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GREEN AND HAPPY?

The Relationship between Personal Well-Being and Environmental Knowledge, Attitudes and Behaviours

By

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A report submitted in partial fulfilment of the requirements for the MSc and/or the DIC.

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DECLARATION OF OWN WORK

I declare that this thesis

Green and Happy? The Relationship between Personal Well-Being and Environmental Knowledge, Attitudes and Behaviours

is entirely my own work and that where any material could be construed as the work of others, it is fully cited and referenced, and/or with appropriate acknowledgement given.

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ABSTRACT

By investigating the linkages between environmental knowledge, attitudes and behaviours and personal well-being this report reveals some ways in which the goals of sustainability and improving personal well-being can be allied. A socio-economic survey of 700 individuals reveals ‘sustainability double-dividends’: lifestyle choices which improve both well-being and sustainability. By identifying key areas where sustainability and well-being meet, easy gains can be made. People will choose to improve their well-being when these opportunities are made available to them. A *higher* quality of life can be attainable with a significantly *lower* throughput of resources.

Today’s advanced capitalist societies are low-synergy and unsustainable. There is growing evidence that they fail to satisfy a range of basic human needs. Shifting to a higher-synergy, sustainable state, society can focus more on cooperating to improve well-being rather then competing to accrue wealth. A currency of well-being can guide the transition. Values orientate society and motivate individuals. This report attempts to illustrate how the emergence of ecological values as a response to the failings of the dominant social paradigm is adaptive. Hence happiness acts as an evolved signal creating movement to a desirable state.

Results indicate a small but highly significant correlation between respondents’ integrated ecologism score and their subjective well-being. Logit regression analysis revealed that the key determinants of well-being related to ecologism were a sense of connection to nature; more localized living and non-materialist values. This study indicates that ecological values can lead to personal well-being gains and reduced personal eco-footprints.

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1. INTRODUCTION

1.1. AIMS

The aim of this project is to develop an integrated measure of individuals' degree of environmentalism or 'ecologism' and to compare this to their subjective well-being. By examining these relationships the project aims to uncover lifestyle choices that reduce environmental impacts whist improving well-being: so called 'sustainability double-dividends.'

1.2. OBJECTIVES

The objectives of this thesis are:

- To look at the historical context of the emergence of the 'New Ecological Paradigm' and identify some central characteristics of an ecological worldview.
- To understand the concept of well-being and how it can be used to as a measure of social progress.
- To develop a questionnaire that provides an integrated assessment of participants' level of ecologism.
- To develop a questionnaire that effectively surveys participants' subjective well-being.
- To sample as large a demographic as possible to explore the relationship between ecologism and subjective well-being.
- To develop broad conclusions about how society can become more efficient and sustainable by encouraging lifestyles that reduce environmental impacts whist improving well-being.
- To explore the possibility that happiness could function as a signal creating social movement to a high synergy, sustainable state.

1.3. OUTCOMES

The initial output will be an understanding of the New Ecological Paradigm and an identification of key knowledge, attitudes and behaviours that distinguish this worldview from that of the Dominant Social Paradigm. An understanding of well-being and how this might relate to ecologism will follow.

My output from the survey will be 700 questionnaire responses which I will then submit to statistical analysis using SPSS software. The relationship between people's degree of environmentalism and subjective well-being will be explored. Specific life-style choices (behaviours), environmental opinions and knowledge that affect subjective well-being will be investigated so as to identify sustainability double dividends.

I will develop broad conclusions about the potential for gains to be made in well-being and sustainability through the highlighting and promotion of synergistic pathways. I will explore the possibility of using well-being as an indicator and catalyst to facilitate the shift to a sustainable society and discuss what further work needs to be done to inform the debate.

1.4. THESIS STRUCTURE

Chapter 1: Introduction
An introduction to the thesis, the aims and objective are stated.

Chapter 2: The modern age: change is the only constant
This chapter provides the historical context for the thesis topic. Modern society has greatly increased the material wealth (human capital) of those in the developed world. However, this progress has come at a heavy cost. Natural capital is deteriorating. Furthermore, economic growth has decoupled from well-being in most developed countries.

Chapter 3: The new ecological paradigm

This chapter explains how a new world-view has come into being in response to the perceived environmental crisis. This can be distinguished from the Dominant Social Paradigm by five key beliefs: that there are limits to growth, that there is a balance to nature, that humans are not exempt from natural laws, that anthropocentrism is erroneous and that there is an awareness of the possibility of system failure or sudden ecological collapse.

Chapter 4: Well-being: measuring what counts

This chapter introduces subjective well-being as a new indicator of social progress. The static or declining well-being in many developed countries suggests that the current social paradigm may not be the optimum for the environment or humans. What do we require for happy, healthy lives?

Chapter 5: Why look for a relationship between well-being and ecological knowledge, attitudes and behaviours?

Much of the resistance to creating sustainable societies hinges on the belief that ‘going green’ represents a sacrifice reducing quality of life. This need not be the case. Indeed there is evidence a sustainable society would be a more fulfilling place in which to live. This chapter outlines these theories and the logic behind the study

Chapter 6: Methodology

This chapter describes the source material for much of the survey and explains how ecologism and well-being can be measured in a quantifiable way. Sampling and logistics are also discussed. Details of how each objective was achieved are given.

Chapter 7: Results and analysis

The results are presented and analysed in this chapter.

Chapter 8: Discussion

The results are discussed in this chapter.

Chapter 9: Policy implications

This chapter gives highlights potential sustainability double-dividends. Proposals for policy that might be most able to catalyse improvements in sustainability and well-being synergistically are made.

Chapter 10: Conclusions and Recommendations for Further Work

This chapter summarises the overall conclusions of the thesis and gives recommendations for further work in this area.

2. THE MODERN AGE: CHANGE IS THE ONLY CONSTANT

2.1. AN INCREASING RATE OF CHANGE

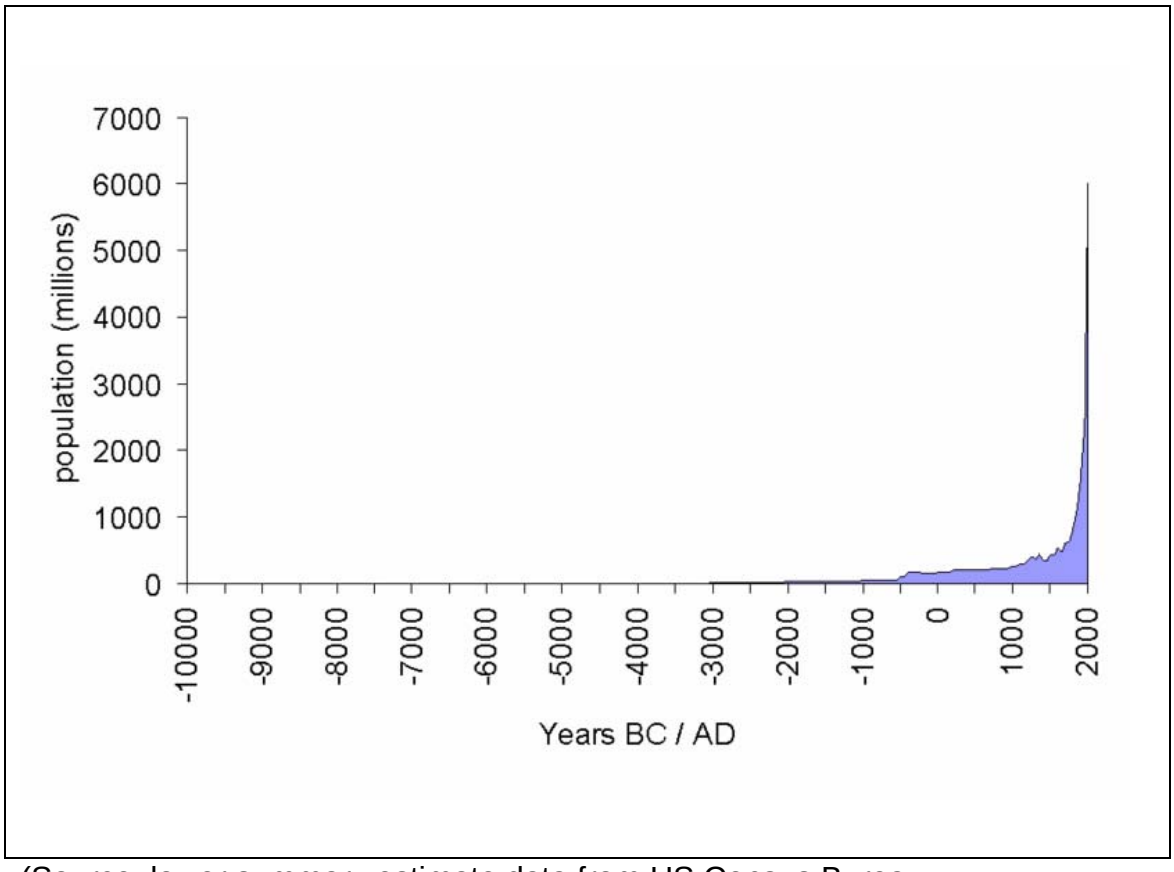
“May you live in interesting times” Old Chinese Curse

Life has existed on earth for around 4 billion years (Miller & Orgel 1974). In comparison with this vast amount of time Homo sapiens have existed for a mere blinking of an eye. Modern humans are thought to have emerged during the upper Palaeolithic 40,000 years ago (Campbell 1988). The first musical instruments found are 32,000 years old. Dogs were tamed 12,000 years ago. The first writing and the wheel were developed in the Sumerian civilization of Mesopotamia 3,500 years ago when the global human population was between 5-10 million people (Swimme & Berry 1994).

The development of agriculture 5000 years ago allowed stable, hierarchical societies to develop within urban settlements (Diamond 1997). Humans began modifying the planet on a significant scale. 300 years ago, the industrial revolution multiplied the power of our species to alter the natural environment further still. As machines performed the tasks of many men, society stratified further, with increasing specializations, more science and more technology. Industrialization applied to agriculture led to an exponential increase in human numbers [see figure 1]. Since then, a fraction of a moment in evolutionary terms, humans have become the dominant species of earth. Humans are now using half the world’s accessible fresh water, have transformed one third to one half of its surface land area and appropriated more than two fifths of the planet’s land based primary productivity (Vitousek & Mooney 1997).

The planet is changing rapidly. The land surface increasingly manipulated by humans; the atmosphere's composition and temperature alter at an unprecedented rate (Worldwatch Institute 2005). Society also changes. It is increasingly interconnected, global and developed (Bloom 2000). Social change is driven by technology (e.g. McGinn 1991, Diamond 1998, Bloom 2000). This driving force itself is accelerating. Technological evolution speeds up. This is captured by Moores law: computer processing power doubles every 18 months (Moore 1965). Where are we rushing to? And is it a place to which we want to go?

Figure 1: Historic Population Growth



(Source: lower summary estimate data from US Census Bureau http://www.census.gov/ipc/www/worldhis.html)

2.2. THE MYTH OF PROGRESS

The modern age is said to have started with the enlightenment thinkers of the 17th century (e.g. Capra 1988, Sheldrake 1990, Spowers 2002). Visionaries such as Bacon (1561-1626) foresaw the taming of nature. Descartes (1596-1650) described the natural world as a machine and encouraged the development of new technologies to extract ever increasing quantities of goods for human use. For the Western thinkers of the age it seemed obvious that the 'Empire of Mankind' was dominant on Earth and that through the mastery of nature, the future was ours to shape through science and technology (Spowers 2002).

The notion of indefinite progress was born. One of its fathers, Condorcet (1743-1794) divided History into a succession of ten steps. He asserted that the tenth (ours) is the age of science, rationalism and revolution, and would lead to an age of prosperity and tolerance (Alfonseca 1998). The notion of the irresistible march of progress gained credence following Darwin's publication of 'The Origin of the Species' and with it the concept of evolution and the increasing complexity of life on earth with humans at the zenith (Darwin 1859).

The progress myth lit the industrial human endeavour with a bright light of confidence. Man's place as the dominant being on Earth seemed god-given and immovable. It was not until the twentieth century dawned and the first industrial and global wars shook the planet that doubts began to surface. In the later half of the 20th century the doubts had to turn to a total reassessment. Ongoing industrialization, swelling populations and continuous economic growth were taking their toll. The planet's ecosystems were deteriorating with serious implications for the future of life on the planet.

2.3. ENVIRONMENTAL COSTS: THE EXPANSION OF HUMAN CAPITAL AT THE EXPENSE OF NATURAL CAPITAL

"Kill not the moth or butterfly, for the last Judgement draweth nigh"

William Blake

In large part, modern economies are based upon linear processes. Industry and corporations extract natural resources and convert them into products that are bought by consumers and then discarded as waste (Hawken et al 1999). Nature functions as both the source of the materials and the sink for the waste. Both functions degrade. Industrial systems have allowed the accumulation of previously unimagined quantities of human capital. However, natural capital is now declining; oil, trees, fish, soil and clean air, for example. The situation has now become so serious that a new report of leading experts from 13 nations states that Earth is on the verge of 'a major biodiversity crisis' (Loreau et al 2006), Furthermore, natural systems are retreating, including: estuaries, grasslands, coral reefs, rain forests (Hassan et al 2005).

This is all happening in an era of unprecedented economic growth. The destructive processes driving our economies are reinforced by a measure of wealth that is defined by Gross Domestic Product (GDP). GDP increases as natural capital is converted to waste. Modern capitalism is non-sustainable because it liquidates its capital and calls it income (Hawken et al 1999). The basis of all living economies on planet Earth is natural systems powered by the sun. Yet modern capitalism fails to assign value to the natural resources and living systems it exploits. The solution does not simply lie in assigning monetary value to living systems. To be sustainable society must live off the interest of natural capital not the capital itself. That is to say that society is failing when any natural system that sustains society is declining.

Examples of critically deteriorating natural eco-systems and global environmental changes which have serious ramifications for human well-being:

- Decline of fish stocks: roughly two-thirds of the world's major fish stocks are now fished at or beyond their capacity
- Nearly one in four mammal species is in serious decline
- Countries continue to lose more trees than they regenerate: an average of 9.4 million hectares of forest (roughly the size of Portugal) was lost annually during the 1990s. Brazil lost 2.3 million hectares of Amazon forest between August 2002 and 2003.
- Global warming will contribute to rising numbers of environmental refugees as climate change translates into more intense storms, flooding, heat waves, and droughts. More communities will be affected. Desertification, for example, puts some 135 million people worldwide at risk of becoming environmental refugees.
- The year 2002 was the second hottest since record-keeping began in the 1880s. The global average temperature climbed to 14.52 degrees Celsius. The nine warmest years on record have occurred since 1990.
- Weather-related disasters have a growing economic and human toll. In 2004, weather-related disasters caused nearly $105 billion in economic losses (in 2003 dollars)—almost twice the total in 2003.

(Worldwatch 2005)

Natural resources are becoming scarcer whilst Humanity’s eco-footprint (impact upon nature) is increasing (Wackernagel et al 2002). This is known as ecological overshoot and means that we are no longer living within the sustainable boundaries of the planet (WWF 2004). The severity of ecological overshoot has been recognized by a range of national policies and international multi-lateral environmental agreements, the Millennium Development Goal number 7, for example, aims to achieve ecological sustainability by 2015 (UN 2005).

To redress the imbalance, governments can seek to address demand and supply side factors. Supply of nature's services can theoretically be increased by increasing bio productive area or average productivity (Field & Field 2002). Much work continues to be done in this area, most noticeably in agriculture. Currently increases are not enough to compensate for the overshoot and there are biologically imposed constraints on the theoretically proposed increases that might be possible (Campbell 1988). Thus we must look to demand-side gains by either reducing population, reducing average per-capita consumption or by increasing resource use efficiency.

Work on demand-side factors are controversial and stunted because they are seen as slowing economic growth and thus, conflict with the stated aims of nearly every government and corporation. There is, however, no way around this problem; we cannot 'have our cake and eat it too'. The natural world is declining rapidly due to present rates of consumption. Increasing population and growing economies mean that, globally, consumption patterns and our species' eco-footprint will continue to grow. This could be catastrophic (e.g. Boulter 2002, Rees 2003 & Diamond 2005).

2.4. SOCIAL COSTS: THE COST OF CONTINUOUS ECONOMIC GROWTH ON OUR LIVES

"Growth for the sake of growth is the philosophy of the cancer cell"

Edward Abbey

There has been an implicit assumption in economic theory that increases in human capital correspond to increases in human well-being. For example Adam Smith said "[society is] … engaged in a process of continual improvement, brought about by investment, increased productivity and the accumulation of individual wealth" (quoted from Spowers page 35). However, new research has revealed how continuous economic growth negatively impacts on human welfare as well as natural systems. This is perhaps most apparent in poor nations who suffer disproportionately from the rapidly globalizing world. The global economy has grown sevenfold since 1950. Meanwhile, the disparity in per capita gross domestic product between the 20 richest and 20 poorest nations more than doubled between 1960 and 1995 (Worldwatch 2005).

More surprising is that even in rich nations with continuously growing economies human well-being has decoupled from economic growth. For example, people today in Britain are richer then ever before. UK national income has tripled in real terms over the last 50 years. However, people's well-being has not improved proportionally (Jackson 2004). It is hard to understand why economic growth is valued with such 'mystical reverence'. As early as 1967 E.J. Mishan critiqued ongoing economic growth in a book entitled 'The Costs of Economic Growth'. Before this, Keynes, Hicks and Kuznets warned against using measures such as GDP in the national accounting system (Hamilton 2003).

Using GDP to measure prosperity or well-being is clearly flawed. Events that are a cost to society can contribute to swelling gross national product. Increasing crime can lead to increasing spending on security which may boost GDP. Fighting wars of oppression, clear felling forests and increasing chronic mental disease can all also lead to ‘improvements’ in GDP (Daly 1997). Conversely, much work in society that contributes to well-being, such as childcare, does not have a marketplace and as such is not accounted for. The fundamental error is the underlying assumption that well-being is a function of consumption (Hamilton 2003).

Critics of economic growth point out that increasing growth and consumption carry a heavy cost not just for the environment but also for the consumers. For example, a high growth/consumption society increases the materialist values of its citizens. This can lead to reduced well-being (Kasser 2002). Rising rates of depression seen in developed countries have been linked to economic growth (for example, Klerman et al 1985, Murphy 1986, Lewis et al 1993).

The pressure to always increase consumption has spawned the multi-billion dollar advertising industry which has been blamed for increasing anxiety, depression and eating disorders (Hamilton 2003). A great deal of the thrust of the work of advertisers is to increase the gap in perception between what we have and what we need. In this sense they perpetuate a sense of dissatisfaction and desire that breeds unhappiness. A continuous growth economy based on increasing consumption requires consumers to work longer hours to earn more. This increases the stress of child rearing and reduces valuable family time. The idea that modern industrial society would become largely automated allowing a more leisured society has not materialized. Indeed working hours are increasing steadily for many social groups in developed countries (Grice 2006).

The growth in mass consumerism has led to the demise of town centres as more competitive superstores locate outside of town. Between 1995 and 2000, the UK lost 20 per cent of what could be considered an important part its social fabric: corner shops, grocers, high street banks, post offices and pubs, in total over 30,000 local economic outlets (Simms et al 2003). This has contributed to the delocalization of our basic habits and has negative ramifications for both the environment and our well-being. Community activities and cultural identity are often based around small local institutions. Their loss contributes to what The New Economics Foundation (NEF) calls ‘Ghost Town Britain’ The environment suffers because more resources are extracted and emitted as we travel ever greater distances to meet our basic needs.

From a human perspective it is not growth per se that is important, but improvements in well-being. By measuring well-being rather then simple capital gain it is possible to incorporate the full range of factors that are important to human welfare. NEF in particular has pioneered well-being research which reveals how modern society fails many of its citizens by focusing on economic growth and increasing human capital above all else (e.g. Jackson 2002, Simms et al 2003, Marks & Shah 2004)

The march of progress has transmogrified into the march of capital. Our financial systems are based on permanent growth, without which they fail to function (Greco 1990). However, beyond a certain level of growth there is no relationship between well-being and economic growth or between well-being and income (Hamilton 2003). With the natural environment deteriorating and human well-being declining it is important to change direction. This can be facilitated by shifting to a measure social progress that more accurately gauges actual welfare. New integrated measures of personal well-being may have a role to play.

A new measure of progress is more significant then simply changing ‘currencies’. More profoundly, such a change comes about through a change in the underlying value systems of society i.e. through reassessing needs and revaluing well-being over wealth. As we shall see, a new value system does not need to be invented. It has been evolving steadily in response to our changing conditions.

3. THE NEW ECOLOGICAL PARADIGM

Before the second half of the 20th century there had never been a global environmental paradigm. It has taken a great deal to convince people that the planet as a whole could change and that the long term survival of the species could be under threat. As scientific evidence of a deteriorating and changing environment has accumulated, so people's understanding of the problems has deepened. Today, global warming, deforestation, acid rain, species loss, ozone depletion and pesticide poisoning have gained a hold of the public's psyche and become important political issues (Dobson 2000).

The emergence of global environmental problems as major policy issues is emblematic of the growing awareness of the problematic relationship between modern industrialized societies and the natural environments on which they depend (Stem et al 1992). A new perception of humanity's place and role on earth is developing. Initially a minority view held by a small group of scientists and radicals, an environmental perspective has now become more mainstream. This supports the notion that there is a fundamental shift underway in our relationship with the natural world (e.g. Milbrath 1984, Capra 1988, Fox 1990, Sheldrake 1990, Hawken et al 1999).

The measurement and analysis of the growth of a 'New Environmental Paradigm' (NEP) began in the mid 1970s when Dunlap and Van Liere set out to define the challenge that environmentalism represented to our fundamental views about nature and humans' relationship to it. In particular they identified 3 key tenets of this new paradigm:

- The existence of limits to growth for human societies (limits to growth)
- Beliefs about humanity's ability to upset the balance of nature (balance)
- Doubts about humanity's right to rule over the rest of nature (anti-anthropocentric)

(Dunlap & Van Liere 1978)

In a Washington State study Dunlap and Van Liere (1978) used these three tenets to create a 12 point Likert agreement scale that exhibited internal consistency. The scale output could strongly discriminate between known environmentalists and the general public. Therefore, they argued that the items could legitimately be considered a New Environmental Paradigm Scale. In a later study they found that endorsement of the NEP was negatively related to endorsement of the Dominant Social Paradigm (DSP) (Dunlap & Van Liere 1984). Further studies have shown that a pro-ecological orientation or 'seeing the world ecologically,' will be revealed in a high score on the NEP Scale and will tend to lead to pro-environmental beliefs and attitudes on a wide range of issues (Pierce, Dalton, & Zaitsev 1999 and Stern, Dietz & Guagnano 1995).

Worsening environmental problems and their perception in the 1980s led to two new key tenets being added to the NEP scale:

- Humans are not exempt from biological systems (anti-exempt)
- Global environmental change may be non-linear and catastrophic (eco-crisis)

(Dunlap & Van Liere 1984)

The scale was then renamed the New Ecological Paradigm (NEP) scale to reflect the broader and more far reaching implications of an ecological approach (Dunlap 2000).

By understanding the history of these key beliefs that are central to the environmental movement we can understand the evolution of ecological consciousness. This will allow us to establish some key differences between the attitudes, behaviours and knowledge of people who have and ecological worldview with those who do not.

3.1. LIMITS TO GROWTH

The concept of scarcity is fundamental…it is rooted in the bio spherical realities of the planet, ruled and limited by entropy and ecology

(Irvine & Ponton 1988)

In their 1974 report The Club of Rome identified 5 areas of global concern: accelerating industrialization, rapid population growth, widespread malnutrition, depletion of non-renewable resources and a deteriorating environment (Meadows et al 1974). This challenged the pervading perception of Earth as abundant, resilient and largely unchangeable.

The researchers developed computer models to predict the changes likely to occur as human civilization continued to expand and take over an ever larger proportion of the global eco-system. Their computer models predicted the collapse of civilizations in a variety of unpleasant ways from soil erosion and the failure of food crops to severe pollution (Meadows et al 1974). Their models predicted collapse even when massive improvements in technologies and food production capacity were factored in. The scientists argued that continuous growth was simply not possible on a finite planet. Although their report met a sustained barrage of criticism and counter arguments (e.g. Solow & Kneese & Riker 1972) their work had a lasting impact on the widespread perception of our planetary home.

Seeing the planet as a finite system of limited resources has a range of significant conceptual repercussions. For example, it negates the possibility of ongoing expansion of populations and economies. The limits-to-growth arguments suggest that creating a sustainable society may require more than simply technological solutions (although these may have a large role to play). A technological solution 'requires only a change in the techniques of the natural sciences, demanding little or nothing in the way of change in human values or ideas of morality' (Hardin 1968). In contrast, creating sustainable societies may require a fundamental re-evaluation of what humans actually *need* in order to have happy, healthy, sustainable lives. Ongoing population growth is also deemed implausible with a limits-to-growth outlook. Indeed many environmental thinkers argue for a reduction in human population (Porritt 1984).

The notion of limits-to-growth leads to a limit on per capita consumption. Limiting consumption starkly contrasts with the aims of advanced capitalist consumer society. Indeed, the 'main contrast of green and conventional politics is that quantitative demand must be reduced not expanded' (Porritt 1984). Conventional economic theory postulates that humans gain increasing utility or well-being from increasing consumption. An ecological worldview supposes the opposite: that over-consumption degrades the natural world and human well-being. Thus a central tenet of an ecological worldview is the desire to consume less and seek satisfaction elsewhere, that is, a less materialist outlook.

The Club of Rome's pioneering work of global, integrated world-models illustrated a highly interdependent world in which no one variable can be looked at in isolation: an ecological interpretation. Although many of the actual predictions failed to materialise, their efforts have had a lasting effect on ecological consciousness and the environmental movement. It was this and other studies that led to the concept of 'Spaceship Earth' and a more widespread conception of the limits of our planetary home. As the modern age has shrunk our planet, so it has broadened our perception. It is for us as it was for the first astronauts gazing out from their orbiting space capsule. We see the planet is an isolated living entity, powered from the sun. Our destinies are utterly dependent upon each other and the rest of the living community… here on Spaceship Earth.

3.2. BALANCE OF NATURE

“Looking outward to the blackness of space…I saw majesty - but no welcome. Below was a welcoming planet. There, contained in the thin, moving, incredibly fragile shell of the biosphere is everything that is dear to you... That's where life is…”

Loren Acton, US Astronaut

In his book ‘Collapse’ Jared Diamond reveals how many civilizations prior to our own have engineered their downfall by failing to recognize the balance of nature. The Easter Island civilization, for example, removed their island’s forest cover in order to roll huge rocks into place to carve effigies of human heads. In doing so their eco-system degenerated. They became extinct (Diamond 2005).

Globally, the balance of nature is under threat. The Amazon rainforest is critical not just in maintaining the local micro-climate of the Amazon basin but also for generating a significant proportion of the oxygen in the air that we breathe, as well as generating much of the moisture that precipitates over the American mid-west (Shukla et al 1990). Should the Amazon be lost there will be global ramifications. We see that the global eco-system is complex and interdependent (Dobson 2000). Countries cannot take a nationalistic or protectionist stance in the face of global environmental change.

Concern for the balance of nature urges precaution in our dealings with nature. A technocratic vision may be one in which the majority of the earth’s surface is terra-formed into a man made conglomeration and other species that are deemed of interest are held in zoos and reserves. In contrast, an ecological worldview would seek to limit human activities to certain regions of the world and leave other ecologically significant regions solely for the other species that live there. This is recognized within the ecological hot spot approach (Myers 2000) and the attempt at creating intercontinental wilderness areas such as the North American Wildlands projects (Soulé &Terborgh 1999).

The concept of nature being in balance urges precaution in our relationship with the natural world. It sanctions a global, inter-disciplinary response. The natural world is by far the most precious commodity in the known universe. Its demise is humanities greatest loss. Becoming sustainable - our existence - depends on recognizing the intrinsic value of all life forms on earth and constraining the human eco-footprint so that there is space for other life forms to continue evolving.

3.3. ANTI-EXEMPT

“Fill the earth and subdue it”

Genesis 1:28

Exemptionism has biblical roots that run through history to today. The expansion of Western Europe following the industrial revolution was nurtured by a philosophy that saw the white western male as the superior being on Earth (section 2.2). Thus the thrust of the anti-exemption argument is that humans, although distinctly different from other life-forms, are ultimately still ecologically constrained. The New Ecological Paradigm seeks in some way to return human society to a more natural state in which humans live closer to where our food is grown and in general have a deeper interaction with the natural world.

The economy of modern society grows continuously by stimulating new desires and then providing a product to satisfy the want. For example, today we eat foods out of season all year round by flying them in from countries where they are in season. Natural constraints of climate are defied. The full costs of this are now becoming apparent. Air transport food miles alone have been recognized as a serious contributor to global warming (Jones 2001). Recognizing that we are not exempt from the natural systems of which we are a part means abandoning some of the wants we have come to see as normal and re-submitting to some of the natural laws by which we used to live and are currently over-extending.

The concept of bioregions is helpful here. A bioregion has been defined as a ‘recurring pattern of ecosystems associated with characteristic combinations of soil and landform that characterise that region’ (Brunckhorst 2000). It is a region that is biologically and geographically distinct from its surrounding areas. Before mass transport many people would have spent the vast majority of their lives within their bioregion and the vast majority of their food and resources would have come from there as well (Sale 1993).

A central thrust of the NEP is localization. Localization has a vast array of positive environmental benefits. In general, by growing food, working, educating, and socializing locally, the amount of travel and transport required to sustain our lives is hugely reduced. This results in fewer resources used and less pollution. Localization is a unifying theme of this project because it is one of the clearest examples of how sustainability and well-being are so related. Delocalization has had serious environmental ramifications. It is also responsible for many aspects of declining well-being. The decline of local communities and increasing commuting times are both implicated in some aspects of declining well-being in developed countries (Oram 2003).

For Kirkpatrick Sale and others bioregionalism is about far more then reducing travelling times. For example, they believe the bioregional approach should be applied to governance as well (e.g. Sale 1993 & Madron & Jopling 2003). Having many smaller autonomous political units would lead to a heterogeneous and quite different social structure. A benefit is that local, social and environmental issues are dealt with where they are felt. These nested sub-systems, or *holons*, influence and are influenced by the larger whole. Effective bidirectional information flows between smaller and larger sub-systems maintains overall coherence and viability. This social structure with dynamic feedback more closely resembles natural systems. Thus, we can use knowledge of living systems to make society more closely resemble nature and her self-sustaining characteristics.

Some new scientists directly attempt to utilize intelligent designs in nature in the development of new technologies (Benyus 2002) and economic systems (Hawkins & Lovins 1999) through the process of biomimicry. Broadly, features of the structure of life that are deemed relevant for these considerations are: diversity, interdependence, stability and evolution. It has been noted that modern society is unsustainable precisely because it has become unwieldy, abstract, divorced from nature and distinctly unnatural in its linear, expansive, unstable form.

An ecological worldview holds that nature is of primary importance and that all human endeavours are secondary to this. Thus Aldo Leopold, an early pioneer of deep ecological thought, stated:

"A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise."

(Leopold 1948)

3.4. ANTI-ANTHROPOCENTRIC

“If all the beasts were gone, we would die from a great loneliness of spirit, for whatever happens to the beasts also happens to us. All things are connected. Whatever befalls the Earth, befalls the children of the earth”
Chief Seattle 1855 (quoted in Bunyard and Morgan-Grenville 1987)

Anthropocentrism has been defined as the mistake of ‘giving exclusive or arbitrarily preferential considerations to human interests as opposed to the interests of other beings’ (Hayward 1997). This mistake has been largely held responsible for the advancement of human capital at the expense of natural capital and therefore is widely held by greens to be a route cause of the environmental crisis (Dobson 2000).

In contrast, an anti-anthropocentric stance sees human concerns embedded within those of the wider biotic community. As such, being anti-anthropocentric is central to deep-ecology and seeing the world ecologically. Indeed deep ecologists would maintain that the critical response to the environmental crisis is a widespread expansion of the sense of self such that people identify with the entire biotic community. Thus, human interests and the interests of other beings become one and the same thing. Transpersonal psychology and transpersonal ecology hold that the atomistic sense of self is a root cause of much human misery. This will be discussed further in section 5.1.

3.5. ECO-CRISES: THE POSSIBILITY OF SYSTEM FAILURE

“Climate change is for real. We have just a small window of opportunity and it is closing rather rapidly. There is not a moment to lose.”
Dr. Rajendra Pachauri, Chairman, Intergovernmental Panel on Climate Change

The concept of the limits to growth and the logic of sustainability are sound but they have not been effective at motivating people and governments to act. It seems unless there is an immediate threat we put off for tomorrow what we should do today. The next layer of environmental consciousness that has become significant in the NEP involves an understanding that planetary change will not be linear. Our environment may not slowly deteriorate. Ecosystems may collapse once a threshold is crossed (Diamond 2005).

The destructive processes upon which our societies are founded are compounded by the fact that the human population continues to rise significantly. Today the global population grows at a rate of 220,862 people per day which equates to 80,614,726 people per year (Population Reference Bureau 2006) (see figure 1). The ever increasing burden of a growing population is non-linear. This presents the possibility that the global environment could change very rapidly.

This possibility of system failure has serious and broad policy implications. For many environmentalists the Precautionary Principle should be applied globally (Montague 1998). They believe that it would be so costly and difficult to attempt to reverse the damage caused by a significant global environmental shift that we should pre-emptively shift to sustainable modes of existence. Rather than aiming to reap the maximum possible amounts of resources from the Earth's natural systems society should extract safely below any threshold levels, providing a buffer zone as insurance.

The possibility of a global cataclysm emphasises the need for global action immediately. The increasingly dire warnings from the Intergovernmental Panel on Climate Change (IPCC) are pushing global warming to the top of the international political agenda. In 2003 the IPCC Fourth Assessment Report warned that the world is warming in an unprecedented and dangerous fashion as a result of human activities (IPCC 2003).

Adequately heeding climate scientists' warnings, brings to the mainstream the notion that radical change may be required and may be required immediately. Colin Challen, a Labour MP and chairman of the All-Party Parliamentary Climate Change Group, recently wrote in The Independent newspaper that 'climate change means that business as usual is dead'. He goes on to argue that economic growth may no longer be feasible and that it is the responsibility of MP's to persuade the electorate of this. For some it has become apparent that very different modes of living will have to be accepted.

Global warming is a distinctive issue for a number of reasons. It affects all countries although not all countries contributed to the problem. It is global in scope and it has potentially catastrophic consequences on a shorter timescale then that envisaged for other problems. There are many proposed remedies to global warming such as a carbon tax, 'cap and trade', and 'contraction and convergence'. All of these could be successful so long as they limit the quantity of greenhouse gases entering earth's atmosphere below a safe boundary level. Achieving this reduction will require profound changes to society.

To sum up: an ecological worldview tends to incorporate the 5 elements highlighted by De Veiere and Dunlap. This4 new way of thinking is instigated through new knowledge which manifests as opinions and behaviours. People who endorse NEP identify more closely with nature, urge a less exploitative, more harmonious relationship with the natural world and emphasise the value in experiences rather then commodities. Their behaviour may be altered so as affect a smaller eco-footprint. They may be involved in responding to environmental issues. It is clear from the evolution of environmental issues and the associated body of thought that if human society is going to become sustainable (which is a matter of increasing urgency) then far reaching and profound changes to the ways in which we live on our planet are required.

4. WELL-BEING: MEASURING WHAT COUNTS

4.1. HAPPINESS: A UBIQUITOUS HUMAN DESIRE

“We hold these truths to be self evident, that all men are created equal, that they are endowed by their creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness”

Thomas Jefferson, American Declaration of Independence 1776

Happiness is a light in our lives guiding us to desirable states. It is a measure of how well we are doing. As such it is for many the most important thing in life. It is first known to have been discussed by the ancients such as Epicurus who told us it could be found in friendship, freedom and thought (De Botton 2000). The quest for happiness has also informed political movements and declarations, perhaps most noticeably in the case of the American Declaration of Independence (1776). For some, the goal of society should be the maximization of collective happiness, as expressed by Francis Hutcheson who summed up utilitarianism with the phrase “the action is best, which procures the greatest happiness for the greatest numbers”.

For many scholars in certain epochs happiness may have seemed a frivolous subject to study and thus it has been renamed repeatedly by different disciplines. Examples include: utility, hedonic tone, positive emotionality and subjective well-being. However it is discussed, it remains an over-arching component of the human experience, something that unites cultures, sexes and ages, perhaps one of the few aspirations we as a species can agree on.

The broadness of the happiness concept makes it hard to define. Linguistically, happiness as a word can be used in a wide range of circumstances. Three distinct uses have been defined revealing different levels of happiness that are significantly distinct (see yable 1).

Table 1: 3 Linguistically Distinct Levels of Happiness

Level 1 Momentary feelings	Level 2 Judgements about feeling	Level 3 Quality of life
Pleasure Joy	Well-being	Flourishing Fulfilling one's potential
	Also called: Subjective well-being Hedonics	Also called: Psychological well-being Eudaimonics (Aristotle)

(Source: Nettle 2005)

Level 1 happiness is more immediate, sensual and emotional and more easily measurable. Moving up to level 3, the happiness becomes more cognitive, moral and political, involving cultural norms and values (Nettle 2005). Because of the complex nuances associated with the use of the word happiness a more defined term that may encompass the aims of society has been developed. Today there is a resurgence of interest in political, academic and scientific communities of happiness studies and the term of consensus is 'well-being'.

Well-being is the psychological term given to people's overall levels of happiness and satisfaction with life. The New Economics Foundation's model of well-being has 3 dimensions:

- People's satisfaction with their life: satisfaction pleasure and enjoyment
- People's personal development: engagement in life, growth and fulfilling of potential
- People's social well-being: a sense of belonging, pro-social behaviour, belief in social progress

(NEF 2004)

This more comprehensive interpretation of well-being takes into account personal development and progress through life. This recognizes that food and security and relationships may make us immediately happy but over the course of our lives we need more to give us a deeper satisfaction. Freud is reported to have said that what we need to be happy is ‘love and work’. This captures the sense that our restless human consciousnesses need projects and endeavours and challenges to be fulfilled. It is in this multi-dimensional level 3 domain that state intervention may be deemed appropriate. We do not want governments interfering with our sensual enjoyment of life. However, we may want governments to create a society in which people have the opportunity to reach their full potential and find meaningful livelihoods.

Well-being is of critical importance to society. Happy people are more: sociable, generous, creative, active, tolerant, healthy, altruistic, economically productive and long living (Lyubomirsky et al 2004). Therefore it follows that a healthy, successful society is a happy one. Working towards improving individual well-being is not just an end in itself. There are manifold benefits to society in totality (NEF 2004). Should we aspire for social progress then a first port of call should be improving individual well-being since this leads to a higher calibre of citizen.

4.2. THE PURSUIT OF HAPPINESS (IN ALL THE WRONG PLACES)

“I don’t know why we are here but I am pretty sure that it is not in order to enjoy ourselves”

Wittgenstein

Evolutionary psychology allows us to understand why and for what purpose the emotion of happiness has come about. Happiness is pleasure. It functions as a signal encouraging us to continue or repeat activities that are good for us or increases the chances of the propagation of our genes. Thus, the main sources of joy have been identified as interactions with food, drink, friends, sex and experiences of success (Scherer et al 1983). It is clear that these are events that would have lead to increased fitness in ancestral environments.

In order for the signal to be effective it must return to a base level. The signal must be temporary. There is no adaptive benefit in prolonged bouts of joy. This explains why the quest for permanent happiness may be a hollow one if the kind of happiness desired is level 1 carnal pleasure. We are simply not designed to remain in these states. Should we be exposed for extended periods to experiences that we are evolved to garner pleasure from a process called ‘adaptation’ (or habituation) makes us increasingly desensitized to the event. Thus winning the lottery makes us happy but we rapidly adapt to our new circumstances and relatively soon afterwards gain no extra happiness as a result of the event (Brickman et al 1978).

People consistently over-estimate the amount of happiness that they will gain from events in life and from their life circumstances. We are conditioned to believe that we will be significantly happier when we earn £30,000 rather then £20,000 but in actual fact we will rapidly adapt and begin longing for £40,000 a year (Frank 1999). Well-being fails to increase as income grows (Myers & Diener 1996). Acquiring new possessions may give us short bursts of pleasure but we adapt and there is no net improvement in our quality of life. Should we seek happiness through the accumulation of material things we will rapidly discover we need a new item. This has been termed the ‘hedonic treadmill’ (Brickman & Campbell 1971).

Evolutionary psychology also explains the relative nature of our happiness. The Red Queen Effect is a term coined by Matt Ridley and describes the way in which we must constantly improve to remain competitive in an evolving world (Ridley 1993). If we are to reproduce successfully we must keep up with the advances of our competitors. The ability to secure resources is a powerful attractor in the mate selection process and thus increases chances of successful procreation. We have therefore evolved to garner happiness from the securing of resources. In ancestral times a good club and cave may have been highly seductive but today they have lost their sparkle. Happiness derived from securing resources is relative to the quantity of resources secured by peers. Herein lies a root cause of the so called ‘rat-race’. We need to secure ever more resources in order to be equally as successful as our peers.

Our societies are highly competitive places as a result of the highly competitive processes driving the selection and dispersion of our genes. We are genetically predisposed to behaviour patterns that have now become pathological when multiplied by six billion people in the modern world. Acquiring increasing amounts of resources was an adaptive behaviour increasing our fitness. Now on a global scale it is unbalancing the planet's eco-systems and could lead to humanities untimely extinction. Happiness can be a mirage and in our quest for happiness we can be fooled into striving in the wrong places with grave ramifications for personal and planetary well-being.

We see that money and level-1-happiness are actually very similar. They are both currencies (information). The pursuit of happiness or wealth is likely to be unsatisfying because these are not ends in themselves but routes to the more profound things in life that we deeply drawn to. Thus it is not really the expensive watch that we want but the respect and admiration of our peers that comes with success. In order to attain the sustained multiple benefits of level three happiness i.e. to flourish and have a good quality of life we should not chase the signals we are evolved to chase but seek out quality relationships, meaningful work and significant experiences.

The values which society encourages can help orientate people towards experiences in life that are likely to satisfy psychological needs, which are a prerequisite for well-being, as opposed to the distress and anxiety that can be associated with extrinsic motivation and over-consumption (Kasser 2002 & Kasser & Ahuvia 2002). Government can direct society towards activities and ways of life that improve well-being without being collectively pathological.

To achieve a vibrant, productive, positive and healthy society, we can reduce the emphasis on wealth acquisition, and develop a ‘service and flow’ economy (Hawkens 1999). A growing body of research reveals that shifting focus to experiences, relationships and meaningful activities rather then material gains will improve quality of life and overall well-being (e.g. Brickman & Campbell 1971, Myers & Diener 1996, Kasser 2002, Diener & Seligman 2004, Marks et al 2006, Sheldon & Lyubomirsky 2006). As we will see in section 5.1, the fulfilling of people’s psychological needs has multiple benefits that can have positive ramifications that ripple outwards from the person into their communities and their environments. Interesting and enjoyable activities bring happiness, and as we shall see, when these activities are meaningful, life satisfaction, personal development and social well-being all benefit. The intentional activities in life we choose include: work, sports, hobbies, community activities and interpersonal relationships.

As society has become more successful at delivering the material necessities to satisfy our basic human needs, material things have lost their capacity to stimulate increased well-being. Robert Lane (2000) expresses it like this: “the richer the society and its individuals become, the less purchasable are the goals that bring them happiness – although they may still pursue wealth with their accustomed vigour.”

Adaptation and comparison have profound implications for our understanding of happiness and mean that happiness is caused by cognitive processes behind the perception the world, rather then objective circumstances (assuming basic needs are met). Much of the competition in society is an unnecessary evolutionary relic that could be overcome. It is what we *do*, not our circumstances, that has the most effect on happiness (Sheldon & Lyubomirsky 2006).This shift in emphasis in what is important in life can have a significant impact upon society becoming sustainable.

5. WHY LOOK FOR A RELATIONSHIP BETWEEN WELL-BEING AND ECOLOGICAL KNOWLEDGE, ATTITUDES AND BEHAVIOURS?

In 1983 the General Assembly of the United Nations established the World Commission on Environment and Development. The aim was to make sense of environmental and development issues allowing the international community to form some kind of joint position. Madam Gro Harlem Brundtland, Prime Minister of Norway, was appointed to head the commission and 'The Brundtland Commission' published its final report, 'Our Common Future', in 1987. The seminal report had a huge impact and its definition of sustainable development has become a foundation for much future work.

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

(Brundtland 1987)

The United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit, held in Rio de Janeiro in June 1992, extended the concept:

"Human beings are at the centre of concern for sustainable development. They are entitled to a healthy and productive life in harmony with nature ... the primary health needs of the world's population are integral to the achievement of the goals of sustainable development."

(UNED 1992)

Central to the earliest definitions of sustainable development were the ideas of health, production, and of harmony with the natural world.

The Millennium Ecosystem Assessment (MA) is an international work program launched by the U.N. The MA focuses on how changes in ecosystem services have affected human well-being. The WHO recently released its publication Ecosystems and Human Well-being: Health Synthesis. It is abundantly clear therefore that there is a growing consensus that human well-being and environmental quality are intractably linked. Indeed a more subtle and profound notion expressed by biologist David Suzuki is that “we *are* the environment”.

The macro-level sustainability of our society is an amalgam of individual knowledge, attitudes and behaviours. Our ecological knowledge, attitudes and behaviour determines our relationship with the natural world. Our relationship with the natural world is responsible today for the health of the natural world. The health of the natural world impacts upon our well-being, sustainability and likely future success. The starting point is cognitive but mindsets, environmental and human health are systems in constant feedback.

It is widely accepted that the human relationship with the natural world must change in order for societies to become sustainable. What is unclear is how to change that relationship. The perennial problem is that many people are convinced that moving to a sustainable society will lead to lower standards of living for themselves and their families and thus lower well-being. This is an appalling irony. By creating a lower throughput society we can have improved standards of living and sustain a healthy evolving natural world. Thus, we can increase our well-being, our environment and the security of ourselves and our descendants. The challenge is to clearly reveal how an ecological society will be a society of higher well-being.

5.1. WHY AN ECOLOGICAL WORLDVIEW MIGHT BE HAPPIER

“We are human in good part because of the particular way we affiliate with other organisms. They are the matrix in which the human mind originated and is permanently rooted, and they offer the challenge and freedom innately sought”.

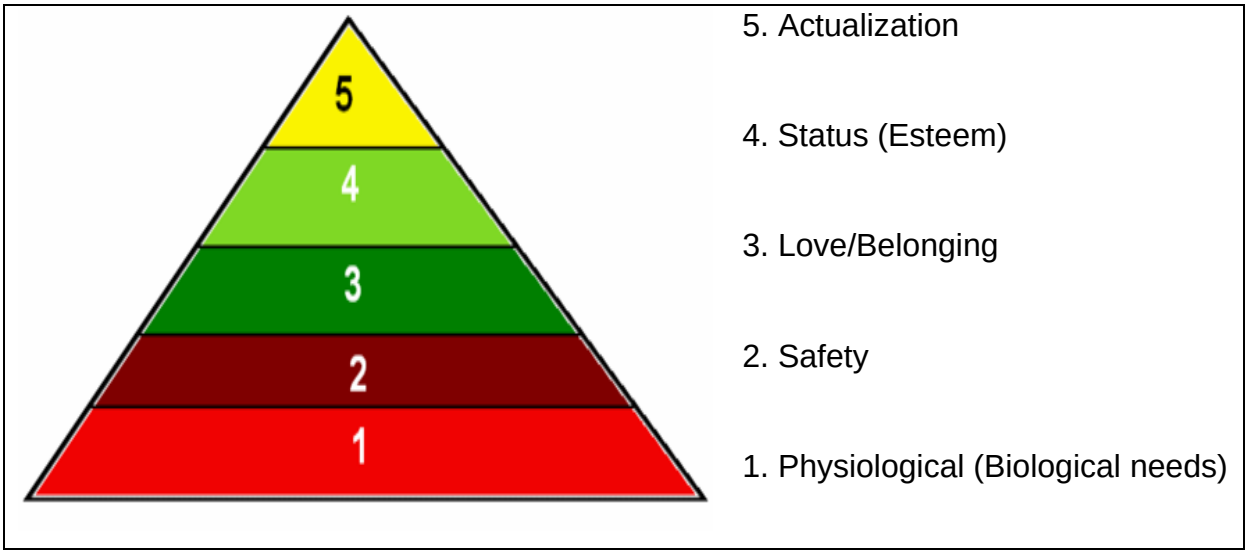
Edward O Wilson

Edward O Wilson's Biophilia Hypothesis proposes that as a consequence of evolution, humans have an innate tendency to focus on life and life-like processes (Wilson 1986). This seems to be a re-encapsulation of atavistic thought. No successful ancestral society saw itself as separate from nature. That is a phantasm of the modern age. For many commentators it is the separation of human society from nature that is the root cause of both the environmental crisis and the decline in well-being associated with modern society (e.g. Leopold 1949, Porritt 1984, Capra 2002, Spowers 2002). Modern ways of living as prescribed by Western industrialised culture stand in stark contrast to our evolutionary history, and as such, may precipitate significant adverse outcomes for the human psyche (Gullone. 2000).

The application of reductionist, atomistic thought to science led to great breakthroughs in technology and the modern world. Its limitations have been discussed. Behaviourist and Freudian psychology took a similar tack with the human mind, treating patients largely as machines and focusing on deficiencies in isolation. Abraham Maslow (1908-1970) complained that “Freud supplied to us the sick half of psychology”. Maslow went on with his colleague Anthony Sutich (1907-1976) to develop humanistic psychology and attempted to focus on improving psychological well-being and self-fulfilment as opposed to seeking out and treating isolated psychological maladies.

In 1943 Maslow proposed his highly influential theory of a Hierarchy of Needs. He went on to develop this over the course of his life. He contends that as humans meet 'basic needs', they seek to satisfy successively 'higher needs' that occupy a hierarchy. The lowest levels are occupied by physiological needs and are termed ‘deficiency needs’. As these are met, higher levels of needs emerge, and the person moves up the pyramid. The higher levels are termed ‘growth needs’ and are associated with psychological needs. While our ‘deficiency needs’ must be met, our growth needs are continually shaping our behaviour. Personal growth creates upward movement through the hierarchy.

Figure 2: Maslow’s Hierarchy of Needs



True to his desire to focus on positive psychology rather then studying the mentally ill he studied exemplary people such as Albert Einstein, Jane Addams, Eleanor Roosevelt, and Frederick Douglass who one might expect to have reached the pyramid’s apex. Maslow writes the following of self-actualizing people:

- They embrace the facts and realities of the world (including themselves) rather than denying or avoiding them.
- They are spontaneous in their ideas and actions.
- They are creative.
- They are interested in solving problems; this often includes the problems of others. Solving these problems is often a key focus in their lives.

- They feel closeness to other people, and generally appreciate life.
- They have a system of morality that is fully internalized and independent of external authority.
- They judge others without prejudice, in a way that can be termed objective.

These people are intrinsically motivated. As explored in section 4.2 it is clear that intrinsic motivation may avoid pathological, over-consumptive behaviour because it orientates people towards meaningful pursuits, often for the good of others. We see that personal development positively impacts upon the well-being of the individual, the well-being of others and the quest for sustainability. In contrast the aim of an ever-expanding economy based on increasing consumption requires that people do not move up the hierarchy of needs, so that they remain obsessed with lower level needs such as safety and status. We see again how the thrust of advanced capitalist society are diametrically opposed to the well-being of people and planet.

Early criticisms of humanist psychology were that it still reduced the human condition to the individual and the ‘skin encapsulated ego’. By setting an idealized ‘unencumbered self’ against the world, the approach could actually worsen feelings of loneliness, unsatisfying relations, longing for community and other modern angst (O’Hara 1989). A new movement was growing, seeing our identities and sense of personhood given to us by our cultures rather then being self-generated. In the Western world a sense of self was generated that was atomistic and particle-like, much like the early conceptions of light and matter. Modern physics presented a radical new conception of light as a wave, and matter as a probabilistic field of energy. New developments in psychology were to present the individual as a complex interface of human culture. Reductionism is slowly losing ground to integrated, holistic, ecological approaches (e.g. Capra 1988 & 2002, Fox 1990, Hawkens et al 1999).

Transpersonal psychology evolved as a result of this growing awareness. Sutich explained in 1966 how he felt that humanistic psychology failed to give "…sufficient attention to the place of man in the universe or cosmos" (quoted in Fox 1990). Transpersonal psychology shares with Eastern spiritual traditions the belief that the sense of self can expand to identify with other aspects of the world and humanity beyond the body. In doing so it transcends conditions of separateness and isolation that are the source of so much human misery and psychic angst. Thus, there is an implicit recognition of the inherent unity of all existence and subsequent feelings of belonging, unity and peace.

Later in his life Maslow adapted his hierarchy of needs and added a 6th layer which was defined as those who have transcended self-actualization. These people find it 'easy to transcend the ego, the self, the identity', they live in the 'kingdom of ends' and they see people and other entities in the world as ends in themselves rather then in term of their utilitarian value. This intrinsic value approach has been applied to ecology and is termed either deep ecology or transpersonal ecology. Deep ecologists apportion value to other living things because of their life: their ability to self-organise and self-sustain. Thus, rather then arguing for the sustenance of all complex forms for their utilitarian value, those with an ecological worldview see other life forms as intrinsically valuable in themselves. Such an approach increases the value of our environment. We derive pleasure from value. This process has been described as the re-sacrilization of nature. By sacrilizing our environments we can in some senses return to 'Eden' or at least rediscover the majesty of nature.

There are myriad benefits to this transcendent sense of ecological self both for the individual and the environment. Individuals that care about biodiversity loss are believed to reveal a psychological connection with other living organisms and psychologically benefit from this association (Ferrer-i-Carbonella & Gowdy 2006) (Kellert & Wilson 1993). These people may be more likely to exhibit environmental behaviours. Ecological people may engage in their surroundings more actively. The individual may experience a sense of belonging and a compassion for the rest of existence as reported by Western deep ecologists and Eastern mystics alike. As Arne Naess, a pioneer of Western deep ecological thought, points out “care flows naturally if the “self” is widened and deepened so that the protection of free nature is felt as the protection of ourselves” (quoted in Fox 1990).

well-being can be improved through recognizing humanities place as an integral part of the natural systems. As dissipative structures sustained by an influx of matter and energy that starts at the sun and is channelled, through plants, up food chains to us, any separation in time or space between us and the natural world is a projection of the ego mind, not a scientific observation. This separation may be necessary for basic functioning but it is limiting to higher processes. the situation can be rebalanced by, above all, teaching children and adults of the innate connections that constitute existence. As Vaclav Havel puts it, “education is the ability to perceive the hidden connections between phenomena” (quoted in Capra 2002)

The Cartesian supposition that humans are separate entities in a mechanistic universe is the source of much modern alienation and misery. The void between our ‘selves’ and the rest of the universe is from where existential angst wells up. It is here that we strive for meaning. An ecological interpretation focuses on connections, not separations. Meaning comes from the understanding that we are a strand in the web of life, a part of the grand unfolding of the cosmos. As Harold Morowitz puts it, “life is a property of planets rather then of individual organisms”. Our well-being benefits when we see ourselves as part of the wider and broader destiny of life on Earth.

5.2. WHY A SUSTAINABLE SOCIETY WOULD BE A PLACE OF INCREASED WELL-BEING

“The foolish man seeks happiness in the distance, the wise grows it under his feet.”

James Oppenheim

It may seem obvious that a sustainable society, one in which the environmental crisis had been averted and the long term survival of the human race was secured, would be a place of increased well-being. However, there is still a pervading distrust of sustainability and a widespread belief that significant sacrifices, lowering quality of life, would be required for society to become sustainable. In contrast to this it is argued that because a sustainable society would be designed, with due consideration for personal well-being and environmental quality and because a sustainable society would be ecological, and therefore support our evolved psychological needs more appropriately, an ecological society would be a happier, safer and more satisfying place in which to live.

By understanding the principles of organization common to all living systems sustainable societies can be constructed by applying the same principles to the way we live and operate. The fundamental characteristics of life are that it is autopoietic and self sustaining. This is in stark contrast to the principle inadequacies of modern industrial society: it has no defined boundary and is non-sustainable. At the Centre for Ecoliteracy in Berkley, Fritjof Capra and colleagues are developing a system of education for sustainable living based on ecological literacy. They have identified 6 basic principles of ecology that are critical to sustaining life:

Table 2: Six Principles of Ecology Critical to Sustaining Life:

Principle	Characteristic
Networks	Living systems nest within living systems and connect through complex adaptive networks
Cycles	Living systems are sustained on continual flows of matter but no ecosystem produces net waste. Matter cycles continuously.
Solar energy	Solar energy transformed into chemical energy by photosynthesis drives the ecological cycles.
Partnership	Energy and resources in an eco-system sustained by pervasive co-operation.
Diversity	Eco-systems achieve stability and resilience through the richness and complexity of their ecological webs
Dynamic balance	An eco-system is a flexible, ever fluctuating network. Its flexibility is a consequence of multiple feedback loops that keep the system in a state of dynamic balance. No single variable is maximized; all variable fluctuate around their optimal values.

(Source: Capra 2002)

Applying these principles through legislature, market based initiatives, education and the mass media to the ways we live would give rise to very different societies. Exactly what these new societies would look like is hard to predict because there would be emergent properties. However, we can imagine there would be a resurgence of local communities in close contact to their agricultural bases. People would be more closely rooted to their bioregions. However, advanced technology would ensure that the globalization of information continues. These bioregional units would be nestled in holonic fashion up to the global level at which global principles of sustainability would have to be in place.

5.3. WHY WELL-BEING MAY BE THE KEY TO UNLOCKING MOTIVATION TO CHANGE

Self-determination theory (Ryan 1995 and Ryan & Deci 2000) distinguishes among three broad forms of motivation for behaviour in a given domain: intrinsic motivation, extrinsic motivation, and amotivation. Intrinsic motivation represents the most self-determined of all behaviours. It involves doing an activity for its own sake because it is naturally interesting and fun, i.e. because of its inherent appeal. In contrast, extrinsic motivation refers to a wide variety of instrumental behaviours that are engaged in as a means to an end. Deci and Ryan (2000) have categorized and ranked extrinsic motivations according to degree of autonomy.

External regulation corresponds to behaviours that are motivated directly by external means, such as by rewards and constraints, and are the least autonomous. They are not chosen and the reason for participation is outside of the person. Nearly the entire thrust of both governments and civil societies efforts to green society have been based on these coercive techniques. Encouragement, chastising, threats, and doom and gloom stories all highlight ends that are either desirable or not, outside of the individual. Perhaps it is not surprising that the environmental movement has not yet created the widespread change it has sought to precipitate. People are more motivated to change themselves.

Amotivation is the least self-determined of all types of motivation. It reflects the perceived lack of contingency between one's actions and the outcomes that are produced. There is no accompanying sense of purpose, reward, or change of course with respect to those behaviours, and so it creates feelings of incompetence and lack of control (Ferrer-i-Carbonella & Gowdy 2006). This has surely been the effect of much of the widespread publicity of the environmental crisis. Ordinary people feel scared, unable to act, frustrated and ultimately apathetic. For example, it has been shown that a pre-occupation with the hole in the ozone layer reduces personal well-being (Ferrer-i-Carbonella & Gowdy 2006). This kind of environmental problem represents a 'Sword of Damocles' type threat that looms continuously and that ordinary people may not feel empowered to respond to effectively. This could contribute to 'learned helplessness' i.e. not just an inability to respond to this problem but an inability to respond to *any* problem (Peterson et al 1996).

The process of identification is profoundly different. Activities are perceived as chosen and valued by oneself and become part of one's values, goals, and identity. Here, instrumental behaviours have been completely internalized, and goal-directed activity is carried out completely of one's personal choice. Integration represents complete unification of external regulations with the individual's core sense of self, i.e. it becomes part of his or her self-definition (Ryan & Deci 2000). It may be impossible to ever coerce, guide or encourage people in society to radically change their lives to sustainable modes. The limited motivation from these externally valued costs and benefits is not enough for a social 'phase transition'. In contrast, by working to encourage identification both with the environment and the goals of preserving it individuals will do the work themselves.

These distinctions in motivating factors reveal how social coercion, either by rewards or penalties, will never come close to motivating people as effectively as if they identify with the goals and internalize them. In some senses the environmental movement has added to alienation and amotivation with regards to environmental problems. Self-determination theory suggests that governments may never be successful at coercing people into behaving differently since this is unlikely to generate sufficient motivation to precipitate radical change. In contrast, by focusing efforts on educating people more thoroughly in biology, ecology and eco-literacy people may come to a more sound understanding of the inherent linkages of all living organisms on earth. This understanding could precipitate a widespread reassessment of the sense of self leading to a greater identification with the natural world and thus an adoption of ecological values as a natural succession. People would not change for their governments, their future children or the good of the planet. They would change for themselves.

It is said that for anything to happen there must be the will and the way (Anon). The sustainable way has existed for some time now and is well documented (e.g. Irvine & Ponton 1988, Porritt 1984, Hawkens et al 1999). The green movement has been extremely prolific in generating the ‘DNA’ of a sustainable society but has lagged in successfully proposing how to bring its genesis about (Dobson 2000). The way exists but not the will. How can a critical mass within society be motivated to actively strive for a sustainable ecological society when it is viewed with such suspicion?

Herman Daly writes that it is “unrealistic to believe that we will choose simplicity and frugality except under ecological duress” (Daly 1977 quoted in Dobson 2000). It is an issue to debate whether global warming represents a level of ecological duress capable of catalysing change. However, duress might not be required if a more simple life came about alongside a more local, communal, less stressful - in short happier – life, in other words, if a convincing case for an ecological society could be made in which it was shown that there would be actual *gains* in well-being.

Happiness is an adaptive signal that is used by living organisms to move to states that improve fitness. In the movement between a non-sustainable to a sustainable society there may be incremental gains in well-being at subsequent levels of improvement. These could be used as a signal. Well-being is universally understood and desired. Governments can shift the emphasis from pushing or pulling society to focusing on the areas of synergy between well-being and sustainability and pursuing this ‘low-hanging fruit’.

Crisis can be opportunity. The environmental crisis presents humanity with a significant novel challenge. It can be overcome, but only through global cooperation and a profound change of values. Global sustainability will require all of humanity’s basic needs to be met and a social design that eases a critical mass up Maslow’s hierarchy of needs. A society that provides more room for personal and social actualization will allow for more meaningful endeavours to be entered into. This opens the door to a new kind of society where we can raise our collective aspirations.

Society underwent stratification after the invention of agriculture. Fewer people where required to get food. The move to the ecological age may involve stratification with more people self-actualizing and more people transcending. Freed from the constant need to secure food and shelter new horizons can be approached.

6. METHODOLOGY

6.1. GENERAL PRINCIPLES

The aim of this study is to investigate the relationship between people's subjective well-being and environmental knowledge, attitudes and behaviours. This was done by use of an online questionnaire. The questionnaire can be found in appendix 1.

An online survey was used because this enabled a much larger number of respondents to be surveyed on limited resources. An invitation to the survey was forwarded and included an invitation to forward again. This invitation letter can be found in appendix 2. Thus, a 'snowball' effect was achieved with increasing numbers of responses.

The online survey company Surveymonkey.com was used because it was highly recommended by multiple sources. It is easy to use, with a clear format encouraging good responses. The website's facilities were rented for £10 a month. The most basic package was ample for the purposes of this survey.

The way in which an invitation can spread online is termed viral. It is impossible to control who receives the invitation once it has been released. This is good because it increases the number of responses beyond those easily accessible. However, it introduces the possibilities of the survey being misused or poor, irrelevant data being collected. There is a trade off. The life circumstance section of the survey is designed to account for most confounding factors and to effectively provide a filter allowing irrelevant data to be removed.

Table 3: Survey Process

	Action	Input	Output
1.	Assemble sections from other questionnaires	➢ Chambers (personal communications 2006) ➢ Marks (personal communications 2006) ➢ Riley & Dunlap (1978, 1984 & 2000) ➢ Diener (1999) ➢ Kasser(2002)	Rough structure
2.	Add additional questions	➢ Mellen	Draft questionnaire
3.	Check with supervisor and NEF	➢ Dr Susana Mourato ➢ Nic Marks & Dr Sam Thomson	Finished questionnaire
4.	Put questionnaire online	➢ www.surveymonkey.com	Online questionnaire
5.	Pilot	➢ 5 friends	1st results
6.	Amend questionnaire	➢ Mellen	Final questionnaire
7.	1st invitation sent out	➢ Contact list of friends and ex-colleagues	300 online responses after 2 weeks
8.	Follow up email sent out	➢ Contact list of friends and ex-colleagues	700 online responses after 1 month
9.	Download data	➢ Excel	Data to process
10.	Convert to SPSS	➢ SPSS	Final data output

6.2. CONSTRUCTING THE SURVEY

6.2.1. Measuring environmental behaviour

In order to measuring environmental behaviour I adapted questionnaires developed by Best Foot Forward that are used to assess eco-footprint (Chambers 2006). Ecological footprint analysis has established itself as a key sustainability indicator (Chambers et al 2001). Ecological footprinting allows us to measure human impacts upon the biosphere. It is a measure of the demands that we place on renewable natural resources. An eco-footprint is the area of bio-productive land required to sustain an activity, an individual or a population. The questions used to assess the level of a person's environmental impact are devised to give a comprehensive window into the lifestyle components of the participants. Questions range from gauging how much recycling is done to how much meat is eaten. Main topic areas are: housing, consumption and recycling, air travel, electricity, transport, food.

It is impossible with a finite questionnaire to completely survey respondent's lifestyles but by examining key areas, broad conclusions can be made about how green/sustainable respondents are. I did not translate the results into actual eco-footprints as described by a land area as this was an unnecessary complication in this instance. For the purposes of a comparison between respondents I changed the eco-footprint questionnaire into a series of Likert agreement scales and thus each respondent would generate an aggregate score allowing comparison with all others. Thus a relative green scale was developed. A Likert agreement scale was used as this was the easiest way for respondents to answer the questions online and it would result in clear data to be analysed.

6.2.2. Measuring environmental attitudes

In order to measuring environmental attitudes I employed the scales developed by Dunlap et al devised to test endorsement of the New Environmental Paradigm (NEP). These were enhanced with a series of additional questions. Dunlap and Van Liere 's NEP Scale, published in 1978, has become a widely used measure of proenvironmental orientation. The scale was revised in 2000 to replace outmoded terminology, sexist language and improve the structure of the questionnaire. The scale consists of a series of statements which the respondents then indicate the degree to which they agree with, using a Likert agreement scale.

6.2.3. Measuring environmental knowledge

In order to measure environmental knowledge I devised a series of 7 questions. Each referred to a different environmental problem. The questions had 5 possible answers of which the respondent had to select the correct one(s).

6.2.4. Measuring subjective well-being

The well-being section of the survey employed scales used and tested by the New Economics Foundation. These were supplied by Nick Marks in a personal communication. Sections of these scales in turn draw on successfully tried and tested research into well-being carried out by psychologists and reported in scientific journals. The NEF approach examines 3 areas of personal well-being; life satisfaction, personal development and social well-being. (Likert agreement scales where also used here).

Table 4: Survey Format

Section	Subsections	Questions	Example questions	Method of measurement
A. How Green?	Behaviour	21	I use as little electricity as possible	Likert agreement scale (rate 1-5) or Times spent travelling
	Attitude	27	When humans interfere with nature it often produces disastrous consequences	Likert agreement scale (rate 1-5)
	Knowledge	7	What pollutant is primarily responsible for the hole in the ozone layer?	Multiple bounded answers: 5 boxes, tick 1 or 2
B. Well being	Life satisfaction	5	"In most ways my life is close to my ideal." (Diener)	Likert agreement scale (rate 1-5)
	Personal development	3	"I enjoy learning new skills and meeting new challenges." (Marks)	Likert agreement scale (rate 1-5)
	Social well-being	10	"I think the world is becoming a better place for everyone."	Likert agreement scale (rate 1-5)
C. Confounding factors	Demo-graphic factors	11	• salary • country of residents • marital status • number of children	Multiple bounded answers: drop down menus
D. Participant statements		2	• What would motivate you to be more green (environmental)? • What factors could most increase your well-being (happiness)?	Straight un-bounded answers

6.3. SAMPLING (HOW MANY, HOW SELECTED, CHARACTERISTICS)

Due to limitations of time and resources a ‘convenience’ sample was taken that consisted of the author’s contacts and subsequently a proportion of their contacts. This demographic may not be representative of the population at large but the large number of responses eventually collected was sufficient to allow meaningful inferences to be drawn.

6.4. CONSIDERATIONS

The questions throughout the survey were worded both positively and negatively to encourage the respondents to think carefully about each answer. The questionnaire began with the easiest questions going through to the more difficult and more personal at the end in an attempt to minimize drop outs. Thus the behaviour questions came first. The knowledge questions were last followed by personal information including salary etc.

The invitation email was designed to be enticing and viral: enticing to encourage the reader to participate, and viral to encourage onward dispersal. (See appendix 3 for a copy of the invitation email.) The email was sent to friends, course peers and ex-colleagues on a Tuesday morning. This was deemed to be the time when the highest number of people may have been inclined to complete the survey and/or forward it.

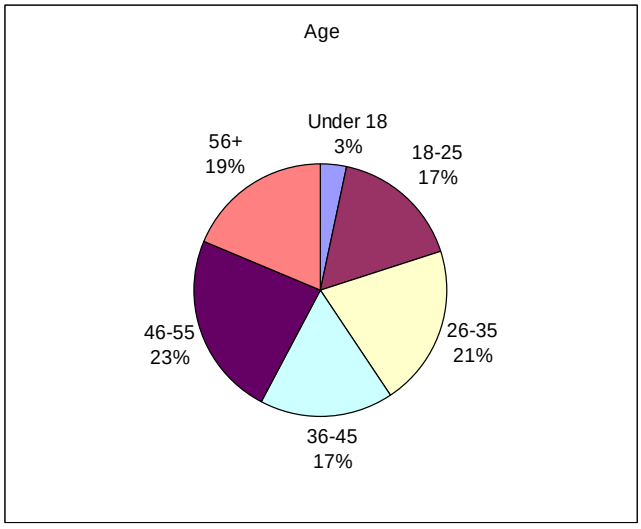
7. RESULTS AND ANALYSIS

7.1. DESCRIPTIVE STATISTICS

7.1.1. Sample characteristics

In total 712 people began the questionnaire online. 69 of the responses were incomplete. This left 643 to be analysed. Thus successful completion was attained from 90% of respondents. The respondents were 56% female. The mean age of the sample was 32.7 (SD=10.2) with a range of 17 -71.

Graph 2: Distribution of Respondents Ages (Years)



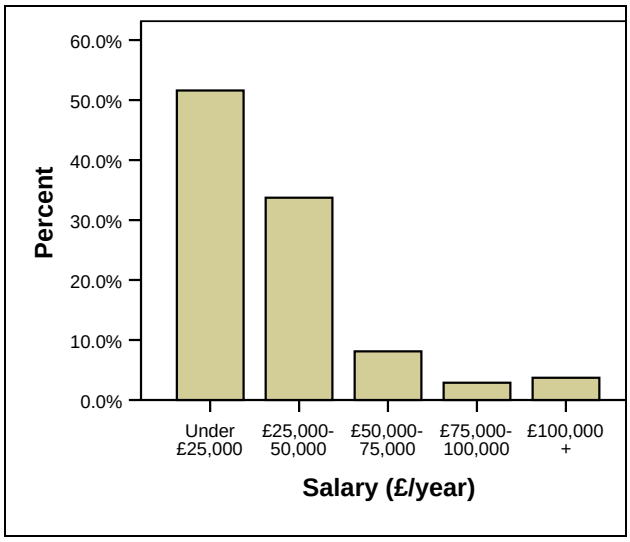
75% of respondents were from the United Kingdom. 5.1% were from the United States. 3.3% Ireland 2.2% Australia 1.4% were from China. The other countries were all represented by less than 1 percentile. The other countries represented were: Armenia, Austria, Belgium, Canada, China, Colombia, Cyprus, Czech Republic, Denmark, Djibouti Dominica, Egypt, United Kingdom, France, Germany, Greece, Iceland, Indonesia, Ireland, Italy, Japan, Kenya, Korea, South Liberia, Micronesia, The Netherlands, New Zealand, Poland, Russia, Singapore and Spain.

79.3% of respondents were city dwellers. 15.7% were rural inhabitants. 2.8% reported having homes in both the city and the countryside.

The respondents were largely graduates with 45.7% having completed 1st degrees and 36.7% with postgraduate qualifications. Most respondents reported themselves to be healthy (54%) and a further 21.2% very healthy.

47.9% of respondents were professionals. 15.5% were students. Most of the remaining were managerial and technical or skilled non-manual. Most respondents earned under £25,000. For each successive increase in wage bracket there was a reduced frequency of people attaining that income, except in the highest wage bracket (£100,000+) where there was slightly more respondents than in the previous bracket (£75,000-100,000).

Graph 3: Frequency of Salary Brackets (£ per annum)

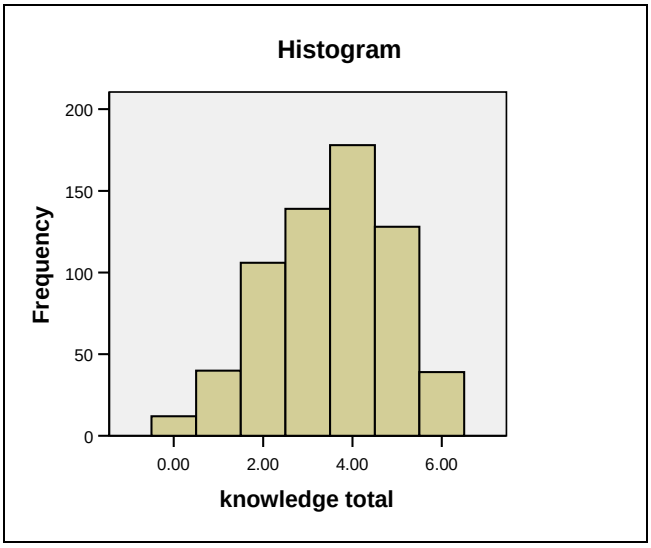


For a complete breakdown of demographic factors please see appendix 1

7.1.2. Environmental knowledge

In general the environmental knowledge of the respondents was found to be high. Each respondent received an aggregate environmental knowledge score out of the 6 environmental knowledge questions analysed which varied from 0-6, with 0 being the lowest possible environmental score and 6, the highest. 75.3% got over 50% of the questions right. The mean knowledge score was 3.5 (SD=1.39). However, there were extremes of knowledge represented, with a range of 0.00-6.00. 1.9 % got every answer wrong and 6.1% got every answer right. A normal distribution was found with a right skew. The high level of environmental knowledge can be attributed to the convenience sampling technique. A significant proportion of the 94 students who completed the questionnaire were colleagues of the author on the Environmental Technology course at Imperial College. Furthermore, some of the author's ex-colleagues from previous employment who would have received the survey and forwarded it are also involved in environmental work. However there were many less environmentally minded people represented and a range of knowledge, behaviours and opinions expressed.

Graph 4: Frequency Distribution of Aggregate Environmental Knowledge Score

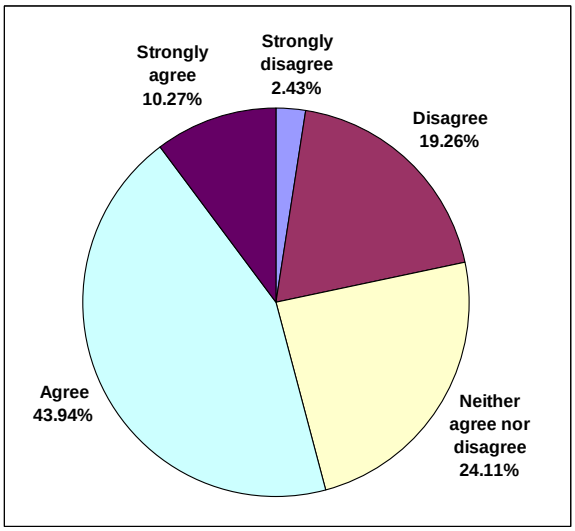


7.1.3. Environmental behaviour

Respondents' environmental behaviour scores were calculated by averaging the scores of 21 different behaviour variables. These were each expressed as a statement to which respondents expressed their agreement using 5 point Likert agreement scales. There was also a normal distribution in the behaviour scores. The mean score was 3.08 (SD=0.48) the range was 2.74 (from 1.79 up to 4.53 out of 5). Significant differences in behaviour were found.

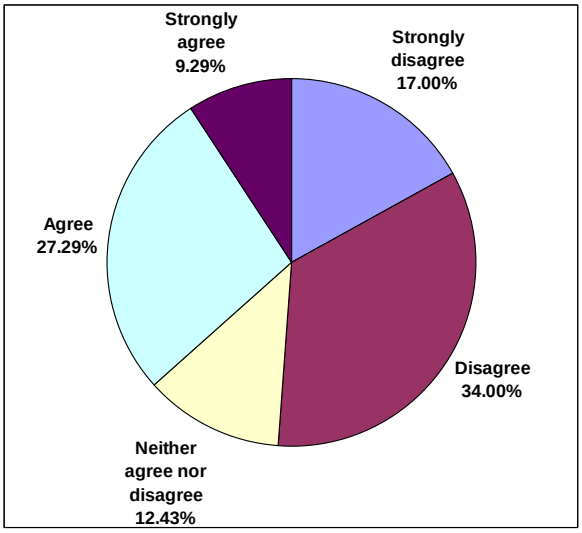
Some of the statements were largely agreed with. For example, only 21.7% of respondents disagreed or strongly disagreed with the statement "I use as little electricity as possible".

Graph 5: Distribution of Responses: I Use as Little Electricity as Possible



Some statements were more divisive, for example, the issue of purchasing organic foods. 37.6% of respondents agreed or strongly agreed with the statement "I rarely buy organic food." In contrast 51% disagreed or strongly disagreed. This could be attributed to the fact that in the former case, minimizing energy use will result in a saving of money for nearly all respondents and is thus desired i.e. there is a widely perceived benefit. However, in the latter case, the benefits of organic foods are more controversial and indeed contested in some corners. Thus the two distinct pro and anti organic camps could be based on an ideological split within the respondents.

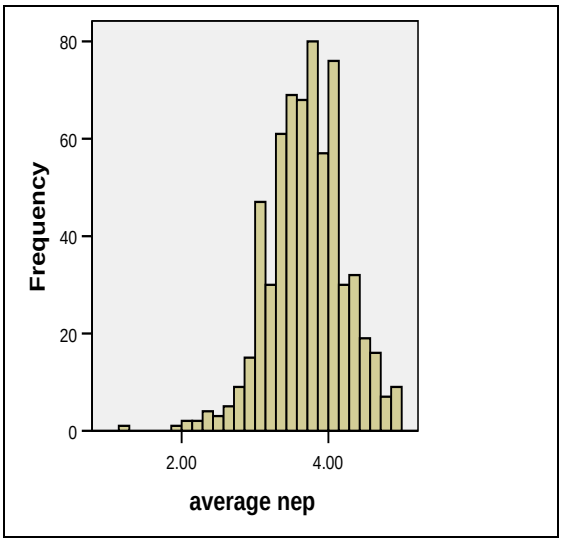
Graph 6: Distribution of Responses: I Rarely Buy Organic Food



7.1.4. Environmental attitudes

The primary component of the environmental attitudes section was Dunlap's endorsement of the New Ecological Paradigm (NEP) scale. The average environmental NEP score was 3.70 (SD=0.517) with a range of 1.20-5.00. This shows a distinct pro-environmental orientation as compared to previous studies by Dunlap (Dunlap, 2000). This is to be expected because of the nature of the convenience sample (as mentioned earlier). For example 90.61 % of respondents agreed or strongly agreed with the statement: "Humans are severely abusing the environment." The respondents widely agreed with the general principle of the balance of nature being under threat from human activities.

Graph 7: Frequency Distribution of Average NEP Endorsement

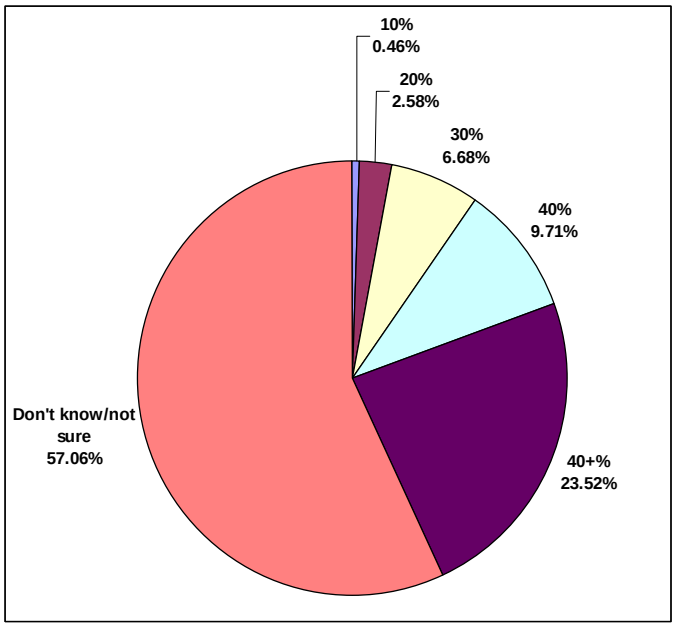


The respondents were less inclined to agree with the limits-to-growth statements. For example, 67% of respondents agreed or strongly agreed with the statement “The Earth has plenty of natural resources if we just learn how to develop them”. This is possibly because so many of the original of the ‘Limits to Growth’ report’s predictions have failed to materialise and as such have been largely discredited in the public domain. It may also point to the widespread faith in technology as the solution to environmental problems.

Further questions were added to explore specific issues. In order to explore the closeness that respondents felt to nature they were asked to rate their degree of agreement for the two statements: “The natural world is a source of inspiration for me.” and “I feel a deep connection with nature”. These scores where used to give and aggregate “connection with nature” score.

Respondents where asked to specify the percentage of Earth's productive area that should be left for other species. They could choose between: 10%, 20%, 30%, 40%, 40+% and “don’t know/not sure”. Most people selected the “don’t know/not sure” option. However, most people who selected an area selected 40+%. It is suggested that this is an indicator of above average concern for other species. The presence of a high level of concern for other species in the sample is supported by the finding that under 8% of the participants disagreed or strongly disagreed with the statement “Plants and animals have as much right as humans to exist”.

Graph 8: Distribution of Responses: I Believe This Percentage of Earth's Productive Area Should Be Left for Other Species:



In general the participants showed a positive, pro-active attitude to environmental problems. Only 12% of respondents agreed or strongly agreed with the statement: “Environmental problems are too big for my actions to have any effect.” And only 11% disagreed with the statement: “If we all make significant lifestyle changes we can solve the environmental problem”. Perhaps most surprising of all was the fact that only 8% of respondents disagreed or strongly disagreed with the statement: “I would be willing to pay more money (e.g. for food and other goods, or in taxes) if it would be used to protect the environment”. There is the possibility that this is an inflation of actual opinions. For example, ‘warm-glow bias’ occurs when respondents increase their support for a good cause (Andreoni 1989) or when they feel a moral obligation towards the scenario being valued (Diamond & Hauseman 1992). It could be attributed to the sampling bias towards environmentalists. Alternatively, it could reflect a growing trend in society in valuing the importance of environmental issues.

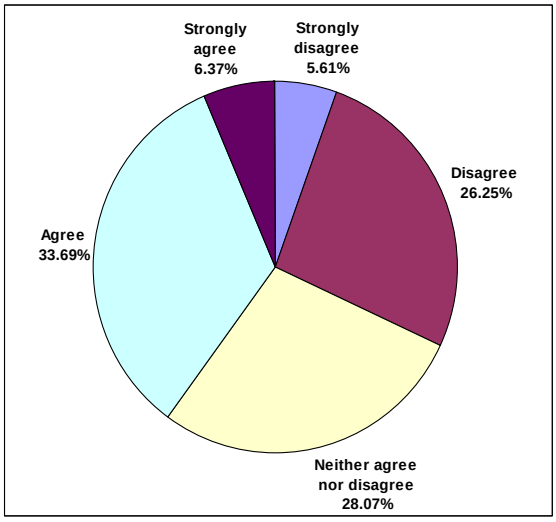
“The never-ending emergence of new scientific evidence concerning the deleterious impacts of human activities on environmental quality and the subsequent threats these pose to the welfare of humans (and other species) will generate continual pressure for adoption of a more ecological worldview.” (Dunlap 2000)

We might expect this ecological worldview to be more mature in a sample of well-educated people of above average environmental concern. Thus the willingness to pay for protection of the environment is high.

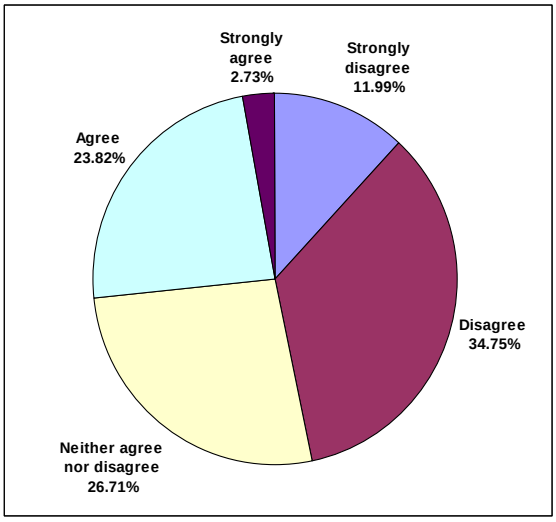
Internal and external motivation has been distinguished in psychological theory and the benefits of being internally motivated highlighted (Ryan et al 1997) (see section 5.3). The benefits include enhanced subjective well-being, and better assimilation of the individual within his or her social group. This project attempts to link the benefits of greater internal motivation with a more ecological worldview and conversely increased external motivation with lower scores on the scales of ecologism. In order to do this, two questions were devised to test motivation type. These were: "It is not important for me to make a lot of money" and "my life would be better if I owned things I don't have right now." These both created an almost even split throughout the sample revealing a wide range of attitudes to material acquisition. Together these questions where used as a scale of orientation towards materialism.

Graphs 9 & 10: Distribution of Responses Relating to Degree of Materialism to the Questions:

'It is not important for to make a lot of money'



'My life would be better if I owned things…'



7.1.5. Environmental aggregate

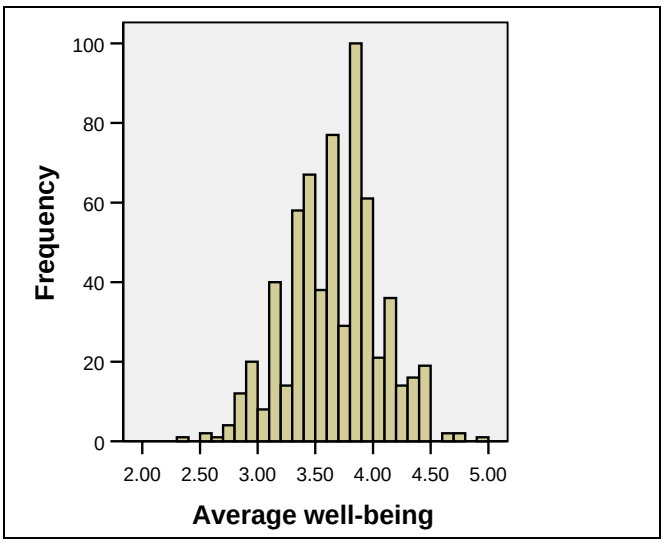
An integrated, multi-dimensional degree of ecologism was established by averaging environmental knowledge, opinion and behaviour scores. This was used in the correlation and logit model analysis to investigate the relationship between ecologism and subjective well-being.

7.1.6. Well-being: aggregate

An aggregate well-being scale was established by integrating three different dimensions of well-being. These were: life satisfaction, personal development and social well-being, and were based on the use of multi-item scales, such as the Satisfaction with life scale (SWLS) (Diener et al 1985).

The average well-being was 3.67 (SD=0.40) with a range of 2.38-5.00 (out of a possible 5). This is above the UK average (3.55) but below the means of comparable western countries like Austria (3.9) and Denmark (4.1) (Marks et al 2006). Given that this was a well-educated and healthy sample we would have expected to see well-being scores above the UK average.

Graph 11: Frequency Distribution of Average Well-being



7.2. STATISTICAL ANALYSIS

7.2.1. Correlations

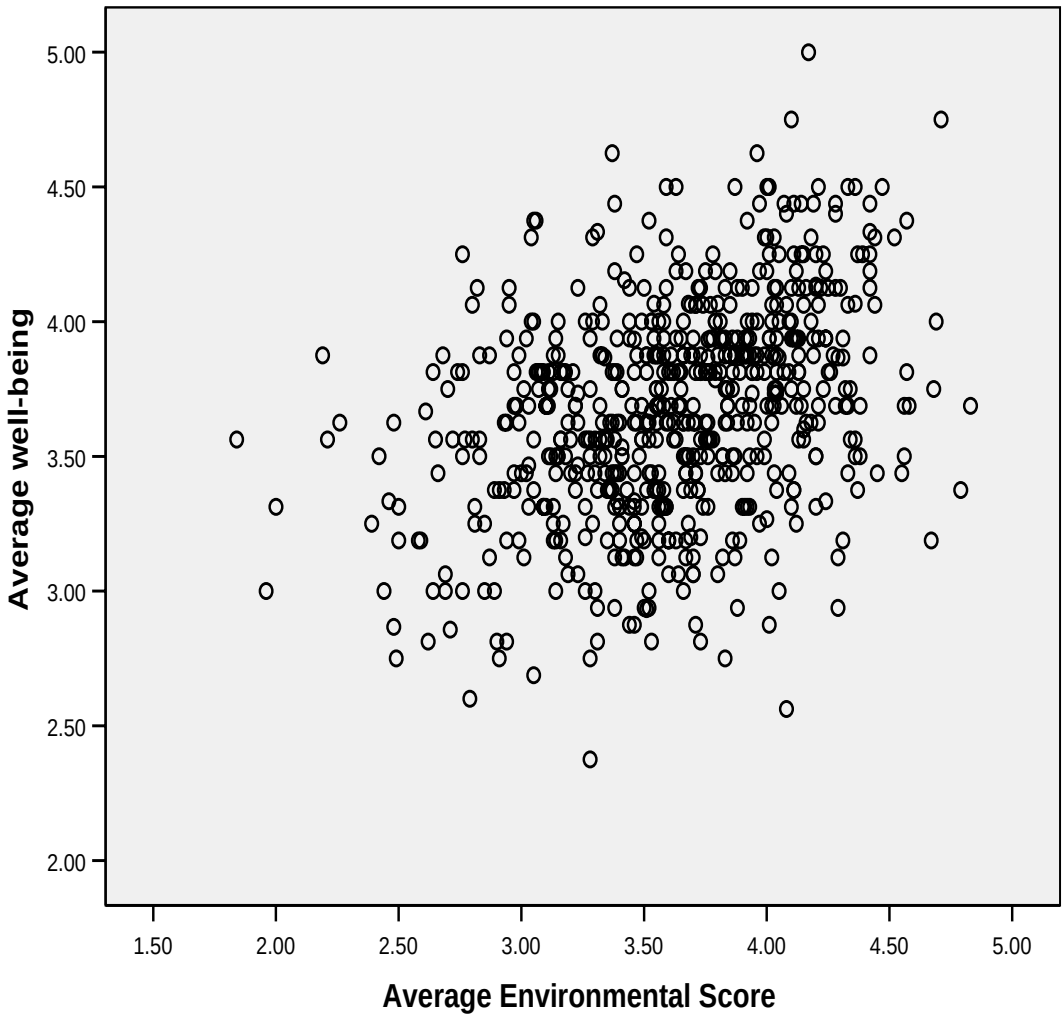
There is correlation between environmental knowledge, attitudes and behaviours. For example, environmental knowledge correlates with environmental behaviours ($r=0.246$ $p< 0.001$). This suggests that a greater understanding of environmental issues is linked to behaviour change and might reinforce the notion that information provision can orientate people environmentally. However, the correlation is small. There are clearly many people with a low level of environmental knowledge who achieve high environmental behaviour scores and vice versa. This could be due to the influence of other demographic factors such as income (see section 7.7.2). A possible alternative hypothesis is that those of lower incomes may have a smaller eco-footprint because they cannot afford a larger one. i.e. their environmental behaviour is dictated through constrained finances rather then being a conscious choice. However, this doesn't preclude the possibility of more ecologically minded people being less materialistic.

Environmental attitudes correlate with environmental behaviours ($r=0.289$ $p< 0.001$). This correlation is comparable to that found by Dunlap's 0.31 (Dunlap 2000). This suggests the survey does have internal consistency and that the integrated ecologism score is valid.

People's overall environmental score correlates with their well-being score ($r=0.360$ $p< 0.001$). The small but significant correlation between overall degree of ecologism and well-being was expected for the range of reasons discussed in sections 5.1 & 5.2. The effect was small but we would expect this because of the wide range of exogenous and endogenous variables that come into play around these complex integrated issues.

The correlation cannot expose whether people of higher well-being tend to be more ecological or whether being more ecological leads to higher well-being. This will be explored further in section 7.2.2. It is also possible that there could be unknown third agents involved. However, the correlation is highly significant. It is therefore proposed that it is a reasonable supposition that ecologism and well-being are linked. Further studies could uncover more especially with a sample that was more representative of society at large.

Graph 12: Scatter Plot of Total Environmental Score against Subjective Well-being



The more materialistic people tended to have lower environmental scores ($r=0.342$ $p< 0.001$) and had lower levels of well-being ($r=0.281$ $p< 0.001$). The inverse relationship between materialism and well-being has been established previously (for example (Kasser 2002). A materialist orientation would likely lead to increased consumption of non-essential goods which could be a factor in the decreasing environmental score. So this might suggest that intrinsic motivation is more typical of an ecological worldview and that extrinsic motivation tends to be inversely proportional to ecologism. It is also suggested that materialist values could preclude ecological values or that the 2 interests might be divergent.

It is important to note that there has been recent growth in ‘environmental consumerism’. Specific examples include the growth in the organic food market or the popularity of the Toyota Prius. It is conceivable that people could be extrinsically motivated by image, status or conspicuous wealth values, and satisfy these desires through behaviour that may be considered environmental on certain scales. In other words there could be people with both materialist and ecological values although it is suggested that this is unlikely to be a frequent occurrence.

The finding of decreasing well-being with increasing materialism concurs with previous research in this area (Kasser 2002) and can be likely attributed to a tendency in these materialist people for extrinsic motivation. It is very interesting that the more materialist people also have lower environmental knowledge, opinions and behaviour, thus, showing that materialism and environmentalism are inversely proportional. In Kassers study of materialism and well-being in business students he found an inverse correlation ($r=0.24$ $p<0.05$).

The people who reportedly had a closer connection to nature correlated to higher well-being scores (r=0.278 p< 0.001). This could be as a result of the discussed benefits of identification with nature as discussed in section 5.4 and supports the discussed Biophillia hypothesis (Wilson 1986). The people who reportedly had greater concern for other species had a very small correlation to higher well-being scores (r=0. 087 p< 0.001). This could be due to the widespread reporting of the on-going 'biodiversity crisis'. The potential benefits of an anti-anthropocentric outlook could be countered by a suffering caused by the loss of fellow life forms. However, this conflicts with the findings of Ferrer-i-Carbonella & Gowdy (2005). Using data from the British Household Panel Survey they found a negative coefficient for concern about ozone pollution on individual's well-being and a positive one for concern about species extinction using an ordered probit. However, both sets of findings reveal a positively orientated relationship between concern for other species and well-being which is consistent.

Causation cannot be established between reported connection to nature and well-being because endogenous factors may be correlated with individual's psychological traits. Happy people may be more likely to engage in outdoor pursuits, 'commune with nature' and thus have more concern for nature. Conversely it might be this interaction with nature that makes them happy. Some of these psychological orientations will be looked at in the logit regression analysis 7.2.2.

The people who reportedly had a more locally orientated life-style were more environmental (r=0. 365 p< 0.001) and had higher well-being (r=0. 175 p< 0.001). There are a range of explanations for why this might be that were explored in sections 5.1 and 5.2. Respondents were given the opportunity to enter their own views about improving well-being and environmentalism at the end of the survey. A large number of respondents expressed a desire for more time, both time with their families and time away from work. It is proposed therefore that reduced travel time may be the most significant factor in the correlation between well-being and local living. However, more work would need to be done to examine exactly what is behind this finding.

Researchers have consistently found young, well-educated, and politically liberal adults to be more proenvironmental than their counterparts and have offered theoretical explanations for these findings (Jones & Dunlap 1992). In addition, one would expect to find people with such characteristics more likely to endorse, in particular, an ecological worldview.

To see the full table of correlations see appendix 3.

7.2.2. Logit model results

A logit regression was used to identify which variables influence respondents' subjective well-being. Subjective well-being scores were divided into high well-being which was 4.01 and above and low well-being which was below 4.01.

Table 5: Variables included in logit regressions and their coding

Variables			Score	df	Sig.
	a1	Local	10.820	1	.001
	a2	Behaviour	18.620	1	.000
	a3	NEP	2.249	1	.134
	a4	Connection	21.065	1	.000
	a5	Concern	2.452	1	.117
	a6	Non-materialism	28.027	1	.000
	ktotal	Knowledge	4.427	1	.035
	a7	Total ecologism	38.795	1	.000
	q64	Sex	.385	1	.535
	q66	Age	1.478	1	.224
	q74	Health	34.832	1	.000
	q76	Salary	.011	1	.915
	Overall Statistics		93.585	12	.000

The logit model regression shows that the total degree of ecologism is most closely linked to a high level of well-being and that this is highly significant . Health was the next most important determinant followed by non-materialist values. Connection with nature, green behaviours and local living all also had highly significant effects. These findings support the notion that ecologism in general and aspects of green behaviours in particular can positively impact upon well-being. The reasons why this may be the case will be explored in more detail in the discussion (section 8).

8. DISCUSSION

The correlation analysis and logit model results indicate that a person's degree of ecologism is significantly linked to their subjective well-being. In particular the aspects of ecologism that most impact on personal well-being are non-materialist values, local living and a sense connection to nature.

1. Non-materialist values

As discussed in section 4.3 materialist values negatively impact upon well-being and leads to extrinsic motivation. People are motivated to engage in pursuits that do not fulfil psychological needs. This report supports these findings. Also salary has no effect on reported subjective well-being which supports research that shows how adaptation decouples material gains from well-being once basic needs are met (Brickman & Campbell 1971). This study concurs with proposals by the New Economics Foundation and other groups that the emphasis on wealth creation, increasing human capital and economic growth is no longer beneficial to human well-being.

These findings emphasize a fecund sustainability double-dividend. Reducing consumption can contribute to a reduced throughput society and remove a great deal of pressure from natural systems. It is clear there will be well-being benefits as well. Thus, a shift in emphasis from growth measured by GDP to a service and flow economy that measures progress through increasing national well-being can reap dual benefits. Reducing consumption is likely to have many other benefits as well - for example, energy and time saved could be focussed into community activities, leisure pursuits, education, science and the arts.

A government with the two aims of increasing sustainability and increasing well-being could begin by working to encourage a less materialist outlook and less consumption whilst increasing opportunities for interesting work, community building and leisure pursuits. This could be done by treating over-consumption like pollution: by taxing and legislating against it. Advertisers could be more tightly regulated so that only healthy and necessary consumption is promoted. Status acquisition will likely always be central to human nature. However, how we accrue this status could change.

2. Local living

Local living was found to be an aspect of green behaviour that significantly impacted upon well-being. This could be because of the reduced time spent travelling which has been identified as a significant drain on well-being. There are also psychological benefits from associating locally. This behaviour promotes and is promoted by active local communities which would be crucial in the creation of more devolved bioregions.

Encouraging localization through legislation and market-based incentives will have manifold environmental and well-being benefits. Localization would impact upon the individual by reducing the average ‘life triangle.’ Life triangles consist of the distance between home, work and the primary shopping foci. This geometry can be expanded to include schools, hospitals and centres of arts. The thrust for localism would require smaller units, more evenly spread nationally. By spending less time travelling between these essential life elements people have more time for leisure and their families.

The requirement that a larger percentage of the food people consume should come from their bioregion would lead to the rebuilding of links between communities and the farms that grow their food. This is beneficial to well-being in a number of ways: children grow up with a better understanding of how food is grown, the food is fresher, and the local food chains would contribute to rebuilding local communities- small shops, butchers, dairies and bakeries could reopen to serve the community.

The redevelopment of more active communities will lead to many well-being gains because, as we saw in section 2.4, a feature of ongoing economic growth and globalization has been the degeneration of local communities. More active communities with greater autonomy will be empowered to deal locally with issues of environment, health, education, and well-being. This devolution is expected to be a more effective and dynamic form of governance.

3. Connection to the natural world

The findings of this report support the theories discussed throughout that a disconnection from the natural world is negative for human well-being and the environment. It may contribute to the devaluing of nature by people. It is not clear what the best ways for governments to try and reconnect people to the natural environment are without increasing degradation. However, proposals to start at the school level seem logical. School trips to wild areas could be increased combined with more ecological and ‘ecoliteral’ education.

Reversing the urbanization trends of the modern age would be environmentally catastrophic. Therefore an alternative approach is the greening of cities both literally and metaphorically. This can be done literally by increasing green spaces, wildlife gardens, trees, roof gardens and even urban farms; metaphorically by switching to more ecological infrastructures.

This study has also shed light on other areas where there are double dividend gains to be made in both sustainability and personal well-being, for example, human powered transport. ‘Active transport’– walking, cycling and/or using public transport instead of car travel can have dual health benefits by providing the required physical activity levels and reducing the adverse health effects of motor vehicle transport (Mason 2000). This is already widespread in Copenhagen (Denmark) for example, where one third of the city goes to work by bike (Câmara 2001).

Active transport is more important now then ever before. Obesity is becoming the UK's primary health concern. Most adults in England are overweight, and one in five—around 8 million in total—is obese. The prevalence of obesity is increasing world wide, and, in England, has nearly trebled in the last 20 years. The most likely causes are an increasingly sedentary lifestyle combined with changes in eating patterns (Select Committee on Public Accounts 2001). Furthermore, Psychological well-being- studies have shown that regular cyclists compared with inactive people present improved well-being, higher self-esteem and also greater confidence in their ability to perform active tasks, along with better mental functioning (Mason 2000).

Attempting to reorientate the values of society could lead to the growth of a shared sense of direction and progress i.e. increases social actualization. The transition from advanced capitalist state to ecological society will involve changes in values at every level of society. The journey from here to there will be a great mobilization. As with the strong sense of unity during the Blitz of London in the Second World War, communities and well-being can benefit when united behind a common cause, even if the cause involves hardships (Johnstone 2006). As discussed in section 5.1, there will be psychological benefits associated with shifting to a sustainable society and the widespread adoption of ecological values.

There is more to being green then simply consuming less, although consuming less may itself be a route to a happier life (Jackson 2005). Living in a more sustainable fashion may require us to take control of our lives, increase our autonomy, engage in local communities, identify with an entity larger then ourselves and to become more active citizens. On a more profound level living more harmoniously with nature may require us to better understand, and ultimately emulate, the flow of life. We must become more ecological; that is, better embedded in the cycles of the natural world around us. The increasing depression and anxiety of the modern world may in part be due to isolating ourselves from these natural systems. Becoming green offers a route back. Thus we discover the double dividend: sustainable living based on healthy consumption and lifestyle choices leading to increasing well-being and improved social coherence.

9. POLICY IMPLICATIONS

Policy-makers strive to allocate limited public resources to where they will do the most good. The findings of this report suggest that there are distinct areas where gains can be made synergistically in both personal well-being and sustainability. These should be emphasised for preferential government funding since there is a double-dividend incurred from such investment. See table 5 for a summary of these win-win areas.

It is proposed that an ecological worldview per se may be a happier and healthier perspective to take. Thus an increased emphasis on the study of life - ecology in general and eco-literacy in particular will have benefits for children and adults alike. It is proposed that the success of shifting to a sustainable society may hinge upon a wider and more profound sense of identification with nature. This will intrinsically motivate people to engage with their natural environments and their threats.

Table 5: Summary of Key Sustainability Double-Dividends

	Sustainability gain	Well-being gain
Curbing consumption	• Lower throughput society • Less resource use • Less pollution	• Shift to less materialist society • Focus on well-being not wealth • More profound fulfilment
Localization	• Lower energy/fuel requirements for transport of people, food and other commodities • More biodiverse farming to satisfy local needs	• Resurgence of active communities • Less time spent commuting • Greater closeness of people to the natural systems that sustain them
Human powered transport	• Less resource use • Less pollution • Less road space required can lead to biodiversity gains	• Physiological benefits of exercise • Psychological benefits of exercise • Decline in city pollution and congestion • Reduced traffic related casualties
Ecological education	• Encourage behaviours that positively impact upon nature	• Growth in ecological values promoting motivation that is more likely to lead to psychological fulfilment

10. CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER WORK

- There is a growing appreciation that the values and aspirations of the Dominant Social Paradigm (DSP) are driving much environmental degradation. This is most obvious in the cases of ongoing economic growth and increasing per capita consumption. In response, the New Ecological Paradigm offers an alternative set of values. These question consumption and ongoing economic growth and emphasise a closer, more profound relationship with nature, and the valuing of natural systems above all else.

- Well-being is emerging as an increasingly used indicator of social success. The decoupling of well-being from economic growth has opened a new front in the critique of the DSP. It is clear that significant gains in the efficient delivery of well-being could be made through a reorientation of society towards well-being rather then wealth.

- This study successfully looked for and found a relationship between environmental knowledge attitudes and behaviours and subjective well-being. In this instance the relationship was small but highly significant. Further work could be significant in continuing to reveal how positive steps can be taken that increase both well-being and sustainability. The path to a sustainable society may not be easy. It makes sense to seek out and focus on changes that are synergistic.

- Relocalization, reducing consumption and active transport emerged as the clearest synergistic pathways between sustainability and well-being. However, it is significant that these findings concur with others that an appreciation of nature per se may improve well-being, i.e. reorientating toward more ecological values has inherent benefits even if behaviours don’t change.

- Positive psychology in general and self-determination theory in particular may be able to provide insights into how positive social change can come about. The discussion should shift from how to coerce the general public to how to engage people actively in the shift to sustainable societies. This can be achieved through ecological education that encourages a greater identification with the natural world and lifestyle changes that connect with nature. The shift to sustainable societies could be a social phase transition that can only be accomplished through global cooperation and a new shared set of values that place planetary concerns before those of nations or individuals. In the quest to make sustainable societies we may unwittingly enter a new era of peace on Earth and harmony with the natural world in which a majority of humanity is able to self-actualize. The least we can say is that the planet is ecological, and when society is too, our well-being will benefit.

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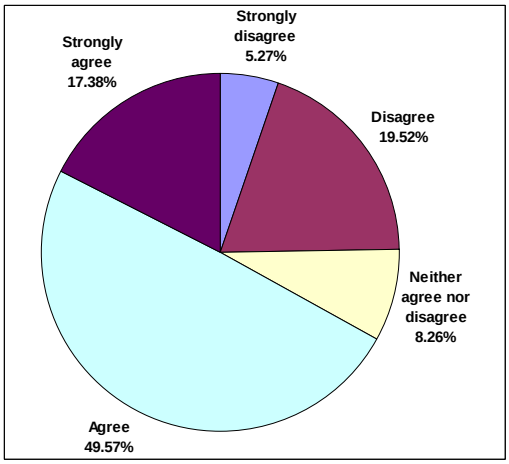
12. APPENDICES

12.1. APPENDIX 1: ONLINE QUESTIONNAIRE

Section 1

Q1. My house/flat is just big enough for the number of occupants.

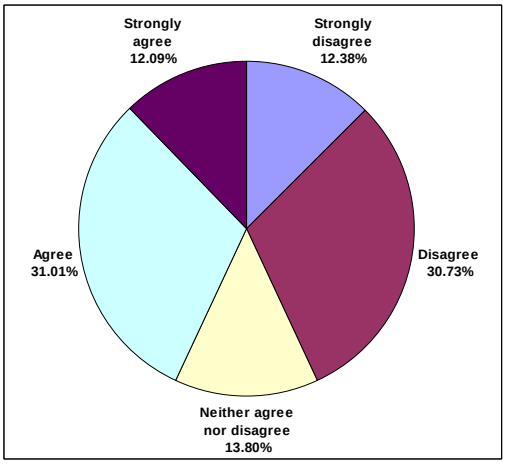
Response	Percent Response	Total
Strongly disagree	5.3%	37
Disagree	19.5%	137
Neither agree nor disagree	8.3%	58
Agree	49.6%	348
Strongly agree	17.4%	122



Total Respondents	702
skipped this question	8

Q2. My home is well insulated (e.g. I have double glazing and good wall insulation).

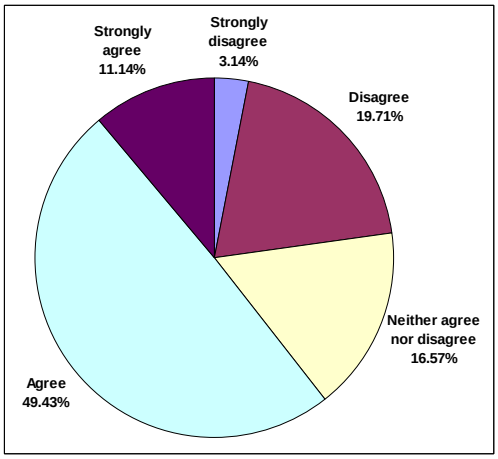
Response	Percent Response	Total
Strongly disagree	12.4%	87
Disagree	30.7%	216
Neither agree nor disagree	13.8%	97
Agree	31%	218
Strongly agree	12.1%	85



Total Respondents	703
skipped this question	7

Q3. I frequently use heating/cooling equipment.

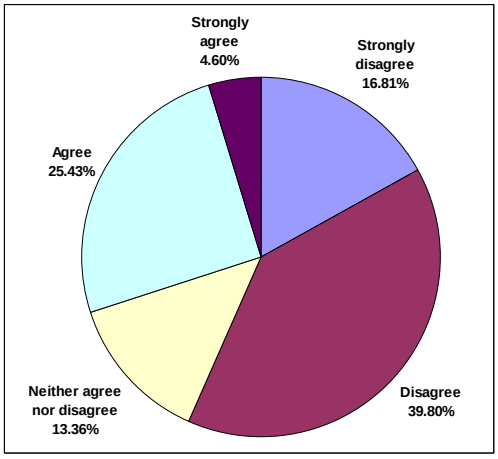
Response	Percent Response	Total
Strongly disagree	3.1%	22
Disagree	19.7%	138
Neither agree nor disagree	16.6%	116
Agree	49.4%	346
Strongly agree	11.1%	78



Total Respondents	700
skipped this question	10

Q4. I buy new consumer (non-essential) items every week.

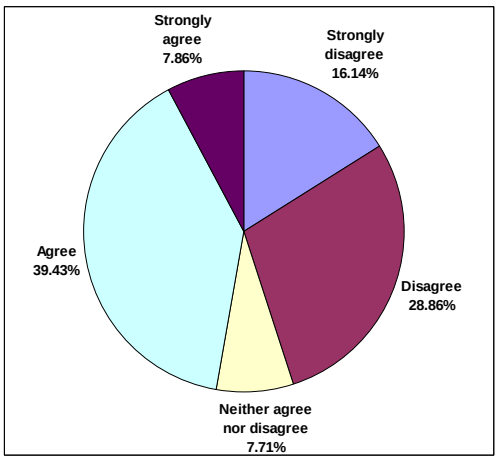
Response	Percent Response	Total
Strongly disagree	16.8%	117
Disagree	39.8%	277
Neither agree nor disagree	13.4%	93
Agree	25.4%	177
Strongly agree	4.6%	32



Total Respondents	696
skipped this question	14

Q5. I normally accept plastic bags from a shop when offered one

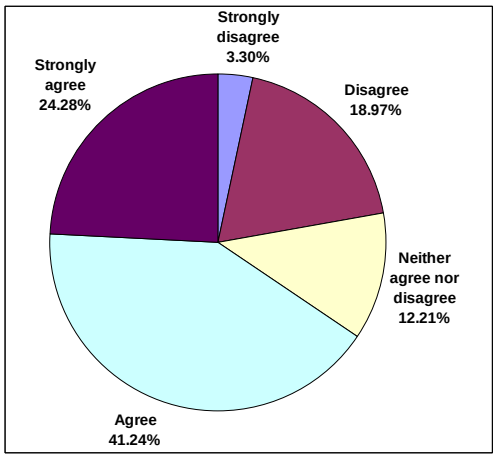
Response	Percent Response	Total
Strongly disagree	16.1%	113
Disagree	28.9%	202
Neither agree nor disagree	7.7%	54
Agree	39.4%	276
Strongly agree	7.9%	55



Total Respondents	700
skipped this question	10

Q6. I recycle everything that I feasibly can.

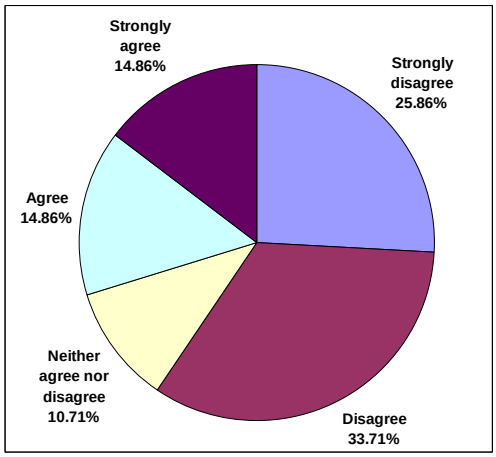
Response	Percent Response	Total
Strongly disagree	3.3%	23
Disagree	19%	132
Neither agree nor disagree	12.2%	85
Agree	41.2%	287
Strongly agree	24.3%	169



Total Respondents	696
skipped this question	14

Q7. I compost as much of my organic waste as I can.

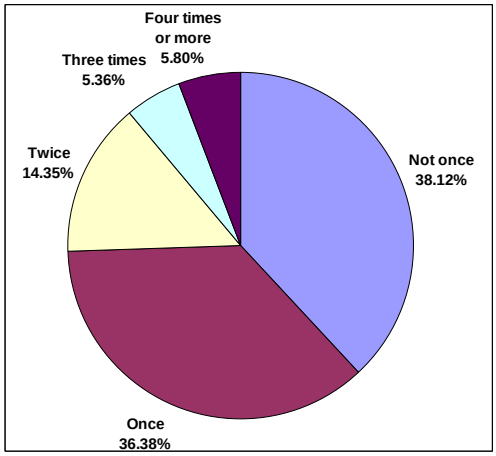
Response	Percent Response	Total
Strongly disagree	25.9%	181
Disagree	33.7%	236
Neither agree nor disagree	10.7%	75
Agree	14.9%	104
Strongly agree	14.9%	104



Total Respondents	700
skipped this question	10

Q8. On average I fly long haul this many times a year:

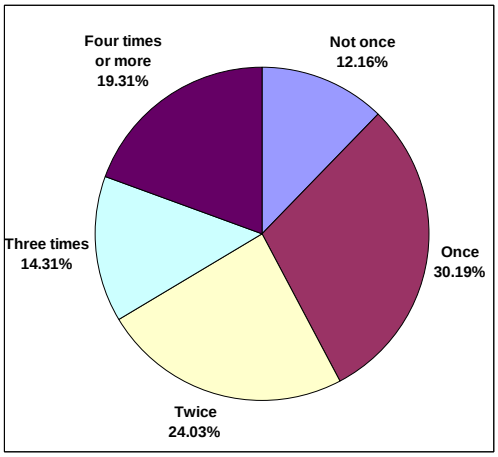
Response	Percent Response	Total
Not once	38.1%	263
Once	36.4%	251
Twice	14.3%	99
Three times	5.4%	37
Four times or more	5.8%	40



Total Respondents	690
skipped this question	20

Q9. On average I fly short haul this many times a year:

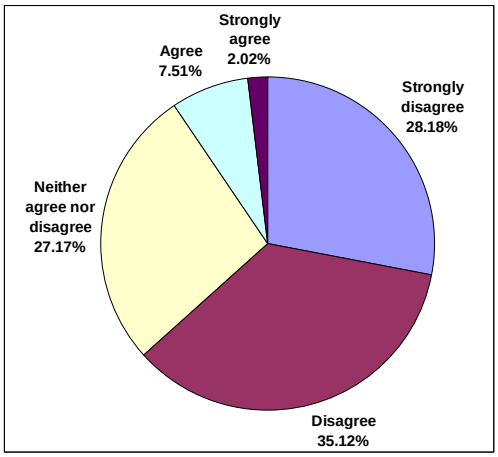
Response	Percent Response	Total
Not once	12.2%	85
Once	30.2%	211
Twice	24%	168
Three times	14.3%	100
Four times or more	19.3%	135



Total Respondents	699
skipped this question	11

Q10. I pay voluntarily to offset the carbon of my flights.

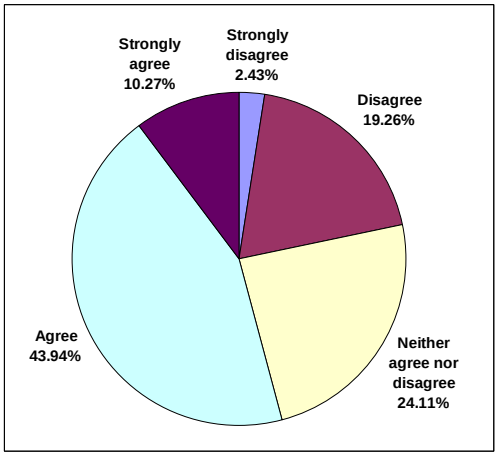
Response	Percent Response	Total
Strongly disagree	28.2%	195
Disagree	35.1%	243
Neither agree nor disagree	27..2%	188
Agree	7.5%	52
Strongly agree	2%	14



Total Respondents	692
skipped this question	18

Q11. I use as little electricity as possible.

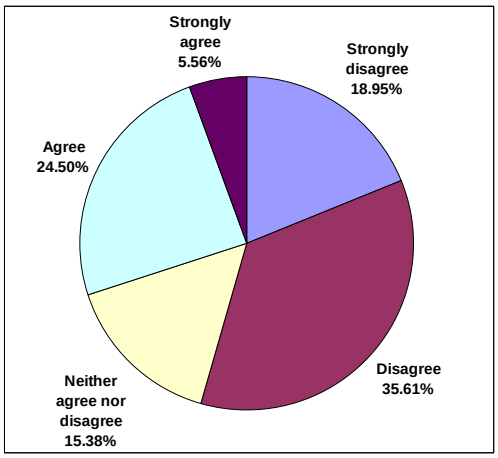
Response	Percent Response	Total
Strongly disagree	2.4%	17
Disagree	19.3%	135
Neither agree nor disagree	24.1%	169
Agree	43.9%	308
Strongly agree	10.3%	72



Total Respondents	701
skipped this question	9

Q12. I do not consider efficiency when purchasing electrical products.

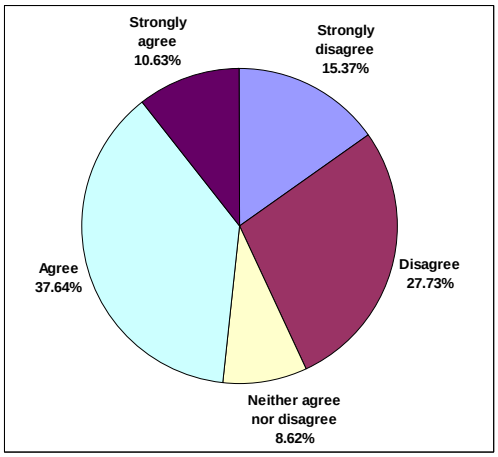
Response	Percent Response	Total
Strongly disagree	18.9%	133
Disagree	35.6%	250
Neither agree nor disagree	15.4%	108
Agree	24.5%	172
Strongly agree	5.6%	39



Total Respondents	702
skipped this question	8

Q13. I rarely switch off appliances at the wall socket.

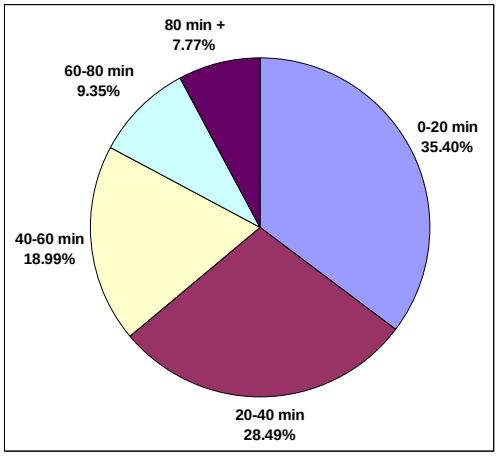
Response	Percent Response	Total
Strongly disagree	15.4%	107
Disagree	27.7%	193
Neither agree nor disagree	8.6%	60
Agree	37.6%	262
Strongly agree	10.6%	74



Total Respondents	696
skipped this question	14

Q14. My average time spent commuting per work day is:

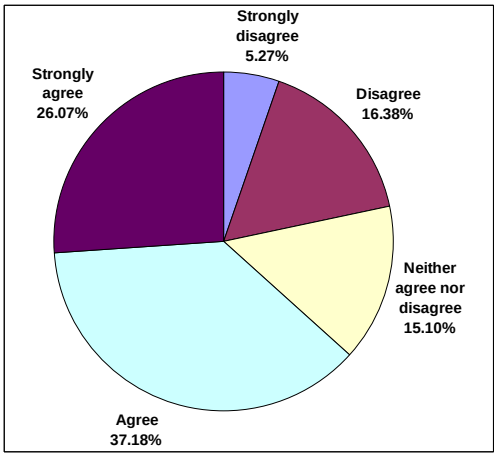
Response	Percent Response	Total
0-20 min	35.4%	246
20-40 min	28.5%	198
40-60 min	19%	132
60-80 min	9.4%	65
80 min +	7.8%	54



Total Respondents	695
skipped this question	15

Q15. I often walk or cycle to get around.

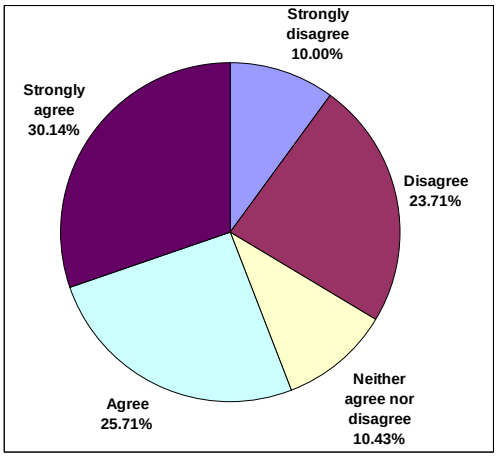
Response	Percent Response	Total
Strongly disagree	5.3%	37
Disagree	16.4%	115
Neither agree nor disagree	15.1%	106
Agree	37.2%	261
Strongly agree	26.1%	183



Total Respondents	702
skipped this question	8

Q16. I take public transport wherever possible (if not cycling/walking).

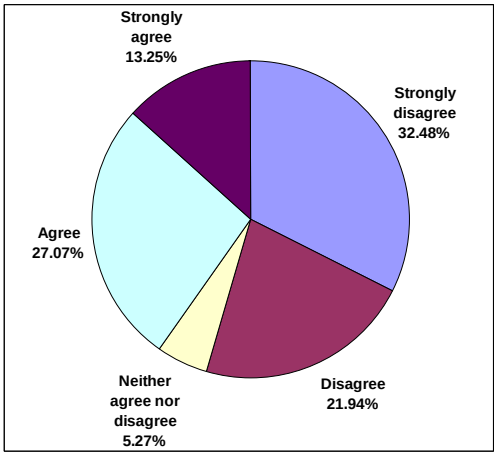
Response	Percent Response	Total
Strongly disagree	10%	70
Disagree	23.7%	166
Neither agree nor disagree	10.4%	73
Agree	25.7%	180
Strongly agree	30.1%	211



Total Respondents	700
skipped this question	10

Q17. Most of my travelling is by car.

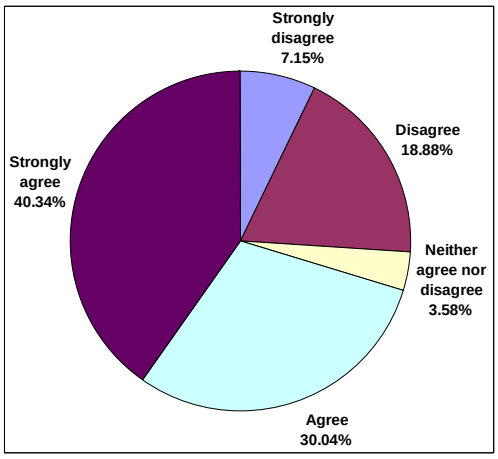
Response	Percent Response	Total
Strongly disagree	32.5%	228
Disagree	21.9%	154
Neither agree nor disagree	5.3%	37
Agree	27.1%	190
Strongly agree	13.2%	93



Total Respondents	702
skipped this question	8

Q18. I do not grow any of my own food.

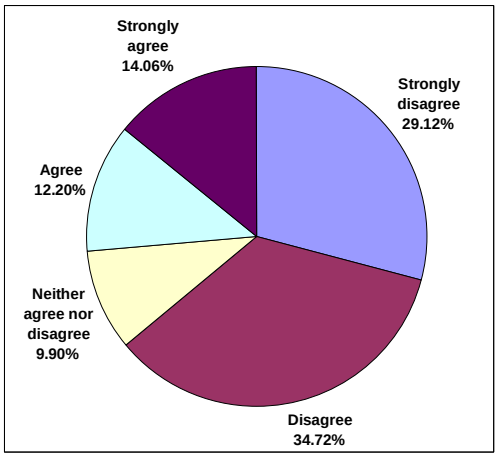
Response	Percent Response	Total
Strongly disagree	7.2%	50
Disagree	18.9%	132
Neither agree nor disagree	3.6%	25
Agree	30%	210
Strongly agree	40.3%	282



Total Respondents	699
skipped this question	11

Q19. I rarely eat meat.

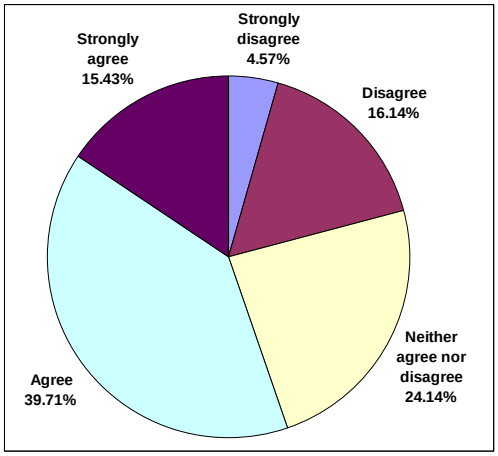
Response	Percent Response	Total
Strongly disagree	29.1%	203
Disagree	34.7%	242
Neither agree nor disagree	9.9%	69
Agree	12.2%	85
Strongly agree	14.1%	98



Total Respondents	697
skipped this question	13

Q20. I buy local food wherever possible. (e.g. I would buy nationally grown food before imported food).

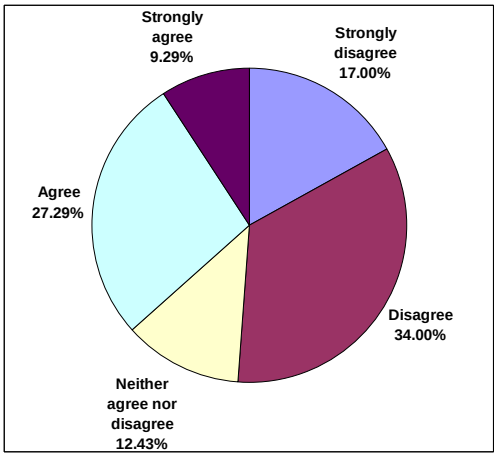
Response	Percent Response	Total
Strongly disagree	4.6%	32
Disagree	16.1%	113
Neither agree nor disagree	24.1%	169
Agree	39.7%	278
Strongly agree	15.4%	108



Total Respondents	700
skipped this question	10

Q21. I rarely buy organic food.

Response	Percent Response	Total
Strongly disagree	17%	119
Disagree	34%	238
Neither agree nor disagree	12.4%	87
Agree	27.3%	191
Strongly agree	9.3%	65

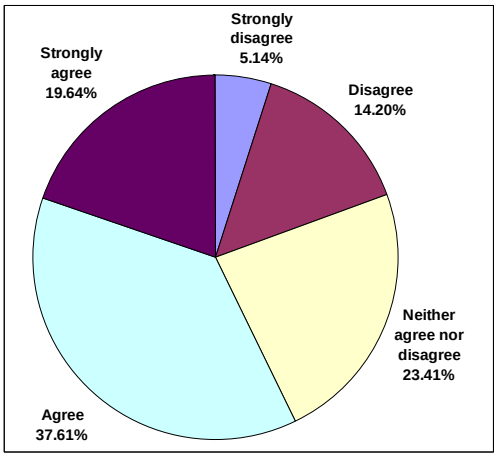


Total Respondents	700
skipped this question	10

Section 2

Q22. We are approaching the limit of the number of people the Earth can support.

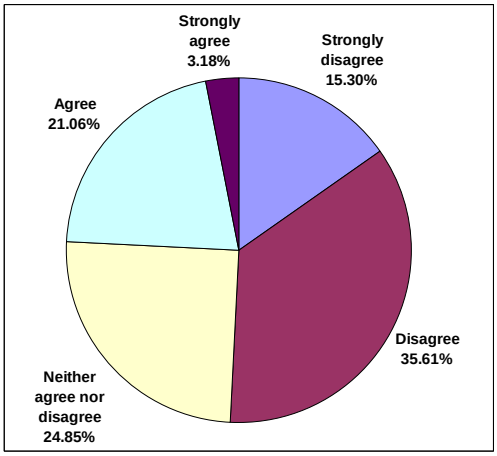
Response	Percent Response	Total
Strongly disagree	5.1%	34
Disagree	14.2%	94
Neither agree nor disagree	23.4%	155
Agree	37.6%	249
Strongly agree	19.6%	130



Total Respondents	662
skipped this question	48

Q23. Humans have the right to modify the natural environment to suit their needs.

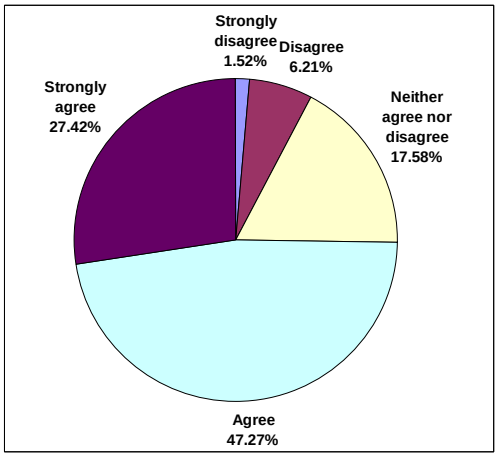
Response	Percent Response	Total
Strongly disagree	15.3%	101
Disagree	35.6%	235
Neither agree nor disagree	24.8%	164
Agree	21.1%	139
Strongly agree	3.2%	21



Total Respondents	660
skipped this question	51

Q24. When humans interfere with nature it often produces disastrous consequences.

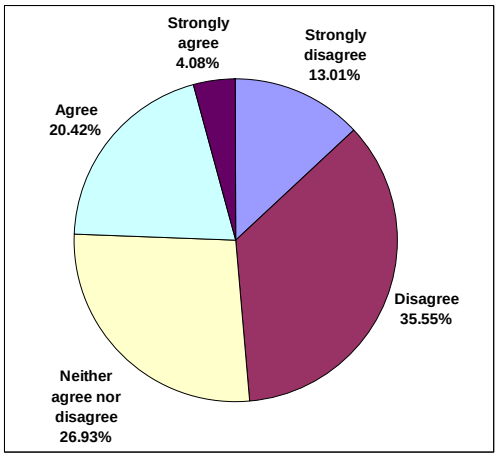
Response	Percent Response	Total
Strongly disagree	1.5%	10
Disagree	6.2%	41
Neither agree nor disagree	17.6%	116
Agree	47.3%	312
Strongly agree	27.4%	181



Total Respondents	660
skipped this question	51

Q25. Human ingenuity will insure that we do NOT make the Earth unliveable.

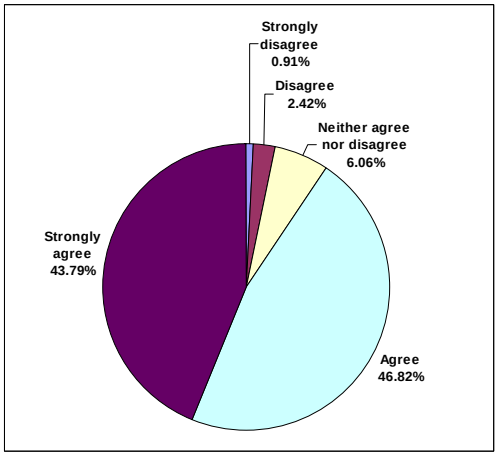
Response	Percent Response	Total
Strongly disagree	13%	86
Disagree	35.6%	235
Neither agree nor disagree	26.9%	178
Agree	20.4%	135
Strongly agree	4.1%	27



Total Respondents	661
skipped this question	49

Q26. Humans are severely abusing the environment.

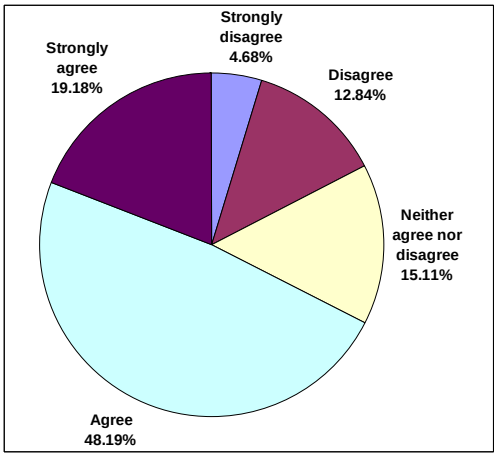
Response	Percent Response	Total
Strongly disagree	0.9%	6
Disagree	2.4%	16
Neither agree nor disagree	6.1%	40
Agree	46.8%	309
Strongly agree	43.8%	289



Total Respondents	660
skipped this question	50

Q27. The Earth has plenty of natural resources if we just learn how to develop them.

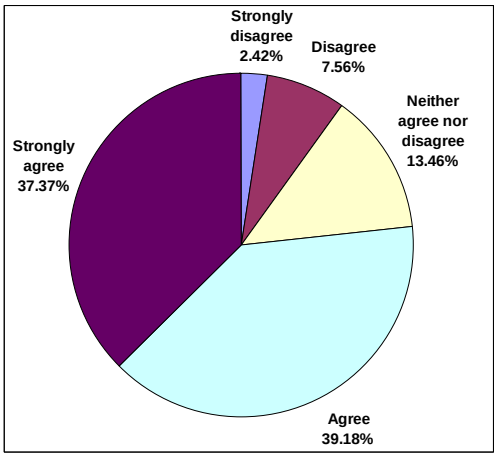
Response	Percent Response	Total
Strongly disagree	4.7%	31
Disagree	12.8%	85
Neither agree nor disagree	15.1%	100
Agree	48.2%	319
Strongly agree	19.2%	127



Total Respondents	662
skipped this question	48

Q28. Plants and animals have as much right as humans to exist.

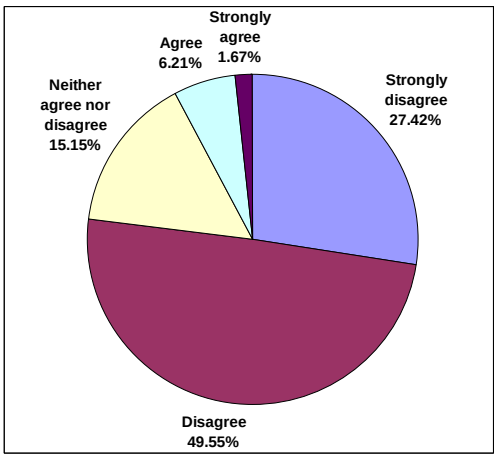
Response	Percent Response	Total
Strongly disagree	2.4%	16
Disagree	7.6%	50
Neither agree nor disagree	13.5%	89
Agree	39.2%	259
Strongly agree	37.4%	247



Total Respondents	661
skipped this question	49

Q29. The balance of nature is strong enough to cope with the impacts of modern industrial nations.

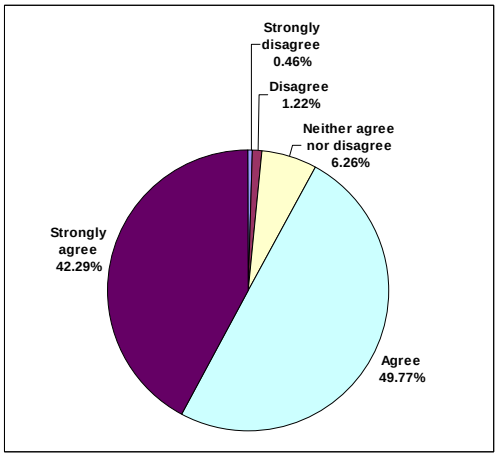
Response	Percent Response	Total
Strongly disagree	27.4%	181
Disagree	49.5%	327
Neither agree nor disagree	15.2%	100
Agree	6.2%	41
Strongly agree	1.7%	11



Total Respondents	660
skipped this question	51

Q30. Despite our special abilities humans are still subject to the laws of nature.

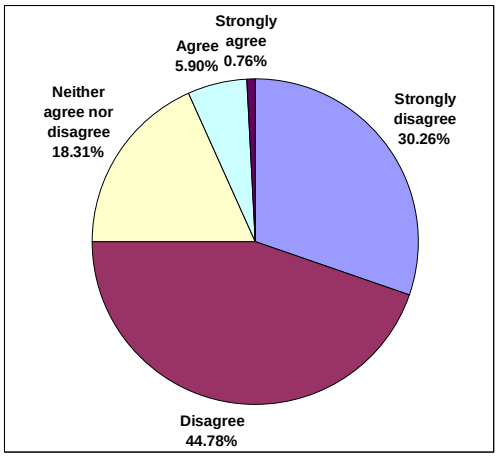
Response	Percent Response	Total
Strongly disagree	0.5%	3
Disagree	1.2%	8
Neither agree nor disagree	6.3%	41
Agree	49.8%	326
Strongly agree	42.3%	277



Total Respondents	655
skipped this question	55

Q31. The so-called "ecological crisis" facing humankind has been greatly exaggerated.

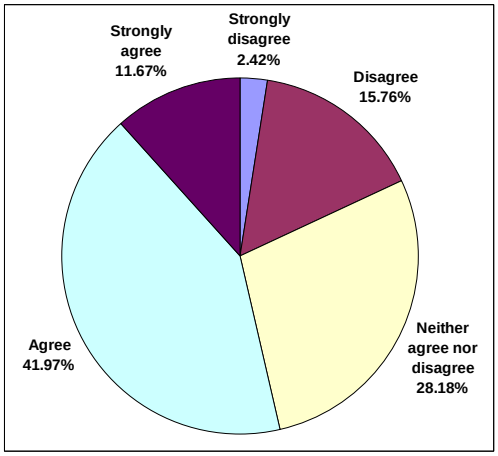
Response	Percent Response	Total
Strongly disagree	30.3%	200
Disagree	44.8%	296
Neither agree nor disagree	18.3%	121
Agree	5.9%	39
Strongly agree	0.8%	5



Total Respondents	661
skipped this question	49

Q32. The Earth is like a spaceship with very limited room and resources.

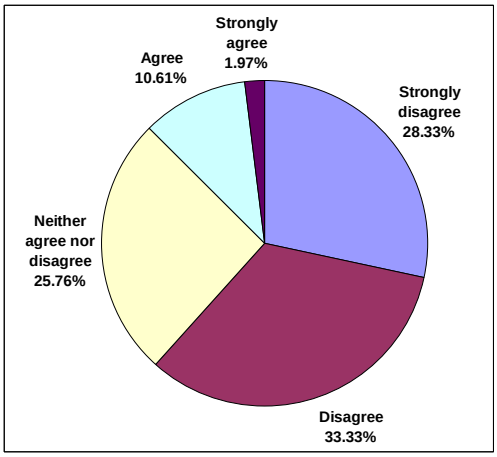
Response	Percent Response	Total
Strongly disagree	2.4%	16
Disagree	15.8%	104
Neither agree nor disagree	28.2%	186
Agree	42%	277
Strongly agree	11.7%	77



Total Respondents	660
skipped this question	50

Q33. Humans were meant to rule over the rest of nature.

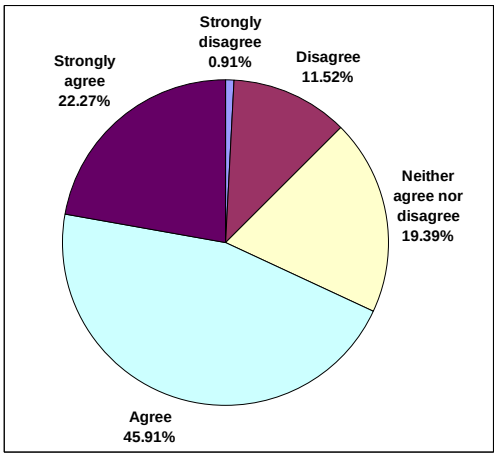
Response	Percent Response	Total
Strongly disagree	28.3%	187
Disagree	33.3%	220
Neither agree nor disagree	25.8%	170
Agree	10.6%	70
Strongly agree	2%	13



Total Respondents	660
skipped this question	50

Q34. The balance of nature is very delicate and easily upset.

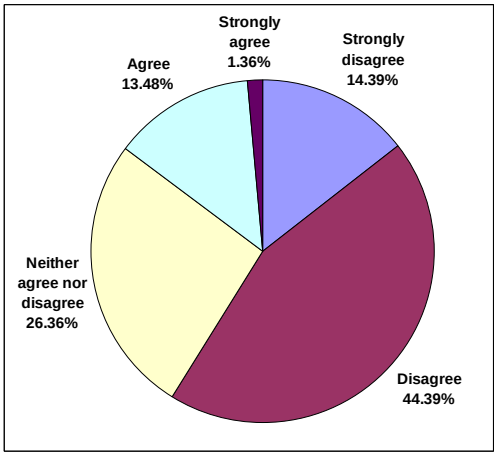
Response	Percent Response	Total
Strongly disagree	0.9%	6
Disagree	11.5%	76
Neither agree nor disagree	19.4%	128
Agree	45.9%	303
Strongly agree	22.3%	147



Total Respondents	660
skipped this question	51

Q35. Humans will eventually learn enough about how nature works to be able to control it.

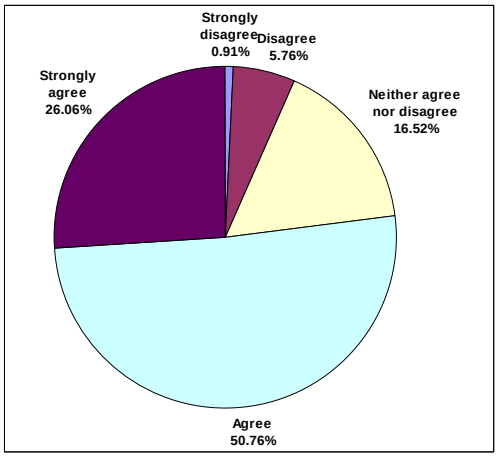
Response	Percent Response	Total
Strongly disagree	14.4%	95
Disagree	44.4%	293
Neither agree nor disagree	26.4%	174
Agree	13.5%	89
Strongly agree	1.4%	9



Total Respondents	660
skipped this question	51

Q36. If things continue on their present course, we will soon experience a major ecological catastrophe.

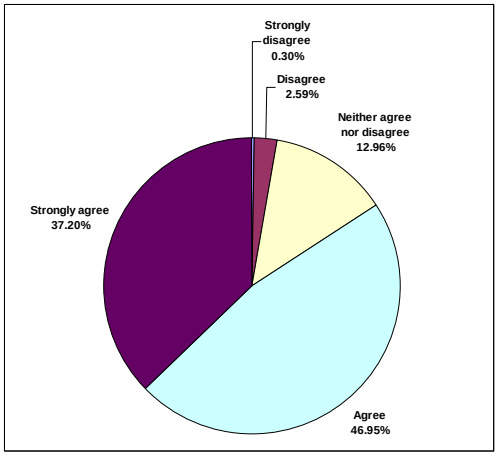
Response	Percent Response	Total
Strongly disagree	0.9%	6
Disagree	5.8%	38
Neither agree nor disagree	16.5%	109
Agree	50.8%	335
Strongly agree	26.1%	172



Total Respondents	660
skipped this question	51

Q37. The natural world is a source of inspiration for me.

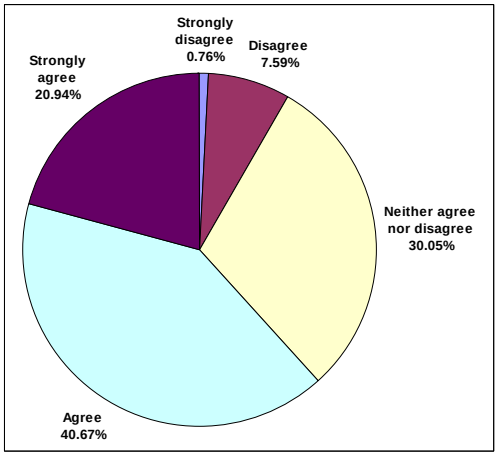
Response	Percent Response	Total
Strongly disagree	0.3%	2
Disagree	2.6%	17
Neither agree nor disagree	13%	85
Agree	47%	308
Strongly agree	37.2%	244



Total Respondents	656
skipped this question	55

Q38. I feel a deep connection with nature.

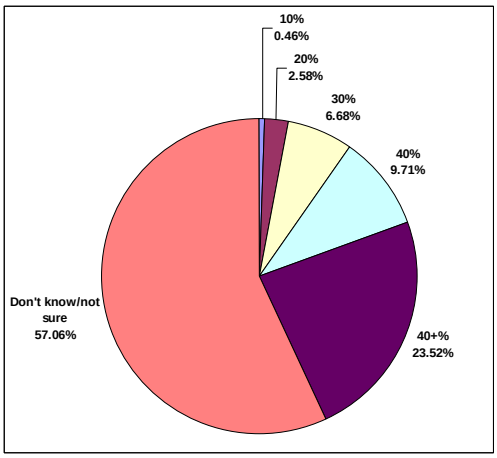
Response	Percent Response	Total
Strongly disagree	0.8%	5
Disagree	7.6%	50
Neither agree nor disagree	30%	198
Agree	40.7%	268
Strongly agree	20.9%	138



Total Respondents	659
skipped this question	51

Q39. I believe this percentage of Earth's productive area should be left for other species:

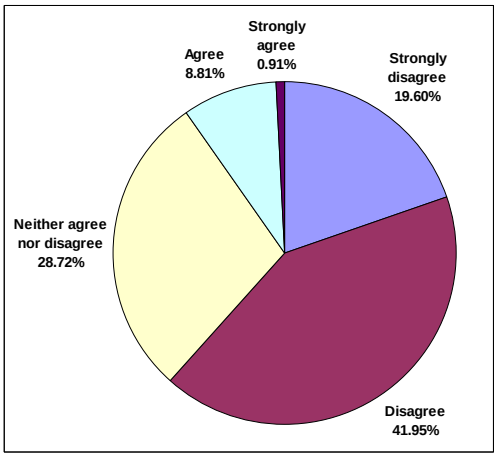
Response	Percent Response	Total
10%	0.5%	3
20%	2.6%	17
30%	6.7%	44
40%	9.7%	64
40+%	23.5%	155
Don't know/not sure	57.1%	376



Total Respondents	659
skipped this question	51

Q40. Future prospects are bleak so I say "just enjoy today"?

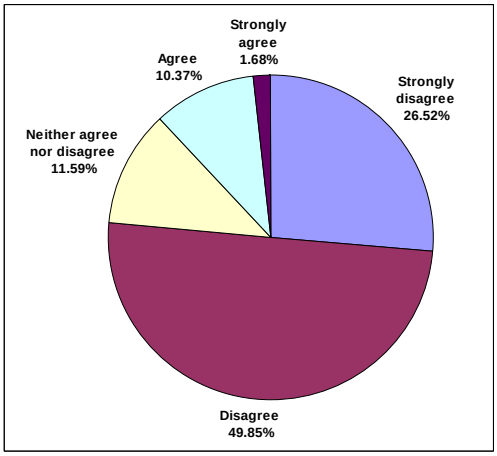
Response	Percent Response	Total
Strongly disagree	19.6%	129
Disagree	41.9%	276
Neither agree nor disagree	28.7%	189
Agree	8.8%	58
Strongly agree	0.9%	6



Total Respondents	658
skipped this question	52

Q41. Environmental problems are too big for my actions to have any effect.

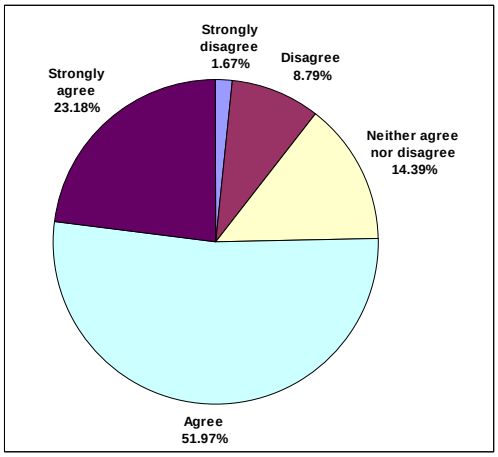
Response	Percent Response	Total
Strongly disagree	26.5%	174
Disagree	49.8%	327
Neither agree nor disagree	11..6%	76
Agree	10.4%	68
Strongly agree	1.7%	11



Total Respondents	656
skipped this question	54

Q42. If we all make significant lifestyle changes we can solve the environmental problem.

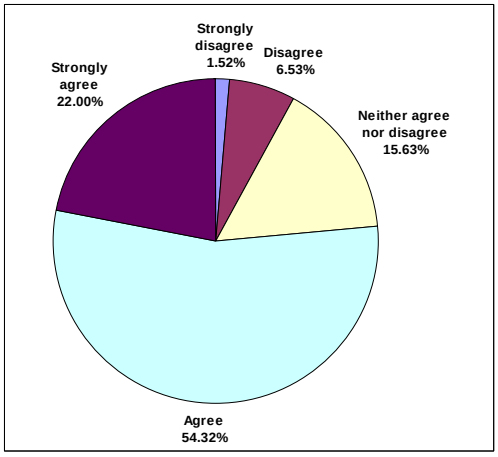
Response	Percent Response	Total
Strongly disagree	1.7%	11
Disagree	8.8%	58
Neither agree nor disagree	14.4%	95
Agree	52%	343
Strongly agree	23.2%	153



Total Respondents	660
skipped this question	50

Q43. I would be willing to pay more money (e.g. for food and other goods, or in taxes) if it would be used to protect the environment.

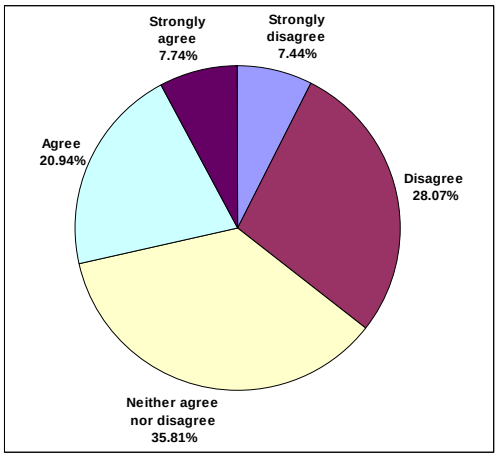
Response	Percent Response	Total
Strongly disagree	1.5%	10
Disagree	6.5%	43
Neither agree nor disagree	15.6%	103
Agree	54.3%	358
Strongly agree	22%	145



Total Respondents	659
skipped this question	51

Q44. Governments should never consider gradual population reduction to protect the environment.

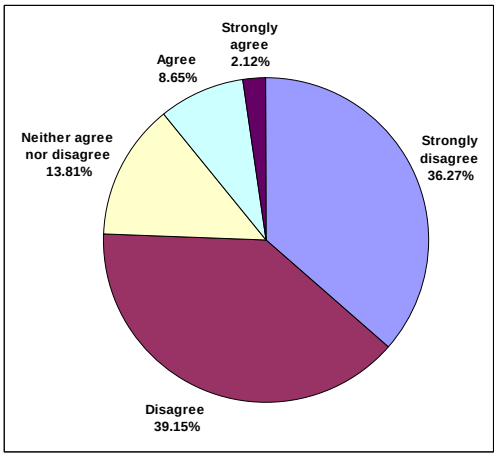
Response	Percent Response	Total
Strongly disagree	7.4%	49
Disagree	28.1%	185
Neither agree nor disagree	35.8%	236
Agree	20.9%	138
Strongly agree	7.7%	51



Total Respondents	659

Q45. I am anti any congestion charging or increased tax for car users to pay for environmental protection.

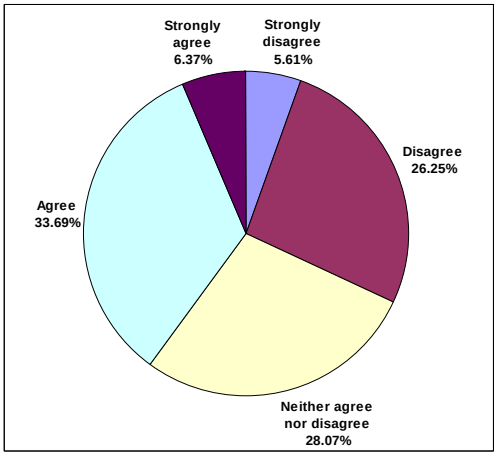
Response	Percent Response	Total
Strongly disagree	36.3%	239
Disagree	39.2%	258
Neither agree nor disagree	13.8%	91
Agree	8.6%	57
Strongly agree	2.1%	14



Total Respondents	659
skipped this question	51

Q46. It is not important for me to make a lot of money.

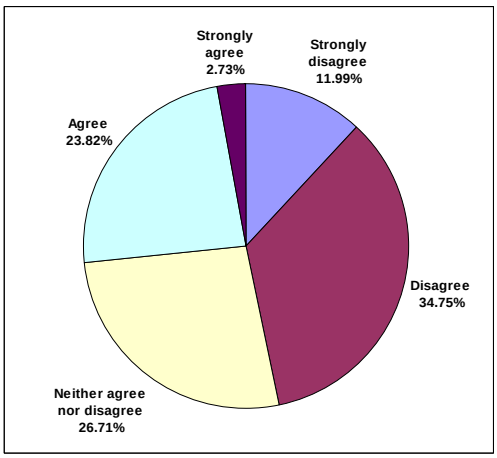
Response	Percent Response	Total
Strongly disagree	5.6%	37
Disagree	26.3%	173
Neither agree nor disagree	28.1%	185
Agree	33.7%	222
Strongly agree	6.4%	42



Total Respondents	659
skipped this question	51

Q47. My life would be better if I owned things I don't have right now.

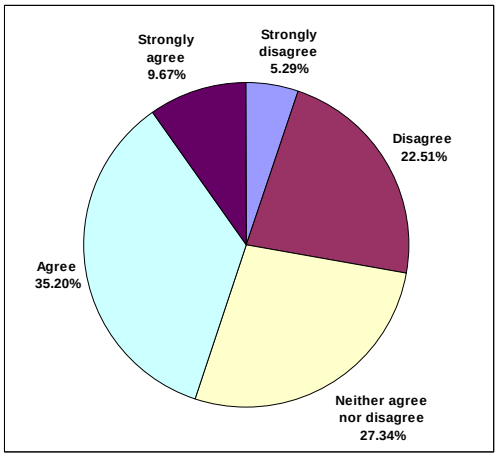
Response	Percent Response	Total
Strongly disagree	12%	79
Disagree	34.7%	229
Neither agree nor disagree	26.7%	176
Agree	23.8%	157
Strongly agree	2.7%	18



Total Respondents	659
skipped this question	51

Q48. I would participate in a demonstration against companies that are harming the environment.

Response	Percent Response	Total
Strongly disagree	5.3%	35
Disagree	22.5%	149
Neither agree nor disagree	27.3%	181
Agree	35.2%	233
Strongly agree	9.7%	64

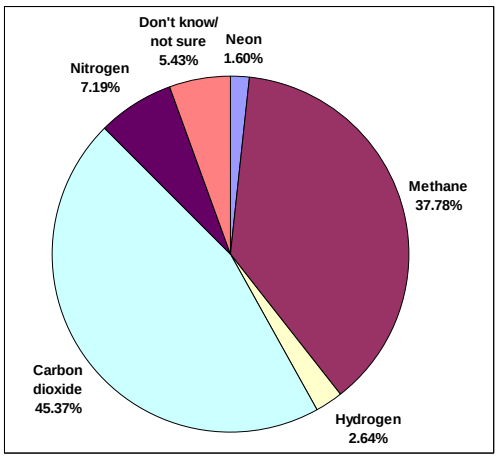


Total Respondents	662
skipped this question	48

Section 3

Q49. Select 2 greenhouse gasses?

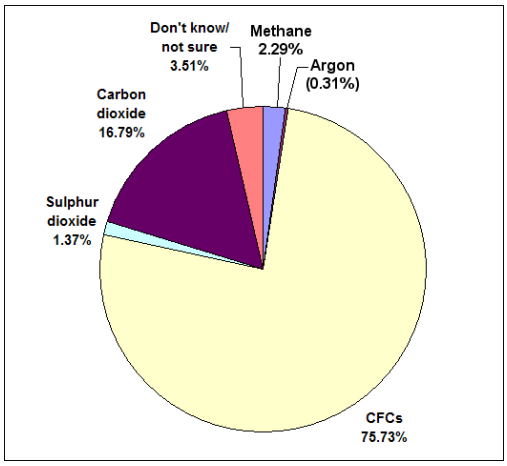
Response	Percent Response	Total
Neon	3.1%	20
Methane	72.7%	473
Hydrogen	5.1%	33
Carbon dioxide	87.3%	568
Nitrogen	13.8%	90
Don't know/ not sure	10.4%	68



Total Respondents	651
skipped this question	58

Q50. What pollutant is primarily responsible for the hole in the ozone layer?

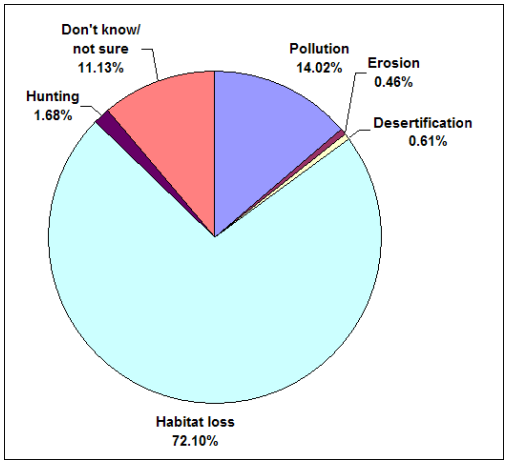
Response	Percent Response	Total
Methane	2.3%	15
Argon	0.3%	2
CFCs	75.7%	496
Sulphur dioxide	1.4%	9
Carbon dioxide	16.8%	110
Don't know/ not sure	3.5%	23



Total Respondents	655
skipped this question	54

Q51. Which single factor is most responsible for species loss in the UK

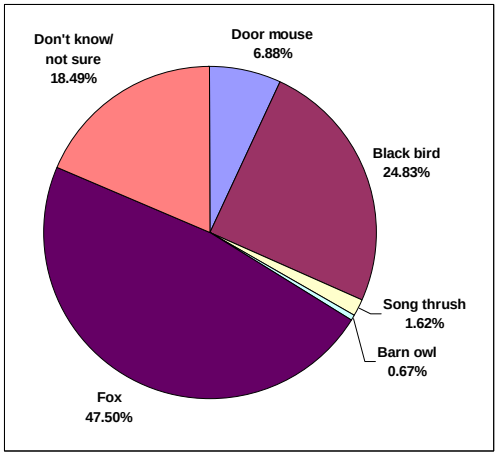
Response	Percent Response	Total
Pollution	14%	92
Erosion	0.5%	3
Desertification	0.6%	4
Habitat loss	72.1%	473
Hunting	1.7%	11
Don't know/ not sure	11.1%	73



Total Respondents	656
skipped this question	53

Q52. Which of these English species is NOT endangered

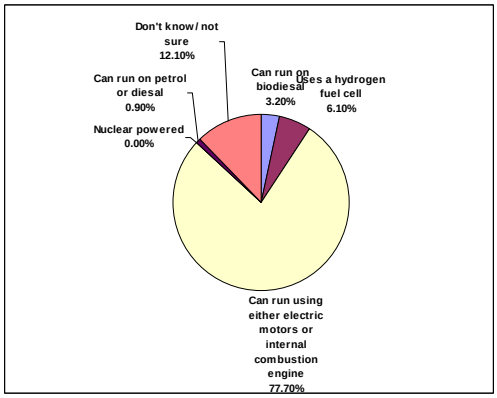
Response	Percent Response	Total
Door mouse	7.9%	51
Black bird	28.4%	184
Song thrush	1.9%	12
Barn owl	0.8%	5
Fox	54.3%	352
Don't know/ not sure	21.1%	137



Total Respondents	648
skipped this question	61

Q53. What is a hybrid car?

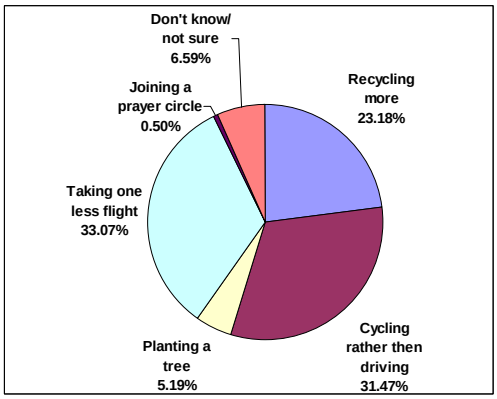
Response	Percent Response	Total
Can run on biodiesal	3.2%	21
Uses a hydrogen fuel cell	6.1%	40
Can run using either electric motors or internal combustion engine	77.7%	509
Nuclear powered	0%	0
Can run on petrol or diesel	0.9%	6
Don't know/ not sure	12.1%	79



Total Respondents	655
skipped this question	54

Q54. You could most significantly reduce your ecological footprint (impact on the environment) by:

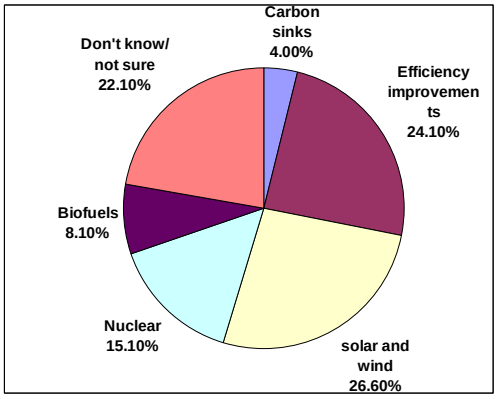
Response	Percent Response	Total
Recycling more	23.2%	152
Cycling rather then driving	31.5%	206
Planting a tree	5.2%	34
Taking one less flight	33.1%	217
Joining a prayer circle	0.5%	3
Don't know/ not sure	6.6%	43



Total Respondents	655
skipped this question	54

Q55. Which of the following technology scenarios has the greatest potential to mitigate dangerous climate change?

Response	Percent Response	Total
Carbon sinks	4%	26
Efficiency improvements	24.1%	158
solar and wind	26.6%	174
Nuclear	15.1%	99
Biofuels	8.1%	53
Don't know/ not sure	22.1%	145

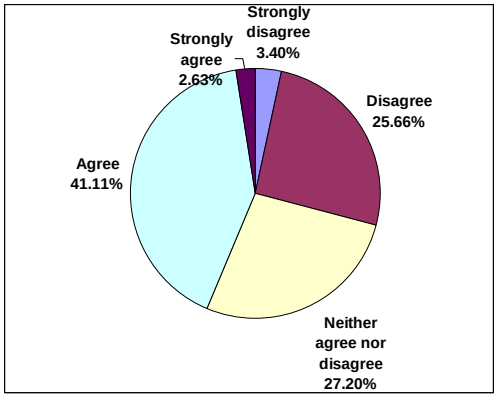


Total Respondents	655
skipped this question	54

Section 4

Q56. In most ways my life is close to my ideal.

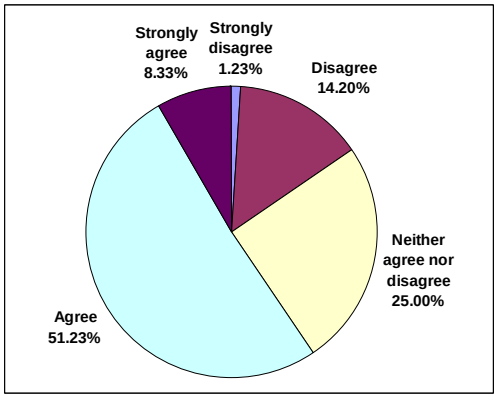
Response	Percent Response	Total
Strongly disagree	3.4%	22
Disagree	25.7%	166
Neither agree nor disagree	27.2%	176
Agree	41.1%	266
Strongly agree	2.6%	17



Total Respondents	647
skipped this question	63

Q57. The conditions of my life are excellent.

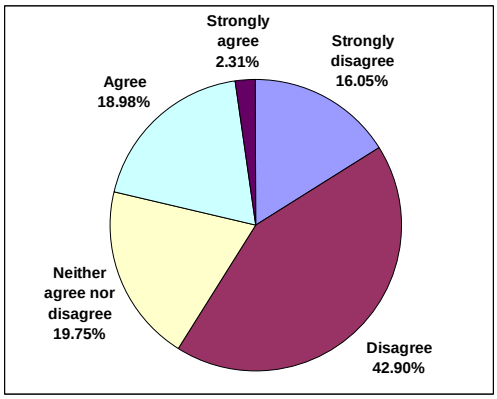
Response	Percent Response	Total
Strongly disagree	1.2%	8
Disagree	14.2%	92
Neither agree nor disagree	25%	162
Agree	51.2%	332
Strongly agree	8.3%	54



Total Respondents	648
skipped this question	62

Q58. I am not satisfied with my life.

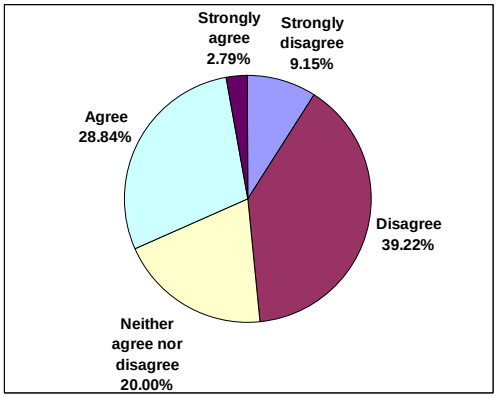
Response	Percent Response	Total
Strongly disagree	16%	104
Disagree	42.9%	278
Neither agree nor disagree	19.8%	128
Agree	19%	123
Strongly agree	2.3%	15



Total Respondents	648

Q59. So far I have not got the important things I want in life.

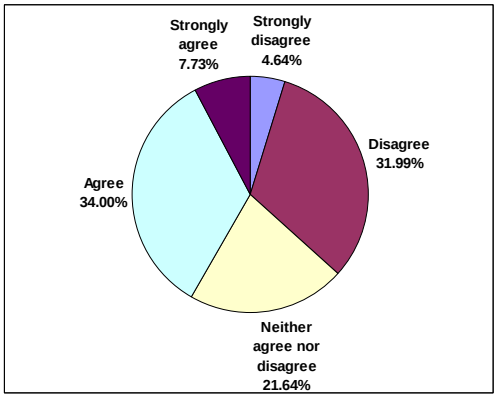
Response	Percent Response	Total
Strongly disagree	9.1%	59
Disagree	39.2%	253
Neither agree nor disagree	20%	129
Agree	28.8%	186
Strongly agree	2.8%	18



Total Respondents	645
skipped this question	65

Q60. If I could live my life over, I would change almost nothing.

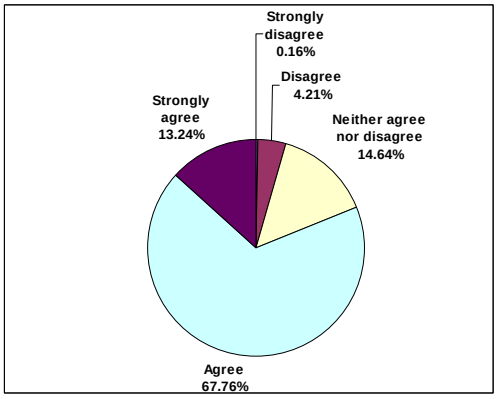
Response	Percent Response	Total
Strongly disagree	4.6%	30
Disagree	32%	207
Neither agree nor disagree	21.6%	140
Agree	34%	220
Strongly agree	7.7%	50



Total Respondents	647
skipped this question	63

Q61. I always look for ways to improve myself.

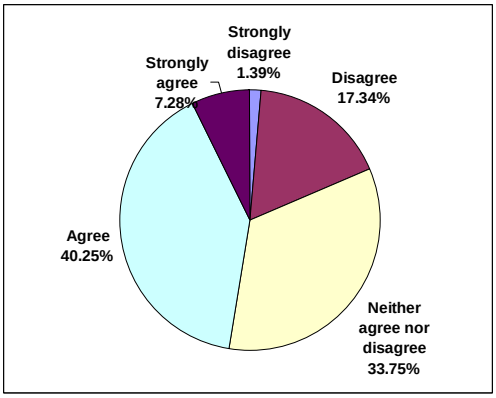
Response	Percent Response	Total
Strongly disagree	0.2%	1
Disagree	4.2%	27
Neither agree nor disagree	14.6%	94
Agree	67.8%	435
Strongly agree	13.2%	85



Total Respondents	642
skipped this question	68

Q62. I won't be told how to live my life by other people.

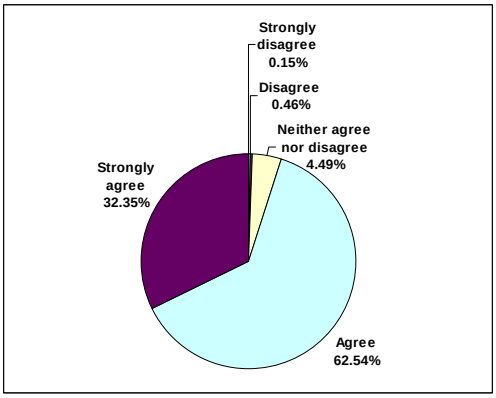
Response	Percent Response	Total
Strongly disagree	1.4%	9
Disagree	17.3%	112
Neither agree nor disagree	33.7%	218
Agree	40.2%	260
Strongly agree	7.3%	47



Total Respondents	646
skipped this question	64

Q63. I enjoy learning new skills and meeting new challenges.

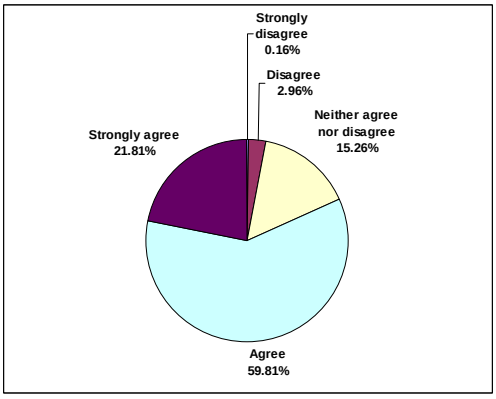
Response	Percent Response	Total
Strongly disagree	0.2%	1
Disagree	0.5%	3
Neither agree nor disagree	4.5%	29
Agree	62.5%	404
Strongly agree	32.4%	209



Total Respondents	646
skipped this question	64

Q64. I aspire to improve the world in which I live.

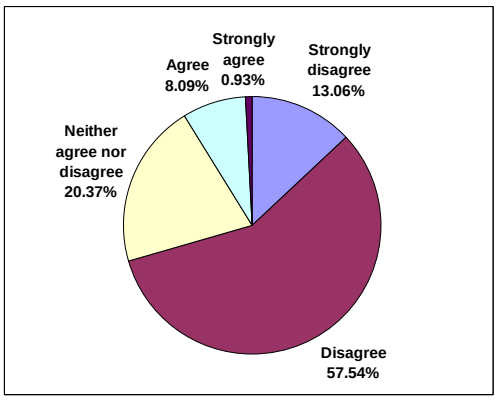
Response	Percent Response	Total
Strongly disagree	0.2%	1
Disagree	3%	19
Neither agree nor disagree	15.3%	98
Agree	59.8%	384
Strongly agree	21.8%	140



Total Respondents	642
skipped this question	68

Q65. I do not try to modify my way of living for the good of society.

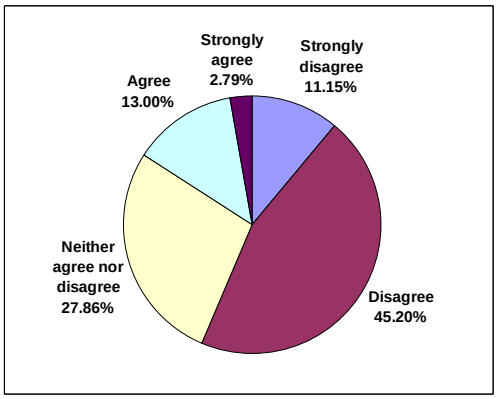
Response	Percent Response	Total
Strongly disagree	13.1%	84
Disagree	57.5%	370
Neither agree nor disagree	20.4%	131
Agree	8.1%	52
Strongly agree	0.9%	6



Total Respondents	643
skipped this question	67

Q66. I believe that society has stopped making progress.

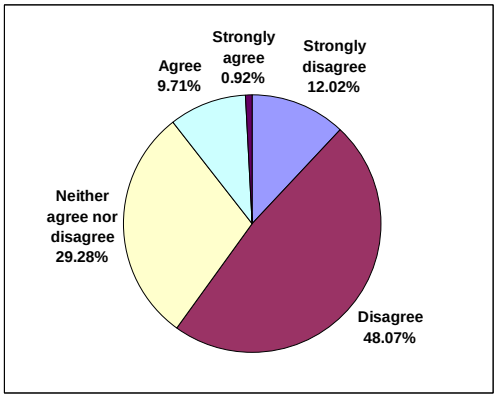
Response	Percent Response	Total
Strongly disagree	11.1%	72
Disagree	45.2%	292
Neither agree nor disagree	27.9%	180
Agree	13%	84
Strongly agree	2.8%	18



Total Respondents	646
skipped this question	64

Q67. I think the world is becoming a better place for everyone.

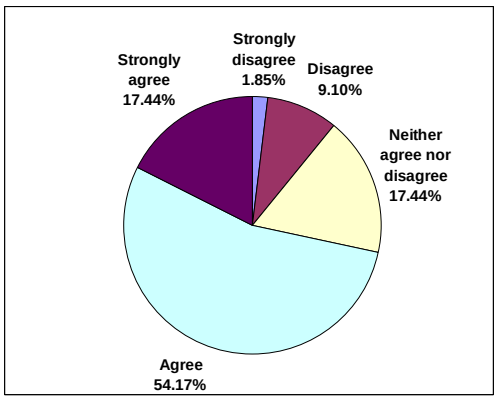
Response	Percent Response	Total
Strongly disagree	12%	78
Disagree	48.1%	312
Neither agree nor disagree	29.3%	190
Agree	9.7%	63
Strongly agree	0.9%	6



Total Respondents	649
skipped this question	61

Q68. Humans can achieve anything if we all unite behind a common cause.

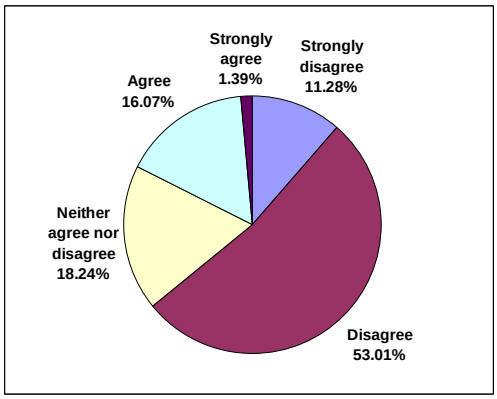
Response	Percent Response	Total
Strongly disagree	1.9%	12
Disagree	9.1%	59
Neither agree nor disagree	17.4%	113
Agree	54.2%	351
Strongly agree	17.4%	113



Total Respondents	648
skipped this question	62

Q69. My behaviour has little impact on other people in my community.

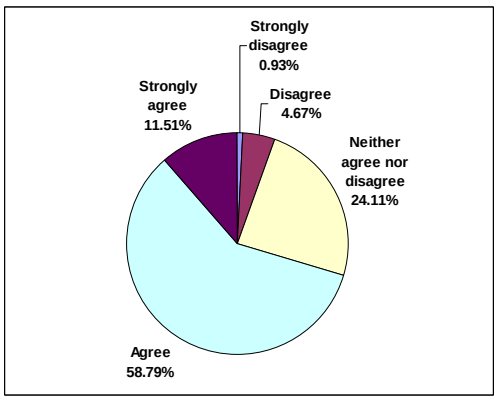
Response	Percent Response	Total
Strongly disagree	11.3%	73
Disagree	53%	343
Neither agree nor disagree	18.2%	118
Agree	16.1%	104
Strongly agree	1.4%	9



Total Respondents	647
skipped this question	63

Q70. I think I have something valuable to give to the world.

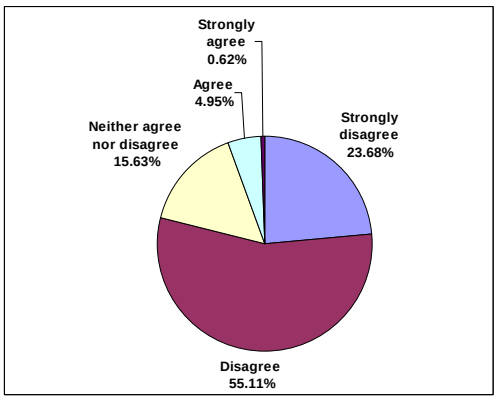
Response	Percent Response	Total
Strongly disagree	0.9%	6
Disagree	4.7%	30
Neither agree nor disagree	24.1%	155
Agree	58.8%	378
Strongly agree	11.5%	74



Total Respondents	643
skipped this question	67

Q71. I don't really like the people I interact with.

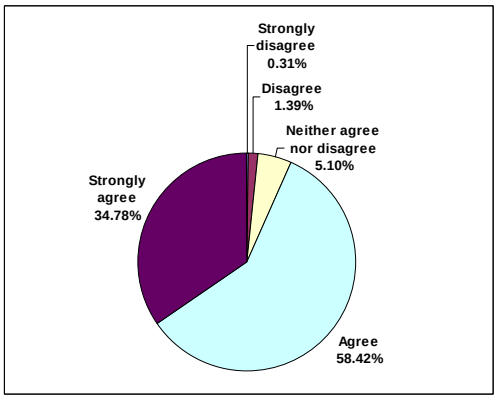
Response	Percent Response	Total
Strongly disagree	23.7%	153
Disagree	55.1%	356
Neither agree nor disagree	15.6%	101
Agree	5%	32
Strongly agree	0.6%	4



Total Respondents	646
skipped this question	64

Q72. People in my life care about me.

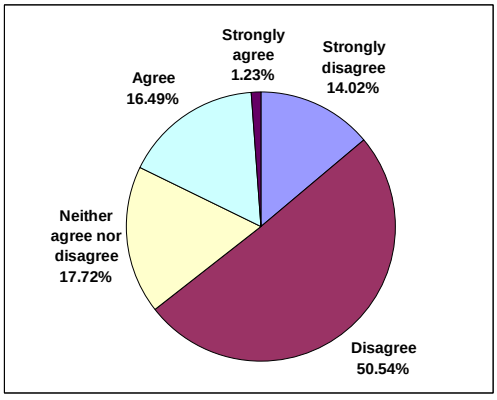
Response	Percent Response	Total
Strongly disagree	0.3%	2
Disagree	1.4%	9
Neither agree nor disagree	5.1%	33
Agree	58.4%	378
Strongly agree	34.8%	225



Total Respondents	647
skipped this question	63

Q73. I do not often feel part of a network.

Response	Percent Response	Total
Strongly disagree	14%	91
Disagree	50.5%	328
Neither agree nor disagree	17.7%	115
Agree	16.5%	107
Strongly agree	1.2%	8

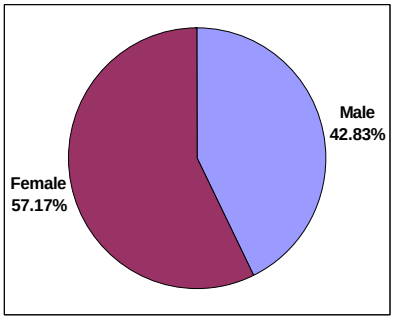


Total Respondents	649
skipped this question	61

Section 5

Q74. Sex:

Response	Percent Response	Total
Male	42.8%	272
Female	57.2%	363



Total Respondents	635
skipped this question	75

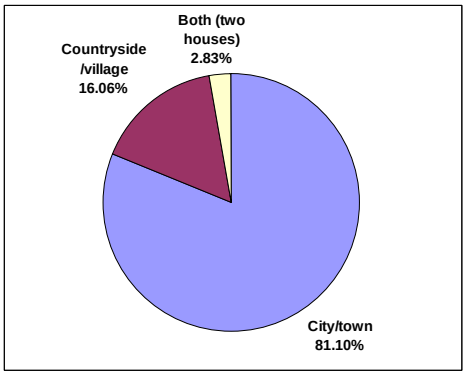
Q75. What is your year of birth (e.g. 1962)?

Total Respondents	636
skipped this question	73

Q76. Where do you live? (what country?)

Q77. Do you live in a city/town or in the countryside/village?

Response	Percent Response	Total
City/town	81.1%	515
Countryside/village	16.1%	102
Both (two houses)	2.8%	18



Total Respondents	635
Skipped this question	75

Q78. What is the name of your city/town/village?

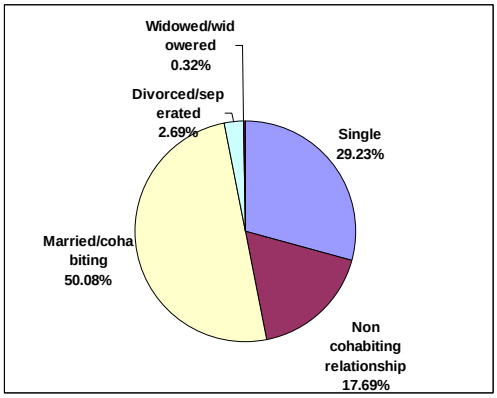
Total Respondents	625
Skipped this question	84

Q79. What are the first digits of your postcode?

Total Respondents	607
Skipped this question	102

Q.80 How would you describe your relationship status?

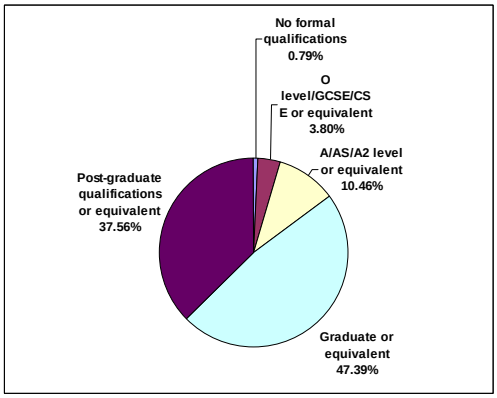
Response	Percent Response	Total
Single	29.2%	185
Non cohabiting relationship	17.7%	112
Married/cohabiting	50.1%	317
Divorced/seperated	2.7%	17
Widowed/widowered	0.3%	2



Total Respondents	633
Skipped this question	77

Q81. What is the highest educational level you have achieved:

Response	Percent Response	Total
No formal qualifications	0.8%	5
O level/GCSE/CSE or equivalent	3.8%	24
A/AS/A2 level or equivalent	10.5%	66
Graduate or equivalent	47.4%	299
Post-graduate qualifications or equivalent	37.6%	237



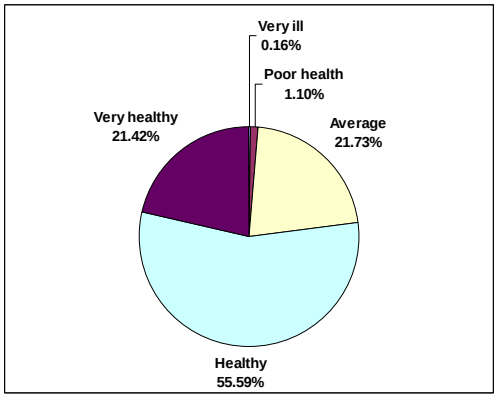
Total Respondents	631
Skipped this question	79

Q82. How many children do you have?

Total Respondents	621
Skipped this question	88

Q83. Perception of health:

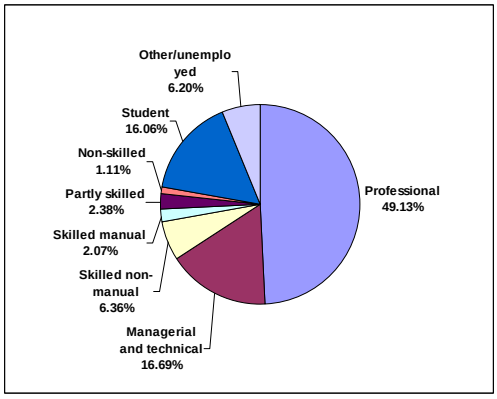
Response	Percent Response	Total
Very ill	0.2%	1
Poor health	1.1%	7
Average	21.7%	138
Healthy	55.6%	353
Very healthy	21.4%	136



Total Respondents	635
Skipped this question	75

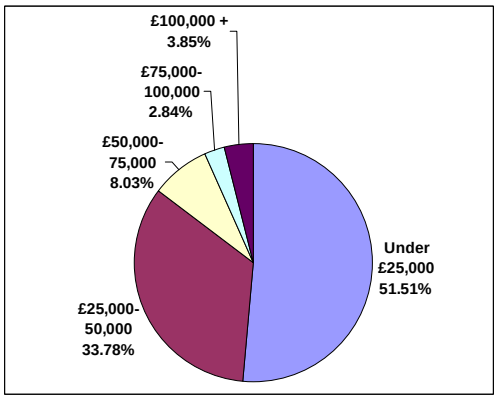
Q84. How would you describe your occupational status:

Response	Percent Response	Total
Professional	49.1%	309
Managerial and technical	16.7%	105
Skilled non-manual	6.4%	40
Skilled manual	2.1%	13
Partly skilled	2.4%	15
Non-skilled	1.1%	7
Student	16.1%	101
Other/unemployed	6.2%	39
Total Respondents	629	



Q85. Salary:

Response	Percent Response	Total
Under £25,000	51.5%	308
£25,000-50,000	33.8%	202
£50,000-75,000	8%	48
£75,000-100,000	2.8%	17
£100,000 +	3.8%	23



Total Respondents	598

Q86. Your thoughts (space provided for answers): What would motivate you to be more green (environmental)?	
Total Respondents	428
Skipped this question	281
Q87. What factors could most increase your well-being (happiness)?	
Total Respondents	371
Skipped this question	338

12.2. APPENDIX 2: INVITATION LETTER

Dear Friend,

Today is an important day for me I am launching my MSc thesis questionnaire. The results will form the back-bone of my dissertation. I hope to get as many responses as possible. I cannot bias the survey by telling you what it is about but rest assured it is fascinating stuff!

I would appreciate your help in 2 ways:

1. Please fill in the questionnaire. It should take no more then 10 minutes of your time. Please be as honest as you can.
2. The greater the sample size the more reliable the results so I would be grateful if you would forward this invitation to anyone you know who might be prepared to take part in the survey (including those overseas).

http://www.surveymonkey.com/s.asp?u=60542262121

Huge thanks in advance to you and your friends/contacts for taking part.

All best wishes,

Matthew Mellen.

Notes:

- The survey is anonymous. It is not possible for me to track who completes the survey.
- No information will be forwarded to third parties.
- For every completed survey I will give 5p to charity.
- The results of the survey will be available to anybody who is interested from September.