directly associated with having contact with the natural environment. As was discussed in Section 2.2.2 (page 33), there is evidence indicating that childhood contact can be the foundation of positive relationships with, and an appreciation of, the natural environment in later life, and also an increasing awareness regarding the value of having local green spaces within urban and suburban settings and the positive influence of such places on people's sense of well-being. Local green spaces have the potential to link the issue of carbon emissions and the natural environment for people because they create opportunities for mitigative action, such as planting trees.

As a result of the interview analysis, it was found that there were differences in the nature of the emotional experience that the motivated individuals have when visiting the natural environment, as was discussed in Section 2.2.2. In line with the understanding by Wilson (1984), 21 of the interviewees associate the contact with a feeling of being at one with nature and sense a strong bond, or connection, with their natural surroundings, in a similar way to how Ben and Sandy express their sensual experiences, i.e. in relation to the five senses:

*Ben: Being in the natural environment awakens something inside. There is real natural beauty all around us – we just have to be able to connect with it and appreciate it.*

*Sandy: Although a car gives me a lot of freedom, it makes me feel isolated and like I'm in a cocoon....taking a journey is greatly enhanced when I am able to connect with the surrounding environment...feel it all around me...the sounds, the smells...*

The other four, including Dan, describe their experiences as a release of stresses that leave a more positive sense of well-being and happiness, similar to the notions by Kaplan and Kaplan (1989) and Ulrich *et al.* (1991):

Dan: *When I am in the countryside I feel really relaxed and a real sense of contentment, as the stresses of work and other things start to disappear.*

It is possible that, in the context of this study, experiencing a feeling of being at one with nature is a specific manifestation of the ability to make connections that was discussed earlier in this chapter (see page 152).

It is important to gain an understanding of the experiences that the motivated individuals have when they are in contact with natural environments, as this can influence policy development and the type of approaches that are used in promoting the natural environment as part of engaging people to take mitigative action.

Connecting with nature comprises a substantial part of the next three stages of research, the results of which are presented in Chapter Seven. Questions remain regarding, for example, the impact of the frequency of contact and the types of experiences that individuals associate with that contact, whether or not there are unique aspects regarding the contact, the impact of developing an attachment to a specific place in the natural environment and the importance of local green spaces.

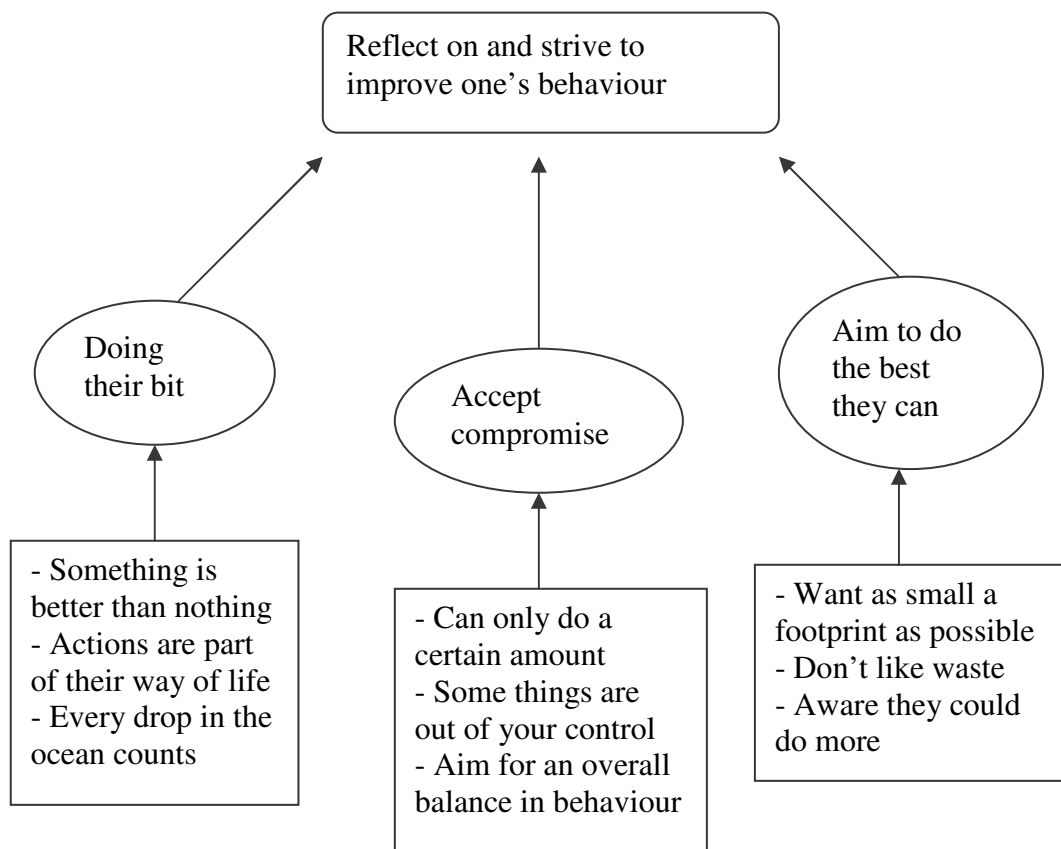
### **5.10 Reflect on and strive to improve one's behaviour**

The final characteristic that is discussed in this chapter concerns the ability to reflect on, and strive to improve, one's behaviour (henceforward referred to as self-reflect on one's behaviour). The manner in which this characteristic evolved from the interview analysis is schematically shown in Figure 5.10.

The motivated individuals behave in an environmentally-focused manner on a daily basis and in everyday situations; as Jane, Janette and Sandy explain, such behaviour is of prime importance to them:

Jane: *...realising that what we do has a big impact on the environment, so it's really important we think about what we do.*

Figure 5.10: Examples from the interview analysis of how the characteristic 'reflect on and strive to improve one's behaviour' evolved.



Janette: *What possible reason would there be for me not to act in this way?*

Sandy: *I've always had an environmental conscience, so looking after the environment, for example by reducing how much I consume has always been very important to me.*

They strive to act in such a manner across all aspects of their lives and place a high degree of value on undertaking activities that reduce carbon emissions compared with other issues in life, such as buying the latest electronic equipment and getting away on cheap package holidays. As was discussed in Chapter Two, modern day industrialised societies are founded on materialism and consumption (Catton and Dunlap, 1978; Schnaiberg, 1994) with people often reliant on material possessions to gain a sense of well-being in their lives (Maitney, 2002) and resistant to taking action regarding environmental problems (Jensen, 2004). The way that the motivated individuals strive to behave is in stark contrast to the more common materialistically-based lifestyles in countries such as the UK and this is examined further in the next chapter.

The interviewees describe how they reflect on the ways that they behave and modify what they do, so they are more in line with how they want to behave. One example that was given by the entire group, during the interviews, was the regular monitoring of their domestic energy consumption and ongoing thoughts of ways to reduce their total heating and lighting requirements. Another commonly cited example is the use of vehicles, whereby seven of the individuals choose not to use cars and, instead, use public transport, walk or cycle. The other 18, who do drive vehicles, monitor their usage and fuel consumption and endeavour to reduce both totals as much as possible. Helen identifies three ways in which she is aware that she can make changes to undertake more in her everyday life:

*Helen: ...but look at the chemicals we're using, and I have to look at my cosmetics a bit more and I really have to purchase less, so those are three areas that we instinctively know we've got to do better.*

The interview analysis, however, reveals a marked difference in the actual amount, and types, of activities that the motivated individuals are undertaking to reduce carbon emissions, even though the individuals perceive that they have the same level of motivation, i.e. high. For example, Derek puts a lot of effort into turning off the computers at work and then drives home in a fuel guzzling sports utility vehicle, whilst Norton stopped using cars and aeroplanes over ten years ago:

*Derek: I make a point of switching off my computer each day, and invariably go round checking other peoples ... the fuel consumption of my 4x4 isn't too bad generally.*

*Norton: I last owned a car in 1985 ...when we travel into Europe we go by land and sea.*

A parallel can be drawn between these examples and the earlier work by Maitney (2002), in which he proposed that people deal with their anxiety and concern regarding environmental issues in one of three ways (see page 41). The examples given by Derek and Norton illustrate two of these three ways, a change of consumptive behaviour within an acceptable level of convenience and a heightened belief regarding individual responsibility for changing behaviour, respectively. These results reflect, perhaps, that there is a limited range of responses that people make when addressing environmental issues. The present results also indicate that the self-reported measure of motivation level (high/medium/low) used in this study is a poor predictor of the actual amount, or type, of activities undertaken to reduce carbon emissions.

The interview analysis also revealed variability in whether or not the motivated individuals perceive that they are as motivated as they could be to reduce carbon



emissions. For example, 22 of the individuals, including Tony and Eric, are aware that the way they behave in certain respects, such as total energy use, is not exactly the way they would like to be behaving and they endeavour to improve their behaviour:

*Tony: I could do much more at home to reduce the amount I use...my efforts are mainly at work, though I have started to recycle more stuff at home.*

*Eric: I know I should cut down the amount of driving I do ...I'm much better at monitoring what I do than I used to be.*

Sandy, however, believes that in the context of climate change, the way she actually behaves is the way she wants to behave and yet, still continues to look for better ways to do things:

*Sandy: Everything at home and here at work runs how I would like it to really – just ongoing tweaks are required.*

The individuals continue to strive and improve their behaviour, irrespective of how close they perceive that they are to undertaking all the activities they can, or want. This ongoing desire to improve indicates that the feeling of not being satisfied translates into a drive to achieve more.

As discussed earlier in this chapter, having the ability to make local, tangible and achievable changes by setting practical and realistic short-term goals is crucial in developing a positive type of motivation and the ability to minimise the actual-intention gap. The motivated individuals focus on improving the way that they actually behave, termed self, rather than altering the behaviours they most desire to achieve, or self-standards, in line with their behaviour; refer to Figure 2.1 (page 43). They accept that their actual behaviour, for example, excessive energy use, is not in

line with their desired behaviour, for example, minimal carbon footprint. For these individuals, it is not that they believe they must behave in a particular manner at, say, home or work. It is more that they have identified the parts of their life in which they believe they can achieve the most to address climate change and strive to maximise the effect of their efforts in those areas. By reflecting on their behaviour, the motivated individuals maintain their self-standards and change their actual behaviour towards the self-standards, so reducing the actual-intention gap.

In summary, it is proposed as a result of the interview analysis that having an ability to self-reflect on one's behaviour is one of the defining characteristics of individuals who have internalised motivation. The analysis revealed that there is a desire by the motivated individuals to improve their actual behaviour regarding carbon emissions reduction in line with their desired behaviour, and that there is a difference in the amount, type and perception of activities being undertaken. It is unclear from the analysis how individuals are able to reduce the gap between these two behaviours and the specific type of goals that they set to achieve their desired behaviour. Both these aspects are considered in the next phase of research.

## **5.11 Discussion**

The analysis of the third stage of this research, the in-depth interviews, revealed there are nine characteristics that are common to individuals who have internalised motivation to reduce carbon emissions. The key findings from the interview analysis regarding the nine characteristics are as follows.

The motivated individuals value the actions they take to reduce carbon emissions and place value on themselves, others, society and the natural environment. Visiting natural environments throughout their lives is cited as the most important source of value they place on the natural environment. There is no evidence of a discernible pattern in the sample regarding the types of needs associated with the perception of having all that is needed in life; a values stance is of greater consequence than the needs hierarchy approach in the context of this motivation.

These individuals have a well-established sense of responsibility, which manifests as an obligation in a stewardship type of role towards appreciating and protecting the natural environment.

They have a strong family background and a sense of being part of their community and/or workplace with no awareness of needing approval from others. This feeling of belonging is also associated with being contented in life and having a sense of well-being, and facilitated by the sense of freedom they feel in life in general.

The motivated individuals are knowledgeable in the science and proposed solutions regarding climate change. They bring the global problem to a local level by setting and achieving tangible short term mitigative goals, facilitated by their ability to undertake the mundane activities repetitively. They consider that making connections between actions and their consequences is fundamental for people to be able to address the climate change issue, irrespective of the level of concern or awareness.

One example of making connections is the sense of being at one with nature and sense a strong attachment to their natural surroundings that a vast majority of these

individuals feel when they visit the natural environment. The individuals continue to strive and improve their own behaviour regarding carbon emissions reduction, irrespective of how close they perceive that they are to behaving how they intend.

It is proposed at this stage of the research that six of the nine common characteristics can be mapped directly onto the following five predisposing or defining characteristics: sense of value, a sense of responsibility, a sense of belonging, an ability to make connections and an ability to self-reflect on one's behaviour, as illustrated in Figure 5.11. The characteristics in Figure 5.11 are listed in no particular order of importance. It is unclear at this point how the other three common characteristics should be mapped because the survey and interview analysis, which has been presented in this chapter and Chapter Four, did not provide sufficient evidence to identify the relationships for these three characteristics. The results at this point suggest, however, that feeling a sense of independence maps onto a sense of belonging and the final two, feeling competent and having contact with the natural environment, map onto the ability to make connections. Refer to the characteristics denoted with a question mark in Figure 5.11. The mapping of all nine common characteristics and the five defining characteristics is confirmed in the next two phases of the research.

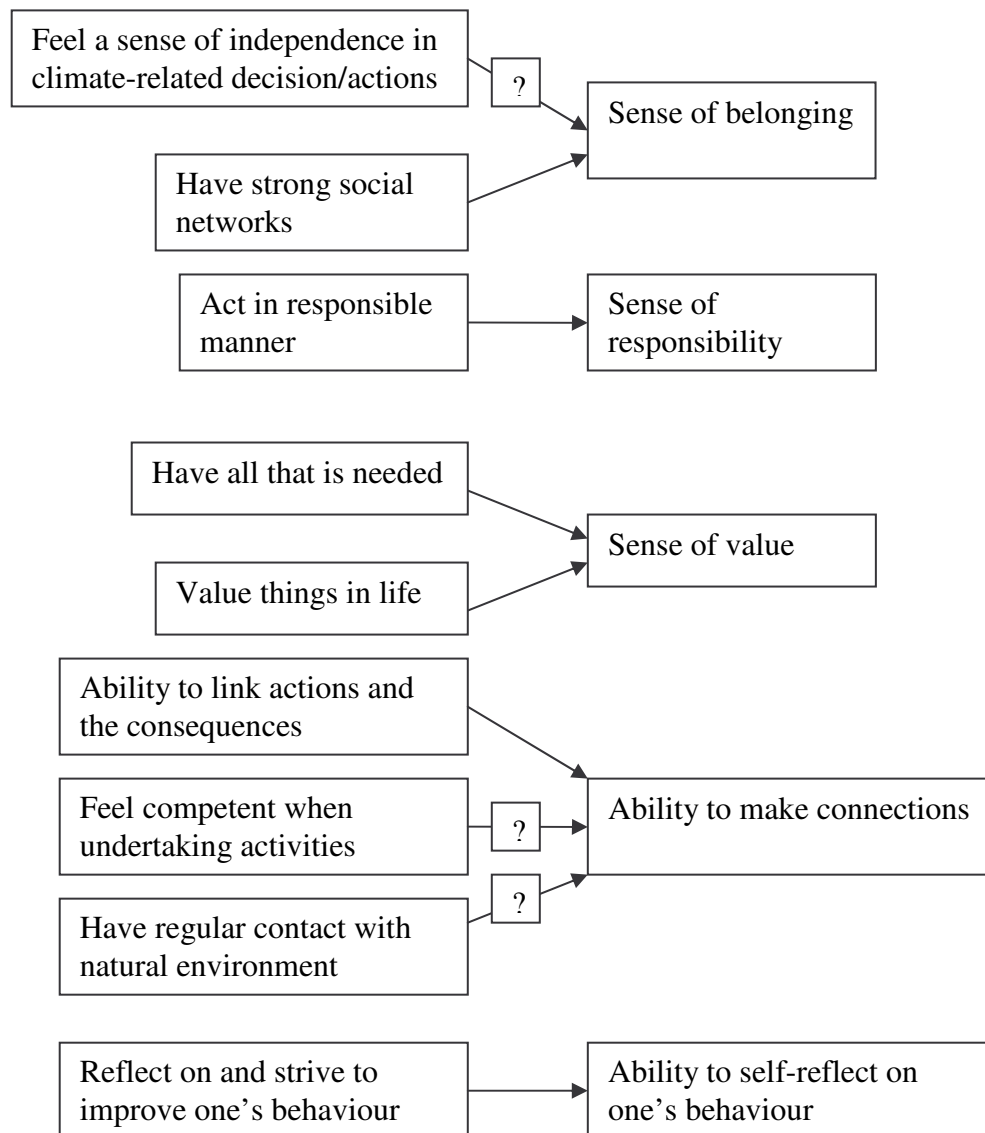
### **5.11.1 Interpreting results with Deci and Ryan's (1985) model**

The final analysis in this chapter pertains to linking the interpretation of motivation by Deci and Ryan (1985) to the results in this first phase of the research and identifying the applicability of their model, the self-determination theory, in the context of climate change mitigation, specifically in carbon emissions reduction. The model that

was used to select the motivated individuals for this study is detailed in Chapter Three (see page 68). In this model, Deci and Ryan (1985) identified three basic human needs that are prerequisites for human motivation to become internalised: autonomy (freely choosing to pursue the activity), relatedness (having approval and support from

Figure 5.11: Proposed mapping of the nine characteristics common to the motivated individuals onto the five predisposing, or defining, characteristics.

The question mark (?) denotes mapping that needs further investigation.



significant others) and competence (mastering the activity); the approval and support, in particular, is required for the development of a strong and well founded internal component. They also proposed that individuals whose motivation has an internal nature associate a sense of value, or worth, with the activity or activities that they are undertaking.

The results presented in this thesis indicate that motivation in the climate context does not need the prerequisite of freely choosing to pursue activities, as Deci and Ryan proposed. Fifteen of the motivated individuals believe that having the control to pursue an activity is needed; ten, however, do not. It is the case, though, that the individuals in the motivated sample all have roles in the workplace that provide them with a certain degree of autonomy. It is possible that they are not fully aware of the impact that autonomy has on their perception of needing control over activities, as such control is inherent in their daily work behaviour. Those individuals who do not feel that control is needed suggest that a belief in the value of the activity is sufficient to overcome the elements that are not in their control to an extent that allows them to pursue the activity. For example, in an area where there is no curbside recycling service, someone who believes recycling particular materials is worthwhile would find out where the nearest recycling facility is; if recycling is not believed to be worthwhile, another individual might just put the waste in a bin for the landfill.

The individuals in the motivated sample also described having a sense of freedom, which can be associated with a state of mind as well as the practical reality of life. They described feeling a freedom in their attitude towards life in general, which enables them to behave in ways that are different to the norm and approach life with a

'can do' rather than 'cannot do' attitude likely to facilitate the endeavours to find a way to pursue activities regarding mitigative behaviour, even when elements of such activities are out of their control. There was a unanimous perception, however, that the feeling of freedom is not directly associated with their motivation to reduce carbon emissions. It is possible that these individuals are not fully aware of the underlying impact of such a sense of freedom, especially as 14 of the 25 individuals have felt such a sense for as long as they can remember.

The concept of relatedness as defined by Deci and Ryan (1985) is similar to the sense of belonging that the motivated individuals in this study have towards their social network. At first glance, it appears that the results from this study contrast with the way that Deci and Ryan (1985) interpreted relatedness, the second prerequisite, when they developed their model. The motivated individuals make no suggestions that they require the approval and support of influential people in their lives to follow mitigative action or vindicate their behaviour. It is apparent, however, that one factor is common to all the individuals; namely, having strong family connections.

The findings regarding the extent to which relatedness, or the sense of belonging, is experienced in this climate context do, however, contrast with Deci and Ryan's interpretation of motivation. The motivated individuals described their sense of belonging to, and connecting with, the wider community, the natural environment in the respect of having an attachment to a particular place, and/or their workplace.

The results here indicate that the role of competency in the climate-related motivation is different to Deci and Ryan's definition of competence in their model, mastering the

specific activity undertaken. The consensus of opinion amongst the motivated individuals is that getting started, by undertaking any mitigative activity, is more important than necessarily feeling competent when doing so. The results so far have established that competence manifests as a capacity to perform simple and repetitive activities on a regular basis, such as sorting the rubbish to recycle or driving more efficiently to reduce fuel consumption. This description of activities being repetitive and not complex supports the extension that Ryan and Deci (2000a) made to their self-determination theory, whereby activities may become internalised when they are important yet not particularly enjoyable.

Having a sense of value is an integral part of the model developed by Deci and Ryan (1985), in which they proposed that certain externally driven motivations have an internal sense of value associated with the actions and, as a result of this value, the action is believed to be worthwhile and the self-determination to act motivates the person. The interviewees in this study believe that the actions they take to reduce carbon emissions are of value and make a positive difference to addressing the climate issue and that this sense of value directly motivates them to continue and strive to undertake more.

Finally, the evidence discussed in Section 5.10 that there is a difference in the amount, and types, of activities being undertaken is in line with subsequent work by Deci and Ryan following the development of their motivational model. For example, Ryan and Deci (2000a) found that even though the amount of motivation between individuals performing the same task can be similar, the nature and focus of that motivation can be markedly different.



Certain conclusions can be drawn at this stage. First, a feeling of competency acts as a facilitator in the climate context due to the ability to undertake mundane acts repetitively, rather than a prerequisite of the motivation as proposed by Deci and Ryan in their model. Second, the sense of value plays a similar role in the motivation to reduce carbon emissions as the interpretation by Deci and Ryan. Third, motivation to undertake mitigative action requires relatedness as part of a sense of belonging to, and connecting with, nature as well as human beings. It is unclear, however, whether or not the sense of belonging is as influential in the development of internalised motivation as Deci and Ryan proposed or that the characteristic of freedom contributes to motivation in a similar fashion to their concept of autonomy. These aspects are discussed further in Chapter Eight.

### **5.12 Concluding remarks**

As a result of these key findings, it is proposed that there are five characteristics that predispose individuals to have internalised motivation to reduce carbon emissions, termed the defining characteristics. The significance of these defining characteristics will be tested during the next phase of the research. Issues raised in the interviews warranted further investigation as questions remain regarding two of the five defining characteristics: contact with the natural environment, which is associated with the ability to make connections, and the ability to self-reflect on one's behaviour. The methods for the next phase are described in Chapter Three and the results are presented in Chapters Six and Seven (excluding the ones discussed in this chapter).

## **CHAPTER SIX**

### **DEFINING CHARACTERISTICS OF THE MOTIVATED INDIVIDUALS**

#### **6.1 Introduction**

The analysis presented in this chapter identifies the defining characteristics of individuals who have internalised motivation to reduce carbon emissions. The analysis is based on a self-assessment by the motivated individuals that ranked the characteristics identified earlier and a comparison with the results of a survey that was completed by a public group. This addresses the second research question:

Can the defining characteristics of the internal nature underpinning the motivation of individuals to mitigate climate change be identified?

The results from the survey analysis are presented in the three main sections of this chapter. First, the broad characteristics of the two samples are presented, followed by the results regarding four of the five proposed defining characteristics. The results concerning the fifth defining characteristic, the ability to self-reflect on one's behaviour, are discussed in detail in the fourth section.

The results were collected via three surveys. Two of the surveys, one written and the other via email, were completed by the sample of motivated individuals who took part in the in-depth interviews (n = 20). The methods for this second phase of the research are detailed in Section 3.5 (page 95); refer to Table 3.3 (page 78) for an overview of the research structure. Five interviewees elected to discontinue their involvement due to a time constraint on their part, including the one individual who associated her increase in motivation with being in paid employment to reduce carbon emissions (see

Table 4.7, page 139). A third survey, modified from the written one completed by the motivated sample, was completed by a public group of adults from the East Anglia region of the United Kingdom (n = 152). To encourage a high response rate within the motivated sample, especially as it is small, non-respondents were sent a reminder on two separate occasions; no reminder was used for the public group.

## **6.2 Demographic results**

The final response rate was 80% for the written survey from the motivated individuals and 28% from the public group. Forty six per cent of the public group was excluded from the analysis due to the respondents being retired, aged over 69 or the surveys were returned with incomplete data. This exclusion was necessary even though it reduced the size of the public group markedly, because it ensured that the public group retained the same age range and employment characteristics as the motivated sample, i.e. aged 20 to 69 and in full-time employment. Hence, the response rates that were used for the analysis was 80% for the motivated sample (n = 20) and 15% for the public group (n = 82).

Even though the response rate for the public group is relatively high for a cold mail drop survey, there is clearly a risk that responses are more likely to have been submitted by more motivated individuals therefore introducing an element of bias into the sample of completed surveys. The effect of this is likely to mean that any differences identified between the motivated sample and the sample that we are treating as random will be smaller than the differences that would be identified with a truly public group. While this might limit the ability to draw conclusions from this process, it does not undermine the validity of the conclusions that can be drawn.

The results of the survey can be used to define and compare the gender and age characteristics of the two samples, as shown in Table 6.1. The gender mix is similar between the two samples, revealing a strong male bias in both. There is a difference of eight years in the average ages between the two samples and no attempts were made to reduce the difference in the interests of maintaining a sample size that had been reduced already, as highlighted above.

Table 6.1: The age (years) and gender (percentage and/or actual number) demographics for the two samples.

	<b>Motivated individuals</b> (n = 20)	<b>Public group</b> (n = 82)
Age (mean : mode)	43 : 40-49	51 : 50-59
Gender (male : female)	65% : 35% (13 : 7)	67% : 33%

### **6.3 The defining characteristics**

In addressing the second key research question, the conclusion can be drawn that there are five defining characteristics of individuals who have internalised motivation to reduce carbon emissions:

- a sense of value;
- a sense of responsibility;
- a sense of belonging;
- an ability to make connections; and,
- an ability to self-reflect on one's behaviour.

The motivated individuals confirmed via the email survey that these five characteristics play a key role in their motivation. They were asked to select all the

options that are *not* key to their motivation, from the eight possible characteristics listed in Table 3.6 (page 108). The defining characteristics listed above are the five options that were not selected by any of the 20 respondents. This conclusion serves to confirm the mapping illustrated in Figure 5.11 (page 192) regarding these five defining characteristics.

The group of five defining characteristics consists of two different types of characteristics. Three of them, the senses of value, responsibility and belonging are all an ethics type of characteristic, whereby specific rules and principles govern the moral conduct of the individuals. The other two are a capacity type of characteristic, whereby individuals have an ability to perform specific processes; namely, the ability to make connections and the ability to self-reflect on one's behaviour.

There was a range of responses regarding whether or not one of the five defining characteristics is more influential to motivation than the other four. The motivated individuals were asked to select the most influential characteristic, if there is one, as part of the email survey. Table 6.2 shows that for 12 of the individuals, one specific defining characteristic is more influential than any of the others; for example, three people consider a sense of responsibility to be the most important. None of the sample selected a sense of belonging or the ability to self-reflect on one's behaviour, and eight of them stated that all five defining characteristics are of equal importance, which is shown by the final category in Table 6.2. This shared importance reiterates the complex interrelation between these five characteristics, whereby none of them has the capacity to activate or drive the motivation on its own. As shown in the table, having a sense of value is the most commonly selected defining characteristic for the

Table 6.2: The distribution of responses by the motivated individuals regarding which defining characteristic is perceived to be most important to their motivation, with a final category for those who perceived that all the characteristics are of equal importance.

<b>Characteristic of most importance</b>	<b>Number of individuals</b> (n = 20)
A sense of responsibility	3
A sense of value	6
An ability to make connections	3
All characteristics are of equal importance	8

individuals who do perceive that one characteristic is more influential than the other four. The relevance of this finding is discussed in later chapters.

The research next determined whether or not the five defining characteristics could be considered as unique characteristics of the motivated individuals, so distinguishing them from the general population. Four measures were developed to test out four of these characteristics with a public group from a specified population in East Anglia. The measures were labelled the Value measure, Responsibility measure, Connection measure and Belonging measure and were each defined by three statements as listed in Table 3.5 (page 106).

Each measure was correlated with the scores for the Activity Level measure from the two samples, which records the frequency of activities to reduce carbon emissions that are currently being undertaken. The findings are presented in Table 6.3; the

Table 6.3: Correlation analysis (arbitrary units) for the measures of four of the five defining characteristics with the Activity Level measure.

<b>Measure</b>	<b>Defining characteristic</b>	<b>Extent of component</b>	<b>Sample</b> (MI, n = 20; RS, n = 82)	<b>Pearson Correlation</b>  ( <i>r</i> )	<b>Significance level (2-tailed)</b>  ( <i>p</i> )	<b>Type of influence on motivation</b>
Value	Sense of value	Self, others, environment and/or what we have	<b>Motivated Individuals</b>	0.87	0.00	Positive and irrespective of sample characteristics
			<b>Public group</b>	0.79	0.01	
Responsibility	Sense of responsibility	Obligation to protect natural environment	<b>Motivated Individuals</b>	0.68	0.00	Positive and irrespective of sample characteristics
			<b>Public group</b>	0.63	0.05	
Belonging	Sense of belonging	Within family, community, and/or workplace	<b>Motivated Individuals</b>	0.59	0.00	Positive and irrespective of sample characteristics
			<b>Public group</b>	0.57	0.00	
Connections	Ability to make connections	With natural environment and/or own actions and consequences	<b>Motivated Individuals</b>	0.54	0.01	Positive and irrespective of sample characteristics
			<b>Public group</b>	0.41	0.05	

statistical significance testing allows for the low sample size of motivated individuals, though caution is warranted in drawing conclusions based on a sample of this size. The fifth defining characteristic, the ability to self-reflect on one's behaviour is considered in the next section. It is likely that the ability to make connections, determined by the Connections measure, is less significant amongst the motivated individuals compared to the other defining characteristics because, for these individuals, visiting the natural environment and connecting in that way has more impact on their behaviour than, for example, their awareness and understanding of the climate change issues (refer to Table 3.5, page 106, for the statements that comprise the Connections measure); the impact of contact with the natural environment is explored further in the next chapter.

The main findings from the results shown in Table 6.3 are that the four defining characteristics are better developed in the motivated sample compared to the public group, and there is no evidence that any of these four characteristics is only present in the sample of motivated individuals. This is a significant finding in this study.

#### **6.4 The ability to self-reflect on one's behaviour**

The surveys results from the two samples that are associated with the fifth defining characteristic, the ability to self-reflect on one's behaviour, are presented in this section. The manifestations of this characteristic are central to how the motivated individuals behave regarding action to reduce carbon emissions.

The discussions based around the surveys develop two of the conclusions drawn from the interview analysis presented in Chapter Five. The first conclusion was that there is



a marked difference in the actual amount and types of activities undertaken by the motivated individuals even though they perceive that they all have the same level of motivation, i.e. high. Refer to page 187. The second conclusion from the interview analysis was that there is variability in whether or not the motivated individuals perceive that they are as motivated as they could be to reduce carbon emissions (see page 187). They measure this perception by being aware of how close to their intended behaviour they actually are regarding the actions they undertake. The gap between these two behaviours is referred to as the actual-intention gap.

The three aims of the survey questions that relate to these two conclusions are:

- To measure, in quantitative terms, the amounts and types of activities that the motivated individuals are currently undertaking to reduce carbon emissions;
- To measure, in quantitative terms, the impact of the actions that these individuals are taking on their primary goal to reduce carbon emissions, which is associated with the actual-intention gap; and,
- To identify the types of goals they most aspire to.

The results are based on the scores from the Activity Level measure, the Carbon Emissions measure and the question regarding most aspired activities. Full detail of the methods for the surveys is given in Chapter Three (see page 95) and copies of the surveys can be found in Appendices F, G, J and K.

The comparison of the scores for the Activity Level measure, which records the amount and type of activities undertaken, for the sample of motivated individuals and the public group confirms that the motivated individuals are characterised correctly.

First, a greater percentage of the motivated individuals have higher total scores for the

Activity Level measure, compared to the public group. For example, as shown in Table 6.4, 70% (14) of the motivated individuals scored 40 and over, compared to 24% of the public group.

Second, the mean average figure for the Activity Level measure is higher for motivated individuals than for individuals in the public group, as shown in Table 6.4. Hence, the distribution curve for the Activity Level measure is skewed to the right for the sample of motivated individuals. Third, the motivated individuals have a higher average frequency of undertaking each of the 12 activities listed in the table, compared to the public group.

Table 6.4: The distribution of Activity Level measure scores (percentage and/or actual number) and mean score (Likert totals) for both samples.

<b>Scores for Activity Level measure</b> (max score = 61)	<b>Motivated individuals</b> (n = 20)	<b>Public group</b> (n = 82)
Less than 30	5% (1)	31%
30 – 39	25% (5)	45%
40 – 49	60% (12)	23%
50 +	10% (2)	1%
Mean average score	42	34

The particular type of activity that individuals choose to undertake to reduce carbon emissions is similar between the two samples. As shown in Table 6.5, there was very little difference in the comparative rank order of the frequency of activities, with recycling being the most frequent. Refer to Section 2.3.2 for a discussion on previous studies that have researched recycling behaviour (from page 48). This finding

Table 6.5: The average frequency scores and rank order for each activity to reduce carbon emissions for both samples. (1 = most frequent)

Activity to reduce carbon emissions	Motivated Individuals (n = 20)		Public group (n = 82)	
	Rank order	Average frequency score	Rank order	Average frequency score
Recycle glass, metals, plastics, paper	1	3.86	1	3.62
Turn lights off when no one is in the room	2	3.62	2	3.26
Reuse supermarket bags rather than throw them away	3	3.29	3	3.15
Hang out washing to dry rather use a tumble dryer	4	3.24	4	3.15
Put on extra clothing rather than turn the heating up	5	3.05	6	2.67
Monitor the fuel consumption of a vehicle that you use	6	2.83	5	2.71
Turn off appliances at the wall socket when not in use	7	2.76	7	2.42
Check that the products you buy are produced locally	8	2.67	8	2.01
Walk/cycle/use public transport although using car would be more convenient	9	2.33	10	1.93
Only buy foodstuffs that are produced locally	10	2.09	11	1.72
Make an effort to counterbalance your carbon emissions	11	2.05	9	1.95
Choose not to fly for environmental reasons	12	1.86	12	0.87

regarding the comparative rank order of activities undertaken suggests that the having a high level of motivation does not influence the decisions regarding which activities to undertake or the frequency with which the activities are undertaken.

As shown in Table 6.5, the frequency for each of the 12 activities to reduce carbon emissions is higher for the motivated individuals than for individuals in the public group. This finding confirms the robustness of the selection process for the motivated sample, as it is axiomatic that a high level of motivation results in a person taking more action than a low level of motivation.

The Carbon Emissions measure, the second quantitative tool used in the surveys scores total reported carbon emissions for domestic energy usage, car use and air travel. The scores for this measure provide data on the range of total reported carbon emissions from these three sources within the sample of motivated individuals. These individuals strive to behave in ways that result in the production of minimal carbon emissions and this measure indicates the effectiveness of that endeavour, comparative to the other motivated individuals who are striving to behave in a similar fashion. The percentage of surveys returned with incomplete data regarding this measure, and so excluded from the analysis, was greater in the public group (57% compared to 20% (four) of the motivated sample). Since this information is readily available to all householders and car and aeroplane users, the difference in response rate could be due to less interest in monitoring consumption patterns compared to the motivated individuals, or to being overwhelmed by the requirements or unwillingness to complete the survey due to, for example, possible socio-economic differences. The motivated individuals who returned surveys with incomplete data regarding their reported carbon emissions all scored below average for the Activity Level measure, indicating that these particular individuals are less motivated to undertake activities to reduce carbon emissions and/or monitor their own behaviour, than the other individuals.

The scores for the Carbon Emissions measure were compared between the two samples. This measure calculates air miles travelled and domestic energy usage, based on reported figures from each respondent. The results, excluding the surveys with incomplete data, are shown in Table 6.6. There was a lower value for the sample of motivated individuals for all four of the statistics, when compared to individuals in the public group. These results, although perhaps unsurprising, reflect, in a positive manner, the situation that individuals who perceive themselves to be motivated to reduce carbon emissions do, overall, produce less carbon emissions, reportedly.

Table 6.6: Descriptive statistics for the scores of Carbon Emissions measure for both samples (lbs CO<sub>2</sub>/yr).

<b>Statistic</b> (lbs CO <sub>2</sub> /yr)	<b>Motivated individuals</b> (n = 16)	<b>Public group</b> (n = 47)
Lowest total value	978	1421
Highest total value	34773	43376
Median value	9015	9214
Mean value	11691	12522

Further correlation analysis extends the understanding of the influence that having an ability to make connections has on the motivation to reduce carbon emissions. For example, there is a moderately strong and significant association between the Connection measure and the Activity Level measure ( $r = 0.54$  at  $p = 0.05$  level) for the motivated sample and a strong and highly significant negative correlation between the Connection measure and the Carbon Emissions measure ( $r = -0.69$  at  $p = 0.005$  level). These results support the earlier conclusions in Chapter Five that the perception of having a high motivation does not predict a narrow actual-intention gap

and that the efforts made by the motivated individuals do make a difference regarding the carbon emissions they reportedly produce. This finding indicates that the ability to make connections influences the total reported carbon emissions that individuals who have internalised motivation are responsible for, more than the total amount of activities that they undertake.

Finally, the results for the two quantitative tools from the 16 motivated individuals that returned completed data for the carbon calculation are presented in Table 6.7. The results are in ascending rank order for the Activity Level measure from top to bottom. Correlation analysis of the results in Table 6.7 reveals a significant negative correlation between the two measures ( $r = -.64$  at  $p = 0.01$  level). The correlation

Table 6.7: Scores for Activity Level and Carbon Emissions measures for the motivated individuals. (n = 16)

<b>Activity Level measure scores</b>	<b>Carbon Emission measure scores</b>
29	28645
34	20057
36	13157
37	34773
41	978
42	6377
43	5125
43	7221
45	10670
46	11373
46	4386
46	7766
49	8154
49	10637
51	7864
52	9876
Mean = 43	Mean = 11691

indicates that, on average, the more activities to reduce carbon emissions that a person undertakes, the less carbon emissions they reportedly produce. The three individuals who scored the highest scores for the Activity Level measure and lowest reported scores for the Carbon Emission measure stated in their interviews that the way they actually behave is the way they want to be behaving. This suggests that these two measures, as used in this study, can predict the actual-intention gap in this context.

As a result of the survey analysis, it was found that the data collected by the quantitative tools also substantiate the earlier conclusion from the qualitative analysis that there is a marked difference in actual behaviour amongst the motivated individuals. The results in Table 6.7 illustrate in quantitative terms that the perception of being highly motivated in this climate context is interpreted differently amongst the individuals within the sample; for example, the scores for the Activity Level measure vary between 29 and 52, and the scores for the Carbon Emissions measure vary between 978 and 28645. Also, individuals who are undertaking a similar amount of activities can produce dissimilar reported totals of carbon emissions; see, for example, the Carbon Emission measure scores for the three individuals with an Activity Level measure score of 46. Hence, the perception of being highly motivated is a poor indicator of actual behaviour and lifestyle.

The idea that individual lifestyles and human behaviour require compromise was discussed in the interviews. Fourteen of the motivated individuals accept that although they might want to change their behaviour to be more in line with what they know is needed concerning carbon emissions reduction, certain changes are outside their control. The most common example given regarding the lack of control is the location

of work commitments resulting in the need to use a car either because of visiting a number of different places in a normal working day, or, as Dan explains, because the workplace is relatively inaccessible by other modes of transport:

Dan: *I would have to leave home at 4.30 in the morning if I wanted to get to work on time and by public transport.*

Having to make such compromises in their behaviour and not be able to behave how they want in certain aspects of their lives is acceptable for the motivated individuals, because they perceive that making selected efforts are better than none. They believe that they are doing the best they can as an individual within the constraints of a democratic society and institutional authority. As Liam points out, the awareness that such cooperation is necessary serves to heighten his efforts overall:

Liam: *...having to compromise functions to motivate me to try and work out a way round it, for example, using my trips to do errands for others.*

Irrespective of the size of the actual-intention gap, the motivated individuals focus on setting and achieving tangible short term goals in their everyday lives. Table 6.8 lists the types of activities that the motivated individuals aspire to, in achieving their ultimate self-standard (Higgins, 1987) or ideal self (Markus and Nurius, 1986). All of the activities listed in Table 6.8 are specific, local and personal to the individual and of a practical, tangible and achievable nature. Setting goals that are short-term, achievable and tangible is a crucial part of minimising the gap between actual and intended behaviours (Fishbach *et al.*, 2006). As the motivated individuals set similarly focused goals, however, there remains a lack of understanding into why there is such a marked difference in the actual-intention gap amongst the sample.



Table 6.8: Types of activities that the motivated individuals most aspire to, as part of their ideal self.

<b>Category</b>	<b>Most aspired activity to achieve ‘ideal self’</b>	<b>Count per item</b> (n = 20)
Transport	Reduce flying	2
	Reduce car emissions (fuel; less usage)	3
	Increase public transport use	1
	Achieve zero emission from travelling	2
Domestic emissions	Use only renewable energies	2
	Reduce heat loss	2
	Improve energy efficiency in home	3
	Reduce landfill waste	1
Climate change strategies	Develop low carbon community cooperative scheme	1
	Run company that reduces water/energy consumption	1
	Persuade friends/colleagues to reduce car usage	1
	Raise awareness within local construction industry of energy efficiency	1

Central to the internalised motivation to reduce carbon emissions is the ability of individuals to undertake activities in a manner that results in these activities becoming a routine way of life and be performed without needing to think consciously. For example, eleven of the motivated individuals, including Janette and Ross, describe that the way they behave in environmental terms is automatic and instinctive and has become the normal way of life for them:

*Janette: I don't even think about the way I behave anymore – I just do it.*

*Ross: I do it now without thinking – it's just the way we do things.*

Acquiring the ability to undertake activities to reduce carbon emissions automatically requires individuals to change their way of life by breaking old habits and establishing new ones. Previous work by Kollmuss and Agyeman (2002) and Maitney (2002) concluded that a strong internalised motivation is more likely to provide the level of effort and resilience required to break a habit, compared to an externalised motivation.

It is clear from the present results that simply performing activities to reduce carbon emissions is not adequate to develop automatic behaviour. Previous work is inconclusive regarding whether or not habitual behaviour is directly proportional to frequency of performance, as was discussed in Chapter Two (see page 52). Aarts *et al.* (1998) found that by simply performing a particular activity regularly, such as driving a car to work, the activity can become habitual and Bargh and Gollwitzer (1994) argued that knowing what to do and feeling competent plays a crucial role in developing a habit. The finding of the present study that frequency does not directly result in automatic behaviour is, perhaps, unsurprising considering the complexity of the climate issue. Having said that, it is axiomatic that undertaking an activity is fundamental in achieving automaticity rather than, for example, being concerned about a particular issue or having the intention to take action.

One of the most significant findings of this study so far is the understanding that being able to undertake activities automatically and without any conscious thought is an integral part of the internalisation process of motivation in the climate change context. Eleven motivated individuals who behave automatically to reduce carbon emissions all scored above average for the Activity Level measure, and below average for the Carbon Emissions measure, which indicates that such individuals have a relatively narrow actual-intention gap, and behave in a manner that is close to how they wish themselves to behave. Ryan and Deci (2000b) extended their previous work (Deci and Ryan, 1985) and identified that a shift in behaviour occurs when a motivational state changes from being self-orientated and internalised due to its value and importance to being assimilated into an individual's existence. The mechanisms behind why undertaking activities to reduce carbon emissions become part of the

normal way of life for certain individuals and not others, and how the internalised motivation develops is explored in Chapter Eight.

### **6.5 Concluding remarks**

It can be concluded as a result of the analysis presented in this chapter that there are five defining characteristics of individuals who have internalised motivation. A core of three ethics, the sense of value, of responsibility and of belonging are reinforced by two capacities, the ability to make connections and the ability to self-reflect on one's behaviour. The three ethics and the ability to make connections are better developed in individuals who have internalised motivation compared to the wider population, though present in both groups.

The results of the quantitative analysis confirm the earlier qualitative findings that the gap between how individuals behave and how they intend to behave, the actual-intention gap, is markedly different between individuals in the motivated sample even though they all perceive that they have a high level of motivation. The new information resulting from the survey analysis reveals that the individuals who have a narrow actual-intention gap undertake many of their activities to reduce carbon emissions automatically, with no conscious thought and as a part of the normal way of life. Questions remain regarding the process to achieve that automatic, inherent behaviour and these are addressed in Chapter Eight as part of examining the development of the internalised motivation. The next chapter, however, examines contact with the natural environment, which the motivated individuals consider is influential in their environmental behaviour as adults.

## **CHAPTER SEVEN**

### **CONTACT WITH THE NATURAL ENVIRONMENT**

#### **7.1 Introduction**

In this chapter, the relationship between contact with the natural environment and the motivation to reduce carbon emissions is examined in detail. The interview analysis in Chapter Five concluded that having regular and ongoing contact with such environments is one of the nine characteristics of the motivated individuals. The aim of further examination of the relationship is to identify whether or not there are any aspects regarding the contact that are unique to these individuals.

The link between carbon emissions reduction and the natural environment is not necessarily well established in people's minds perhaps because people generally think of birds, green grass and trees when they consider natural environments (Sullivan *et al.*, 2004), whereas greenhouse gases such as carbon dioxide are released directly into the global atmosphere. The motivated individuals identified the importance of making connections between actions and their consequences in the context of climate change to bridge the gap between awareness or concern regarding the issue and taking action to address it. They also described the value of localising their efforts by, for example, setting goals that consist of undertaking everyday activities in their local surroundings. Local green spaces have the potential to link the issue of carbon emissions and the natural environment because they create opportunities for mitigative action such as planting trees and so reiterate the local nature of action to address a global problem.

The methods used to understand the link between carbon emissions and the natural environment are based on comparative analysis between the motivated individuals and the public group. All percentage statistics quoted in this chapter are rounded to the nearest whole number, and adjusted to total 100% where necessary. Returned surveys with missing data were excluded from the analysis. The sample of motivated individuals sample,  $n = 20$  and the public group,  $n = 82$ . Refer to Section 3.5 (page 95) for full details of the methods and survey design used to collect the data.

The rest of this chapter is divided into six sections. The results regarding whether or not people appreciate and want to protect the natural environment, and the source of the value they place on it, are presented in the second section; those concerning the favourite types of natural environment that people visit and the need for more green spaces in urban areas are presented in Section Three. The results regarding the frequency of contact with the natural environment during three periods, as a child, a teenager and an adult and the development of a place identity are discussed in Section Three. The particular features of favourite natural environments and the nature of feelings that individuals experience when there are examined in the fourth section, followed by a discussion of the results and concluding remarks.

## **7.2 Appreciation of the natural environment and the source of its value**

The natural environment is one of many aspects that are valued by the motivated individuals, rather than them specifically identifying that their sense of value is only towards the natural environment (see Section 5.8, page 178). It is well established in the literature that valuing the natural environment influences environmental behaviour (for example, see Stern *et al.*, 1993; Saunders *et al.*, 2006; Slimak and Dietz, 2006),

but little is understood regarding the sources of the value that the motivated individuals place on the natural environment. The discussions that follow are based on the results from the surveys in research stages four and six (refer to Table 3.3, page 78, and pages 104 and 111 for details of the methods).

The comparison of the survey results regarding whether or not individuals appreciate and want to protect the natural environment indicates a similarity between the motivated sample and the public group. Refer to Table 7.1. For example, all of the motivated sample and over 90% of the public group agree, or strongly agree, with the statement, ‘I appreciate and want to protect the natural environment’. The strength of feeling amongst the motivated group towards the natural environment is unsurprising considering the context of the motivation being studied. The strength of feeling, however, amongst the public group seems relatively high (although comparative data is not available), augmented by the fact that all but one individual in the public group

Table 7.1: The ranked response (percentage and/or actual numbers) of individuals in both samples regarding whether or not they agree that they have an appreciation and desire to protect the natural environment.

<b>Ranked response</b>	<b>Motivated individuals</b> (n = 20)	<b>Public group</b> (n = 82)
Strongly agree	80% (16)	61%
Agree	20% (4)	31%
Neutral	0	4%
Disagree	0	3%
Strongly disagree	0	1%

stated that they value the natural environment. It could well be that the bias in the public group response reflects the fact that people who are interested in the natural environment are more likely to complete and return a survey that concerns environmental issues.

Regarding the source of the value placed on the natural environment, Table 7.2 lists six of the possible twelve sources that were included in the survey responses, and the percentage distribution of each source within the two samples. (The Other category includes responses for the other six possible sources, responses of no value, and when all categories ticked). The top four most common sources were ranked in the same order in the two samples, which suggests that the source of value for the natural environment, specifically, is not a strong influence on motivation to reduce carbon emissions.

Table 7.2: Sources of the value (percentage and/or actual numbers) that individuals in both samples place on the natural environment.

<b>Value source</b>	<b>Motivated individuals</b> (n = 20)	<b>Public group</b> (n = 82)
Childhood outdoor experiences	15% (3)	20%
Self value	5% (1)	1%
Self-taught knowledge	25% (5)	30%
All needs met/contented life	5% (1)	2%
Visiting natural environment throughout life	35% (7)	34%
Valuing others	10% (2)	6%
Other	5% (1)	7%

The most common source of value for the natural environment in both samples is visiting such environments on an ongoing basis throughout life. Individuals in the two samples feel that ongoing contact with the natural environment has been more influential in developing their value for such environments, than outdoor experiences as a child; the impact of such contact is explored further in this chapter.

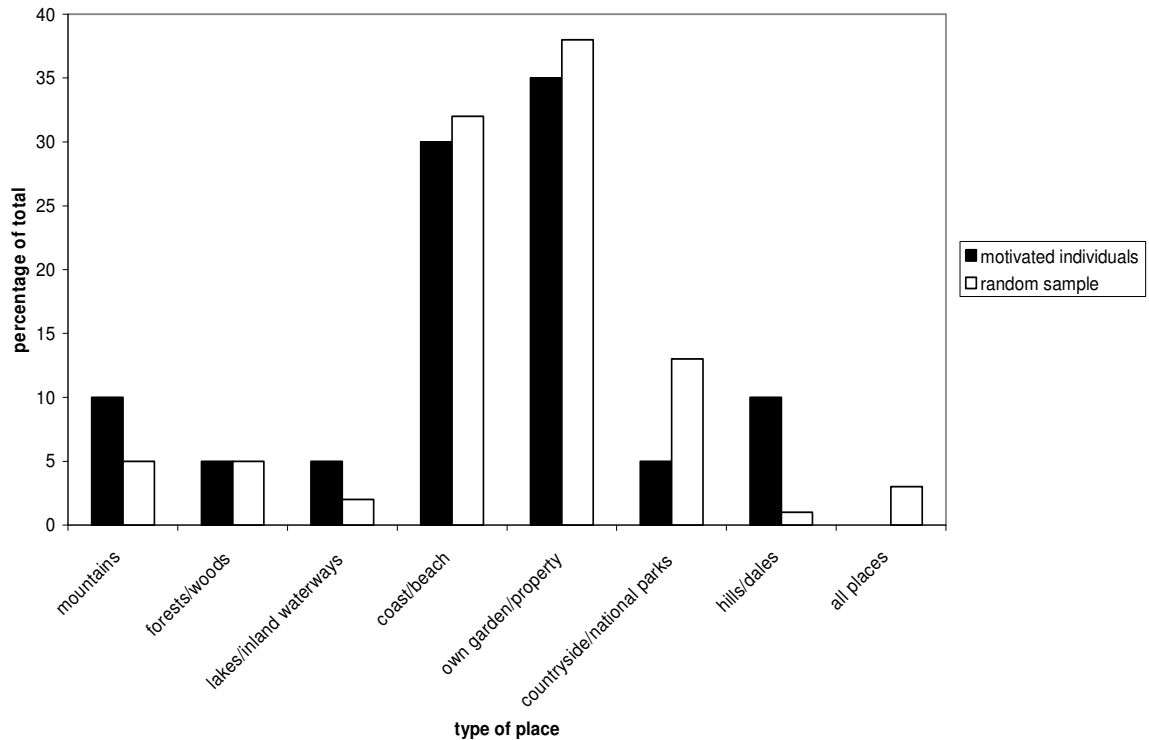
The comparison of the survey results shown in Table 7.2 also indicate that neither of the samples identify having needs met as the main source of the value that they place on the natural environment. It can be argued that individuals may have all their needs met, yet do not connect that specifically with valuing the natural environment. The results, however, that one of the motivated individuals and 2% of the public group identify this option as the main source of their value, does not contradict the argument put forward in this study that a values stance is of greater consequence in the context of internalised motivation to reduce carbon emissions than the needs hierarchy approach.

### **7.3 The favourite types of natural environment**

In the second section of the written surveys, respondents were asked to list their favourite type of natural environment. The results are shown in Figure 7.1 and indicate that the distribution regarding favourite type of natural environment is similar between the motivated individuals and the public group.



Figure 7.1: The percentage distribution of the favourite type of natural environment for the two samples.



Sixty five per cent of the motivated individuals (13 individuals) and 70% of the public group consider that their own garden/property or the coast/beach is their favourite type of natural environment to visit. The inclination that people have towards spending time in their own gardens is indicative of the situation that, for many people, their own home is the most accessible natural environment, being the closest, and somewhere they feel that they belong. Previous environmentally-based work has also suggested that having green spaces nearby can be influential (see page 37). The higher mean age of the public group (51 years compared to 43) may explain the higher percentage of individuals in this sample that prefer their own gardens, compared to the motivated individuals, since spending time in one's garden is a more popular

pastime as a person gets older (DiPietro, 1996; Crespo *et al.*, 1996). The fact that the coast/beach was cited as a favourite place to visit is likely related to the fact that 17 of the motivated sample (68%) and all the respondents in the public group are based within the East Anglia coastal region, where the coastline and beaches are readily accessible. The present results suggest that distance, for some individuals, plays a significant role in the type of natural environment that they most favour. Bateman *et al.* (1995, 2006), for example, found an inverse relationship between distance from, and value placed on, environmental public goods and Coles and Bussey (2000) found that areas of urban woodland in the UK are highly valued providing that they are within a ten minute walk from home.

It was surprising that the percentage of people who prefer to visit lakes or inland waterways is so low, considering the source of the samples. For example, as shown in Figure 7.1, only one of the motivated sample and 2% of the public group prefer to visit such places. The Norfolk Broads is a well recognised landmark in the region and renowned further afield, and is easily accessible for those who wish to visit. Previous studies found that visiting landscapes involving water, of which the Norfolk Broads is an example, improves a person's sense of well-being (Korpela and Hartig, 1996; Mayer and Frantz, 2004). Yet the results of the survey analysis indicate there is little value placed on visiting the waterways by people who live in the East Anglia region.

The motivated individuals confirmed that they appreciate urban green spaces by indicating a preference for the development of more such spaces rather than easier access to the larger landscapes, such as mountains and the coast. The results shown in Table 7.3 support the current evidence of the value of urban green spaces (Kaplan,

1993; Cheisura, 2004) and local access (Bateman *et al.*, 2006; Matsuoka and Kaplan, 2008). As the results of the crosstabulation (see Table 7.4) indicate, however, there is little evidence that individuals who would prefer more local green spaces in urban areas are necessarily more motivated to reduce carbon emissions. It is also unclear if people would make use of urban green spaces if more were available or simply travel to wherever green spaces are located when they want to visit such places. For example, Maat and de Vries (2006) found no compensation behaviour by people who have less access to green space and suggested that people are fully aware of the local surroundings before they make a choice regarding where to live.

Table 7.3: The preference (as an actual number) of more local green spaces or easier access to larger natural environments.

<b>Preference</b>	<b>Motivated individuals</b> (n = 20)
More local green spaces	14
Easier access to larger natural environments	4
Neither or both preferences	2

Table 7.4: Crosstabulation (individual responses) for preference of green spaces/easier access and Activity Level measure.

<b>Activity Level measure</b>	<b>Score 29-38</b>	<b>Score 39-48</b>	<b>Score 49-58</b>
<b>Preference</b>			
More local green spaces	3	6	1
Easier access to larger natural environments	1	2	1
Neither or both preferences	1	0	3

What is perhaps more striking are the results concerning the favourite type of natural environment and the actual-intention gap. All of the motivated individuals who consider that their own garden/property is their favourite environment scored above average for the Activity Level measure and below average for the Carbon Emissions measure. There was no similar association found in the public group. This result may reflect the value that the motivated individuals place on local action and the ability to bring the global problem to a local level. These individuals set local goals to reduce carbon emissions and appreciate their local surroundings more than other types of natural environment. The next section examines the amount of contact that they have with their local surroundings.

#### **7.4 The frequency of contact and developing a place identity**

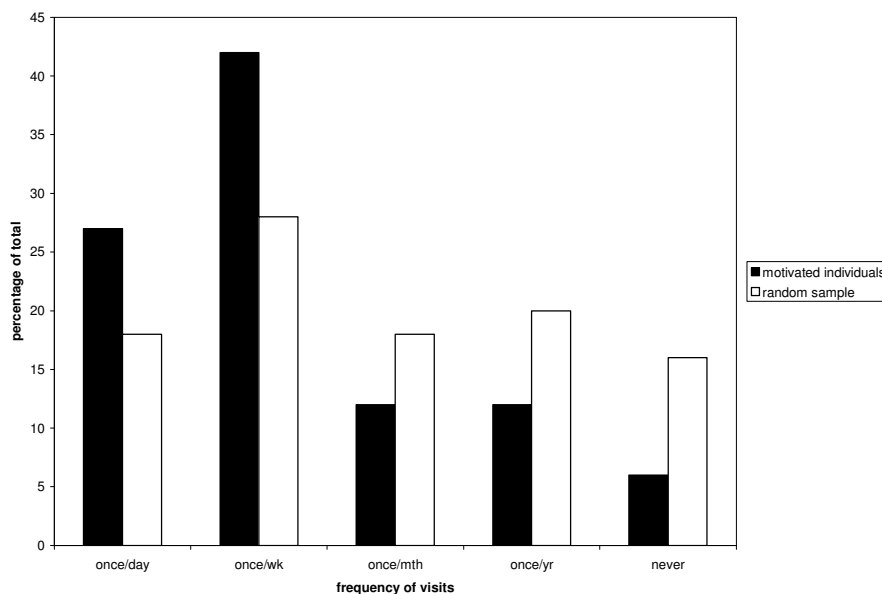
The motivated individuals believe that the contact they have had through their lives with the natural environment influences their environmental concern and behaviour as adults, although they do not suggest that their motivation to reduce carbon emissions is solely a result of this contact. As discussed in Chapter Two, previous work has found that childhood outdoor experiences can be positively influential on adult relationships with natural environments (see page 34). There is little research in any depth, however, regarding the relationship between contact at any age and undertaking activities to reduce carbon emissions. This is probably because, as discussed earlier, the link between climate change mitigation and the natural environment is not well-established.

The results shown in the three graphs in Figure 7.2 indicate that the motivated individuals visit the natural environment on average more often, at any age, when

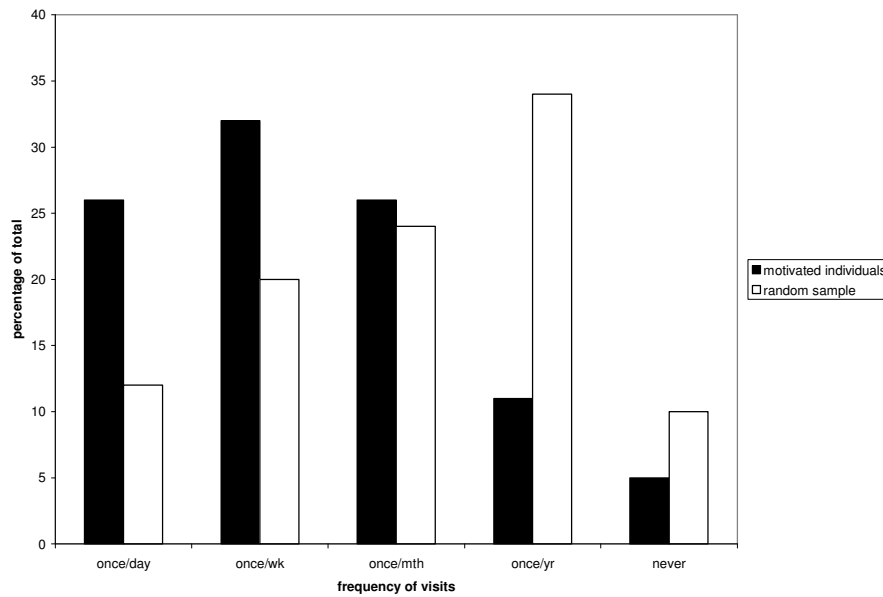
compared to individuals in the public group, and that the modal frequency for the motivated sample has increased from at least once a week as children to at least once a day as adults. One of the major influencing factors on how often a person visits the natural environment is the degree of choice they have. For example, a child has little, or no, choice regarding how often they visit such places, and may end up visiting less, or more, times than they want. A teenager has a certain degree of choice in this regard and an adult has a high degree of freedom to choose how often they visit such environments. The results shown in Figure 7.2 support the conclusion from the interview analysis that the motivated individuals place a high value and importance on having regular and ongoing contact with the natural environment (see page 181). The drop in average frequency that occurs during the teenage years in both samples supports the findings by Kahn and Kellert (2002) that having an interest in the natural environment decreases during the teenage years as the desire to partake in activities that offer more social interactions becomes more prevalent.

Figure 7.2: The percentage distribution of the frequency of visits to the natural environment over three age periods for the two samples.

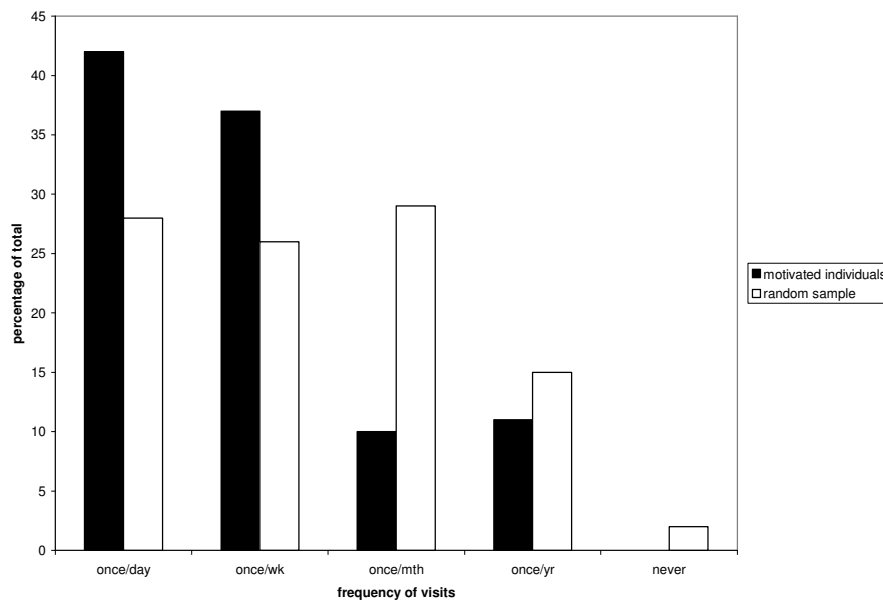
a) as a child



b) as a teenager



c) as an adult



There is little evidence from the results in this study that visiting the natural environment more often results in an individual undertaking more activities to reduce carbon emissions. For example, the correlation analysis between the frequency of visits and the Activity Level measure was not significant for any of the age periods in the motivated sample (child:  $r = 0.47$  at  $p = 0.11$ ; teenager:  $r = 0.49$  at  $p = 0.24$ ; adult:  $r = 0.20$  at  $p = 0.31$ ). To perform the correlation, the frequency of visits were scored

as the total number of visits per year, i.e. once a day equals 365, once a week equals 52, and so on. It was found, however, that those motivated individuals who visit at least once a day as adults and who scored above the average for the Activity Level measure did visit the natural environment at least once a week as a child; hence, reiterating the value and importance that these individuals place on having regular and ongoing contact. Childhood outdoor experiences have previously been associated with developing feelings of appreciation, affinity and attachment with nature in adulthood (see page 34) and there is evidence, in the context of this present study, to indicate that having regular and ongoing contact as a child acts as the foundation of positive relationships with the natural environment later in life.

There are conflicting opinions in the literature regarding whether or not spending time in natural environments influences the development of an attachment to, or identity with, a particular place. Relph (1976), for example, found that becoming attached to a place occurs over time and as a result of developing strong relationships with the people in that location; whereas Tuan (1979) concluded that people can identify with a place in which they had not specifically spent time. The results in Figure 7.3 and Table 7.5 support the opinion that spending time in natural environments positively influences the development of a place attachment; the motivated individuals visit the natural environment on average more often when compared to individuals in the public group (see Figure 7.2). As the results in Table 7.5 reveal, 14 of the motivated sample associate their place identity with spending time in a particular place and, for those individuals in both samples who have developed a place attachment, the most common reason is associated with being brought up in that place or having lived there for most of their life. Thus, the present results chime more

Figure 7.3: The percentage of each sample that identify with a particular place in the natural environment.

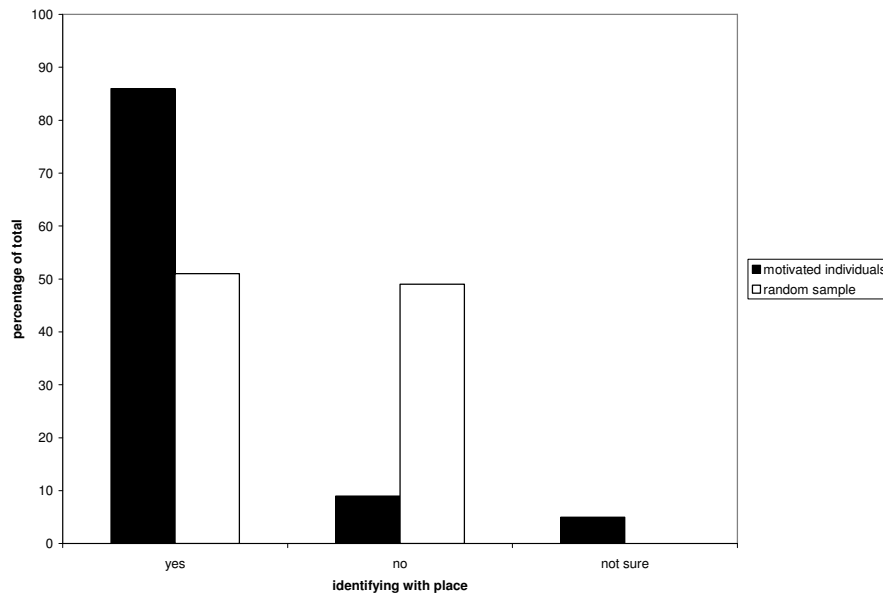


Table 7.5: The most common ways (as a percentage and/or actual number) in which individuals identify with a particular place in the natural environments.

Reason for place identity	Percentage of motivated individuals	Percentage of public group
	(n = 20)	(n = 82)
Brought up there/lived there most of life	30% (6)	23%
Favourite place as child	20% (4)	8%
Own work/efforts	5% (1)	1%
Lived there/family hols	20% (4)	11%
Happiness/fun	5% (1)	5%
Family connection/work	5% (1)	3%
No/not sure	15% (3)	49%



closely with the opinion by Relph (1976) than by Tuan (1979); there is no evidence, however, to indicate that the strong relationships that Relph proposed develop, specifically with people in those places, do so in this instance.

Previous literature has found that when people identify with a particular place in the natural environment a desire to protect the natural environment develops (see page 35). This desire can be focused on a specific place; for example, Hartig *et al.* (2001) found that when people perceive that a particular place in the natural environment provides positive feelings for their general well-being they will protect that place, in environmental terms. The desire to protect can also manifest itself towards the natural environment in general; for example, Kals *et al.* (1999) concluded that having an emotional attachment to a place in the natural environment predicts protective behaviour, in their study on University students. The distribution of observations in the crosstabulation shown in Table 7.6 indicate that testing for an association between place identity and the desire to protect the natural environment is not possible. The nature of the distribution, however, indicates that the conclusions by Kals *et al.* (1999) are also likely to be the case for individuals who have internalised motivation to reduce carbon emissions.

Table 7.6: Crosstabulation (individual responses) for place identity and desire to protect the natural environment.

<b>Place identity</b>	<b>Strongly agree with desire to protect natural environment</b>	<b>Agree with desire to protect natural environment</b>
Yes	13	1
No	2	0
Not sure	2	1

## 7.5 Experiencing the favourite type of natural environment

In the context of this study, there are two characteristics that were considered central to gaining an understanding of why the motivated individuals prefer particular types of natural environment more than others. The first characteristic is the most prominent feature of the type of natural environment that individuals most prefer to visit, and the second is the specific feelings that are experienced and associated with visiting those places.

As Figure 7.4 illustrates, 16 of the motivated individuals (80%) identify the natural beauty, the presence of other living species or an immersion in the environment as the most prominent feature that makes their favourite type of natural environment more important to them than other types. These features all reflect an awareness of the sensual aspects of their favourite natural environments, i.e. in relation to the five senses, in a similar way to how the motivated individuals described their perceptions of natural environments during the interviews, as follows:

David: *...hearing the wildlife....*

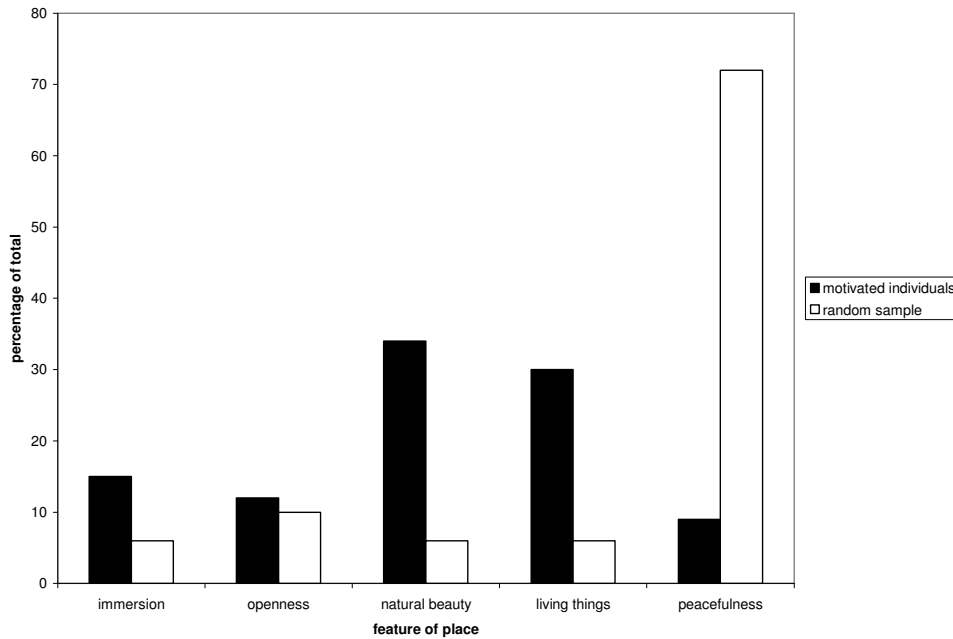
Helen: *...smelling the country smells, as we walk through the woodland and farmland.*

Derek: *...seeing the brightness of the stars in the night sky...*

Sandy: *...watching how different species interact with each other within the landscape.*

In contrast to the type of feature that the motivated individuals consider is most prominent, 72% of the public group identifies that the main feature of their favourite type of natural environment is its peacefulness (see Figure 7.4). Previous

Figure 7.4: The percentage distribution for the feature of the favourite type of natural environment which individuals in the two samples consider to be most prominent.



literature has recognized the influence of such features on a person's welfare. For example, Ulrich (1983) and Kaplan and Kaplan (1989) refer to such features as restorative qualities and Rappe *et al.* (2006) found that people choose to visit the natural environment for reasons that are mainly associated with gaining a sense of well-being. Two thirds of the individuals in the public group also recognize the value of such qualities in natural environments, by enabling them to recover from the factors in fatigue, frustrations and tensions of a hectic pace of life and to regain a sense of well-being in their own lives. Only two of the motivated sample, however, considers the feature of peacefulness as the main feature of their favourite type of natural environment. This small percentage, relative to the result for the public group, implies that the motivated individuals do not consider the restorative qualities of such environments as being of primary importance.

Evidence from earlier stages of this research reveals that the majority of the motivated individuals establish their sense of happiness, contentment and well-being by methods other than from contact with natural environments. For example, 16 of them, including Sandy, indicated during the interviews that their feeling of freedom positively influences their well-being and that their feeling of freedom is based on their sense of belonging, sense of value and of being valued:

*Sandy: I have an immense freedom in my life, even with a husband and children, who add so much to my life....yes, I honestly believe that I am one of the happiest, most contented people I know.*

Nineteen of the interviewees also described that their sense of well-being is as a result of valuing themselves and what they have (see page 180). Hence, for more than three-quarters of the motivated individuals their sense of well-being is in place before they visit the natural environment, which, perhaps, enables them to have a different experience.

The way that these 16 motivated individuals establish their sense of well-being parallels a post-materialism interpretation of needs described by Inglehart (1996). Inglehart developed the concept, based on Maslow's (1943) hierarchy of needs model (see page 174), that people who have experienced material affluence focus on achieving happiness via empowerment, personal freedom and maintaining a healthy natural surroundings. This idea replaces the individual need for higher, or stabilised, levels of the materialism and consumption on which Western society is founded (see page 186). Although the affluence of the interviewees in this study was not formally measured, it can be assumed from information regarding, for example, their upbringing, current lifestyles and type of employment that these individuals have

experienced the material affluence that Inglehart described. The present results indicate that, as discussed earlier in Chapter Five, these individuals establish their sense of well-being by taking control, and responsibility, of their own lives, empowered by the support of their strong family background and social network, which gives them a freedom in life to pursue their goals and a generalised sense of well-being, consistent with Inglehart's notion.

The interview analysis also indicates that there is a difference in the interpretation of the relationship between contact with the natural environment and a sense of well-being amongst the motivated individuals. For example, the following two remarks from Graham and Dan suggest that either variable could be the afferent, or the resultant:

Graham: *...you have to teach people to be happy and along with that comes well-being and then a sense of respect for people, society, environment and a connection with nature;*

Dan: *...when I visit the mountains near where I grew up I feel so much a part of them. If I don't go back there for a while I really miss it....that feeling of happiness and contentment.*

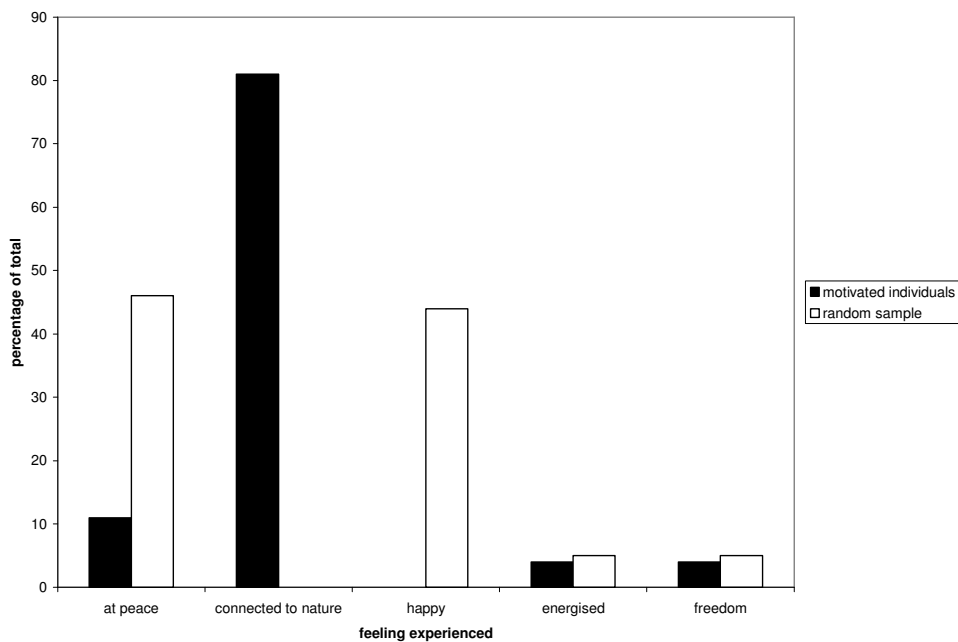
It is unclear at this stage what factors influence which way round individuals perceive this causal relationship. An association, however, is apparent between well-being and the actual-intention gap. For example, the motivated individuals with a narrow actual-intention gap, relative to the rest of the sample, are of the opinion that well-being comes first and then a connection with nature is possible; this is in line with the first quotation above. The motivated individuals with a wider actual-intention gap tend to

agree with the second quotation, in that a person gains a sense of happiness and contentment (synonymous with a sense of well-being) when they visit natural environments.

As well as the prominent features of favourite natural environments, the feelings that individuals experience when they are at such places were also considered. As the results in Figure 7.5 show, 16 of the motivated individuals (80%) experience a feeling of connecting with nature, whilst none of the individuals in the public group experience that feeling. It was revealed during the earlier interviews (see Section 5.9, page 181) that the motivated individuals place value on connecting with nature and consider such contact of importance in their lives, as Ben and Eric describe:

*Ben: There is real natural beauty all around us – we just have to be able to connect with it and appreciate it*

Figure 7.5: The percentage distribution for feelings experienced by individuals in the two samples at their favourite place.



Eric: ...*taking a journey is greatly enhanced when I am able to connect with the surrounding environment.*

The contrast in the two sets of results shown in Figure 7.5, concerning the feelings experienced by individuals at their favourite natural environments, is striking.

Two further findings from the survey analysis support the finding that connecting with nature is important for individuals who have internalised motivation. First, all the motivated individuals who scored above the mean value for the Activity Level measure and below the mean value for the Carbon Emission measure, which is indicative of having a narrow actual-intention gap and so behaving close to how they intend to, said that they experience a connection with nature when they are at their favourite natural environment. Previous studies have highlighted the value of such experiences in the context of environmental behaviour (see page 38). The present results indicate that connecting with nature is also highly influential in the context of motivation to reduce carbon emissions as part of mitigating climate change.

The second finding is that 19 of the motivated individuals (95%) who feel a connection to nature express an identity or attachment to a specific place, which for them represents a place where they feel a sense of belonging to, and a desire to protect, the natural environment and all the living organisms within it. Identifying with a place in the natural environment can result in people gaining a greater understanding of their own identity in relation to nature, as was discussed in Chapter Two (see page 36; also refer to page 170 for the earlier interview analysis). A parallel can be drawn between experiencing such an attachment and the idea of biophilia, the instinctive bond between humans and ecosystems (Fromm, 1964; Wilson 1984, Bell

et al, 1995), whereby the concept of self is extended to include nature and, thus, people are less likely to destroy nature as it would represent a self-destruction (Roszak, 1995; Fisher, 2002; Mayer and Frantz, 2004). This is a significant finding in this study.

## **7.6 Discussion**

In both the public group and the sample of motivated individuals, the most common place to visit proved to be one's own garden, or property. Interestingly, all of the motivated individuals who cited their garden or property as the favourite place to visit have a narrow actual-intention gap. Their actual behaviour regarding carbon emissions reduction is close to how they intend to behave. There was no similar association found in the public group. The motivated individuals generally prefer that more local green spaces are developed than easier access to the larger landscapes. This is a further indication of the desire that the motivated individuals have to connect with, and appreciate, the natural environment at a local level.

The motivated individuals visited their favourite places in the natural environment more often as they get older. Because they have more freedom to choose to visit, or more to the point *not* to visit, as adults than they did as children, this increase is indicative of the value and importance they place on having contact with nature. There is little evidence from the survey analysis of a direct relationship between visiting on a frequent basis and undertaking activities to reduce carbon emissions.

The close association between connecting with nature and a sense of belonging, which the present results have highlighted, is well documented in the literature and is a



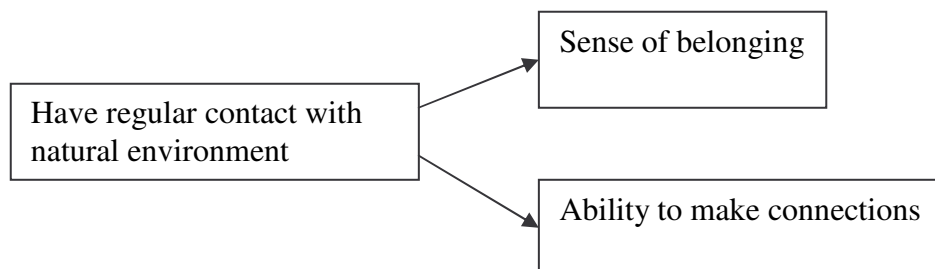
significant finding in this study. The place identity that the motivated individuals develop is most commonly due to spending time at a particular place, especially as a child, and it is likely that a strong relationship is established with the natural surroundings i.e. flora and fauna, rather than specifically with people in those places. It is not the place *per se* that is important, more the individual's ability to connect. Ratcliffe (2005) describes the situation concisely, by saying that "being at one with nature is not the same as feeling...at home in a familiar environment" (p 49). The motivated individuals express an attachment to a specific place in the natural environment, which for them represents a place where they are most aware of being part of, and connected to, the wider concept of the natural world and all that is encompassed in that awareness for them, as individuals.

One of the key findings from the analysis presented in this chapter is that, by making a sensual connection with nature, the motivated individuals experience the natural environment differently from the general population. These individuals understand that the feelings they experience when they visit the natural environment stem from a deeper awareness of the content of the experience, such as the beauty of their surroundings and the presence of other living species within and this underpins their perception of their connectedness with nature. This difference in the experience reflects perhaps that the motivated individuals have a more sophisticated, more developed and certainly a more appreciative and closer relationship with the natural environment, compared to the wider population. The emergence of this relationship from the survey analysis, and the awareness by the motivated individuals of the connection that is being made, has obvious implications for policy regarding, for example, education; it is important to ensure that the contact with the natural

environment facilitates the development of a sensual rather than simply use-oriented relationship.

As a result of the analysis presented in this chapter, it is possible to map the common characteristic, have regular contact with the natural environment, onto the defining characteristics. The first phase of the research indicated that contact with the natural environment translates into an ability to make connections (see page 191 and Figure 5.11, page 192). As the above discussion confirms, such contact also has an impact regarding a sense of belonging and, thus, maps onto two of the defining characteristics as shown in Figure 7.6.

Figure 7.6: Confirmed mapping of the common characteristic, have regular contact with the natural environment, onto two of the defining characteristics.



### **7.7 Concluding remarks**

It can be concluded from the results of comparative analysis with a public group that contact with the natural environment is an integral part of two of the defining characteristics of individuals who have internalised motivation to reduce carbon emissions; namely the ability to make connections and the sense of belonging. These individuals experience the natural environment differently from the wider population, which reflects more appreciation of such environments and probably a deeper,

sensual, more sophisticated relationship; the foundation of which is arguably childhood outdoor experiences and the value they place on having regular and ongoing contact through their lives. Developing a place identity serves more to connect these individuals with the natural environment overall than it does to link them with the specific place.

It can also be concluded that individuals who have internalised motivation behave in a manner that is close to how they intend regarding carbon emissions reduction and have the ability to undertake activities automatically. Questions remain, however, regarding the foundations of the more sophisticated appreciation of the natural environment, the contributors that underpin the development of internalised motivation and the link between the natural environment and motivation to reduce carbon emissions. These three aspects are the focus of Chapter Eight.

## **CHAPTER EIGHT**

### **HOW THE MOTIVATION TO REDUCE CARBON EMISSIONS DEVELOPS**

#### **8.1 Introduction**

The purpose of this penultimate chapter is two-fold. First, the mechanisms behind an increase in internalised motivation to reduce carbon emissions are examined and, second, all the contributors to the development of internalised motivation are presented, as a way of bringing the research to a logical conclusion. Understanding the mechanisms that result in a motivation increase in the motivation represents a crucial part of addressing the third and final key research question:

How does motivation to take mitigative action develop?

Eighty nine per cent of the motivated individuals involved in this research describe a specific time when their motivation increased to its present level, primarily due to a series of changes in their circumstances of their own choice. The mechanisms behind such an increase are poorly understood. The ethics and capacities which represent the defining characteristics of individuals who have internalised motivation are a sense of value, a sense of responsibility, a sense of belonging and the ability to make connections, including with the natural environment and the ability to self-reflect on one's behaviour. The final stage of the research addresses the lack of understanding of the specific mechanisms behind the development of motivation. Full details of the methods used in this final stage are presented in Section 3.6 (page 111).

The evidence that confirms an increase in motivation occurred at a particular point in the lives of the motivated individuals is discussed in the second section, along with a

summary of the methods for the final stage of research, the focused interviews. The results from the interviews are then presented in two sections: first, the personal circumstances at the time when the internalised motivation developed and, second, the trigger for the development. The relationship between individuals who have internalised motivation and society in general, the underlying contributor to the development of motivation and a review of the self-determination theory (Deci and Ryan, 1985) in the context of climate change mitigation are discussed in the final three sections.

## **8.2 The evidence of an increase in motivation**

The survey results that were discussed in Chapter Four reveal that 17 of the motivated sample ( $n = 20$ ) experienced an increase in the level of motivation to reduce carbon emissions at a particular point in their lives and the motivation has stayed at the new level since then. This development involving a rapid increase and then levelling out and remaining at a constant level is evidence of the stable nature of motivation in the climate change context. Understanding the mechanisms behind the development of motivation offers an opportunity, first, to engage other people who may not be as highly motivated and, second, to increase in an ongoing manner the overall number of individuals who are engaged in addressing climate change.

The survey results regarding the duration at a high motivation level are presented in Table 8.1 and show that there is a range in the total number of years since each of the motivated individuals has had a high level. The range varies from a person's motivation increasing one year ago and staying at this high level to a person's motivation being at a high level all of his/her life. The relative age of the individuals

does not explain the variation in duration, as the increase was found to occur at different times for different individuals. For example, a weak and not significant correlation ( $r = .21$  at  $p = .13$ ) was found between motivation duration and age. There is no evidence that motivation developed at a particular age in a person's life due to, for example, natural maturity or the development cycle.

Table 8.1: The actual number distribution of the duration at a high motivation level for the motivated individuals.

<b>Time related variable</b>	<b>Motivated individuals</b> (n = 20)
1 - 9 years	13
10 - 19 years	4
Lifelong (25 + years)	3

Three of the motivated individuals stated that they did not remember a time when their motivation increased, as they considered their motivation to have been at a high level for all of their life. Hence, for these three individuals there has been no discernible time when the motivation specifically changed to a higher level. These three individuals described how they were brought up in a rural environment, in a close family unit and in a lifestyle that was focused on being environmentally conscious and sustainable. Their parents taught them from an early age that wasting resources was morally wrong and having a sense of value and responsibility towards other people and the natural environment was morally right. It is unlikely that any of these three individuals have genuinely felt a desire to reduce carbon emissions throughout all their life as there was little public awareness of climate issue prior to 1990 or so. Hence, the individuals who indicate a lifelong response are perhaps

generalising when they discuss the duration of motivation and perceive undertaking activities to reduce carbon emissions as part of their wider environmental concern. As these three individuals cannot recall a succinct time when their motivation developed, they were discounted from further involvement in this stage of the research.

This final stage of the research employed a one-on-one focused interview technique to concentrate on the time when the development of internalised motivation was most noticeable to the selected individuals. Three main lines of enquiry were pursued during the interviews: the personal circumstances around the time of the motivation increase, the contributing factors that triggered and/or facilitated motivation development and the impact of the change on the nature of motivation and characteristics that define the motivated individuals. The flexibility of the semi-structured format, a framework of key questions based around the three lines of enquiry, was used to guide the direction of the probing and enabled the interviewer to pursue lines of questioning as they appeared of particular interest in the context of this stage of the research. The participants for the focused interviews were selected from the sample of motivated individuals that had completed the surveys for stages four and five of the research, excluding three individuals who stated they did not remember a specific time when their motivation increased.

The reasons that these 17 individuals most associated with the memorable increase in motivation are listed in Table 8.2; the most common of which is an employment opportunity. The selection for participation in the focused interviews was based on the fulfilment of the five variables listed in Table 3.7 (see page 112). Full details of the methods used in this final stage of research are presented in Section 3.6 (page 111).

Table 8.2: The distribution of responses regarding the reasons associated with a motivation increase (individual responses).

<b>Reason associated with increase in motivation level</b>	<b>Number of individuals</b> (n = 17)
Helping others to take action	3
Being aware of having skills that can help	4
Employment opportunity	6
Having children	3

The focused interviews took place with four individuals in February 2007 and the key points from the interviews are presented in Tables 8.3 and 8.4 and discussed in the following sections.

### **8.3 Personal circumstances at the time motivation developed**

As summarised in Table 8.3, the four interviewees described themselves as having low levels of stress and anxiety around the time that their motivation developed, which they perceived as being crucial in their capacity to cope with the change effectively. There was a difference in the level of security that the interviewees felt as the motivation developed which perhaps reflects the earlier typology, which they contributed to, whereby having a safe and ordered life nowadays is not necessarily considered an essential part of daily living, as it might have been in the past.

The interviewees also described being in a stable, long-term relationship, and feeling an integral part of their local community, social network and/or workplace, as Ross highlights:



Table 8.3: A summary of the interview responses by the four individuals selected, regarding their personal circumstances at the time motivation developed.

<b>Social circumstance</b>	<b>Janette</b>	<b>Olivia</b>	<b>Mike</b>	<b>Ross</b>
Perceived level of stress/anxiety in life overall	Low	Low	Low	Low
Perceived level of security in life overall	Medium	High	Low	Medium
Sense of freedom in life	High	High	High	High
State of relationship with immediate family/partner	Stable, long term	Stable, long term	Stable, long term	Stable, long term
Feel part of local surroundings and community	Yes	Yes	Yes	Yes
Sense of well-being	High	High	High	High
Personal goal/feeling prominent at the time	Desire to do my own thing and take on a new challenge	Wanted to do something different	Getting too comfortable; time for change	Although happy, always on look out for new opportunities

*Ross: Yes, we've been together for many years...lived in the same house for the past twelve years, in a small village with the same neighbours as when we moved in, all very friendly, like a big family...just like it is at work, where I see familiar faces every day. I have lived in a lot of areas around the UK, but never at the heart of the countryside like I do now, with a real sense of being part of the community and countryside.*

These descriptions reflect their sense of belonging, which, as discussed in earlier chapters, is a defining characteristic of internalised motivation to reduce carbon emissions. This sense of belonging enables these individuals to feel united and have

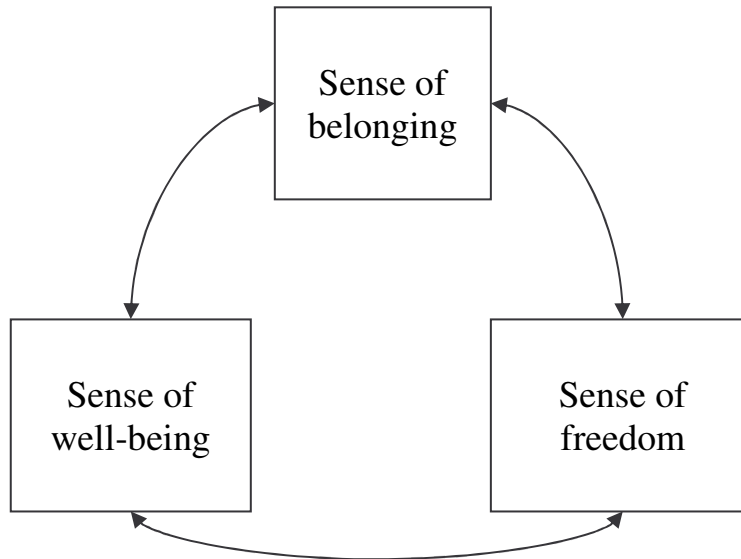
an inherent bond with those people around them who play important roles in their lives, in a similar manner to connecting and being at one with nature when they are in natural environments. The feeling of acceptance by the wider network of people in their community and/or workplace, and foundation of support, reinforces the value that these individuals have for themselves, and gives them a confidence and freedom to be themselves, act as individuals and to carry on behaving how they want. The above process serves to establish a general sense of well-being in these individuals, who feel empowered by the support and acceptance of their social network (whatever that represents for them individually), which gives them the freedom to pursue their goals and self-standards. Hence, positive feedback is established between the three elements, belonging, freedom and well-being, as illustrated in Figure 8.1.

As the individuals develop a sense of belonging, of freedom in their lives and a general feeling of well-being their motivation to mitigate climate change, specifically to reduce carbon emissions, becomes self-orientated and internalised due to its value and importance. Olivia and Mike describe an increasing awareness of requiring less external incentives to take action:

*Olivia: Initially the financial rewards for getting results in recycling cases were a huge incentive, but now I don't even think about that – it's all about achieving a positive result for the environment.*

*Mike: All the media coverage about reducing CO<sub>2</sub> used to make me think oh gosh, I really should be doing more... and yet now I can't remember the last time I heard an advert on the radio, even though I listen to the radio all the time...and I'm certainly doing heaps more these days than I used to.*

Figure 8.1: The positive feedback between three elements: belonging, freedom and well-being.



The four interviewees described that the main impact of developing self-determination to act was the subsequent decision to become more active in environmental protection. As the results in Table 8.4 show, the increase in motivation that these individuals noted was at a similar time to when they all started their present employment. In each of the four cases, the employment opportunity involved an extension of the services offered by the company and was an area of environmental work that the individual had not encountered before. Such a move by these individuals demonstrates a desire and capacity to step into the unknown as they established new environmental services.

Table 8.4: A summary of the interview responses by the four individuals selected, regarding the trigger of the development of internalised motivation.

<b>Variable</b>	<b>Janette</b>	<b>Olivia</b>	<b>Mike</b>	<b>Ross</b>
Started present employment	4 years ago	11 years ago	8 years ago	4 years ago
Motivation increase to high level	4 years ago	11 years ago	8 years ago	4 years ago
Why an environmental focus then	Opportunity became available – wanted to do more	Opportunity arose – wanted to work in environment	Right place at right time - was looking for such an opportunity	Right place - always interested in protecting environment
Why not earlier	Not thought of it	Not available	Not available	Never considered self as an expert in that field
Open to such a employment earlier if available	Probably – not sure	Yes	Yes, working with environmental matters in wider remit	Probably not

It is possible to argue that motivation increased as a result of being paid to be motivated to take action, i.e. driven by an external incentive. It is indicated from the interview analysis, however, that these individuals actively sought an employment opportunity that was going to enable them to behave in a more environmentally-friendly manner as well as be involved in addressing an issue such as climate change, which they considered to be of immense importance. Their efforts are focused mainly on methods and processes designed to reduce carbon emissions because the United Kingdom government has taken an approach of pledging to meet carbon reduction targets with an emphasis on buy-in by business and industry. The interviewees all described that they perceived the specific employment opportunity they chose would enable them to become more active in environmental protection; as Ross and Mike explain:

Ross: *I knew this opportunity would enable me to make more of a difference than I was making already...*

Mike: *I had been looking around for something similar to this for a while...just felt it was time to do more.*

#### **8.4 Trigger for the development of motivation**

Having examined the personal circumstances around the time of the motivation increase, the second line of enquiry during the interviews focused on the contributing factors that triggered and/or facilitated the development of motivation, by investigating the specific change in circumstance that the individuals most associated with the increase in their motivation. For example, specific open ended questions were asked during the interviews regarding the type, and source, of the climate-related knowledge that the individuals associated with motivation increase and the purpose and impact of such knowledge on their subsequent behaviour.

When the four interviewees first started their new employment, they were required to research and familiarise themselves with all the aspects of climate change that were relevant to the requirements and remit of their new position. They became immersed in the strategies and methods needed to reduce carbon emissions; a process which was both ongoing and related to a number of different policy levels, as Janette and Olivia explain:

Janette: *On a day-to-day basis I'm involved in company decision making about our policies and practices to reduce carbon emissions, and those of my clients obviously...which means I have to be up-to-date with current government legislations and national regulations and recommendations*

*concerning solutions to reduce the effects of climate change and, on occasions, my concerns include the international level of the European Union and further afield.*

*Olivia: My clients are based mostly within Norfolk sites or further afield in East Anglia, so I have to be fully aware of local and regional environmental policy and legislation etc., as well as the current government's national stance on issues relating to climate change.*

The degree to which they had to consider the more global aspects of climate change, such as the environmental impacts of importing and exporting products and the collective European Union legislation, depended on the sphere of influence of the company for whom they work and the projects they were involved with at the time. Researching the relevant information was an integral part of their new employment.

There were two effects of the new employment. First, the four individuals increased their ability to make connections between human actions and the consequences related to them, which Mike reflects on:

*Mike: I've found that as my understanding of the issues surrounding climate change has increased I've been able to marry up much more effectively the link between actions on the ground every day in industry and the impact of those actions on the global environment, and just how important it is that efforts are made across industry in general...there's plenty of ways that we can do things differently.*

This process has been critical in enabling them to benefit markedly from their research and familiarisation in the subject concerned, so they could introduce the industry specific solutions required in their workplace that reduced carbon emissions

in the context of their employment and the company's influence. The second effect of the new employment was an increase in the level of competence. For example, when they started their current employments none of the four perceived themselves to be experts in the field of climate change. Further examination revealed that a feeling of competence was not influential in the decision to take the environmental employment that instigated the motivation increase. Instead, as Olivia explains, the feeling of competence developed as the individuals became more established in their new role and more proficient in how to respond effectively to the challenge, facilitated by the related increase in understanding and ability to make connections:

*Olivia: ...as people began to listen, accept and act on what I was saying, my confidence grew and I started to tackle aspects of the employment that I had felt inadequate to address when I first started.*

These results extend the understanding of the role of competency that was identified from the interview analysis in the third stage of research, discussed in Chapter Five (see page 158). For example, competency initially manifests by being proficient at undertaking an ongoing number of repetitive yet simple activities, such as recycling, at home and/or at work. Hence, as motivation develops the scope of competency changes to include the mastering of complex activities as a result of, for example, a change in employment. It is also possible that the motivation was initially influenced by more externally focused incentives to reduce carbon emissions in the workplace. Due to the nature of their employments, i.e. professional rather than manual, in this instance, the feeling of competency would have manifest as mastering complex activities and then extended to undertaking repetitive and simple activities at work and home as motivation developed.

The increase in competency resulted in a change in the sense of responsibility experienced by the four interviewees. Previously, this responsibility manifests as an obligation to act associated with appreciating and wanting to protect the natural environment (see page 147). These individuals felt a level of responsibility to respond to climate change as a member of the human race on the planet. As a result of the increased competency described above, the sense of responsibility evolves to include the realisation that they have the capacity to make a difference in the context of carbon emission reduction, i.e. from I should act to I *can* act, as Ross explains:

*Ross: Its only in recent years, and since I've been with this company that I realise that something has just clicked and people say that when I talk that I'm genuinely passionate in what I talk about, which makes people stand up and listen and then go away and make the changes that are needed.*

Hence, the results indicate that the scope of this particular contributor to the development of motivation increases overall. This indication is supported by evidence from the individuals in the motivated sample who perceive that they have had a high motivation all their lives. For example, as Sandy describes, the sense of responsibility has a dual nature, whereby the initial awareness of having an obligation to act has been retained as the newly acquired belief in their ability to make a difference is established:

*Sandy: I've always felt that I should do as much as I can to address environmental issues and, in fact, still do feel that...though now I also realise that my knowledge concerning specific actions that can be taken is great enough for me to pass on what I know and understand, so others can do more.*



Due to the emergence from the interview analysis that the four individuals all cited the same trigger for their motivation development, further interviews were conducted. The aim of this second set of interviews was to ascertain whether or not the association with an employment opportunity contributed to motivation development in a way that was common with individuals who associated the development with other reasons. Six individuals were selected from the remainder of the motivated sample (excluding the individuals with a lifelong high level of motivation). These six consisted of two individuals for each of the other three triggers associated with the motivation increase - helping others to take action, being aware of having skills that can help and having children - who met the highest number of variables listed in Table 3.7 (page 112). Table 8.5 shows the results regarding how many of the ten repeat interviewees, henceforth termed the selected individuals, met each of the five variables; four of the sample met four variables rather than all five. The questions for the second series of interviews followed the same format as for the first four.

Table 8.5: The number of individuals within the sample of ten repeat interviews, who provisionally fit the variables listed in Table 8.3 (individual responses).

<b>Variable</b>	<b>Number of individuals who fit variable</b> (n=10)
Increase in motivation	10
Activity level	9
Carbon emissions	8
Carry on	9
Behaviour automatic	10

The two individuals who cited helping others to take action described, during the interviews, their desire and efforts to gain an understanding of climate change science and the solutions that are available to address the climate issue, specifically regarding carbon emissions reduction. As Kim explains:

*Kim: I was working in an environmental field for two or three years, learning about climate change as part of my work ... and you have a sort of understanding and motivation ...and I just realised you can make an impact with other people. It's not enough to think to yourself, you've got to inspire others to do it. You can't force them necessarily, it's got to be – everything's got to be really excellent and very motivating and it ends up setting off snowballs. People realise you know what you're talking about, which inspired me to learn more, so I could help others and do more myself – it's that dual capacity.*

The improved understanding resulted in an enhanced ability to make connections between human actions and their consequences, whilst also increasing the level of competence that these individuals felt regarding their ability to perform mundane tasks and understand the complexities of the climate issue. The other people who they were helping to take action began to perceive these individuals as informed in this regard, which reflected onto the two of them who started to feel they needed to be undertaking more activities themselves because they know what action to take. Hence, the contributors to the development of motivation that was triggered by helping others are the same as for individuals who started a new employment.

The two individuals, who cited that they were aware of having skills that can help, described a similar process for their motivation increase with one exception. The

exception is that the initial focus at the time of the increase was associated with a feeling of being competent to undertake the appropriate action, rather than concentrating on searching for knowledge regarding climate change; Adrian elaborates:

*Adrian: I was sorting out the best eco-based heat pump system to put into a house I was renovating and realised that I seemed to know more about the technology than the people selling the products ...and realised that I had the skills that could help make a difference in reducing energy consumption in this way. Before then I would have been aware of the issues, but it wouldn't have been high on the agenda, and realising this made me look at other things I could do to help the environment more.*

For Colin, one of the two individuals who associated having children with motivation development, the emphasis at the time of the development was also on another contributor initially:

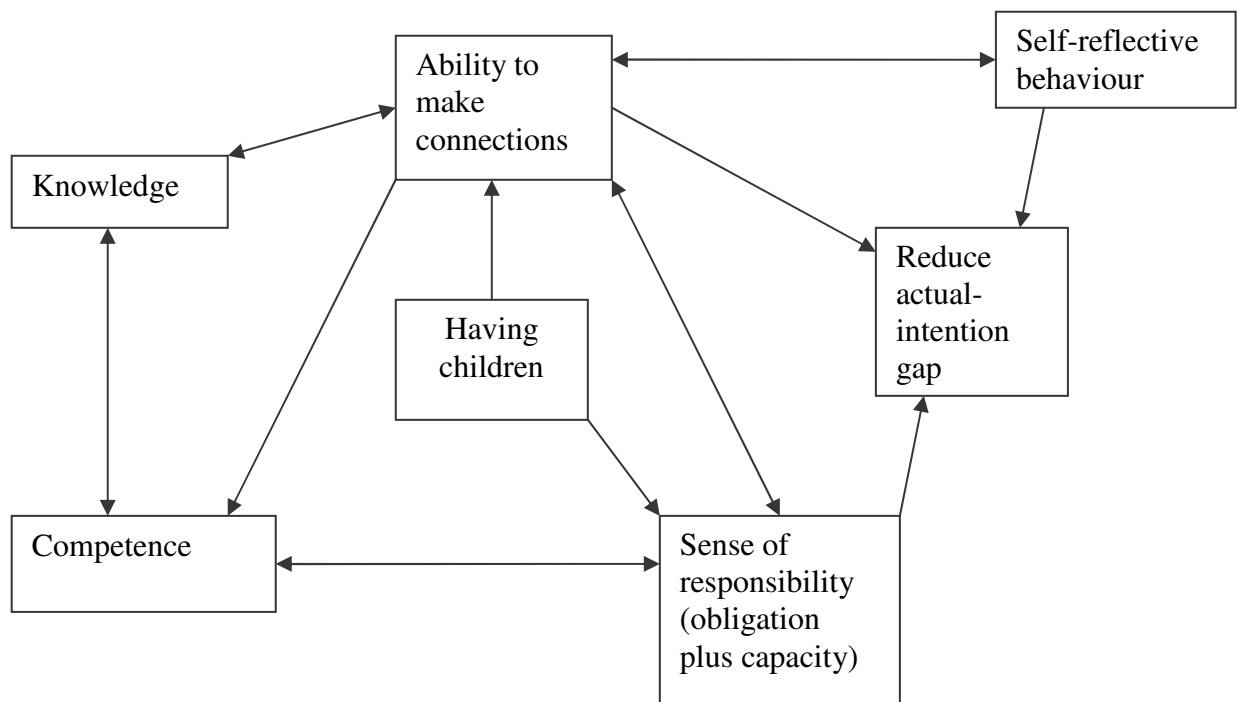
*Colin: It is personal to me. When my first child arrived, it became personal for me, my motivation to do as much as I could increased markedly as I realised that how I behaved now could affect future generations of my family. I felt a real sense of responsibility to learn about the problems and how I could help solve them and do the most I could ...*

He described that having children primarily triggered an obligatory sense of responsibility to protect the natural environment for future generations. The obligation was followed by an increase in his sense of belonging, his ability to make connections

and the desire to improve his understanding of climate-related issues and, finally, the desire to try harder to behave closer to how he intended.

The three processes identified from the interview analysis concerning the development of motivation in this climate context are illustrated in Figure 8.2. The starting point in the diagram is dependent on the specific reason, or trigger, that is associated with the increase, as was described above. The initial reason does not alter the cumulative end result, which is a reduction in the actual-intention gap, whereby the actual behaviour of individuals becomes closer to the intended behaviour. This is a significant finding in this study.

Figure 8.2: A contextual model illustrating the impacts of triggers on the development of internalised motivation.



## **8.5 The development of internalised and habitual motivation**

In this section, the process for developing an internalised and habitual motivation is summarised. The summary is based on the five defining characteristics of value, responsibility, belonging, connections and self-reflective behaviour (see Figure 5.11, page 192), the triad of belonging, freedom and well-being (see Figure 8.1, page 246) and the impacts of the triggers that were discussed in the previous section. The factors that shape and influence motivation to reduce carbon emissions cannot be visualised through a single model or diagram; the practicality, and even meaning, of depicting motivation in this manner is likely to be lost due to the complexities integral to this climate context.

The findings in this study indicate that two of the defining characteristics, having a sense of value and a sense of responsibility, can, on their own, produce motivation to undertake activities to reduce carbon emissions. Such motivation is at least as likely to be driven by an external nature, for example, responding to legislation or a financial reward, as by an internal nature. A third sense, the sense of belonging to society and to the natural environment, contributes to the development of the self-determined and internalised motivation due to the value and importance placed on taking mitigative action. Feeling a sense of belonging in this dual manner promotes a desire to protect people and the physical environment, particularly when a sense of well-being and freedom in life is also established. Ongoing contact with the natural environment facilitates the internalisation process in a similar fashion to having ongoing contact with significant people in one's life, by facilitating a sense of well-being, belonging, freedom, value and responsibility.

This process establishes the desire to become more actively involved in environmental protection in general and, specifically in this case, towards addressing climate change via one of the triggers discussed in the previous section; namely, new employment, helping others, having the relevant skills and having children. These triggers provide the opportunity to increase knowledge and competence regarding carbon emissions reduction, which, in turn, contributes to the development of internalised motivation by developing the sense of responsibility, the belief that their actions make a difference and the abilities to make connections and to reflect on one's behaviour; the senses of value and of belonging are also heightened by this process, in a positive feedback. The contributors to motivation development are similar irrespective of the type of trigger associated with that development.

The abilities to make connections and to reflect on one's behaviour advance specific aspects of the development of the motivation. The ability to make connections enables the selected individuals to understand the impacts of their local and tangible actions in the context of global climate change and, hence, facilitates the sense of value and responsibility for taking such action and the understanding that they are part of the problem *and* the solution to the climate issue. Second, the ability to self-reflect on one's behaviour is essential in effecting the narrow actual-intention gap as it enables these individuals to identify behaviour that they are not satisfied with and have the desire and capacity to improve, via an ongoing process of setting and achieving goals in their daily living.

The self-determination stimulated by the sense of belonging, internalisation of the motivation and the ability to self-reflect on one's behaviour results in the development

of motivation to the extent that activities are undertaken automatically and become a normal way of life, so actual behaviour is in a manner that is very close to intended behaviour. As goals are achieved and subsequent ones developed, the previously achieved behaviours become automatic and normalised in day-to-day living. The transition from self-determined and internalised motivation to behaviour that is assimilated and integrated is an ongoing process involving specific activities, or groups of activities, rather than across the whole lifestyle. The selected individuals identify the parts of their life in which they believe they can achieve the most to address climate change and strive to maximise the effect of their efforts in those areas. As motivation develops, the overall extent of activities undertaken grows, as certain behaviours become assimilated, others become established and new ones are commenced. The result of this development is predominantly a stabilisation of habitual motivation at a level whereby a narrow actual-intention gap is achieved.

A major conclusion can be drawn from this study regarding the link between the natural environment and carbon emissions. Childhood outdoor experiences act as the foundation for the appreciation that the selected individuals develop towards the natural environment and the value that they place on the natural environment. This sense of value, together with the sense of belonging, contributes to the development of a feeling of freedom and general well-being within these individuals. Thus, when they visit their favourite type of natural environment they are able to connect in a sensual manner and feel at one with nature. This connection develops the desire to care for and protect the natural environment. This increased desire, together with self-determination, results in the individuals actively seeking opportunities to protect the

natural environment in a manner that is local, tangible and achievable, such as new employment involving carbon emissions reduction.

## **8.6 Individuals and society**

A second effect of the belonging, freedom and well-being triad (see Figure 8.1, page 246) concerns the relationship between the selected individuals and society. The earlier results in this study were inconclusive regarding the perceptions that the selected individuals have concerning their role in society and the impact of those perceptions on their motivation to reduce carbon emissions. The qualitative analysis in the third stage found that the selected individuals prefer to lead by example and trust that others follow. None of them wanted to be seen in the role of telling people how they should be behaving and many are not particularly concerned of how others might perceive their actions.

As internalised motivation develops, there is a change in the emphasis regarding the return for taking action in this climate context. The return is invariably the drive for human motivation. As discussed in Chapter Four, the selected individuals considered four possible ways to experience the return for their efforts (see page 135). There is the short-term return whereby actions make a local and immediate difference, such as fitting insulation, the experience of an inner feeling of peace that is personal to the individual and not reliant on others, the sense of working towards something bigger by contributing to addressing the global climate issue and, finally, experiencing all three returns. As the internalised motivation develops, the return becomes focused on achieving short-term and local changes and lessens in importance as the motivation



becomes integrated into the normal way of life. This is significant finding, considering the importance that is placed on gaining a return in other types of motivation.

As the importance of a return diminishes and the actions to reduce carbon emissions are integrated, the selected individuals become aware of how they want to interact with society. The results of the focused interviews summarised in Table 8.3 (page 244), confirm that those individuals felt a part of their local community and the natural environment, whilst also wanting to act in an individual way. It is likely that these feelings are associated with the earlier observations in Chapter Four whereby these individuals believe that their sense of freedom in life is based on their established sense of belonging. This belief reflects the way that Kagitcibasi (2005) interprets the concept known as individuation; whereby a sense of belonging (interdependence on others) and a sense of autonomy (independence from others) are involved in developing the relationship between individual and society.

The role that individuals have in society is changing in general. For example, whereas in the past individuals were passive recipients influenced and shaped by society, they are now active participants shaping and influencing the future (Franck, 1999; Bauman, 2001) in a reciprocal relationship with society whereby they form the societal framework that creates and shapes them (Elias, 1991). As individuals control their destiny and take particular action, the society they are a part of becomes autonomous and offers the opportunity to be self-sufficient and self-confident (Balibar, 1991; Zizek, 1991). The idea of self-determination and responsibility is not new, although the general acceptance and tolerance by the state and international

society is (Bauman 2001) and for individuals who are motivated by change this progression is welcomed. The challenge is how to consolidate this change by enabling individual freedom and choice to prosper within a more flexible yet stable society. The process whereby a person strives to be an individual within the security of a wider network is known as individuation. There is extensive literature on the concept of individuation, with distinctions by eminent theorists such as Aristotle, Kant, Heidegger, Jung and Freud and debate amongst the classicists, developmentalists and psychoanalysts regarding the age period in life when such a process occurs (see Horne, 2002). More recently, researchers have interpreted the concept as an interlinking of the uniqueness of a person, the socialisation structure and a specific context (Vidal, 2003). For example, individuation is understood as a process which occurs between mothers and daughters in teenage years (Schuster, 2004; Bernstein, 2004), as a part of the separation progression in adulthood (Colarusso, 2000), and presents difficulties for individuals with eating disorders (Latzer *et al.*, 2002) and alcoholism (Nash *et al.*, 2005).

The results of this research indicate that the selected individuals are not trying to be individuals separate from society, but rather desire to play a specific role within the social framework. There is a sense of wanting to feel a part of their surroundings, irrespective of whether that manifests in society or in the natural environment. They want to belong to a firm foundation of people with a reliable social network that meets their needs and provides a base from which they can propel themselves to achieve their individual goals and reach their aspirations. Ross, for example, describes his place of work:

Ross: *Luckily everyone seems on board from day one as they learn the routines of what goes in which recycling bin and to turn lights off as they leave rooms, they all seem interested in working together at it. We are carbon neutral, let's show you round - that's the first thing we say to customers and visitors. As the sustainability manager, I monitor our energy usage and make changes and can develop the systems knowing that the staff will respond as I want them to.*

There is also a sense of wanting to be an individual separate from society and standing alone for what they believe in, reflected by their strong sense of self and can be associated with the concept of individualism; Olivia elaborates:

Olivia: *I don't drive and have got plenty of pressure from managers to learn and use a car to travel between offices. Instead I arrange to meet people at the train station and have meetings whilst we travel. I am seen as slightly quirky by my colleagues, many of them don't quite know how to take me. Its like my home – it's small, yet has plenty of space for me and my husband and we are warm and dry. When my colleagues come round, you can see they feel almost sorry for me as my house is so small, compared to what they live in. It just makes me laugh.*

These individuals want to be both islands in society and an integral part of a wider network, and such a perception is in line with the view of Elias (1991) that individuals are the fundamental unit, and an integral part, of society. This study concludes that the selected individuals have different perceptions of their role in society. This perception depends on which of the many roles possible, enables them to feel that they are making a difference as an individual within the social framework in which they live.

## **8.7 Underlying contributor to the development of internalised motivation**

As the research draws to its logical conclusion the underlying theme, which corresponds to the underlying contributor to the development of internalised motivation, emerged in the manner that was suggested by Glaser (1978), see page 76. In this instance, one contributor was left unaccounted as all the other contributors slotted into their relevant places in the motivation construct. The reason this is so is because it is recurrent in the interview data, interlinked with all the other contributors to the motivation development and explains the main differences in the behaviour. Hence, it is central to all interrelationships and underpins all the other contributors.

The underlying contributor to the development of internalised motivation to reduce carbon emissions is the sense of value. The sense of value manifests initially as self-value, and then extends to include valuing of others and of the surroundings, including the community and the natural environment. For example, the selected individuals continue to value their immediate family members and other people who are influential in their lives, such as teachers, family friends and leaders of social and sporting groups. There is a strong association between self-value and valuing others more for selected individuals who are actually behaving close to how they intend regarding carbon emissions reduction. The selected sample value the regular and ongoing contact they have with the natural environment are drawn to particular types of natural environment by the expectation that the contact will have a positive influence on their lives. The capacity, and instinct, to value is established within these individuals, instead of the possible desire to have all they need, and/or want; which substantiates the earlier proposal that a values stance is of greater consequence in the

context of climate change mitigation than the needs hierarchy approach. Hence, the selected individuals are happy with, and value, what they have.

Placing value on immediate family members and other people who are influential in their lives underpins a second contributor to the development of motivation, the sense of belonging. For example, Mike and Sandy explain that they experienced a sense of value before they gained a sense of belonging:

*Mike: I've always valued my family immensely, even though as a child it took me a while before I felt close to my parents and siblings.*

*Sandy: I really appreciate how friendly people were when we first moved to this area, but I didn't socialise with people in my local community for the first couple of years, until I felt I'd been accepted by them.*

Studies by Hagerty *et al.* (1992) and Hagerty *et al.* (1996) have also found that a sense of value is established before a sense of belonging. Hence, the sense of value enables the selected individuals to appreciate their strong family connections and develop a sense of belonging, which then extends to include the wider social network, the natural environment in the form of a place attachment and/or the work environment. As discussed earlier in this chapter, the sense of belonging develops motivation in a manner that relies less on external incentives.

A sense of value also underpins the other ethic, a sense of responsibility, which represents a characteristic that defines individuals who have an internalised motivation. The selected individuals demonstrate a sense of responsibility in the form of an obligation to take action to protect the natural environment, which is instilled in them by their parents and influential others who taught them to take responsibility for

their actions and consequences of those actions on all living organisms. Placing value on the natural environment triggers the sense of responsibility specifically towards the natural environment. As discussed earlier in this chapter, the second aspect of responsibility, the capacity to act, develops as the ability to make connections and the levels of knowledge and competence, regarding carbon emissions reduction, increase.

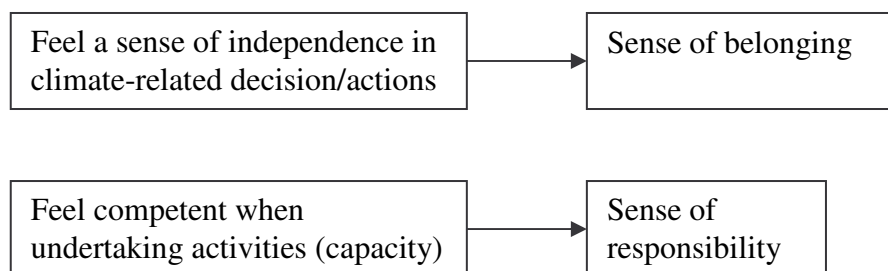
The sense of value strengthens the two capacities that contribute to internalised motivation. For example, when the selected individuals place value on a place, an idea or a person, there is a desire to make a connection and develop a bond, particularly with a place or person. As part of that desire, these individuals want to improve their understanding regarding how that place, idea or person functions and/or integrates. Hence, value underpins the ability to make connections, via knowledge, understanding and competence. The ability to self-reflect on one's behaviour is initiated, and maintained, by the sense of self-value that generates the belief within the selected individuals that they are of value and it is worth behaving close to how they intend.

Finally, a sense of value underpins other contributors of internalised motivation, such as freedom, security/stability and well-being and continues to do so in a positive feedback and ongoing basis as motivation develops. The selected individuals indicated during the interviews that their senses of well-being and of freedom are based partly on their sense of value; for example, valuing what they have, the people who are important to them and of being valued. These aspects of value also create the desire to keep themselves safe and secure in a manner that enhances their lives overall.

## 8.8 Final interpretation of the research results

As a result of the analysis presented in this eighth chapter, the mapping of the two remaining characteristics that are common to motivated individuals can be confirmed. The feeling of independence maps onto the sense of belonging, as was suggested in the earlier discussions (see page 191). The results of this final stage of the research revealed, however, that a feeling of competence maps onto a sense of responsibility rather than the earlier indication of mapping onto the ability to make connections. The analysis of these results showed that increased competency leads to a heightened sense of having the capacity to take action, due to, for example, an increase in the awareness of having skills that can help, which, in turn, manifests as a second type responsibility to act, a capacity, alongside the existing obligatory sense. Figure 8.3 illustrates the mapping of these two remaining characteristics.

Figure 8.3: Confirmed mapping of the final two common characteristics, feel a sense of independence and feel competent, onto the defining characteristics.



### 8.8.1 Applicability of Deci and Ryan's (1985) model

The final consideration in this study concerns the applicability of the motivational model by Deci and Ryan (1985) in the context of reducing carbon emissions. Deci and Ryan proposed that three components, or basic psychological needs, are required to develop the internal nature of individual motivation and the self-regulation of

behaviour, competence (mastering the activity), relatedness (approval and support from significant people in one's life) and autonomy (freely choosing to pursue the activity). They also proposed that individuals whose extrinsic motivation has an internal nature associate a value with the activity they are undertaking, and, hence, a volition or self-determination to act and a belief that such actions are worthwhile. As discussed in Chapter Five (see page 196), three conclusions were drawn from the first phase of this research regarding motivation in this climate context. First, a feeling of competency acts as a facilitator due to the ability to undertake mundane acts repetitively, rather than being a requirement. Second, a sense of value plays a similar role in reducing carbon emissions as in the interpretation by Deci and Ryan. Third, such motivation requires relatedness as part of a sense of belonging to, and connecting with, nature as well as human beings.

The analysis of the results from this final phase of this study extends the understanding regarding whether or not the needs for competency and autonomy, as defined by Deci and Ryan, apply in the climate context. Earlier in this study, it was found that the selected individuals felt competent because they are able to undertake mundane activities repetitively, to reduce carbon emissions in their everyday lives. As motivation develops, the increased knowledge and understanding gained by these individuals promotes a sense of having the relevant skills and/or technical capability to take action, which, in turn, further facilitates their motivation (see Figure 8.2, page 255). Feeling competent due to having the skills and capability to act is similar to how Deci and Ryan interpreted this notion in their model.



Even though the earlier results showed that the selected individuals perceive that autonomy, or a sense of freedom, is not directly associated with their motivation to reduce carbon emissions (see page 194), the results of this final stage support the interpretation that the individuals are not fully aware of the underlying impact of such a sense. The results showed that having support and being accepted by their social networks gives them, amongst other things, the freedom to be themselves, act as individuals and pursue their goals and behave in ways that are different to the norm.

The three components, or needs, and the associated sense of value, which Deci and Ryan (1985) identified in their motivational model, are all actively involved in developing motivation in this climate context. Relatedness is a fundamental part of the extended sense of belonging, regarding society and the natural environment.

Competency is a product of the internalisation process and a facilitator of subsequent behaviour and motivation development. Although autonomy is not a defining characteristic, it is closely associated with a sense of belonging, which is. The sense of value is the overarching contributor to motivation development and, hence, inherent to acquiring motivation to mitigate climate change.

The results of this study show that the model developed by Deci and Ryan (1985) does provide a useful basis for insight into the development of motivation to reduce carbon emissions. There are, however, differences in emphasis and/or interpretation with regard to the core needs and values. Moreover, the development of internalised motivation in this context does require a more extensive range of factors than those described by Deci and Ryan. This is likely to be due to, primarily, the complexity and scale of the climate issue. For example, addressing the spatial dimension of climate

change needs an ability to make connections and bring the global issue to a local and tangible level and overcoming a lack of action due to the temporal dimension requires an obligatory sense of responsibility to protect the planet for future generations, which can be facilitated by having children. The ability to self-reflect on one's behaviour, coupled with the belief that actions make a difference despite the ambiguous information concerning the science and risks involved, plays a crucial role in enabling individuals to reduce the gap between intended and actual behaviour in this climate context.

### **8.9 Concluding remarks**

Four main conclusions emerge from the analysis presented in this chapter.

A core of three ethics, the sense of value, of responsibility and of belonging, are reinforced by two capacities, the ability to make connections (with nature and regarding actions and consequences) and the ability to self-reflect on one's behaviour. These five defining characteristics, facilitated by increased well-being, freedom, competence and knowledge, enable individuals to behave very closely to how they intend and for the activities that they undertake to become automatic. The process via which internalised motivation develops is similar, irrespective of the trigger associated with the development.

The sense of value and sense of responsibility can, on their own, produce motivation that is at least as likely to be driven by an external nature, as by an internal one. The sense of belonging, which comes from the foundation and value of a strong family background, contributes to the development of motivation, and self-determination, by reducing the reliance on external incentives. As part of the sense of belonging, an

inherent bond is created with noteworthy people, be they part of the work environment and/or local social networks, in a similar manner to connecting and being at one with nature. This sense reinforces self-value and generates a confidence and freedom to be an individual.

The childhood contact with the natural environment acts as the foundation of the value that, along with a sense of belonging and of freedom, generates a general feeling of well-being, which enables a sensual connection with nature to occur. The connection creates the protective nature towards these environments and the desire to seek out further opportunities for environmental behaviour. The ability to self-reflect on one's behaviour utilises the increased knowledge, and responsibility due to the developing competence, and contributes to the development of the internalised motivation by enabling activities to become automatic, the actual behaviour to be very close to intended and the importance of gaining a return diminishes.

The underlying contributor to the development of internalised motivation is the sense of value. This sense manifests as self-value initially, instilled at an early age by parents and influential others, and then extends to the placing of value on others and on the surroundings, both societal and the natural environment. There is an inherent value established regarding the actions taken to mitigate climate change and a belief that these actions make a difference. The sense of value underpins the four other defining characteristics and interlinks with all the contributors to the motivation development.

## CHAPTER NINE

### CONCLUSIONS

#### 9.1 Introduction

The objective of this study has been to improve the understanding of why individuals acquire the motivation to mitigate climate change, specifically, to reduce carbon emissions. Human motivation requires a return; yet, the innate properties of climate change mean that the type of return may be unclear. The spatial, uncertainty and temporal dimensions of this climate issue mean that there is no guarantee of when, where or how the efforts that are made by individuals will have an impact. As members of the global community, individuals have a responsibility to take mitigative action. Where there are limited legal obligations to control emissions, as in most countries, the motivation to change behaviour also requires an internal nature, or self-determination, to act. Empirical evidence from previous studies indicates that internalised motivation produces a more long-term behavioural change, with greater persistence and personal satisfaction.

Previous research has focused on identifying the barriers that explain the slow response on the part of individuals to the climate issue. In contrast, this study focuses on the qualities of individuals that are highly motivated to mitigate climate change, and identifies the contributors to the development of a motivation that enables self-determined environmental behaviour.

The central conclusion of this research is grounded in the sense of value. Individuals who have internalised motivation value themselves and the mitigative actions that have become a part of their everyday living and place value on others and the natural

environment. Having a sense of value generates a feeling of being part of local social networks and belonging to the wider community as well as a sense of well-being, the desire to understand the issues surrounding climate change and an obligation to protect both society and natural environments. These facilitate, and are reinforced by, the ability that motivated individuals have to connect with nature when visiting certain places in the natural environment, which enables them to behave in ways that are close to how they want regarding climate change mitigation.

## **9.2 Research design**

The research approach has been multi-disciplinary in nature and was based on a grounded theory approach involving a combination of exploratory and non-exploratory methods and quantitative and qualitative analytical techniques in the form of surveys and interviews. These complementary styles enabled the investigation of motivation in a context, climate change, which is poorly understood by ensuring the flexibility to probe into new lines of enquiry concerning individual behaviour whilst grounding the results in current theoretical understanding. The direction of subsequent stages of the research evolved from the results and analysis of preceding stages. The data analysis was based around two computer packages, the SPSS software programme for the quantitative data and the NVivo computer assisted qualitative data analysis software for the interview transcriptions.

To address the first key research question an email survey was designed, based around a modified version of the well-documented motivation model developed by Deci and Ryan (1985). This model, the self-determination theory, differentiates between extrinsic and intrinsic types of motivation and includes motivational states with an

internal nature, the particular interest of this study. This proven motivation model was put into a new context in this study, being used in the selection of the sample of individuals who appear to have internalised their motivation to reduce carbon emissions. A series of in-depth interviews was then undertaken to identify the common characteristics of these individuals in relation to their motivation. To address the second key research question, the characteristics identified earlier were explored using current theoretical understanding, from which the defining characteristics that predispose individuals to internalise motivation were proposed. A series of three surveys were designed to confirm qualitatively and quantitatively the significance of these defining characteristics and explore specific aspects of the other characteristics identified earlier. The third key research question focused on the processes that are involved when internalised motivation develops. A series of interviews was undertaken with individuals who could recall a distinct time when their motivation increased to its present level. The interviews focused on the trigger(s) for the increase and processes involved in the development of motivation.

The motivated individuals who took part in the research were informed of the conclusions of the research at each stage and were sent a summary of the final conclusions of the study. The conclusions present a well founded base of information with implications for policy of public engagement to take mitigative action. Specific guidelines, based on key factors that act as a basis for action to reduce carbon emissions, were outlined in the summary. For example, to nurture a desire within people, and a sense of responsibility, to change the way they behave and a belief that the way they behave makes a difference. It was indicated in the summary that the

guidelines can be used to promote mitigative action by individuals, both at home and at work.

### **9.3 Major findings**

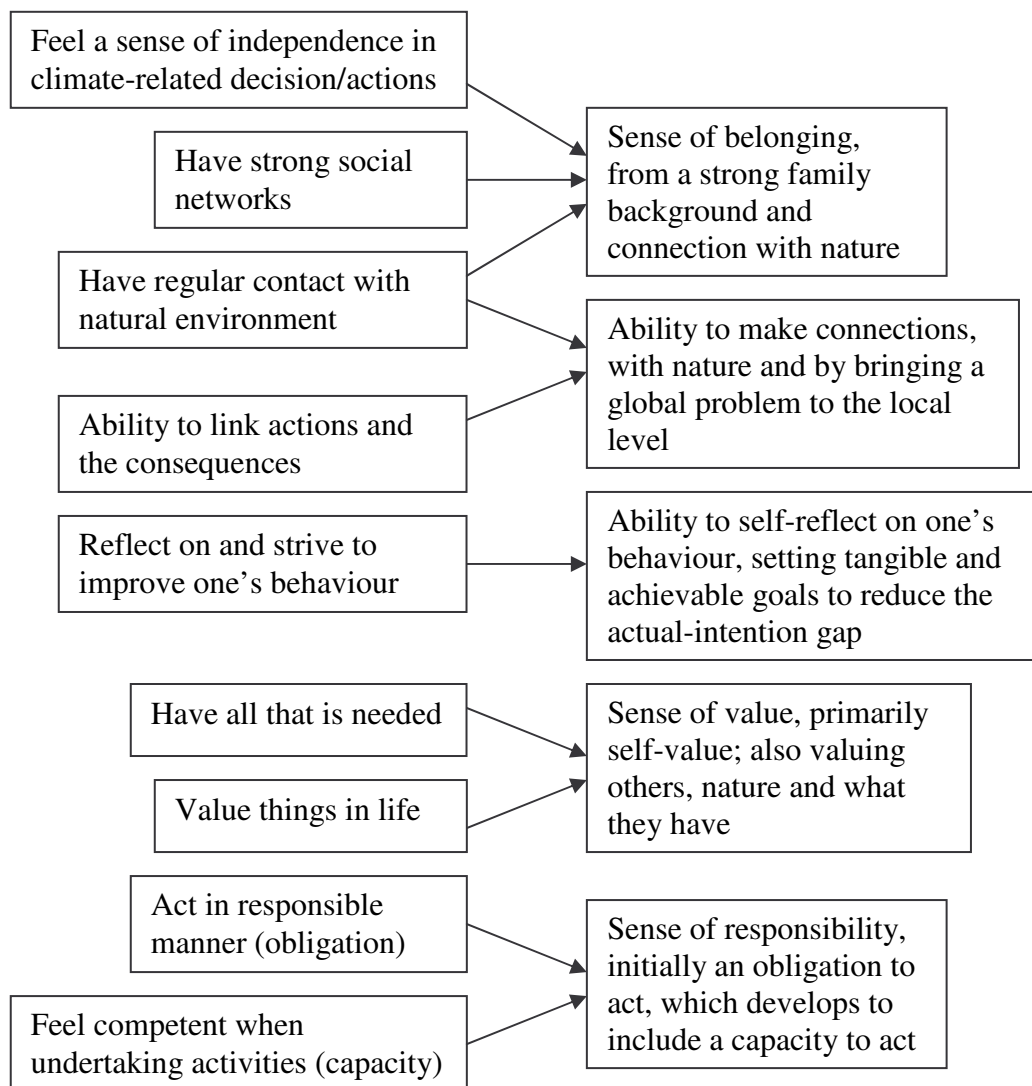
On the basis of the motivated individuals selected for study, nine characteristics were identified as common to people who have internalised motivation to reduce carbon emissions. These nine characteristics can be mapped onto one, or more, of the five defining characteristics, essential and predisposing characteristics, which were identified as a result of further research, including comparison with a control group. Refer to Figure 9.1, which also lists the most influential aspects of each of the defining characteristics regarding the development of motivation in this climate context; the characteristics are listed in no particular order of importance.

A core of three ethics, the sense of value, of responsibility and of belonging are reinforced by two capacities, the ability to make connections (with nature and regarding actions and consequences) and the ability to self-reflect on one's behaviour. These five defining characteristics, facilitated by increased well-being and freedom (see Figure 8.1, page 246) and competence and knowledge (see Figure 8.2, page 255), enable individuals to behave very closely to how they intend, for the activities that they undertake to become automatic and for the importance of gaining a return to lessen.

The ability to address the climate issue at the local level, and identify specific actions that result in local and tangible effects, appears central to overcoming the barriers to taking action for these individuals. The return for taking mitigative action is achieving

short term local goals such as fitting roof insulation, as well as gaining an inner peace and satisfaction and/or feeling part of the global response to addressing climate change.

Figure 9.1: Confirmed mapping of the nine common characteristics onto the five defining characteristics, including the most influential aspects of each defining characteristic in the context of climate change.





Regular contact with the environment through their lives was a common characteristic of the motivated individuals. What is perhaps more striking, however, is the nature of that contact. One of the key findings of this study is that individuals who have internalised motivation experience the natural environment differently from the general population. These individuals have a sensual connection with nature, i.e. in relation to the five senses, and an awareness of being at one with nature when they visit their favourite natural environments; achieving a sense of well-being via characteristics such as a sense of belonging, value and freedom enables this connection to take place. Any attachment that these individuals develop to a specific place acts as an access point to this connection and a representation of an overall effect rather than serving the purpose of providing a specific attachment to a specific place *per se*. This finding suggests that, when considering means of engaging others in environmental action, it is not just a matter of placing people in a natural environment but also of the nature of that contact.

As motivation develops, a transition occurs as individuals move from consciously undertaking activities because they are of value and importance to undertaking them automatically as they become a normal part of life and are assimilated into daily existence. There are a number of concurrent processes that effect this transition. Once the positive feedback between the senses of belonging, freedom and well-being is established, the ability to reflect on one's behaviour enables individuals to identify which behaviours they are not satisfied with and this generates the desire, and capacity, to improve them. The ongoing focus of setting tangible and achievable short term goals facilitates this, whilst increasing the level of knowledge and understanding specific to climate change instigates an increased feeling of competence and ability to

make connections regarding the impact of activities. As noted above, the ability to make a sensual connection with the natural environment, which was found to be present in the sample of motivated individuals and not in the public group, also contributes to the development of internalised motivation.

The second effect of the positive feedback from the triad of belonging, freedom and well-being involves the concept of individuation, whereby individuals strive to develop a balance between a sense of belonging, or interdependence on others, and a sense of freedom, or independence from others, as they establish their relationship with society. The conclusion is drawn from this study that motivated individuals perceive their role in society in different ways, and this perception is dependent on whichever role enables them to feel that they are making a difference in the manner they want to, and maintain a sense of being an individual within the social framework in which they live.

The final consideration in this study concerns the relationship between motivations in relation to the environment and those in the context of climate change. The results show that motivation in the climate change context overlaps with motivation regarding the environment in general. Each of the contributing factors identified from this study has previously been described in the literature in the context of human motivation. A sense of belonging, for example, develops an internalised type of motivation and self-reflective behaviour provides the opportunity to narrow the gap between intended and actual behaviour. There are two conclusions that can be drawn, however, that indicate motivation to reduce carbon emissions differs, in some regards, to motivation in the more general environmental sense. First, there is a unique combination of contributors to the development of internalised motivation in the

climate context that has not been specifically described before. The contributors are value, responsibility, belonging, connection, self-reflective behaviour, freedom, well-being, competence and knowledge. Second, the ability to make connections plays a unique role in this particular motivation. Individuals describe an ability to relate their local tangible actions to the global problem with a belief that their actions make a difference, as well as experiencing a sensual connection with nature when they are in the natural environment. Thus, there is an overlap between motivation in a general environmental sense and motivation associated with climate change, and also unique aspects of the latter regarding how the contributors combine to enable individuals to acquire internalised, automatic motivation, and particularly the ability to make connections.

Critiquing the work of others, in particular within the sociology and psychology disciplines, emphasises the point that there is a need for better understanding of individual motivation to mitigate climate change and that a legitimate way to undertake such research is the use of established work, such as the psychologically-based model developed by Deci and Ryan (1985), to examine this new, climate-related, context. The findings of this study confirm the validity of aspects of existing motivational models, although the spatiality, temporality and uncertainty dimensions and the unprecedented nature and complexity of the climate issue do result in a shift of emphasis with regard to the core needs and a more extensive range of contributors than those described by, for example, Deci and Ryan. The overall findings here contribute to the motivational literature in general and the understanding of individual environmental behaviour, particularly within the psychology field.

#### **9.4 Limitations of the research and further research needs**

As far as the methodology is concerned, the research has been based in grounded theory and started within an exploratory phase due to the lack of previous research on the chosen topic of climate mitigation. The main limitation with exploratory research is that it invariably finds more questions than it does answers, and is only able to speculate and suggest research directions. A number of possible research avenues had been neglected and promising leads ignored. Non-exploratory methods complemented and should have mitigated other adverse effects of the use of an exploratory approach.

The representativeness of the conclusions drawn from this project needs to be considered. The core sample of motivated individuals was limited in size. Whether or not this limited sample is typical of the larger population of motivated individuals should be addressed. The statistical significance testing allows for the low sample size, though caution is warranted in drawing conclusions based on a sample of this size. As far as the selection processes are concerned, the main limitation of purposive sampling is that the researcher, or gatekeeper, may not have identified all contributing variables when selecting possible candidates. With snowball sampling, the researcher is reliant on the recommendations of individuals who have agreed to participate, without prior knowledge of their biases. Finally, it is not possible to achieve a public group with exactly the same demographic characteristics as the motivated individuals. These limitations were acknowledged in the study as possible explanations for certain results or qualifiers on conclusions.

When considering data validity, a disadvantage of the approach taken is that the data collected are based on subjective self-reporting and not on participant observation.

Retrospective self-reporting is based on perceived levels, is reliant on accurate memory recall and is subject to self-enhancement. Observations of actual behaviour, such as measuring recycling or car mileage, are prone to research bias as individuals invariably try their best in front of others, though do provide more external validity than self-reporting. Asking the respondents to make their own list of environmental behaviours rather than giving them a pre-prepared list that they had to rank would probably make the procedure less vulnerable to socially desirable responses. Ensuring validity and reliability of data collection and analysis in a study of human behaviour is, of course, problematic. Human motivation and behaviour is complex and it would be very difficult to isolate, and study, “pure” environmental behaviours. Participants may have other reasons for undertaking activities to reduce carbon emissions. For example, due to inflated fuel prices, people may currently be choosing to use their car less for economic rather than environmental reasons

There are a number of potential weaknesses inherent in the use of interviews in research. For example, the interviewer brings biases, beliefs and assumptions (many of which are subconscious) to the interview process, and can send unintentional non-verbal messages to the participant; yet, in an effort to reduce these, there is a risk that relevant material may be missed. There is also a risk that participants will be affected by the unnatural situation created in an interview environment and respond in ways that do not represent their true emotions and opinions on the questions. There is also a chance that the participants will give inaccurate information due to poor memory recall or are under pressure from an external body, such as a sponsor or authoritative person at work, to reply in a certain way. By interviewing individuals who are currently involved in establishing changes to reduce carbon emissions, and providing

a relaxed and informal atmosphere during the interview, it is expected that the impact of these potential problems was minimised.

Finally, there are specific conclusions drawn from this research that may have been particularly affected by one or more of these limitations. Particular note is made of the analysis of the reasons for an increase in motivation, which had, by necessity, to be based on a small sample of individuals.

There are a number of avenues for further research,

- Comparative research is needed involving other populations to develop a larger number of datasets concerning motivation to mitigate climate change and establish causal relationships in the wider population.
- An extension of this line of research is to then to undertake cross country analysis in Europe involving motivated individuals, to appreciate how social, cultural and political aspects affect the motivation.
- Objective measures of activities being undertaken to reduce carbon emissions are required to substantiate the findings of the self-reported measures in this study; for example, actual observed measures or reports from third parties are needed.
- Longitudinal studies would be beneficial, such as to understand the time lag between the increase in motivation and the increase in activity level and to determine whether or not development of motivation levels (either up or down) occurs.
- Extensive understanding of the value of making a connection with nature is desirable, particularly regarding the nature of the contact (for example,

feelings experienced) as this appears a key distinguishing factor. The role of individuation, emerging late in the research analysis, also warrants further study.

Finally, the effective dissemination of knowledge is critical to the success of engaging people to mitigate climate change. The results of this study suggest that one key aspect of an effective process is identifying the reason that individuals are searching for knowledge. Further research into the relationship between communication and engagement would be of immense value.

### **9.5 Concluding remarks**

Simply engaging individuals to mitigate climate change cannot solve the problems associated with global climate change. There are many other national and international political, societal and cultural changes that must be made, within a unified, multi-disciplinary approach. It is hoped, however, that this research provides a useful insight into the climate issue at the individual level, and extends the understanding regarding why individuals acquire the motivation to mitigate climate change.

Though this research is clearly policy-relevant, it has not been the intention of this project to identify specific policy implications. Nevertheless, three general conclusions can be drawn. First, the importance of regular contact with nature, with the environment, has implications for many areas of human endeavour, not least education, recreation and urban planning. The challenge will be to ensure that the nature of that contact is appropriate, facilitating the development of a sensual rather

than simply use-oriented relationship. Second, nurturing the belief that individuals can make a difference will be facilitated by bringing the climate change issue to the local, tangible and achievable levels. The challenge will be to disseminate information in an engaging manner that empowers individuals to take action. Third, there is a need to reassert a values stance in society to replace the human desire to want more, in material terms. The challenge here will be to develop initiatives that re-establish community spirit and to acknowledge the contributions made by individuals at all levels of society that promote a sense of self-value and place value on others and the natural environment.



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## **APPENDIX A: Letters related to the research**

14th October 2005

Dear ,

I am undertaking a PhD at the University of East Anglia, Norwich. I am investigating the human motivation to reduce carbon dioxide emissions as part of controlling climate change. My supervisory team consists of Dr. Mick Kelly from the Climate Research Unit and Dr. Emily Boyd from the Tyndall Centre, both based at the University of East Anglia.

I am exploring the reasons why some individuals are motivated to establish changes in their workplace to reduce carbon dioxide emissions. Many people are aware of the problems related to climate change and are doing little about it, whilst others are inspired and committed to addressing these problems.

Your name has been put forward as someone who is, or has been, actively involved in the reduction of carbon dioxide emissions in your workplace. I am writing to invite you to participate in this innovative research regarding one of the important challenges of the twenty-first century. There are two parts to research - a written survey and for a smaller group an interview.

A survey will be distributed via email for completion by mid November 2005. The survey covers general questions like age and gender, motivation to reduce carbon dioxide emissions and details relating to the changes you have made within your workplace. This survey is expected to take 30 minutes to complete, can be done at your convenience and returned via email. From this, a sub-group of individuals will be selected for further participation, as detailed below.

I will then undertake indepth one-on one recorded interviews asking specific questions regarding your motivation to address climate change, your time perceptions of the future and your relationship with a society that has generally been slow to respond to addressing climate change. This interview will be exploratory in nature, focusing on motivation across your lifestyle rather than only at work, and will allow you to present your views freely. The interview is expected to last around 2 hours, and will be arranged at the convenience of both parties sometime between January and March 2006.

If you are interested in participating, please respond to me via email by Tuesday 18 October and include your contact details. I will be contacting you again soon with the survey, once a list of participants is collected.

If you know of anyone else who may be interested, please also include their name and contact details in your email and I will get I touch with them directly. I am keen to encourage as many people as possible to be involved.

Thank you.

21th October 2005

Dear ,

Your name has been put forward by (*name removed*) as someone who might be interested in being involved with the research I am undertaking.

I am a second year PhD candidate at the University of East Anglia, Norwich and investigating the human motivation to reduce carbon dioxide emissions as part of controlling climate change. My supervisory team consists of Dr. Mick Kelly from the Climatic Research Unit and Dr. Emily Boyd from the Tyndall Centre, both at the same University.

I am exploring the reasons why a group of individuals are motivated to reduce carbon dioxide emissions in the activities they carry out as part of their employment. Many people are aware of the problems related to climate change and are doing little to address it, whilst others are inspired and committed to addressing these problems.

I am writing to invite you to participate in this innovative research regarding one of the important challenges of the twenty-first century. There are two parts - a written survey and, for a smaller group, an interview.

A survey will be distributed via email for completion by mid November 2005. The survey covers general questions like age and gender, the motivation to reduce carbon dioxide emissions and details relating to the changes you have made within your workplace. This survey is expected to take 20-30 minutes to complete, can be done at your convenience and returned via email. From this, a sub-group of individuals will be selected for further participation, as detailed below.

I will then undertake indepth interviews asking specific questions concerning your motivation to address climate change, your time perceptions of the future and your relationship with a society that has generally been slow to respond to addressing climate change. This interview will be exploratory in nature, and allow you to present your views freely. The interview is expected to last around 2 hours, and will be arranged at the convenience of both parties sometime between January and March 2006.

If you are interested in participating, please respond to me via email by Friday 28th October and include relevant contact details. I will be in touch again soon with the survey, once a list of participants is collated.

If you know of anyone else who may be interested, please also include their name and contact details in your email and I will get in touch with them directly. I am keen to encourage as many people as possible to be involved.

Thank you.

20<sup>th</sup> October 2005

Dear ,

### **Research into Motivations to Reduce Carbon Emissions**

We all know that more has to be done to tackle the issue of climate change. An important aspect of driving change is motivation – often described as the link between attitude and behaviour. Motivation to act is a precursor to taking action, something that CRed knows well. However our understanding of motivations about carbon reduction is less clear.

My colleague Sally Lampkin is undertaking valuable research into the motivations of key individuals to reduce carbon emissions. As a valued supporter of CRed and being recognised as a catalyst for influencing others within your organisation I would like to invite you to take part in the research.

Details of how to participate are contained in the attached letter from Sally. I do hope that you will be able to spare her some time and to contribute to our greater understanding of your own motivations. In so doing we may be able to speed up the process of change.

Kind regards

A handwritten signature in blue ink that reads "S Gerrard". The signature is written in a cursive style with a horizontal line underneath the name.

Dr Simon Gerrard  
CRed Programme Manager

## APPENDIX B: Email survey

### SURVEY REGARDING YOUR MOTIVATION TO REDUCE CARBON EMISSIONS IN YOUR WORKPLACE

November 2005

Please note that particular aspects of this information may be referred to during the interview.

**Click "reply" to this email and fill in the answers to questions in their associated box. There are 18 questions in total.**

**To tick an answer, please insert an asterisk \* in the appropriate box**

#### SECTION 1 - General

Q1) Your age is (tick one)

less than 20 years old

20 - 29

30 - 39

40 - 49

50 - 59

60 - 69

70 +

Q2) Your gender is (tick one)

Male

Female

Q3) Do you have any children?

No

Yes How many? [ ]

Q4) Do you have any grandchildren?

No

Yes How many? [ ]

## SECTION 2 - Motivation

Q5) How strongly do you agree with the following statements, related to why you are motivated to reduce carbon (dioxide) emissions?

Please enter a number 1 to 5 in each box to best fit the statement:

1 = not at all, strongly disagree; 5 = very much, strongly agree; 0 = don't know

I believe that reducing carbon emissions will help slow the rate of climate change

Reducing carbon emissions is a crucial part of the long term survival of species on the Earth

I can't see how my specific efforts to reduce carbon emissions are helping to slow down the rate of climate change

I can't really see what I am personally getting out of reducing carbon emissions

It is a good idea to try to control carbon emissions

I am involved in projects to reduce carbon emissions as part of a team decision, or following instruction from, for example, a manager

As a human being, I have a responsibility to care and protect the Earth

It is challenging to try and establish innovative ways to reduce carbon emissions

I don't know why I am bothering with reducing carbon emissions

My involvement in reducing carbon emissions in the workplace is driven by a commercial incentive and/or financial gain

I want to be involved in reducing carbon emissions so I can receive recognition and praise from others

Reducing the greenhouse gas effect and the rate of atmospheric temperature rise, is essential to addressing the issue of climate change and associated problems, like droughts, famine, poverty and floods

I believe reducing carbon emissions is a good thing I can do to help slow the rate of climate change

It is fun to be involved in projects related to reducing carbon emissions

I have to reduce carbon emissions otherwise I would feel anxious and under pressure for not participating

I would feel guilty/ashamed if I was not involved in reducing carbon emissions to help slow the rate of climate change

Reducing carbon emissions is the "right thing to do"

It is satisfying to see strategies and practises be employed in the workplace that reduce carbon emissions

### SECTION 3 Reducing carbon emissions

Q6) What is the name of the organization that you are involved with, in reducing carbon emissions?

[            ]

Q7) What is your occupation and current employment title?

[            ]

Q8) How many staff are you responsible for?

[   ]

Q9) What is the total annual budget that you are responsible for?

[ £   ]

Q10) Whose interest would you say you are looking after in your pursuits of reducing carbon emissions? (tick one)

- your own
- your immediate family
- the organization you work for
- United Kingdom
- Europe
- industrialised nations
- developing world
- the world human population
- all living organisms
- other, please specify [            ]

Q11) What level of motivation to reduce carbon emissions would you say you have?

- high
- medium
- low

Q12) How long have you had this level of motivation?

[    ]

Q13) Currently is this motivation level increasing, decreasing or static?

[       ]

Q14) Briefly explain why this is so?

[       ]

Q15) What level of resistance, or obstacles, do you feel you have had to overcome in order to achieve the progress so far in reducing carbon emissions?

[ ] high

[ ] medium

[ ] low

Q16) Have you published any articles or spoken to the media concerning your involvement in reducing carbon emissions and addressing climate change?  
If so, please give brief details.

[       ]

Q17) Describe a recent development in your workplace that you have been involved in, which is designed to reduce carbon emissions. (may still be current)

[       ]

Q18) Are there any other comments you wish to make?

[       ]

**Thank you for completing the survey.**



## **APPENDIX C: Information Sheet**

### MOTIVATION TO REDUCE CARBON EMISSIONS

#### Information sheet for interviewees

Jan 2006

Thank you for agreeing to partake in this interview, which is a unique opportunity to explore in depth your opinions and experiences related to climate change. The discussion will focus on topics like what drives your individual motivation to reduce carbon emissions, the link between such reduction and the global problem of climate change, the resistance you have overcome in your efforts, why society appears so slow in its efforts, how individuals might be empowered to reduce emissions, how gender impacts on this motivation, and what or whom can best facilitate your efforts.

It is fascinating to me that in a world generally full of apathetic people, communities and societies (with obvious exceptions) there are people like you, who have managed to overcome that lack of interest and take the whole problem related to climate change seriously. How do you do it? What makes you different? What will help you to continue? These are just a few of the questions buzzing in my head, that I would like answers to.

There are no right or wrong answers in this interview - it is your beliefs, opinions and experiences that we will discuss. The direction of the interview will be very much guided by what and how you answer the questions I pose. You will do most of the talking, whilst I will be probing deeper into certain items that you bring up.

My aim from the interviews is a greater understanding of individuals like you, who are considered highly motivated to reduce carbon emissions. This whole process enables me to compare a group of people with a similar nature of motivation (as identified by the email survey) to see if there are any commonalities, or patterns, that distinguish you from others. I will be using a software package known as VNivo to help me analyse what is said in the interviews, once I have transcribed them.

The interview is expected to take a maximum of 90 minutes, centres around six key areas and I am sure will be a very fruitful discussion. You may well find a particular question silly or weird - if so please ask for clarification. If for whatever reason you do not wish to answer a particular question or continue with a line of questioning then please say and I will redirect the interview.

Thank you again for agreeing to partake and I look forward to meeting with you soon.

## **APPENDIX D: Informed consent form for interviews**

### PhD research: Motivation to reduce carbon emissions

#### Consent form

I have read and understood the information sheet explaining the research project.

I understand that I may withdraw myself from this project at any time without having to give reasons.

I understand that any information I provide will be kept confidential to the researcher and supervisors.

I understand that the published results will not use my name, and that no opinions will be attributed to me in any way that can be used to identify me.

I understand the tape recording of interviews will be erased when the transcription is completed.

I understand that I can withdraw the data from this interview at any time after the interview and before data analysis.

I have asked and had answered to my satisfaction any questions I have regarding my participation in this research.

I would like to receive a summary of the results of this research when it is completed.

signed:

Date:

name of participant:  
(please print clearly)

S.LAMPKIN - JAN 2006

## **APPENDIX E: Interview guides for in-depth interviews**

### Interview Guide 1 – January 2006

#### MOTIVATION AND SPACE (5)

What do you understand by the term ‘climate change’?

In your own words, how do you perceive the local versus global dimension?

What impact do you intend your efforts to reduce carbon emissions will have?

At which level are your efforts primarily aimed? (local or global)

Who do you believe is responsible for reducing carbon emissions? (individ or govt)

#### MOTIVATION AND TIME (6)

You stated that your motivation increased 2 years ago – what happened then?

What was your attitude to the climate change problem 10 years ago?

And as a child – were you in an environmentally friendly household?

In your opinion, is climate change happening already?

Will climate change affect you? (N v. S)

Why are you so motivated for action for which the major returns are expected after you die?

#### RESISTANCE (7)

How does uncertainty of climate change predictions impact on your motivation?

How do the conflicting international opinions affect your motivation?

When you have control over action to reduce emissions, how influential is that in its success (test TPB)?

How effective do you think you are in achieving reductions?

How are you perceived as a person who is motivated?

How does that impact on your motivation?

How influential are you amongst your friends and colleagues in selling the cause?

#### GENDER (4)

In your experience, how do you perceive the motivation levels of men and women when dealing with issues related to changing lifestyles?

How willing are you to reduce harmful behaviours in your own lifestyle?

How influential a role should science and technology play in mitigating climate change?

How well informed would you say you are regarding climate politics and climate change mitigation?

Do you believe you have as much opportunity to participate in discussions on emission reductions as your female/male colleagues?

#### SOCIETY (5)

There is an awareness that society is generally slow to respond to concerns regarding climate change. Do you agree and if so, why do you think this is so?

Recent findings in a February 2005 report, Defra identified that “*creating fear without providing solutions won’t motivate change; it will simply increase the already generous helpings of apathy in the UK*” (Climate Fear v Climate Hope)

In your opinion, how can we change the apathy?

What do you think of, or say to, people that are uninterested in addressing climate change?

What do you believe is the most effective way(s) to drive societal change in this regard?

#### FACILITATION

What additional support do you require to increase your motivation to reduce emissions? *Prompt – money, resources, trust, cooperation*

Who might best facilitate your efforts?

If you had to select just one factor, which would be most influential for you?

Is there anything else you would like to add?

**THANK YOU** + what happens now.

## Interview Guide 8

### MOTIVATION AND TIME

You stated that your motivation increased 8 years ago – what happened then?

What was your attitude to the climate change problem 10-15 years ago?

And as a child – were you in an environmentally friendly household?

Accepting that climate change is already happening, does it or will it affect you?

How does the fact that the major returns from your efforts will be after you have died, impact on your motivation?

### RESISTANCE

How influential is being in control of your action to reduce emissions in its success?

How effective do you think you are in achieving reductions?

As a person who is motivated to take action, how are you perceived by others?

How do you perceive your role, in the context of climate change?

### OTHER TOPICS

Awareness of other cultures and travel

Sense of humour

Contentment

Society attitude to waste

Religion/core philosophies

Material needs and status

### GENDER

In your experience, how does your mot level compare to that of your male colleagues, in regard to reducing carbon emissions?

How influential a role do you see science and technology playing in mitigating climate change?

How influential a role do you see reducing harmful human behaviours playing in mitigating climate change?

## **SOCIETY + RESPONSIBILITY**

Who do you believe is responsible for reducing carbon emissions?

There is an awareness that the United Kingdom society is slow to respond to concerns regarding climate change in general – why do you think this is so?

In your opinion, how can we change the apathy and drive societal change effectively?

Whose responsibility is it to drive any changes to engage people to take action?

Many people accept that there is a problem, but don't really know what to do – whose responsibility is it to provide solutions?

What do you think of people that are uninterested to reduce carbon emissions?

In your opinion, what are the critical factors that will make an effective response to climate change more likely?

## **SUPPORT**

What additional support do you require to increase motivation to reduce carbon emissions? Who might best facilitate your efforts?

Is there anything else you would like to add?

**THANK YOU** + what happens now

## Interview Guide 18 – March 2006

### SPACE

How do you perceive the term 'climate change'?

Accepting that climate change is happening, does it affect you?

What do you intend your efforts to reduce carbon emissions will achieve? (making a difference)

How do you link your local efforts to being part of 'saving the planet'?

Has the increased scientific evidence impacted on your motivation? When you are driving around the countryside and nothing is obviously changing, why do you believe in climate change?

### MOTIVATION AND TIME

You stated your motivation increased approximately 13 yrs ago when you had children.....what aspect of having children led to this change?

Before then what was your attitude towards reducing carbon emissions and climate change?

Do you feel you generally have enough time to do what you want in life or do you feel under pressure and aware of the lack of time?

If you arrange to meet someone at say 11 o'clock, what time, or time period would you arrive? How punctual would you expect them to be?

How does the fact that the major returns from your efforts will be after you have died, impact on your motivation?

### TRAVEL

What role has an increased awareness of other cultures played in your motivation to reduce carbon emissions, if any?

What is your ideal holiday like?

When travelling, is the journey or the destination more important for you....why?

Do you consider travelling by plane when you know the amount of emissions released?

### RESISTANCE

How influential is being in control of your action to reduce emissions in its success?

How effective do you think you are in achieving reductions?

If you were the only person making efforts to reduce emissions would you continue?

What aspect(s) of the environment drives you more to address emissions reduction than say the fight against AIDS?

How influential a role do you see science and technology playing in mitigating climate change?

Who do you trust to tell you reliable information concerning climate change, its impacts and solutions?

## VALUE

Do you feel valued as a human being? (grounded in the satisfaction of human needs)

Would you call yourself altruistic (high degree of self regard and enough internal love to share it with others)?

How would you describe your confidence and self-belief?

Would you consider that you live your life in a high degree of freedom?

Do you believe that you have reached your full potential yet?

What is the activity you value the most in your life?

Did your parents praise you and encourage you to feel good about yourself?

Bird watching...?

Do you generally live within your means? (save first, or buy and buy later)

Do you feel valued as a human being?

Do you have all you need? Want....?

Is it important to you to have a status as part of your self-identity?

## SOCIETY + RESPONSIBILITY

Who do you believe is responsible for reducing carbon emissions?

Do you think people are aware that many of their behaviours are harmful?

How strong is your sense of responsibility regarding your own behaviours in life?

How responsible do you feel towards the human disasters attributed to anthropogenic climate change?

Do you see yourself as part of the problem, the solution or both?

In your opinion, what are the critical factors that will make an effective response to climate change more likely?

Is there anything else you would like to add? **THANK YOU** + what happens now



## APPENDIX F: Survey for the motivated individuals

12<sup>th</sup> September 2006

Dear ,

Thank you for your continued support and participation in my PhD research.

This survey is in five sections and will take approximately 30 minutes to complete. It asks questions related to contact with the *natural environment* over a lifetime, actions to reduce carbon emissions, meeting basic human needs, valuing the natural environment and your aspirations for reducing emissions. For the purposes of this survey the *natural environment* is defined as non built-up areas of any size that contain natural features, and includes places like back gardens, local parks, the seaside, and mountainous regions.

Please return the completed survey in the s.a.e. provided, by Friday 22<sup>nd</sup> September.

### **SECTION ONE**

**Q1 What is your gender?** *Circle one*

M

F

**Q2 What is your current age bracket?** *Tick one*

\_\_\_ 20 - 29

\_\_\_ 30 - 39

\_\_\_ 40 - 49

\_\_\_ 50 - 59

\_\_\_ 60 - 69

\_\_\_ 70 - 79

**Q3 Describe the type of place where you predominantly lived as a ....?**

(For example urban, suburb or countryside. Do not put your street address)

**child** \_\_\_\_\_

**teenager** \_\_\_\_\_

**adult** \_\_\_\_\_

**Q4 In what type of area do you currently live?**

*Tick the answer that best describes where you live*

- Urban (town centres and inner city)
- Suburban (outskirts of built up areas and rural towns)
- Rural area (farmland, countryside, villages and rural industrial complexes)
- Coastal settlement

**Q5 In what type of area do you currently work?**

*Tick the answer that best describes where you work; leave blank if you do not work*

- Urban (town centres and inner city)
- Suburban (outskirts of built up areas and rural towns)
- Rural area (farmland, countryside, villages and rural industrial complexes)
- Coastal settlement

**Q6 How much do you agree with the following statement:**

I appreciate, and want to protect, the natural environment

**Circle the number that best reflects your opinion of the statement**

*1 = very much, strongly agree      5 = not at all, strongly disagree*

1      2      3      4      5

**Q7 Is having contact with the natural environment an important part of your general life and overall well-being? Circle one**

Yes

No

***If yes, continue with Q8 (Section Two) below***  
***If no, go to Q17 (Section Three)***

**SECTION TWO**

**Q8 What is your favourite type of place within the natural environment to visit?**

*Write up to 3 types, in descending order of preference so that the first is your favourite type. Examples include your back garden, the coast, national park, a mountain range. Your choices can include specific locations.*

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

**Q9 What feature, of the first type of natural environment that you listed in Q8, makes that type your favourite more than anywhere else?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Q10 How do you feel when you are at the first place you listed in Q8?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Q11 What feelings are you most trying to alleviate (or get rid of), if any, when you visit your favourite type of natural environment?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Q12 How much do you agree with the following statement concerning the feelings you have when you are at the first place you listed in Q5?**

The feelings I experience are important to my overall well-being

**Circle the number that best reflects your opinion of the statement**

*1 = very much, strongly agree      5 = not at all, strongly disagree*

1    2    3    4    5

**Q13 Are there other ways that you experience the feelings you described in Q10?**

For example being with loved ones, listening to music, socialising with friends

If yes, state what

---

**Q14 If you experience any other feelings when you visit either of the other places you listed in Q5, state what the feelings are.**

---

---

---

**Q15 How many times on average did/do you visit the natural environment, as a .....?**

*Tick the box that best fits the number of times in each age bracket. Include only purposeful visits and not times you 'passed through'*

	<b>child</b>	<b>teenager*</b>	<b>adult*</b>
At least once a day			
At least once a week			
At least once a month			
At least once a year			
Less than once a yr/never			

\*include purposeful visits in work breaks.

**Q16 What percentage of those purposeful visits were/are related to work activities as a .....?**

*Write an average percentage, to nearest 5 per cent, for each age range*

	<b>child*</b>	<b>teenager*</b>	<b>adult**</b>
Percentage work related			

\*for example when helping on the farm or with van deliveries

\*\* include visits specifically to consider activities related to work

### **SECTION THREE**

#### **Q17 How often do you... ?**

*Circle a letter in each row which best fits the statement: N=never; R=rarely; S=sometimes; O=often; A=always*

Turn lights off when no one is in a room	N	R	S	O	A
Recycle glass, metals, plastic, paper	N	R	S	O	A
Hang out washing to dry rather than use a tumble dryer	N	R	S	O	A
Turn off appliances at the wall socket when not in use	N	R	S	O	A
Recycle supermarket bags rather than throw them away	N	R	S	O	A
Choose not to fly even though it is the quickest or cheapest way to travel for your journey	N	R	S	O	A
Use public transport or cycle even though using a car would be more convenient	N	R	S	O	A
Check that the products you buy are produced locally	N	R	S	O	A
Only buy foodstuffs that are produced locally	N	R	S	O	A
Monitor the fuel consumption of a car/motorcycle that you use ( <i>leave blank if this does not apply to you</i> )	N	R	S	O	A
Put on an extra layer of clothing rather than turn the heating thermostat up	N	R	S	O	A
Make a conscious effort to offset your carbon emissions	N	R	S	O	A

#### **Q18 Have you ever...?**

*Circle the answer in each row which best fits the statement*

Switched to an energy supplier because it uses renewable sources of generation	Yes	No
Moved house specifically to help your efforts to reduce carbon emissions	Yes	No
Talked to staff regarding a company's environmental policies before buying a particular item	Yes	No
Spent money on an energy saving device (like insulation or light bulbs) when the economic saving is not the primary reason for the purchase	Yes	No
Discussed activities to reduce carbon emissions with family/friends	Yes	No

**Q19 Measuring your carbon emissions.**

*Please complete the following questions.*

a) How many miles do you drive on average per month?

\_\_\_\_\_

b) What type(s) of vehicles do you use? (small, medium or large/SUV)

\_\_\_\_\_

c) How many miles do you travel by plane on average per year?

\_\_\_\_\_

e) What is your energy consumption?

*Detail below the amount of each energy type you use and include the unit measure and the time period (for example electricity 100 kWh per summer month).*

electricity\_\_\_\_\_

natural gas\_\_\_\_\_

other types of energy\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

How many people are there in your household? \_\_\_\_\_adults \_\_\_\_\_under 16

**Q20 What recent additional action to reduce carbon emissions have you taken that has given you the most satisfaction? And why?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Q21 What additional action to reduce carbon emissions do you most aspire to achieve in the future? (That will give you the most satisfaction) And why?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## **SECTION FOUR**

### **Q22 How strongly do you agree with each of the following statements, concerning your own needs?**

*Circle a number in each row which best fits the statement*

*1 = very much, strongly agree      5 = not at all, strongly disagree*

Helping other people achieve their potential is the most important thing for me	1	2	3	4	5
I look for beauty and balance in all things around me and this is central to me	1	2	3	4	5
I have a roof over my head with water/sanitation, enough food and money to buy what I need	1	2	3	4	5
My main focus is enlightenment, self-knowledge and realising my ultimate personal potential	1	2	3	4	5
Gaining self-awareness, knowledge and the meaning of things are extremely important to me	1	2	3	4	5
I feel safe, secure and protected in my life, which is generally stable and structured	1	2	3	4	5
I am part of, and loved by, my family and have good relationships with my friends and colleagues	1	2	3	4	5
I have adequate health, employment, and personal freedom	1	2	3	4	5
I am valued in my life generally and have a sound reputation	1	2	3	4	5
I feel I belong to, am integrated in, and accepted by, society in general	1	2	3	4	5

### **Q23 What do you understand to be your 'essential human needs'?**

---

### **Q24 What amount of annual income would be sufficient to meet your essential human needs?**

*Write a figure to the nearest £1000*

---



**SECTION FIVE**

**Q26 Think of a place in the natural environment that you enjoy visiting the most and answer the following.**

**How much do you agree with the following statement?**

My favourite place in the natural environment relates to something in my past or to a part of my identity

*Circle the number that best reflects your opinion of the statement*

*1 = very much, strongly agree      5 = not at all, strongly disagree*

1    2    3    4    5

If circled number 1 or 2, state what?

---

**Q27 How much do you agree with the following statements?**

*Circle ONE number for each statement*

agree strongly

disagree strongly

I am responsible for part of the solution for climate change

1    2    3    4    5

I have a strong sense of self-value or worth

1    2    3    4    5

I am responsible for part of the problem of climate change

1    2    3    4    5

Buying products from overseas contributes to carbon emissions in the atmosphere

1    2    3    4    5

Individual actions to reduce carbon emissions, such as turning lights off, make a difference to climate change

1    2    3    4    5

I value others more than I value myself

1      2      3      4      5

It is my duty, as a member of the human race, to take actions to reduce carbon emissions

1      2      3      4      5

Understanding the climate change issue helps me take action aimed at reducing its effects

1      2      3      4      5

**Q28 Where does the value you place on the natural environment come from?**

*Rank up to 3 of the options below    1= most likely source    3= least likely source*

- \_\_\_ Childhood outdoor experiences
- \_\_\_ Parental influences
- \_\_\_ Peer influences
- \_\_\_ Work environment
- \_\_\_ Education (formal)
- \_\_\_ Self-taught knowledge
- \_\_\_ Connecting with the natural environment throughout lifetime
- \_\_\_ Valuing the natural environment
- \_\_\_ Living in a rural area
- \_\_\_ Having a full and contented life, with all needs met
- \_\_\_ Having self-value
- \_\_\_ Valuing others (family, community, society)
- \_\_\_ Other source (*specify*) \_\_\_\_\_

**Q29 Are there any other comments you wish to make?**

---

---

Thank you for completing this survey.

## APPENDIX G: Email survey for the motivated individuals

### FOLLOW UP QUESTIONS RELATING TO YOUR MOTIVATION TO REDUCE CARBON EMISSIONS November 2006

**Click "reply" to this email and fill in the answers as directed in each question box. There are 5 questions in total.**

Q1) Look at the list below containing 8 factors. If you feel any of them DO NOT play a key role in your motivation to reduce carbon emissions and address climate change, please write it down after the list and briefly explain why it is not important. Repeat the process if there is more than one. If all 8 of them do play a role, just leave it blank.

- Having all you need (in material and/or non-material terms)
- A sense of responsibility (towards looking after the natural environment)
- A feeling of belonging (within family, community, workplace etc)
- A sense of freedom (in life in general)
- An ability to make connections (with the natural environment and/or ability to link actions and consequences in life)
- A sense of value (for self, others, environment and/or what we have in material terms)
- A feeling of competence (to undertake mundane activities repetitively)
- An ability to reflect on and strive to improve one's behaviour (specific to activities to reduce carbon emissions)

Q2) If any ONE of the 8 factors listed above stands out as by far the most influential factor for you personally, please write it below. If not, leave blank

Q3) Can you explain (in as many/few words as you wish) why that particular factor is so important to you.

For example, why having [*a sense of value*] in life is so important to you. What it gives you in life. How it improves your life. What you are able to achieve because you have [*a sense of value*].

Q4) In general, would you prefer more local areas of natural environment that you can visit near to where you live and/or work; or an easier and quicker access to the larger landscapes, which are further away, such as the coast, national parks, or mountains? Briefly explain your answer.

Q5) Do you perceive yourself as a role model in society, when you consider your motivation to reduce carbon emissions and the actions you take? Briefly explain your answer.

**Thank you.**

## APPENDIX H: Covering letter for individuals in public group

Dear,

26th October 2006

I would be most grateful if you (or another member of your household over 19 years old) could complete the survey attached. It will take approximately 30 minutes.

I am a third year PhD researcher at the School of Environmental Sciences, University of East Anglia investigating what motivates individuals to reduce carbon dioxide emissions as part of the human response to slow down the rate of climate change. It is now commonly accepted that man-made activities like burning fossil fuels, combustion engines and deforestation release carbon dioxide emissions (termed 'carbon emissions') into the atmosphere. This is causing an excessive warming effect on Earth (global warming) and changes to the global climate system (climate change). Identifying what motivates individuals to take action is a crucial part of any effective solution to addressing this global environmental problem.

Earlier this year I interviewed a group of individuals who are highly motivated to reduce carbon emissions and found out what factors are likely to be influencing this motivation. Now I am comparing those findings with a public group of people within East Anglia. You have been selected as part of this public group, which was taken from the BT Phone Book 2006/7. Your answers to this survey are completely anonymous - there is no tracking system for identifying returned surveys. The information will be compared as a whole group, rather than individually, with the original sample.

For the purposes of this survey the *natural environment* is defined as non built-up areas of any size that contain natural features, and includes places like back gardens, local parks, the seaside, and mountainous regions.

Please return the completed survey in the envelope provided by

.....

Thank you for your time.

Ms Sally Lampkin  
Climatic Research Unit  
Hubert Lamb Building  
University of East Anglia  
Norwich, NR4 7TJ  
01603 592235  
[s.lampkin@uea.ac.uk](mailto:s.lampkin@uea.ac.uk)

## APPENDIX J: Survey for the Public group

### SURVEY REGARDING ASPECTS RELATING TO THE MOTIVATION TO REDUCE CARBON EMISSIONS

OCTOBER 2006

#### SECTION ONE

**Q1 What is your gender?** *Circle one*

M

F

**Q2 What is your current age bracket?** *Tick one*

\_\_\_ 20 - 29

\_\_\_ 30 - 39

\_\_\_ 40 - 49

\_\_\_ 50 - 59

\_\_\_ 60 - 69

\_\_\_ 70 - 79

**Q3 What is your current work situation?**

For example full-time paid employment, unemployed, retired, part-time student.

---

**Q4 Describe the type of place where you predominantly lived as a ....?**

(For example urban, suburb or countryside. Do not put your street address)

**child** \_\_\_\_\_

**teenager** \_\_\_\_\_

**adult** \_\_\_\_\_

**Q5 In what type of area do you currently live?**

*Tick the answer that best describes where you live*

- Urban (town centres and inner city)
- Suburban (outskirts of built up areas and rural towns)
- Rural area (farmland, countryside, villages and rural industrial complexes)
- Coastal settlement

**Q6 In what type of area do you currently work?**

*Tick the answer that best describes where you work; leave blank if you do not work*

- Urban (town centres and inner city)
- Suburban (outskirts of built up areas and rural towns)
- Rural area (farmland, countryside, villages and rural industrial complexes)
- Coastal settlement

**Q7 How much do you agree with the following statement?:**

*Circle the number that best reflects your opinion*

I appreciate, and want to protect, the natural environment

agree strongly                      disagree strongly  
1            2            3            4            5

**Q8 Is having contact with the natural environment an important part of your general life and overall well-being? Circle one**

Yes                      No

***If yes, continue with Q9 (Section Two) below***  
***If no, go to Q17 (Section Three)***

## **SECTION TWO**

**Q9 What is your favourite type of natural environment to visit?**

*For example your back garden, the coast, national park, a mountain range.*

---

**Q10 What feature of this type of natural environment makes you prefer it to other types of natural environment?**

---

**Q11 How do you feel when you are at there?**

---

**Q12 What feelings, if any, are you trying to alleviate (i.e. get rid of) when you are there?**

---

**Q13 How much do you agree with the following statement?**

The feelings I experience at this place are important to my overall well-being

Circle the number that best reflects your opinion

*1 = very much, strongly agree      5 = not at all, strongly disagree*

1    2    3    4    5

**Q14 Are there other ways that you experience the feelings you described in Q10?**

*For example being with loved ones, listening to music, socialising with friends*

If yes, state what

---



**Q15 How many times on average did/do you visit the natural environment, as a ....?**

*Tick the box that best fits the number of times in each age bracket. Include only purposeful visits (including work breaks) and not times you were 'passing through'*

	<b>Child</b>	<b>Teenager*</b>	<b>Adult*</b>
At least once a day			
At least once a week			
At least once a month			
At least once a year			
Less than once a yr/never			

\*include purposeful visits in work breaks.

**Q16 What percentage of those times were/are related to work activities as a ....?**

*Write a number, to nearest 5 per cent, for each age bracket*

	<b>child*</b>	<b>teenager*</b>	<b>adult**</b>
Percentage work related			

\*for example when helping on the farm or with van deliveries

\*\* include visits specifically to consider activities related to work

### **SECTION THREE**

**Q17 How often do you... ?**     *Circle ONE letter for each statement*

	never	rarely	some	often	always
Turn lights off when no one is in a room	N	R	S	O	A
Recycle glass, metals, plastic, paper	N	R	S	O	A
Hang out washing to dry rather than use a tumble dryer	N	R	S	O	A
Turn off appliances at the wall socket when not in use	N	R	S	O	A
Reuse supermarket bags rather than throw them away	N	R	S	O	A
Choose not to fly for environmental reasons	N	R	S	O	A
Walk/cycle/use public transport although using a car would be more convenient	N	R	S	O	A
Check that the products you buy are produced locally	N	R	S	O	A
Only buy foodstuffs that are produced locally	N	R	S	O	A
Monitor the fuel consumption of a vehicle that you use	N	R	S	O	A
Put on extra clothing rather than turn the heating up	N	R	S	O	A
Make an effort to counterbalance your carbon emissions	N	R	S	O	A

**Q18 Have you ever...?**     *Circle ONE answer for each statement*

Switched to an energy supplier because it uses renewable sources of generation	Yes	No
Moved house specifically to help your efforts to reduce carbon emissions	Yes	No
Talked to staff regarding a company's environmental policies before buying a particular item	Yes	No
Spent money on an energy saving device (like insulation or light bulbs) when the economic saving is not the primary reason for the purchase	Yes	No
Discussed activities to reduce carbon emissions with family/friends	Yes	No

**Q19 Measuring your carbon emissions.**

*Please complete the following questions.*

a) How many miles do you drive on average per month?

\_\_\_\_\_

b) What type(s) of vehicles do you use? (small, medium or large/SUV)

\_\_\_\_\_

c) How many miles do you travel by plane on average per year?

\_\_\_\_\_

e) What is your energy consumption?

*Detail below the amount of each energy type you use and include the unit measure and the time period (for example electricity 100 kWh per summer month).*

electricity\_\_\_\_\_

natural gas\_\_\_\_\_

other types of energy\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

How many people are there in your household? \_\_\_\_\_adults \_\_\_\_\_under 16

## **SECTION FOUR**

### **Q20 How much do you agree with each of the following statements?**

*Circle ONE number for each statement*

	agree strongly				disagree strongly
Helping other people achieve their potential is the most important thing for me	1	2	3	4	5
I look for beauty and balance in all things around me and this is central to me	1	2	3	4	5
I have a roof over my head with water/sanitation, enough food and money to buy what I need	1	2	3	4	5
My main focus is enlightenment, self-knowledge and realising my ultimate personal potential	1	2	3	4	5
Gaining self-awareness, knowledge and the meaning of things are extremely important to me	1	2	3	4	5
I feel safe, secure and protected in my life, which is generally stable and structured	1	2	3	4	5
I am part of, and loved by, my family and have good relationships with my friends and colleagues	1	2	3	4	5
I have adequate health, employment, and personal freedom	1	2	3	4	5
I am valued in my life generally and have a sound reputation	1	2	3	4	5
I feel I belong to, am integrated in, and accepted by society in general	1	2	3	4	5

### **Q21 What do you understand to be your 'essential human needs'?**

---

### **Q22 What amount of annual income is sufficient to meet your essential human needs?**

Write a figure to the nearest £1000

---

## **SECTION FIVE**

**Q23 Think of a place in the natural environment that you enjoy visiting the most and answer the following.**

**How much do you agree with the following statement?**

My favourite place in the natural environment relates to something in my past or to a part of my identity

Circle the number that best reflects your opinion of the statement

*1 = very much, strongly agree      5 = not at all, strongly disagree*

1    2    3    4    5

If circled number 1 or 2, state what?

---

**Q24 How much do you agree with the following statements?**

*Circle ONE number for each statement*

agree strongly

disagree strongly

I am responsible for part of the solution for climate change

1    2    3    4    5

I have a strong sense of self-value or worth

1    2    3    4    5

I am responsible for part of the problem of climate change

1    2    3    4    5

Buying products from overseas contributes to carbon emissions in the atmosphere

1    2    3    4    5

Individual actions to reduce carbon emissions, such as turning lights off, make a difference to climate change

1    2    3    4    5

I value others more than I value myself

1      2      3      4      5

It is my duty, as a member of the human race, to take actions to reduce carbon emissions

1      2      3      4      5

Understanding the climate change issue helps me take action aimed at reducing its effects

1      2      3      4      5

**Q25 If you are someone who values the natural environment, where does that value come from?**

*Rank up to 3 of the options below      1= most likely source      3= least likely source*

- \_\_\_ Childhood outdoor experiences
- \_\_\_ Parental influences
- \_\_\_ Peer influences
- \_\_\_ Work environment
- \_\_\_ Education (formal)
- \_\_\_ Self-taught knowledge
- \_\_\_ Connecting with the natural environment throughout lifetime
- \_\_\_ Valuing the natural environment
- \_\_\_ Living in a rural area
- \_\_\_ Having a full and contented life, with all needs met
- \_\_\_ Having self-value
- \_\_\_ Valuing others (family, community, society)
- \_\_\_ Other source (*specify*) \_\_\_\_\_

**Q26 Are there any other comments you wish to make?**

---

---

**Thank you for completing this survey.**

## **APPENDIX K: Interview guide for focused interviews**

### Interview guide - Feb 2007

#### PERSONAL CIRCUMSTANCES

Can you describe your personal relationship, i.e. with a partner, just before the time when your motivation increased?

How long had you lived where you were living?

Can you describe the types of interactions you had with your local community?

Was that time of your life an anxious and stressful time?

How would you describe the level of freedom you had generally?

Was it a happy and contented time for you?

How secure did you feel in your life overall?

Can you recall how you were feeling at the time, regarding your own goals in life?

#### SPECIFIC CHANGE THAT TRIGGERED INCREASE

What change in your circumstances do you associate most closely with the increase in motivation?

Why did this change not happen earlier in your life?

If the opportunity had been available earlier, would you have taken it?

#### IMPACT OF INCREASE

In what ways did the change influence your behaviour to reduce carbon emissions?

In what ways did the change affect the nature of your motivation?

In what ways did the change in your behaviour impact on your life overall?

How do you perceive that you fit into society? What do you see your role as, in the context of carbon emissions reduction?

What factors helped you maintain your motivation at this increased level?