UNIVERSITY OF KWAZULU-NATAL

Egoistic, Altruistic and Biospheric Concerns and Environmental Behaviour of Young Adults

By
Treneya Camilla Reddy
209512601

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School of Management, IT and Governance
College of Law and Management Studies

Supervisor: Professor Debbie Vigar-Ellis

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I, Treneya Camilla Reddy declare that

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Abstract

Over the past decade environmental conditions of the earth have begun to deteriorate and this has led to an increase in environmental concern as well as the promotion of green products, campaigns and conservation behaviours. However it is still unclear as to which specific concerns have the greatest effect on the actual green behaviour of individuals in South Africa. This study investigates which particular ecological concerns have the most impact on a variety of environmental behaviours. In order to fully understand this, ecological concerns were analysed by measuring the egoistic, altruistic and biospheric values of individuals, as well as their environmental beliefs. By utilizing data obtained from a sample of 386 students from the University of KwaZulu-Natal, statistical analyses that include descriptive statistics, factor analyses, correlation tests and multiple regression analyses were employed to determine the frequencies and relationships between environmental values, beliefs and behaviours. It was found that egoistic values were the most common of all the values, followed by altruistic values, with biospheric values possessing the least importance to the respondents. Environmental beliefs were found to be marginally pro-environmental. Possible reasons for the low levels of biospheric values and environmental beliefs include low levels of ecological awareness and a disconnection between the lives of well-being of individuals and nature. However it was determined that in fact biospheric values and environmental beliefs had the strongest positive relationship with the green behaviours tested and were also found to be the only individual significant predictors of green behaviour. Based on these conclusions recommendations for governments, businesses and marketers were made that should focus on emphasizing the protection of the elements of the earth as well as creating a connection between biospheric elements and egoistic needs of individuals. Marketing strategies should also increase the environmental awareness of consumers and concentrate on promoting products and services that are in line with environmental beliefs. Limitations of the research are stated and recommendations for future research are outlined.

Table of Contents

List of Appendices

List of Tables

List of Graphs

List of Figures

Chapter 1: Introduction

In recent years there has been a steep rise in global economic growth as well as irresponsible consumer behaviour and this has led to an increase in ecological degradation (Datta, 2011, p. 124). If this growth and behaviour continues, the state of the environment will decline even further and will lead to problems such as global warming, changes in climate, water and atmospheric pollution, acid rain, a reduction of the ozone layer and droughts (Datta, 2011, p. 124; Lorenzen, 2012, p. 94). Due to these harmful effects sustainability has been emphasized by businesses and a higher priority has been placed on understanding the environmental habits of consumers (Gadenne, Sharma, Kerr, & Smith, 2011, p. 7684; Jansson, Marell, & Nordlund, 2011, p. 192). Environmental concern and its link with environmental behaviour has been a complex topic and has not been easily understood in the past. This research intends to create a greater understanding of consumer environmental concern by assessing the egoistic, altruistic and biospheric values of individuals as well as their environmental beliefs. This chapter presents a brief background of the study, followed by the research problem, problem statement and the purpose for this research. Thereafter a brief review of the relevant literature is examined and this is followed by a brief description of the research methodology. Lastly the contribution of the study is presented and an overview of the research study is outlined.

1.1. Background of the Study

According to Montgomery and Stone (2009, p. 36) there is a link between consumption and environmental issues. Therefore one of the fundamental challenges of achieving sustainability is to increase the environmentally friendly behaviours of consumers (Turaga, Howarth, & Borsuk, 2010, p. 211) With the adverse effects of environmentally destructive human behaviour becoming more apparent worldwide this has caused a rise in concern surrounding environmental matters (Arnocky, Stroink, & DeCicco, 2007, p. 255). The environmental movement that began in the 1970's prompted social psychologists to better grasp the aspects that explain environmental concerns of individuals (Schultz & Zelezny, 1999, p. 255). The term environmental concern has been utilized by individuals to refer to a wide range of green attitudes, knowledge, emotions and values with actual behaviour being omitted from the definition (Bamberg, 2003, p. 21). According to Hansla, Gamble, Juliusson, and Garling (2008,

p. 1) individuals display environmental behaviours because they express concern about the negative consequences of environmental issues pertaining to themselves, other people, and the earth itself, or as what Stern (2000, p. 414) refers to as egoistic, altruistic and biospheric values respectively. Although research has been conducted measuring general environmental concern of individuals, the outcomes of all of these studies have been inconclusive. According to Royne, Levy, and Martinez (2011, p. 329) and Zhou (2013, p. 454), some results report a positive correlation with environmental behaviour, while Steg (2008, p. 4450) states that more than often no significant correlation is found between green concern and behaviour. Thus results pertaining to this subject are contradictory and require more research to be done.

Ajzen (1991, p. 189) states that one's behaviour is also a product of the beliefs that one holds. According to McCarty and Shrum (2001, p. 93) understanding ecological behaviour is extremely challenging and one of the continuous problems encountered is the fact that although almost all individuals possess pro-environmental beliefs, green behaviour is not performed on the same scale. Therefore it has been stated that the relationship between ecological concerns and green behaviour also deals with the gap that exists between environmental beliefs and green behaviour and that in order to deal with the present ecological crisis one should concentrate on changing the beliefs of individuals (Bertoldo, Castro, & Bousfield, 2013, p. 437; Gabler, Butler, & Adams, 2013, p. 160). Jurin and Fortner (2002, p. 373) state that research in the field of environmentalism that concentrates on why individuals act differently as compared to their apparent best intentions, is scarce. Analysing belief structures would be advantageous in determining this reasoning (Jurin & Fortner, 2002, p. 374). According to Pagiaslis and Krontalis (2014, p. 335) a significant proportion of literature proposes that the ecological concern of consumers is in fact a concept of general belief that is an antecedent of more specific concepts such as green knowledge and environmental beliefs associated with green products. Therefore one method of closing the green concern-behaviour gap is to delve deeper into environmental concern and gain a more accurate understanding of specific green concerns of individuals and how these specific concerns affect environmental behaviour. This research divided the general environmental concerns into firstly the three categories of egoistic, altruistic and biospheric values and secondly into the environmental beliefs of individuals and thereafter assessed the relationships that existed between each of these constructs and green behaviour.

1.2. Research Problem

For the past several decades, environmental concern and its relationship with environmental behaviour have been the topic of many studies (e.g. Bamberg, 2003; Kim & Choi, 2005; Ojea & Loureiro, 2007; Said, Ahmadun, Paim, & Masud, 2003; Young, Hwang, McDonald, & Oates, 2010). However the majority of this body of research has yielded ambiguous results. Some studies have found a correlation between green behaviour and green concern while others have determined no relationships to exist between these constructs. This environmental concern-behaviour gap has neither been completely solved nor accurately understood in past studies and is still an unexplained aspect of environmental research. It is also evident that the majority of research relating to the relationship between environmental concern and environmental behaviour have taken place in 1st world countries (Bamberg, 2003; Kim & Choi, 2005; Schultz, 2001; Young *et al*., 2010) and according to De Barcellos, Krystallis, Saab, Kügler, and Grunert (2011, p. 391) research relating to the relationship between green concern and behaviour have been very scarce in developing countries, such as South Africa. It is fundamental for researchers and marketers to fully understand the factors that affect environmental behaviour of consumers, as the more accurately one identifies the causes of green behaviour the more easily one can adapt marketing strategies, images of products as well as campaigns to better influence consumers' behaviour.

The current state of the environment is fragile with environmental issues still posing a serious problem worldwide to the inhabitants of earth as well as to the earth itself, therefore an increase in sustainable behaviour will aid in creating a healthier environment for all species to live in. This study also specifically focuses on young adults' environmental concerns and their behaviour as it is this population of individuals that will be active in purchasing products and services in the future and whose behaviour will have an impact on the earth (Vermeir & Verbeke, 2008, p. 545). Past studies that have focused on young adults describe this age category in several ways. Martinello and Donelle (2012, p. 177) define this group as individuals aged between 18 and 24 years and therefore employ university students in their study, while McDougle, Greenspan and Handy (2011, p. 330) utilize university students younger than 24 years to represent young adults in their research. However Vermeir and Verbeke (2008, p. 4) describe young adults to be individuals from ages 19 to 22. Therefore for the purposes of the current study young adults are defined as individuals approximately between the ages of 18

and 22 and university students are utilized to represent this population. This research aimed to close the gap in knowledge on the relationship between environmental concern and environmental behaviour by concentrating specifically on concern and gaining a deeper understanding of the construct. Instead of testing general green concern this research measured the specific egoistic, altruistic and biospheric concerns of individuals and their relationship with environmental behaviour.

1.3. Problem Statement

The state of the environment is dependent on individuals behaving in an environmentally friendly manner. Understanding the factors that influence ecological behaviour is important. The effect that environmental concern has on green behaviour has surfaced contradictory results. This research therefore examines the relationships between environmental concern and environmental behaviour by analysing the three types of environmental values (egoistic, altruistic and biospheric), and environmental beliefs and their relationship with the environmental behaviour of young adults.

1.4. Research Purpose

The purpose of this quantitative research is to determine if the values of an individual (either selfish values (egoistic), values connected to the concern of other people (altruistic), or values associated with the earth itself (biospheric) as well as one's environmental beliefs have an effect on environmental behaviour. The constructs under investigation were thus egoistic values, altruistic values, biospheric values, environmental beliefs (independent variables), and environmental behaviour (dependent variable). The research took place in the city of Pietermaritzburg and was conducted on the students of the University of KwaZulu-Natal (UKZN – Pietermaritzburg campus). The research questions of this study were:

1. Do the egoistic, altruistic, or biospheric values of young adults influence their environmental behaviour?
2. Do the environmental beliefs of young adults influence their environmental behaviour?

From these research questions the following research objectives were established:

1. To determine which group of environmental values (egoistic, altruistic or biospheric) are most important to young adults
2. To determine the environmental beliefs of young adults
3. To establish the extent of their environmental behaviour
4. To determine the relationship between the three types of environmental values (egoistic, altruistic and biospheric) and environmental beliefs with environmental behaviour.

1.5. Brief Literature Review

In order to achieve sustainability it is essential that the behaviour of individuals be changed and it is becoming clear that information alone is not strong enough to influence the environmental actions of people and ultimately diminish the gap between attitudes and behaviour, therefore it is imperative that a different methodology be used to understand consumers at a closer level (Barr & Gilg, 2006, p. 906). Improvement with regards to environmental problems is expected to depend on the ecologically friendly behaviour of individuals and therefore it is of high importance that studies place attention on the different antecedents of environmentally friendly behaviour and it is pivotal to grasp and comprehend which particular aspects encourage and constrain ecological behaviour (Steg & Vlek, 2009, p. 311). Kim and Choi (2005, p. 592) researched the significant antecedents of environmental behaviour and discovered that ecological concern in fact has a direct effect on environmental behaviour and specifically on ecologically friendly purchase behaviour. A study conducted by Padel and Foster (2005, p. 615) found that it may be the values and concerns of individuals that play an important role in their environmental behaviour. Their study revealed that the values of individuals did influence their environmental purchase behaviour as consumers indicated that values such as ‘personal health’ and ‘caring for the environment’ affected their choice to purchase organic food (Padel & Foster, 2005, p. 615).

According to Roberts and Bacon (1997, p. 81) environmental concern and ecological behaviour should be related to one another and it should be expected that the more concern one has for the environment the more intense green behaviour will result, however the outcomes of research that has been conducted on this topic has clearly yielded ambiguous and misleading results. Samarasinghe (2012, p. 28) agrees and states that there have been various research studies conducted and models developed to try to explain the gap between green antecedents (values and attitudes) and ecological behaviour but the majority of these studies have produced inadequate and inconclusive findings.

According to Young *et al.* (2010, p. 20) the 'attitude-behaviour' gap is also known as the 'value-action' gap and explain that although consumers show a great level of concern regarding ecological problems, about 30% of these individuals are unable to convert this concern into actual green behaviour. This gap is evident in terms of energy use in domestic households as Marechal (2010, p. 1104) states that despite there being sufficient awareness as well as concern towards ecological problems such as the change in climate, energy consumption still continues to increase. Bamberg (2003, p. 21) also agrees with this fact and states that there have always been weak relationships between ecological concern and behaviour and a major reason for this may be a poor comprehension of general environmental concern. Studies conducted by Said *et al.* (2003, p. 311) found similar results. Therefore the current study aimed to achieve a greater understanding of the environmental concern of individuals by analysing both their environmental values and environmental beliefs, and the impact that these constructs have on green behaviour.

1.6. Brief Description of Research Methodology

In order to accomplish the above objectives a quantitative study was conducted with a sample of 386 students. Initially a probability sampling technique was employed that utilized the notice system of UKZN to obtain responses, however this technique proved to be unsuccessful as it provided an extremely low response rate. It was thereafter decided that the non-probability sampling technique of convenience sampling be employed to obtain responses. A structured questionnaire using a Likert scale question format was designed that aimed to determine the egoistic, altruistic and biospheric values of young adults as well as their environmental beliefs

and environmental behaviour. This questionnaire was administered to students of UKZN (PMB campus). The data were analysed with the use of descriptive statistics and frequencies. Factor analyses were conducted on all three sets of variables (values, beliefs and behaviours). Pearson's correlation tests were performed to determine if any relationships existed between the independent variables (values and beliefs) and the dependent variable (environmental behaviour). Lastly a Multiple Regression Analysis was conducted to determine the predictors of environmental behaviour.

1.7. Contribution

Past research reveals that not only are environmental concerns a significant factor of green behaviour but that this concern is still not fully understood by researchers. There is a lack of understanding as to why there is a gap between one's concerns and one's actual environmental behaviour that is evident in research conducted by Barr and Gilg (2007); Chan (1999); Maréchal (2010); Said *et al*. (2003)). As stated previously by Bruni, Chance, and Schultz (2012, p. 2) it is imperative that a deeper understanding of environmental concerns is developed in research and this can be done by analysing the values and beliefs of individuals. To the researcher's knowledge a study of this nature has not been conducted on South African individuals before and very few studies relating to environmental concerns and behaviour have been conducted in developing countries especially in Africa. Therefore this research aimed to add significant information to the body of knowledge of green behaviour in developing countries and in South Africa in particular and contributes to the world of green marketing. Since young adults are the focal point of this research, the majority of the environmental behaviours examined do not require a high level of income to perform such as water and energy conservation, recycling as well supporting ecological campaigns, however the study does also analyse green purchasing behaviour. Therefore the findings of this research do not only influence green businesses but are also beneficial for governments and environmental organizations which aim to increase environmentally friendly behaviour in individuals to promote sustainability. The recommendations made will allow them to implement the appropriate strategies for their citizens and consumers relating to their behaviour change campaigns and environmentally friendly products and services. With South Africans being targeted in the right manner, and with the correct strategies being put into place this will

potentially increase the actual green behaviour of consumers. This could in turn have a major effect on the environment and result in a decrease in environmentally destructive behaviour.

1.8. Overview of the Research Study

The eight chapters that follow aim to accomplish the four objectives mentioned previously by increasing the readers' knowledge and understanding of theories and issues relating to the egoistic, altruistic and biospheric values, environmental beliefs and green behaviour of consumers through the discussion of extant literature as well as presenting primary data relating to the subject. The next chapter enlightens the reader on the theories, definitions, models as well as past research that is significant to environmental issues of individuals and is divided into three main sections. Firstly the environmental behaviour of consumers is discussed. This is followed by environmental concerns which is divided into two subsections namely value orientations (egoistic, altruistic and biospheric) and environmental beliefs. The chapter then discusses and analyses the past literature relating to the constructs mentioned above, concluding with environmental research performed in Africa and South Africa. The inclusion of this chapter is necessary because to fully understand the findings of the primary research that was conducted it is essential that one has an understanding of the theories that surround the topic at hand. This plays a vital role in the worthiness and assessment of a thesis (Hart, 1998, p. 4). Chapter three highlights the methods that were employed to conduct the primary research and outlines the research design, sample design, questionnaire design as well as data collection methods utilized in the study. Thereafter Chapter four illustrates the findings of the primary research including the use of graphs and tables. Stemming from these findings Chapter five discusses the results of the research and the linkages made between these results and the literature examined in Chapter two. Chapter six highlights the key recommendations for businesses and governments that were developed based on the findings and discussion of the results found, and also states the limitations that were experienced in conducting the research as well as recommends topics that could be researched in the future. Overall conclusions of the research are made in Chapter seven. Finally the research concludes with a reference chapter that lists all the secondary sources that were utilized during the course of the research.

As mentioned above the next chapter presents the environmental literature related to the topic at hand and assesses the theories, models, definitions and past research in terms of environmental behaviour and delves deeper into the literature of environmental concern to better understand this construct.

Chapter 2: Literature Review of Environmental Behaviour and Concerns

Introduction

This chapter reviews and evaluates the relevant literature related to the environmental behaviour and concerns of individuals in order to establish a greater comprehension of the antecedents of environmentalism and the different factors that influence the ecological concerns of consumers. This analysis of past environmental literature is necessary as the more knowledge gained in terms of the specific aspects that affect green concerns and behaviour, the more understanding will arise with regards to the possible reasons and explanations for the outcomes of the primary research. In order to determine the environmental concerns of individuals and establish relationships between these concerns and environmental behaviour, it is essential that literature and results of past research are critically assessed to develop a strong basis for the study in question.

Although this study examines and analyses environmental behaviour, the primary focus of the research is to better understand the environmental concerns of individuals. Therefore a funnel approach of writing is utilized in presenting information in this chapter and this entails firstly presenting more general information relating to the topic at hand and thereafter analysing more specific literature that is the focus of the research topic. Thus this chapter is divided into three sections. The first section of this chapter examines the past work, theories and writings relating to the green behaviour of individuals. Thereafter the second section analyses environmental concerns. The analysis of environmental concerns is divided further into two subsections. The first section deals with the examination of value orientations with three values in particular being assessed namely the egoistic, altruistic and biospheric values of individuals. The second subsection assesses the environmental beliefs of individuals. The chapter concludes with section three which is the analysis of the results of past studies that have investigated the relationship between the three value orientations (egoistic, altruistic and biospheric values), environmental beliefs and environmental behaviour and justifies the need for further research.

2.1. Environmental Behaviour

Introduction

In order to understand the concept of environmentalism it is important to first assess environmental behaviour. The following section firstly gives a brief introduction to the topic of environmental behaviour followed by the definition of the term. This is followed by a discussion of the different examples of environmental behaviour and thereafter the factors that affect this behaviour are discussed. The section concludes by examining the theories that are utilized by researchers to gain a better understanding of environmental behaviour and which provide a theoretical foundation to the research.

The destruction of the environment is one of the major trials that our world is presently faced with (Zhou, 2013, p. 454). The effects of global warming have been devastating and far reaching with the gap between the temperatures of land and the temperatures of the oceans growing larger (Becker & Stevens, 2014, p. 1205), while the current elevated levels of carbon dioxide in the atmosphere have the potential of increasing sea levels to a dangerous limit (Byravan & Rajan, 2015, p. 21). Over the last ten years issues such as global warming, the destruction of ecosystems as well as the use of non-renewable resources have become a crucial topic in many global debates (Schaffrin, 2011, p. 11). Greenhouse gases that lead to an altered climate are considered a critical environmental matter (Ngo, West, & Calkins, 2009, p. 151).

Many of the adverse consequences of climate change such as flooding, erratic storms and poor agriculture have been attributed to the activities and behaviour of humans or consumers (Hamilton & Safford, 2014, p. 57; Nordlund & Garvill, 2002, p. 740; Stern, 2000, p. 408). According to Stigter and Ofori (2014, p. 8429) the change in temperature and climate that is caused by consumer behaviour can have a drastic effect on the income of farmers especially in Africa. This is of significance to South African individuals as the country's economy as well as the livelihood of many individuals depends on the condition of the environment and the importance of agriculture (Bryan, Deressa, Gbetibouo, & Ringler, 2009, p. 413). It is predicted that if negligent consumer behaviour continues, climate change and all of the negative ramifications that are associated with it will increase (Datta, 2011, p. 124). Due to this, one of

the phenomena that perhaps has had the most significant impact on marketing worldwide has been environmentalism (Hanson, 2013, p. 62) with the topic of the green consumer being a significant aspect of modern consumer culture (Autio, Heiskanen, & Heinonen, 2009, p. 40). It is thought that in order to rectify current environmental problems the mystery of the green consumer needs to be discovered (Reijonen, 2011, p. 403).

It is stated by Maclean (2010, p. 103) that the fundamental misunderstandings that corporate members of businesses have about environmentalism stem from them not grasping the correct meaning of environmental behaviour. This might also be true for consumers. Therefore the definition of environmental behaviour should be examined.

2.1.1. Definition of Environmental Behaviour

Firstly according to Monroe (2003, p. 115) a behaviour can be described as a precise action. Environmental behaviour can be multifaceted and can be viewed from many different angles (Fraj & Martinez, 2006, p. 167). Studies that have been conducted concerning the characteristics of the green consumer cross many different academic territories such as sociology, psychology and marketing and the green consumer is normally understood by examining their qualities, beliefs, values, economic status as well as their environmental behaviour (Jansson *et al*., 2011, p. 51; Reijonen, 2011, p. 403). According to Stern (2000, p. 408) ecological behaviour can be described by assessing the effect that an action has on the amount of energy and materials of the environment as well as its influence on ecosystems and biodiversity. According to Kim and Choi (2005, p. 592), there is a difference between environmentally friendly behaviour and general purchasing behaviours. General purchasing behaviour is motivated by the personal costs and benefits relating to the consumers' behaviour while pro-environmental behaviour will most likely not provide benefits to the consumer instantly but would instead have a positive effect in the future and the impact will be felt by society as a whole (Kim & Choi, 2005, p. 592).

Stern provides further insight into the different ways environmental behaviour can be explained by stating that it can be analysed in two ways, firstly by the intention of consumers to have an

impact on the environment and secondly by the impact that one's behaviour actually has on the environment (Stern, 2000, p. 408). One's intention to make a difference to the environment can be viewed as an independent source of green behaviour however there is a chance that the intended behaviour will not actually have an impact on the environment (Stern, 2000, p. 408). Therefore it is important to assess ecological behaviour in terms of the actual impact that consumer actions have on the environment, which is what the current study aims to achieve. There are many activities that fall under the category of environmental or green behaviour. The following section will examine some of the examples of environmental behaviour and also define and discuss examples of the specific behaviours tested in the current study.

2.1.2. Examples of Environmental Behaviours

Stern distinguishes environmentally friendly behaviour into four main categories namely, "Environmental Activism", "Non-activist Behaviours in the Public Sphere", "Private Sphere Environmentalism" and "Other Environmentally Significant Behaviours" (Stern, 2000, pp. 409-410). These four types of ecologically significant behaviour are discussed briefly below:

- **Environmental Activism**: This form of environmental behaviour deals with individuals actively taking part in activities of environmental organizations and participating in environmental protests or demonstrations (Stern, 2000, p. 409; Stern, Dietz, Abel, Guagnano, & Kalof, 1999, p. 82). The success of environmental movements depend on individuals who are highly dedicated and engaging with the cause and it is also noted that backing from the public in general is one of the most vital elements for environmental movements and organizations (Stern *et al*., 1999, p. 81). For some ecological associations the change in the behaviour of individuals who are non-activists may be essential to attain environmental objectives (Stern *et al*., 1999, p. 81).

- **Non-activist behaviours in the Public Sphere**: This environmental behaviour consists of two types. The first type deals with individuals who take part in activities that are less public and therefore pose a reduced risk as compared to environmental activists (Stern *et al*., 1999, p. 82). Activities of individuals in this category include writing

letters to members of the government concerning environmental matters, becoming members of environmental organizations and donating funds to these organizations and doing research about the environmental causes (Stern *et al*., 1999, p. 82). The second type of non-activist behaviour includes the approval and support of environmental policies that may result in paying higher taxes, an increased price for certain goods and services and adhering to environmental laws and regulations such as compulsory recycling (Stern *et al*., 1999, p. 82). Although non-activist behaviours are clearly important, the majority of research has focused on green behaviours in the private sphere (Stern, 2000, p. 409).

- **Private Sphere Environmentalism**: These ecological behaviours are personal changes that individuals make to their lifestyle. It can be divided into the purchasing of significant environmental goods and services such as cars and the use and upkeep of products that are ecologically significant such as household temperature systems, the disposal of domestic waste, and finally green consumerism such as purchasing products that are environmentally friendly (Stern, 2000, pp. 409,410). The major difference between public and private sphere environmental behaviour is that the latter has a direct but small impact on the environment as only if these individual green behaviours are performed by the masses of people will a significant environment impact occur (Stern, 2000, p. 410).

- **Other Environmentally Significant Behaviours**: These behaviours involve individuals affecting the activities of the companies and organizations that they work for or are a part of (Stern, 2000, p. 410). Examples of this include engineers creating products that are more environmentally friendly, investors and developers utilizing ecological goals while making decisions, and maintenance workers decreasing the levels of pollution of factories and buildings (Stern, 2000, p. 410). These behaviours can have the greatest impact on the environment as activities performed by businesses are the main sources of ecological problems (Stern, 2000, p. 410).

Of the four types of environmental behaviours mentioned above, non-activist behaviours in the public sphere and private sphere environmentalism have been the most common types amongst individuals and researchers alike. As stipulated by Stern (2000, p. 410) private sphere

environmentalism deals with individual green behaviours of consumers in terms of the activities performed in the household and in everyday life. Green consumer behaviour includes recycling, using the public transport system instead of personal cars, purchasing natural and organic foods, taking part in environmental campaigns and protests by speaking out against the destruction of ecosystems, as well as utilizing methods in the household to save energy and water (Kennedy, Beckley, McFarlane, & Nadeau, 2009, p. 151). The current study analyses 11 environmental behaviours and these behaviours can be grouped into household energy saving, water conservation behaviours, recycling, reusing items, purchasing green, organic or locally produced products, and supporting environmental campaigns. In order to gain a better understanding of the current research these behaviours are discussed next.

2.1.2.1. Household Energy Saving

The household energy consumption sector has substantial potential to save a great amount of energy and is definitely a valuable area to focus on in the future to reduce energy consumption (Sütterlin, Brunner, & Siegrist, 2011, p. 8137). To decrease the levels of energy consumption produced by fossil fuels it is expected that residential homes and households adapt their electricity behaviour to favour more environmentally friendly energy use (Steg, 2008, p. 4449). Sütterlin *et al*. (2011, p. 8138) state that a wide variety of choices that individuals make on a day to day basis is either directly associated or indirectly associated with energy use therefore it can be said that energy consumption is always present in daily life. Steg (2008, p. 4449) elaborates on this point by stating that examples of direct energy consumption for households include electricity use, the utilization of natural gas and other types of fossil fuels, while indirect energy use include any type of energy utilized in the production of any item, using green transportation, and energy used in the removal of goods.

According to Poortinga, Steg, Vlek, and Wiersma (2003, p. 51) household energy use can be distinguished into two categories namely indoor and outdoor activities. Indoor energy saving includes efforts to decrease the use of lighting, heating as well as appliances in the home while outdoor energy saving deals with utilizing environmentally friendly modes of transportation and activities linked to leisure (Poortinga *et al*., 2003, p. 51). Sütterlin *et al*. (2011) have a different take on the categories of energy use as they state that there are also two kinds of

energy conservation behaviours however they divide it into individuals either curtailing their actions or implementing energy saving equipment (Sütterlin *et al*., 2011, p. 8138). According to these researchers the term curtailment means that the individual will have to adopt energy saving behaviour on a regular basis and will therefore have to adopt new energy conservation practices (Sütterlin *et al*., 2011, p. 8138). These behaviours include decreasing the heating in rooms that are not in use and forming lift clubs. The second category of energy saving behaviour normally only comprises one action, for example buying an appliance that saves energy for a long period of time so that it ensures enough energy is conserved so that the individual will not have to change their everyday energy habits (Sütterlin *et al*., 2011, p. 8138). Energy saving methods have become a topic of discussion due to the fact that despite there being a rise in both concern and awareness of environmental matters, household energy use still continues to increase (Maréchal, 2010, p. 1104). There is currently an energy crisis facing South Africa that has had an impact on all South African citizens with the national implementation of load shedding. Load shedding entails a scheduled power outage implemented across the country by national energy provider Eskom in order to decrease the amount of energy consumed by individuals. Therefore the topic of energy conservation is currently an important topic to South Africans. The current study assesses the energy saving behaviour of individuals in order to gain a better understanding about the topic in terms of the frequency of performing these behaviours and determining whether relationships exist between these behaviours and one's environmental values and beliefs. Energy shortages are not the only problem currently facing South Africa as it is evident in recent years that there has also been a shortage of water in the country.

2.1.2.2. Water Conservation Behaviour

One of the most significant problems of this century facing the globe is to ensure that there is sufficient fresh water for human consumption as there are over 2 billion individuals that do not possess an adequate water supply to meet basic human needs, all of whom are from developing countries (Harlan, Yabiku, Larsen, & Brazel, 2009, p. 692). The preservation of the quantity and the condition of water is essential and critical for life on earth and can frequently be unappreciated due to the view that water is somewhat limitless (Delorme, Hagen, & Stout, 2003, p. 28).

According to Randolph and Troy (2008, p. 441) due to drought conditions that were experienced in Sydney, Australia, water conservation behaviours became the focus of attention of the city. These behaviours were both at a macro level (involving governments and industries) as well as at a micro level (involving consumers and households). Macro water conservation activities included the use of desalination plants, utilizing underground water, building a greater number of dams and recycling water that has been used by industries (Randolph & Troy, 2008, p. 441). Micro water saving activities included fitting in water tanks in the household, reusing household water, utilizing household water saving fittings and adapting one's behaviour in terms of watering one's garden (Randolph & Troy, 2008, p. 441). The current study analyses micro water saving activities of individuals.

Just like household energy use, water conservation behaviour can take place either outdoors or indoors, in fact it is stated that half of household water use takes place indoors and the other half outdoors (Harlan *et al*., 2009, p. 694). Outdoor water use comprises all the activities that need the use of water to maintain gardens, lawns or any other types of vegetation and it has been said that the yards of suburban households are one of the fastest growing land covers around the globe (Harlan *et al*., 2009, p. 694). Indoor water conservation behaviours include utilizing less water in the household and installing water saving fixtures (Harlan *et al*., 2009, p. 694) At present South Africa is facing a major water crisis in the form of low rainfall that have resulted in droughts across parts of the country (eNCA, 2015: paragraph 1). The country is said to be the 30th driest state on earth and the water shortages might lead to a crisis that would be on the same scale as the current energy crisis facing the country (eNCA, 2015: paragraph 1-2). Another serious problem that may be a product of the water shortage is unemployment as many farms rely heavily on water for irrigation and without this resource farmers will be forced to cut back on production and this will lead to their staff being forced to leave their jobs (eNCA, 2015: paragraph 5). Due to the importance of water conservation in South Africa the current study assesses two indoor water conservation behaviours namely, "Closing the tap while washing dishes or brushing teeth" and "Having a shower rather than a bath" to better understand whether these water saving behaviours are common amongst young adults and to determine whether a relationship exists between these behaviours and one's green values and behaviours. Along with energy and water conservation the current study also examines the recycling behaviours of individuals to gain a better comprehension of this ecological action.

2.1.2.3. Recycling

Recycling has been a developing trend among industries and consumers alike ever since the environmental movement of the 1970's with a dramatic increase in popularity occurring in the 1990's (Anderson & Brodin, 2005, p. 77). According to Anderson and Brodin (2005, p. 77) the recycling of an item, product or material begins when it is eventually utilized for its main purpose or in other words, the product has reached the end of its monetary life. The recycling of materials such as scrap metal and paper have been taking place for decades however the frequencies that individuals recycle fluctuate (Anderson & Brodin, 2005, p. 78). Although industries are most associated with the recycling of materials in terms of the industrial processes, the importance of consumer recycling at an end-user level also plays a significant role in environmental protection (Anderson & Brodin, 2005, p. 79). According to McDonald and Oates (2006, p. 370) in order to obtain effective results from recycling the general public needs to take part in this environmental behaviour. Due to the importance placed on recycling during recent years the current study assesses the recycling habits of young adults. Another ecological behaviour that is closely linked to recycling is the act of reusing items or products in order to save money, materials and to lessen the pollution of the earth. This behaviour has increased in popularity over recent years therefore the current study assesses this environmental behaviour as well.

2.1.2.4. Reusing items

In terms of reusing items, the environmental issue of the purchase of plastic bags comes about as it is the alternative to reusing one's own shopping bags. In general there are four categories of shopping bags namely paper, plastic, woven and non-woven (Li *et al.*, 2010, p. 71) with reusable bags usually being made of cloth or cotton (Green & DeMeo, 2013, pp. 19, 21). According to Li *et al*. (2010, p. 71) and Ritch, Brennan, and MacLeod (2009, p. 168) plastic grocery bags are a symbol for a society that throws out almost anything and due to this fact the environmental effect of these bags are relatively high as compared to other products. Plastic shopping bags are known to be a hazard to the environment for three reasons. Firstly discarded plastic bags contaminate water and the air, secondly they obstruct water bodies such as rivers, oceans and lakes which also has a negative effect on aquatic wildlife, and thirdly they pose a

serious litter problem for the environment (Green & DeMeo, 2013, p. 17). Other harmful effects include the high cost of producing plastic bags, the fact that they are non-biodegradable, meaning that they are unable to decompose into the ground, and also the short lifespan of the product (Ritch *et al*., 2009, p. 168). The issue of using plastic shopping bags has become an environmental issue over the past few years and has recently begun to take effect in the USA and North America (Green & DeMeo, 2013, p. 17). In the state of Washington D.C. a 5 cent levy has been issued on the use of plastic bags, while the government in Bainbridge in the state of Washington has completely banned the use of plastic shopping bags and have introduced a levy for the use of paper bags (Green & DeMeo, 2013, p. 17). Other countries such as India (Shrikanth & Raju, 2012, p. 35), China (Xing, 2009, p. 156), and Canada (Green & DeMeo, 2013, p. 17) have also supported the environmental movement in terms of banning plastic bags, issuing taxes or extra costs of purchasing these bags or promoting the use of reusable shopping bags. South Africa has also adopted an environmental levy to consumers for every plastic bag purchased at stores and some retail outlets and supermarkets have encouraged the use of reusable bags for shopping. Therefore South African individuals should be aware of the need to utilize reusable bags and due to this the researcher included this environmental behaviour in the current research. Another environmental behaviour that is closely linked to utilizing reusable shopping bags is the purchase of green goods such as organic and locally produced products.

2.1.2.5. Purchasing Green, Organic and Locally Produced Products

According to Follows and Jobber (2000, p. 724) consumers who are environmentally conscious will assess the environmental impact attached to the purchasing of products. The term green consumption can be viewed as being any action that relates to buying environmentally friendly products and this in itself has many other activities attached to it that range from buying ecologically friendly tea bags to purchasing organic meat (Gilg, Barr, & Ford, 2005, p. 481). Examples of environmentally friendly products include energy efficient light bulbs, organic clothing and, as mentioned above, reusable shopping bags just to name a few (Orange & Cohen, 2010, p. 29). Over the years there has been an increase in ecological awareness and consuming healthier foods therefore this has led to many individuals being doubtful of current farming techniques and in turn has created an increase in demand for organic foods (Saba &

Messina, 2003, p. 637). In essence organic products can be described as products that are free from pesticides and therefore are believed to have less of an impact on the environment and are said to be better for one's health than products produced in modern ways (Saba & Messina, 2003, p. 637). The concern over one's health seems to have the greatest influence on purchasing these products (Saba & Messina, 2003, p. 637). Locally produced products include any product that has been grown or made by the local people of cities or communities instead of large global corporations. There are several green advantages linked to supporting local farmers or manufacturers such as increasing the economies of local communities and providing jobs for the local people. Since South Africa is made up of many small communities, particularly in rural areas, and with the recent trend of organic food and clothing spreading amongst South African individuals, the current study aims to shed more light on the behaviours of purchasing organic and locally produced products. It firstly measures the frequency of buying organic products and locally produced products and thereafter establishes whether or not there is a relationship between these two environmental behaviours and one's environmental concerns in terms of their green values and beliefs.

An environmental behaviour which has received much media coverage and environmental awareness over recent years especially in terms of the conservation of wildlife in South Africa is the support of environmental campaigns. These campaigns have grown in popularity due to the adverse effects that poachers have on the population of wildlife in the country, particularly on the endangered rhino population. Therefore the current study analyses the support of this particular environmental cause.

2.1.2.6. Environmental Campaigns

According to Thøgersen and Crompton (2009, p. 141) although small environmental changes made by consumers on a day to day basis are being promoted, it is clear that in today's world environmental actions made on a bigger scale and those that require urgent attention, such as support of ecological campaigns and laws, are what is necessary for consumer behaviour to turn green. These researchers go on to highlight the significance of environmental campaigns aimed at altering consumer behaviour can have a major influence on governments adapting environmental laws and standards (Thøgersen & Crompton, 2009, p. 142). The environmental

campaign system of the World Wildlife Fund (WWF) utilizes this strategy to gain support from environmental organizations and governments (Thøgersen & Crompton, 2009, p. 142). Ecological campaigns have the greatest impact when the initiatives of the campaign encourage individuals to take on other environmental behaviours besides the one's being promoted and it is these residual effects that governments and organizations depend on (Thøgersen & Crompton, 2009, p. 142).

Many environmental campaigns exist today that relate to a number of ecological issues. For example, Duffy and Humphreys (2014, p. 4) state that the wildlife trade is quickly developing into a primary global concern and a priority for international governments, non-governmental organizations as well as philanthropic individuals. This trend is apparent due to the fact that there has been a major increase in international funding being distributed towards wildlife causes, for instance in 2014, the Howard G. Buffett Foundation pledged 25 million US Dollars to protecting the rhino in South Africa (Duffy & Humphreys, 2014, p. 4). At present South Africa is experiencing a drastic surge in rhino poaching and this has been motivated by the increasing value of the rhino horn (Child, 2012, p. 1). In the past the country was quite effective in protecting the rhino however in the past few years the costs of conserving this treasured animal from armed poachers is surpassing the benefit of keeping them by private landowners (Child, 2012, p. 1). The dire state of the rhino population has led to environmental campaigns being developed in South Africa such as the 'Save the Rhino' campaign that has gained much popularity over the past couple of years. Therefore the current research has included the analysis of environmental campaign behaviour specifically relating to the 'Save the Rhino' campaign as most South Africans are already aware of this campaign and the significance behind it.

The motives and causes of performing the different types of environmental behaviour, including the examples mentioned above, are complex and multifaceted with several researchers claiming that different factors play a role in the formation of these behaviours. Some of these factors are discussed below.

2.1.3. Factors affecting Environmental Behaviour

Throughout recent decades researchers that analysed environmental consumer behaviour have discovered many different approaches to ecological consumption, suggested different antecedents and elements that influence environmental actions and studied the identities of the ecological consumer (Reijonen, 2011, p. 403). Some believe that demographic and economic factors play a role in explaining green behaviour (Abrahamse, Steg, Vlek, & Rothengatter, 2005, pp. 273-274; Zelezny, Chua, & Aldrich, 2000, p. 443) while others suggest that one's personality is a determinant of behaviour (Fraj & Martinez, 2006, p. 168). Monroe (2003) provides a useful example of purchasing local organic food to demonstrate different factors that may influence one to be environmentally friendly. The researcher states that in order for a consumer to behave in such a manner they perhaps take the advantages and disadvantages of the organic food into consideration, they might assess the ease of preparing this food and the knowledge that other individuals support this purchase, they would have to have an overall positive view of their purchase, and finally the belief that their action will benefit the environment more than it will cost themselves the extra effort to make the purchase (Monroe, 2003, pp. 115-116).

According to Lorenzen (2012, p. 95) the majority of people involved in a study of hers adapted their personal lifestyles to behave in a more environmentally friendly manner as they wanted to be a part of green initiatives because they felt that environmental action taken by governments or institutions could take time, or not happen at all (Lorenzen, 2012, p. 95). However research conducted by Barr and Gilg (2007, p. 367) that measured environmental behaviour of English households found that when it came to energy saving and water conservation there were mixed results as those behaviours that needed more of a change in lifestyle for their sample were not performed as frequently as behaviours that required less effort. For example, individuals tended to switch off unnecessary lights in their home very often but switching to energy saving light bulbs and decreasing the temperature of the water was not favoured (Barr & Gilg, 2007, p. 367). Similarly decreasing the frequency of showers and baths were not performed as much as closing the tap whilst doing the dishes (Barr & Gilg, 2007, p. 367). According to Wang, Yam, and Tang (2013, p. 982) environmental awareness, knowledge as well as social responsibility also have an effect on green behaviour.

In terms of water conservation behaviour it has been stated that one's water consumption depends of several factors which include location, climate of the area, water limitations stipulated by the government and possessing appliances that use water in the household (Dolnicar & Hurlimann, 2010, p. no page). On the other hand Delorme *et al*. (2003, p. 29) state that factors such as one's ecological knowledge and values play a role in water conservation behaviour.

Steg and Vlek (2009, p. 311) found that one's moral motives as well as environmental concern are determinants of green behaviour. However environmentally friendly behaviour could also be performed due to an individual's selfish needs and wants as well. This could be true in terms of recycling as Mannetti, Pierro, and Livi (2004, p. 227) state that this ecological action could be performed by individuals due to an intellectual reasoning regarding the benefits of recycling in relation to nature, or it could stem from a more egoistic frame of mind that bases recycling behaviour on the rewards or penalties given to individuals.

In terms of household energy use, Sütterlin *et al*. (2011) state that there are several studies that produced conflicting results with regards to describing the green electricity consumer and they state that this is due to the fact that the aspects and procedures associated with energy use behaviour are very involved and extensive (Sütterlin *et al*., 2011, p. 8137). However it was also found that both altruistic and egoistic factors could play a role in energy saving behaviour as well. Ohler and Billger (2014, p. 1) state that factors that influence environmentally friendly energy behaviour and electricity consumption range from one's ecological beliefs and attitudes to the fact that environmental concern, and in particular one's altruistic concerns, have an impact on the use of green electricity. However other egoistic concerns can also play a role in motivating an individual's energy conservation behaviour such as a concern for one's own status, one's level of comfort as well as the effort expended to behave in such a manner (Steg, 2008, p. 4450).

In order to have a deeper grasp of the reasons behind environmental actions several theories have been developed by different researchers relating to the potential sources and motives of

environmental behaviour and each contribute to the understanding and the prediction of this behaviour. The most frequently used theories are discussed below.

2.1.4. Theories for understanding environmental behaviour

Bamberg and Moser (2007, p. 15) state that ecological behaviour is perhaps best described as a combination of one's self-interest, concern about the well-being of future generations, as well as concern about animals and the health of the earth. However it can also be said that green behaviour could originate from concerns that are not associated with the environment at all such as the need to save money or to increase one's own comfort and excitement (Lindenberg & Steg, 2007, p. 118). Three theories are frequently used to explain the motives of environmental behaviour namely the Theory of Planned Behaviour (TPB), the Norm Activation Theory of Altruism (NAT) and the Value-Belief-Norm (VBN) theory (Abrahamse & Steg, 2009, p. 712). These theories are briefly explained below.

2.1.4.1. Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) is one of the theories that has been regularly utilized over the past three decades to explain human social behaviour (Ajzen, 2011, p. 1113). This theory originates from the Theory of Reasoned Action developed by Fishbein and Ajzen and states that the basis of one's behaviour centres around intention to perform that behaviour (Ajzen, 1991, p. 181; Klockner, 2013, p. 1029). These intentions create a sense of motivation for the consumer and it is believed that the more powerful one's intention, the more likely it is that the behaviour will take place (Ajzen, 1991, p. 181). However these intentions depend on the level of control that one possesses to perform the behaviours, that is if he/she can choose at will to either behave or not to behave in a certain manner (Ajzen, 1991, pp. 181-182). Three elements make up the intentions to act and they are one's attitudes, subjective norms, which is the pressure felt from society to take part in certain behaviours and perceived behavioural control, which refers to how easy or difficult an individual believes a behaviour is to perform and this belief can stem from past experiences or expected obstacles (Abrahamse & Steg, 2009, p. 712; Ajzen, 1991, p. 188; Monroe, 2003, p. 116). See Figure 1.

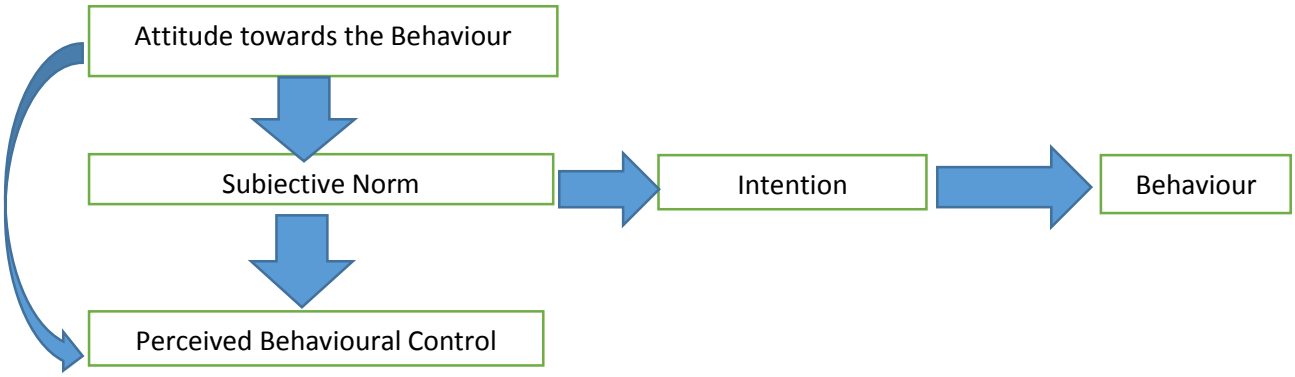


Figure 1: Theory of Planned Behaviour (Ajzen, 1991, p. 182)

The TPB postulates that individuals perform environmentally friendly behaviours if they have a favourable attitude towards them, if people that they value support their behaviour, and if the individual believes that they will be able to perform the behaviour (Klockner, 2013, p. 1029). Therefore this theory can be viewed as describing one's environmental behaviour as being a logical choice that one makes by examining the costs and benefits that the environmental action will have for themselves and is therefore a decision encouraged by self-interest or egoistic interests (Lindenberg & Steg, 2007, p. 124). The TPB has been utilized to explain various types of behaviours and it has been successful in assessing green behaviours such as recycling, energy saving, ecological transportation choices, conservation of water and food purchases (Abrahamse & Steg, 2009; Lindenberg & Steg, 2007, p. 124; Steg & Vlek, 2009, p. 311). While the TPB has been known to measure egoistic aspects of behaviour that deal with individuals placing their needs and effort as a priority, some individuals perform environmental behaviour due to moral motives that they possess. The next theory discussed specifically analyses these motives.

2.1.4.2. Norm Activation Theory (NAT)

In contrast to the TPB, the Norm Activation Theory (NAT) claims that ecological behaviour is determined by one's moral norms and this theory views environmental behaviour as being an altruistic act (Ibtissem, 2010, p. 130; Klockner, 2013, p. 1029). This theory was developed by Schwartz in 1972 and is also closely related to the Schwartz human values model created in

1994. According to Honkanen, Verplanken, and Olsen (2006, p. 421) there have been several studies that have utilized the Norm Activation Theory (NAT), sometimes called the Norm Activation Model (NAM) to describe and predict green behaviour. The basis of this model is that ecological actions of individuals are governed by their ethical obligation to obey their inner personal norms and these norms are triggered by the realization that they have the responsibility to protect their fellow man from harmful environmental conditions (Honkanen *et al*., 2006, p. 422). This theory states that an individual does not perform an environmental action because of the after-effects of their behaviour but rather because of their inner feelings of moral obligation (Godin, Conner, & Sheeran, 2005, p. 500). Therefore the model can be viewed as describing environmental behaviour as a selfless action whereby individuals sacrifice benefits for themselves for the betterment of the environment (Abrahamse & Steg, 2009, p. 712). In order for the model to be successful two factors have to be satisfied. Firstly consumers need to be aware of the effects that their actions have on the earth as well as on other people and secondly these consumers need to possess a feeling of individual responsibility for the effects of their actions (Abrahamse & Steg, 2009, p. 712).

This theory has been successful in determining energy saving behaviour (Abrahamse & Steg, 2009, p. 711). According to Stern *et al*. (1999, p. 83) the factor that drives the moral norms and altruistic behaviour of the NAT is the values that individuals possess. Altruistic values are one of the factors affecting environmental behaviour in another theory known as the Value-Belief-Norm (VBN) theory. The VBN theory is one of the most commonly used theories to predict green behaviour and therefore this theory was utilized as a theoretical framework for the current study. The VBN theory is discussed below.

2.1.4.3. Value-Belief-Norm Theory

By combining the values and personal norms associated with the NAT, with the environmental beliefs of individuals, Stern and his colleagues developed a theory known as the Value-Belief-Norm Theory (VBN) that utilizes five variables in a causal chain to explain and predict environmental behaviour, namely one's values, beliefs, awareness of consequences, ascription of responsibility and their personal norms (Stern *et al*., 1999, p. 85) as can be seen in the figure below.

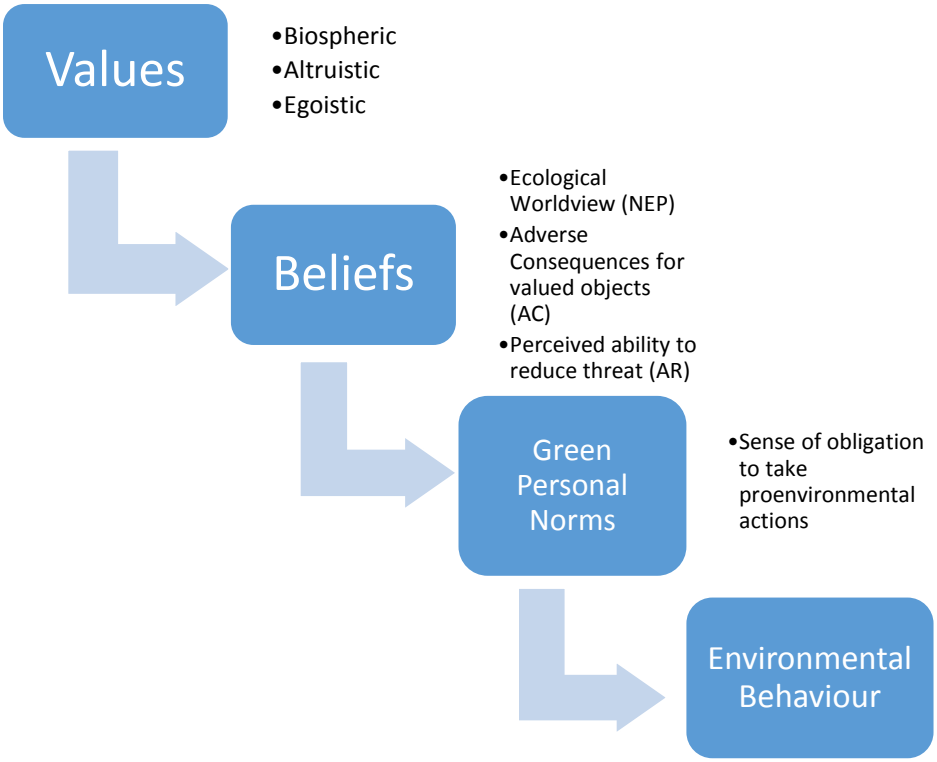


Figure 2: Value-Belief-Norm Theory (Steg, Dreijerink, & Abrahamse, 2005; Stern, 2000; Stern et al., 1999; Wells, Ponting, & Peattie, 2011)

According to Ziaei-Bideh and Namakshenas-Jahromi (2014, p. no page) this theory is the most extensively used by researchers for analysing ecological behaviours and values. The VBN is closely linked to the NAT as it builds on the same notions of the NAT (Klockner, 2013, p. 1029). It simplifies the NAT and includes the construct of personal norms in the mix of the three value structures (egoistic, altruistic and biospheric values) (Turaga *et al.*, 2010, p. 214). The values portion of the theory deals with opinions and objects that individuals believe to be significant, the beliefs section displays the general patterns of belief with regard to the worldview of individuals by utilizing the New Environmental/Ecological Paradigm (NEP), and finally the norms portion of the VBN theory illustrates the personal responsibilities and obligations individuals possess to behave in a certain way (Scherbaum, Popovich, & Finlinson, 2008, p. 821). The NEP is used as a measure of environmental beliefs in the current study and is discussed in detail later. The core of the VBN centres on the triggering of the personal norms by the awareness of the consequences (AC) and the ascription of responsibility (AR) that an individual possesses to behave in an environmentally friendly manner as this will thereafter

have an impact on green behaviour in individuals (Scherbaum *et al*., 2008, p. 821; Turaga *et al*., 2010, p. 214).

Although the purpose of the VBN theory is to describe and predict behaviour, rooted within it is a theory of environmental values and beliefs (Slimak & Dietz, 2006, p. 1691). The analysis of values and concern is significant in understanding environmentalism as these aspects of an individual are considered to be reasonably constant throughout the duration of one's life and aid in both filtering and amplifying environmental information on ecological matters (Slimak & Dietz, 2006, p. 1691). Due to these reasons the values and beliefs of the VBN theory are investigated in the current study to determine the specific environmental values and beliefs that individuals possess and the impact of these values and beliefs on environmental behaviour. Ibtissem (2010, p. 130) states that, the VBN theory has been utilized in many studies to explain ecological behaviours with some researchers only employing certain links of the causal chain in their studies (e.g. Kaiser, Hubner, & Bogner, 2005) while others choose to test all the sections of the theory (e.g. Steg *et al*., 2005). Since the overall aim of this study is to understand the environmental concerns of young adults by analysing their environmental values (egoistic, altruistic and biospheric) and their environmental beliefs, as well as the influence that these factors have on ecological behaviour, the VBN theory was chosen to be the best model to utilize. The decision to utilize only the first two sections of the VBN model (values and beliefs) has been made due to the fact that the researcher believes that by assessing these particular sections of the model this might yield more accurate and specific results as opposed to a more general outcome if the entire model was used.

In summation, by analysing the literature of ecological behaviour presented in the previous sections of this chapter one can ascertain that environmental behaviour is a multifaceted construct that can be viewed in many ways. One way to define this behaviour is by assessing the impact that an individual's actions has on the environment. Therefore any action that results in improving the environment in any way can represent an environmental behaviour. There are many examples of green behaviour. However the current study focuses on six groups of ecological behaviours namely household energy saving, water conservation behaviours, recycling, reusing items, purchasing green, organic and local products, and the support of environmental campaigns. Due to its complexity, many factors have an influence on green

behaviour such as the costs and benefits of performing the ecological actions, the ease of performing the behaviours, as well as the moral and egoistic motives of individuals, and the level of environmental concern individuals possess. The Theory of Planned Behaviour (TPB) assesses green behaviour from an egoistic point of view while the Norm Activation Theory (NAT) deals with the influence of moral motives on ecological actions. Lastly the Value-Belief-Norm (VBN) theory emphasized the importance that one's values and beliefs have on environmental behaviour. The VBN theory also suggests that one's environmental concerns are central to ecological perceptions (Slimak & Dietz, 2006, p. 1691), thus highlighting the importance of one's environmental concerns and the impact it has on green behaviour. The following section therefore presents an intense analyses of the environmental concerns of individuals.

2.2. Environmental Concern

Introduction

This section firstly outlines the definition of environmental concern and is followed by a brief discussion of the relationship between environmental concern and environmental behaviour. Thereafter the factors affecting green concerns are outlined. Royne *et al*. (2011, p. 333) state that by conducting an in-depth examination of the aspects of environmental concern this will assist in determining the significant elements for promoting environmental issues to individuals. The current study gives an in-depth examination of environmental concerns by assessing two aspects that make up green concerns being firstly the environmental values of individuals and secondly the environmental beliefs of individuals. An analyses of the three values orientations (egoistic, altruistic and biospheric values) are discussed, followed by an examination of the methods used in the measurement of these values, with particular attention being placed on the Environmental Concerns (EC) scale. Thereafter the second construct of environmental concern is analysed which is environmental beliefs. This section also examines the measurement methods used to determine ecological beliefs, particularly the New Ecological Paradigm (NEP) scale.

2.2.1. Definition of Environmental Concern

Over the past four decades ecological concern has been a significant subject and in recent years has become more crucial due to concerns today about sustainability and healthy living (Royne *et al*., 2011, p. 329). The term environmental concern can be described in many ways. Environmental concern can be defined as viewing ecological threats as serious, championing green governmental initiatives to promote the quality of the environment, and by performing environmentally friendly behaviours to enhance environmental quality (Schaffrin, 2011, p. 16). Concern for the environment has also been viewed as an assessment of or attitudes towards facts, the behaviour of oneself, and the behaviour of other individuals with regards to environmental consequences (Fransson & Garling, 1999, p. 370). Finally regarding one's environmental beliefs the term 'environmental worldview' has been frequently utilized to describe the association between human beings and nature (Schultz *et al*., 2005, p. 458). Therefore environmental concern can represent distinctive attitudes that establish intentions or it could refer to one's value orientations (Fransson & Garling, 1999, p. 370).

The concept of environmental concern is known to have an impact on the different types of green behaviours from research conducted around the world. The relationship between environmental concern and environmental behaviour can be extremely complicated with many different aspects affecting the two constructs (Gifford & Nilsson, 2014, p. 141).

2.2.2. Environmental Concern and Environmental Behaviour

Bamberg (2003, p. 21) states that the fundamental notion that was developed in the 1970's was that the level of ecological concern that an individual possesses has a strong direct effect on green behaviours such as using energy efficient modes of transport, consuming green products, practicing household energy saving and recycling. This assumption has been utilized since then by researchers with the majority of studies focusing on creating a more accurate definition of ecological concern, determining the elements that affect this concern, and discovering evidence that point towards a strong correlation between green concern and green behaviour (Bamberg, 2003, p. 21). According to Royne *et al*. (2011, p. 329) and Zhou (2013, p. 454) society's green concern is imperative as it creates the first step that is required to improve the state of the

environment and will lead to consumers embracing environmentally friendly behaviours. However Steg (2008, p. 4450) states that when it comes to certain behaviours such as energy conservation behaviour the actions of individuals frequently do not correlate with their concerns, as energy consumption still continues to increase in western countries even though levels of environmental concerns are high. This is known as the attitude-behaviour gap and illustrates that individuals who show concern for the environment do not perform actual environmental behaviour such as purchasing green products (Kilbourne & Pickett, 2008, p. 885). Therefore the current study aims to fill this gap in knowledge by examining two aspects of environmental concern (values and beliefs) in order to gain a better understanding of environmental behaviour. Gifford and Nilsson (2014, p. 151) state that to accurately understand the relationship between environmental concern and environmental behaviour is an extremely difficult task (Gifford & Nilsson, 2014, p. 151). Zhou (2013, p. 454) agrees with this and states that ecological concern is a multifaceted topic that is determined by a mix of elements. Due to the apparent gap in knowledge between one's concerns and one's environmental behaviour and the importance of understanding the different elements that affect environmental concern in individuals, the following section sheds more light on the construct of green concern by analysing the different factors that have an influence on it.

2.2.3. Factors Affecting Environmental Concern

Hamilton and Safford (2014, p. 58) state that some of the aspects that have an impact on environmental concern include factors such as gender, age and education levels as well as internal viewpoints such as one's values. Givens and Jorgenson (2013, p. 421) state that factors such as affluence and environmental degradation have an effect on environmental concern. The affluence description claims that concern stems from a form of egoistic value that involves individuals only concentrating on environmental matters once their own material needs are taken care of (Givens & Jorgenson, 2013, p. 421). This is more evident in developed countries due to the ease of attaining one's materialistic necessities as compared to difficulties experienced in developing countries. Therefore it can be said that environmental concern is more evident in affluent, developed countries (Givens & Jorgenson, 2013, p. 421). However Mostafa (2007a, p. 225) determined that this does not apply in Egypt as the findings in his

study illustrated that Egyptian individuals actually possessed a high level of environmental concern despite Egypt being a developing country.

According to Barr and Gilg (2007, p. 363) the fundamental basis of environmental behaviour is the fact that one's values are closely related to one's behaviour. Results from research conducted by Schultz *et al*. (2005, p. 457) that involved six countries from around the world found that there is strong evidence that values are related to the environmental concern of individuals. It is stated that in order to promote ecological behaviour it is important to identify which aspects of the environment are valued the most by consumers (Royne *et al*., 2011, p. 333). The current study investigates the different values underlying environmental concern in order to gain a better understanding of one's environmental behaviour.

There have been many researchers who state that the concept of environmental concern is made up of many elements and can be measured by using several methods. The ecological concerns of an individual are known to be linked to their beliefs (Kim, 2011, p. 68; Kim & Choi, 2005, p. 593) and it is stated that when examining the construct of environmental concern one can combine other constructs such as environmental values and environmental beliefs to gain a greater understanding of the concept (Best & Mayerl, 2013, p. 708). Furthermore according to Best and Mayerl (2013, p. 693), most of the previous studies analysing environmental concern have only utilized one construct, be it either values, attitudes, or beliefs, to measure ecological concern while Jurin and Fortner (2002, p. 374) state that in relation to environmentalism, values and beliefs have been given little attention. Therefore the current study examines environmental concern with the use of two of the above mentioned constructs, that is the value orientations of an individual as well as the environmental beliefs that they hold. Environmental values can thus be divided more specifically into three categories: the egoistic values, altruistic values and biospheric values of an individual and these three groups originate from one's value orientations (Hansla *et al*., 2008, p. 1). The following section expands on the value orientations of individuals and the methods used to measure these values. Thereafter environmental beliefs are discussed.

2.2.4. Value Orientations

The values that one possesses can be described as the prominent codes or standards that direct and influence one's way of life (Hansla *et al*., 2008, p. 2). Values are known to be reasonably constant in an individual and will tend to prevail in most situations (Kilbourne & Pickett, 2008, p. 887). Value orientations are sequences of fundamental beliefs and they facilitate the relationship between conceptual values and distinct attitudes (Larson, 2010, p. 902). Furthermore the connection between values and green concern is controlled by the level of awareness of the adverse effects to valued objects for individuals (Schultz, 2001, p. 335).

Values have been grouped by some researchers in the form of anthropocentric values and eco-centric values that can be viewed as being a part of one's environmental worldview (Wynveen, Connally, & Kyle, 2013, p. 31). Anthropocentric values are created based on the view that mankind has dominance and superiority over nature and the environment and therefore can utilize and abuse any resource available to them (Ibtissem, 2010, p. 131; Wynveen *et al*., 2013). Additionally this outlook views humanity as separated and independent to the environment and this viewpoint may result in environmental degradation as the overuse of natural resources and pollution are viewed as being merely an ordinary consequence of economic growth (Ibtissem, 2010, p. 131). These views can be categorized as values that are self-centred (Snelgar, 2006, p. 87). In contrast, the eco-centric values (sometimes referred to as biocentric values) of an individual are developed on the basis that mankind is a fundamental part of nature and has to find ways to live in harmony with the elements of the earth (Ibtissem, 2010, p. 131; Wynveen *et al*., 2013, p. 31). These values result in individuals thinking and caring for the environment independently from their own personal interests and therefore can be classified as philanthropic or pro-environmental values (Ibtissem, 2010, p. 131; Snelgar, 2006, p. 87; Steg *et al*., 2005, p. 416). These views can be determined by the use of the NEP scale that the current study is utilizing.

A more common way of defining values is by Schwartz's four groupings of values namely, Conservation, Self Enhancement, Openness to Change and Self-Transcendence (Gifford & Nilsson, 2014, p. 144; Krystallis, Vassallo, & Chryssohoidis, 2012, p. 1439; Nordlund & Garvill, 2002, p. 743). Conservation and Self-Enhancement represent more of a self-centred,

value orientation that does not usually encourage participating in green behaviours while Openness to Change and Self-Transcendence relate to selfless values that promote environmental behaviour (Johansson, Rahm, & Gyllin, 2013, p. 305). These four overall groupings of values have a subset of values that fall under each. The four main values along with their sub groups of values are discussed below.

Self-Transcendence: According to Klockner (2013, p. 1030) self-transcendence is the principal value orientation for other sub-categories of values such as benevolence and universalism. Benevolence is the protection and improvement of the well-being of people that one is in constant contact with (Cieciuch, Döring, & Harasimczuk, 2013, p. 627; Stakhovych, Bijmolt, & Wedel, 2012, p. 815). Universalism is known as empathy, gratitude, open-mindedness and protection for the well-being of all individuals as well as nature (Cieciuch *et al*., 2013, p. 627; Stakhovych *et al*., 2012, p. 815). Self-transcendence refers to an overall value that views everyone as equal and shows concern for the well-being of others and the environment (Klockner, 2013, p. 1030; Steg *et al*., 2005, p. 416). Self-transcendence should have a positive correlation with environmental behaviour as well as the beliefs from the New Environmental Paradigm (NEP) (Klockner, 2013, p. 1030; Steg *et al*., 2005, p. 416). It is argued that there are two measurements for ecological behaviour in self-transcendence value orientation being firstly the philanthropic values that deal with the concern held for the well-being of other human beings, and secondly environmental values that relate to concern for nature and the earth itself (Klockner, 2013, p. 1030). Therefore it can be said that individuals who hold philanthropic views will protect the environment for the sake of other humans, however those that hold environmental values will protect the environment for the environment itself and not for the benefit of other people (Klockner, 2013, p. 1030)

Self Enhancement: This set of values deal with the main concerns revolving around one's personal benefits (Steg, Bolderdijk, Keizer, & Perlaviciute, 2014, p. 107). According to Pinto, Nique, Añaña, and Herter (2011, p. 126) individuals who embody self enhancement values tend to be more independent, are not persuaded easily by other people and this will often have the outcome of less frequent environmental behaviour. It is also stated that there is a higher priority and concern given to personal outcomes and individual happiness in people who possess this overall value group (Lindeman & Verkasalo, 2005, p. 171). Self enhancement

values are known as conceited values that highlight characteristics of personal authority and accomplishment (Rosario, Carmen, & Biagio, 2014, p. 20). The subgroups of values associated with self enhancement are power and achievement (Cieciuch *et al*., 2013; Stakhovych *et al*., 2012, p. 818). Power is the importance that is placed on social status and reputation as well as supremacy and power over other individuals and possessions (Cieciuch *et al*., 2013, p. 627; Stakhovych *et al*., 2012, p. 815). Achievement refers to abiding by social standards to gain individual success (Cieciuch *et al*., 2013, p. 627; Stakhovych *et al*., 2012, p. 815).

Openness to Change: This value group is related to a desire to pursue one's personal, emotional and intellectual well-being in changeable and unknown manners (Borg, Groenen, Jehn, Bilsky, & Schwartz, 2011, p. 2; Lindeman & Verkasalo, 2005, p. 171). This value group is made up of the subgroups of values namely self-direction, stimulation and hedonism (Cieciuch *et al*., 2013, p. 627; Stakhovych *et al*., 2012, p. 818). Self-direction is referred to personal thinking and behaviour dealing with individual choice, development and exploration (Cieciuch *et al*., 2013, p. 627; Stakhovych *et al*., 2012, p. 815). Stimulation refers to the enthusiasm, innovation and the tests in life while hedonism is the liking and intense gratification for oneself (Cieciuch *et al*., 2013, p. 627; Stakhovych *et al*., 2012, p. 815).

Conservation: This value group is associated with the motive to maintain the way things are currently so that this consistency creates a form of assurance in terms of the connection with other people, establishments and traditions (Borg *et al*., 2011, p. 2; Lindeman & Verkasalo, 2005, p. 171). Conservation is made up of the subgroups of values namely tradition, security and conformity (Cieciuch *et al*., 2013, p. 627; Stakhovych *et al*., 2012, p. 818). Tradition deals with having respect, dedication and approval for traditional customs and ideas associated with religion and culture; security is the protection, harmony and steadiness of society, relationships as well as oneself; while conformity refers to the restriction of behaviour, feelings and urges that have the ability to harm or disturb other individuals and that go against social norms (Cieciuch *et al*., 2013, p. 627; Stakhovych *et al*., 2012, p. 815).

Taking the above into consideration later Stern *et al*. (1999) took the self-transcendence items of Schwartz and Bilsky (1990) mentioned above and divided them into two groups, altruistic

values and biospheric values and classified the self-enhancement items as egoistic values (Snelgar, 2006, pp. 88-89).

Snelgar (2006, p. 87) states that any person can possess different degrees of all three value orientations (egoistic, altruistic and biospheric). All three orientations deal with concern for the environment but the basis of each stems from different principle values (Schultz *et al*., 2005, p. 459). The egoistic, altruistic and biospheric values and concerns of individuals have been known to be the root of ecological concern if it is believed that adverse consequences to objects of value will occur due to environmental damage (Snelgar, 2006, p. 87). Therefore taking this into account, environmental concerns are said to be a direct product of the three types of values (Schultz, 2001, p. 335). Due to the importance that is placed on the effect that value orientations have on environmental concern, the current study includes the analyses of the egoistic, altruistic and biospheric values of young adults as one of two methods of interpreting ecological concern. These three value orientations are discussed next.

2.2.4.1. Egoistic Values

Behaviour that is the result of egoism occurs when an individual displays philanthropic actions with the final goal being to benefit themselves or to unintentionally show care towards others in order to obtain the goal of self-fulfilment (Batson, Ahmad, & Tsang, 2002, p. 434; Stern *et al*., 1999, p. 84). Individuals that possess egoistic values tend to only protect the environment if their personal benefits outweigh their personal costs of performing the environmental action (Cho, Bonn, & Kang, 2015, p. 7; Newton, Newton, Salzberger, & Ewing, 2015, p. 353). Steg *et al*. (2014, p. 107) state that egoistic values encourage individuals to concentrate on protecting or enhancing their own resources. This could be in terms of their health, standard of living, wealth and convenience (Tan, Hong, & Lam, 2015, p. 235). It was noted by Hofmeister-Tóth, Kelemen, and Piskóti (2010, p. 11) that when it comes to environmental matters and egoism, individuals with high ego levels believe that they have more environmental knowledge than they actually possess and they have more faith in mankind's technical abilities to solve environmental problems.

According to Lindenberg and Steg (2007, p. 127) several environmentally friendly behaviours such as energy saving and buying green products necessitate individuals to restrict their egoistic values to protect the environment. Anthropocentric values fall under egoistic values and so do Schwartz's values of Self Enhancement and Conservation along with their respective subgroups being power and achievement, and tradition, security and conformity. Although it may seem appealing to act solely in the interest of oneself such as using one's car regularly or purchasing affordable non-organic food that is easily available, in the long term humanity will benefit more if every individual behaved in an environmentally friendly manner and displayed altruistic values (Lindenberg & Steg, 2007, p. 127).

2.2.4.2. Altruistic Values

Individuals who embody altruistic values feel an overall sense of concern for all of humanity and they are mostly concerned about the negative impact that environmental issues have on other people (Newton *et al*., 2015, p. 353; Onur, Sahin, & Tekkaya, 2012, p. 272; Schultz *et al*., 2005, p. 459; Tan *et al*., 2015, p. 235). In contrast to egoistic values, altruistic values are evident when individuals behave in an environmentally friendly manner based on the costs and benefits to other individuals or society, not themselves (Lee, Kim, Kim, & Choi, 2014, p. 2098; Paladino & Ng, 2013, p. 123). According to Schultz *et al*. (2005, p. 460) if an individual regards the well-being of another person, if they are knowledgeable that this person can be potentially harmed and if the individual believes he is accountable for this harm, then there is a greater chance that the individual will help the other person. In a study conducted by Slimak and Dietz (2006, p. 1696) it was found that the higher one's altruistic values, the greater is one's concern associated with ecological risks.

Altruistic concerns fall into the category of Self-transcendence and Openness to Change and so do the subgroups of each value as well, that is benevolence and universalism, and self-direction, stimulation and hedonism respectively. Along with philanthropic principles being held towards other human beings, altruism in an individual can also involve selfless values and concerns towards the earth and the environment (Stern *et al*., 1999, p. 85). The third component of the value orientations is the biospheric values of individuals (Steg *et al*., 2014, p. 107).

2.2.4.3. Biospheric Values

An individual possesses a biospheric value orientation when they focus most of their attention, efforts and concern on all living things of this earth such as the different species of animals and plants when threatened by environmental problems (Newton *et al*., 2015, p. 353; Onur *et al*., 2012, p. 272; Schultz & Zelezny, 1999, p. 263). These values deal with individuals showing concern towards non-human species on earth (Tan *et al*., 2015, p. 235; Turaga *et al*., 2010, pp. 213-214). If a person's environmentally friendly attitude is created in order to protect the nature of the earth it will be categorized as the biospheric values of the individual (Ojea & Loureiro, 2007, p. 809; Soyez, 2012, p. 625). It was found that of all three orientations, biospheric values are intensely felt in both developed and developing countries of the world (Steg *et al.*, 2014). Biospheric concerns relate to the eco-centric value orientation that was previously mentioned (Soyez, 2012, p. 625).

In terms of Schwartz's values, biospheric values fall under the value groupings that altruistic values fall under that were mentioned above. According to Lee and Jan (2015, p. 195) biospheric values play a significant role in affecting green behaviour and ecological beliefs of individuals. Values of a biospheric nature are closely linked to the beliefs of the New Environmental Paradigm (NEP) and it is found to be positively related to the beliefs of the NEP (Turaga *et al*., 2010, p. 215). However Gadenne *et al*. (2011, p. 7685) claim that it is in fact all three value orientations that affect one's belief in the NEP. Individuals who describe themselves as possessing biospheric values report holding more concern about the environment and take part in more environmental behaviours (Gifford & Nilsson, 2014, p. 144).

The current study utilizes the three value orientations explained above as one form of measuring environmental concern of individuals, particularly in young adults, in order to better understand what factors affect environmental behaviour. Over the years several methods and scales have been developed in order to measure the values that one possesses, with each method grouping values in different ways. Some of these methods and scales are explained below.

2.2.4.4. Measurement Methods of Values

According to Schultz and Zelezny (1999, p. 256) the original value scale developed by Schwartz mentioned above consisted of 56 items that were categorized into the self-transcendence or self-enhancement groups. Later this scale was adapted by developing ten subgroups of values to measure the four main groups of values of Schwartz (Openness to Change, Self-Transcendence, Conservation and Self Enhancement) namely benevolence, universalism, self-direction, stimulation, hedonism, achievement, power, security, conformity, and tradition as mentioned previously (Cieciuch *et al*., 2013, p. 626). There are also value items under each subgroup that is associated with the group.

When dealing with just the egoistic, altruistic and biospheric values of an individual many researchers use a shortened version of the value items with 12 items from this scale being used (4 items in each group) namely: authority, wealth, social power, influential (egoistic); social justice, equality, a world at peace, helpful (altruistic); and preventing pollution, protecting the environment, respecting the earth, and unity with nature (biospheric) (Steg *et al*., 2005, p. 418).

Although some researchers articulate that both biospheric and altruistic concerns have an influence on pro-environmental activities there are other researchers who state that it is very difficult to differentiate and distinguish the two types of concerns. In a study conducted by Stern and other researchers in 1995 the researchers utilized Schwartz value items of self-enhancement and self-transcendence on adults in the USA and discovered that the altruistic and biospheric items of the latter group loaded onto one factor during their factor analysis (Snelgar, 2006, p. 89; Stern *et al*., 1999, p. 87). Therefore it was concluded that the biospheric and altruistic value orientations cannot be separated as individual values and should be taken as a single general orientation (Snelgar, 2006, p. 89). This could be possible due to the fact that both the altruistic and biospheric values were selected from the same factor of self-transcendence from Schwartz's value model (Schultz & Zelezny, 1999, p. 257). However the findings of research conducted by Schultz (2000, p. 391) indicates that there is indeed a clear distinction between these two value orientations, in fact all three orientations are evidently distinguishable. The same result was determined in another study conducted by Schultz that consisted of four different studies that analysed the structure of environmental concern and

distinctly differentiated between values relating to oneself, other people and the biosphere (Schultz, 2001, p. 327). Research conducted by Garling, Fujii, Garling, and Jakobsson (2003) that measured the egoistic, altruistic and biospheric awareness of Swedish individuals also demonstrated the distinction of all three value orientations very clearly (Garling *et al*., 2003, p. 8). This illustrates that biospheric values are separate and distinctive from the other two value orientations (Garling *et al*., 2003, p. 8). Results from other studies also support to this finding (e.g. Albayrak, Aksoy, & Caber, 2013; De Groot & Steg, 2007; De Groot & Steg, 2008).

The subsets of values mentioned above have been utilized in many different studies and with the use of several different methods. Some researchers have applied the three groups of values (egoistic, altruistic and biospheric) with different versions of Schwartz's value items (e.g. De Groot & Steg, 2008; Hansla *et al*., 2008; Kennedy *et al*., 2009; Nordlund & Garvill, 2002; Sahin, 2013; Schultz *et al*., 2005; Schultz & Zelezny, 1999; Steg, De Groot, Dreijerink, Abrahamse, & Siero, 2011; Steg *et al*., 2005). In the VBN theory Stern *et al*. (1999, p. 87) utilized the shortened version of Schwartz's value scale to distinguish between egoistic, altruistic and biospheric values.

However some studies have also employed a recently developed and popular scale to measure the three value orientations of environmental concern known as the Environmental Concerns (EC) Scale, which is sometimes referred to as the Environmental Motives Scale (EMS) that was developed by Schultz (2000) (Bruni *et al*., 2012, p. 1). The Environmental Concerns Scale has been utilized in many research studies to explain the environmental concerns and behaviour of individuals (e.g. Bruni *et al*., 2012; Johansson *et al*., 2013; Milfont & Duckitt, 2010; Onur *et al*., 2012; Schultz, 2000, 2001; Schultz *et al*., 2005; Snelgar, 2006). Therefore this particular scale was chosen to be used in the current study in order to measure the levels of the three environmental values of young adults. The details pertaining to this scale are explained below.

2.2.4.5. The Environmental Concerns (EC) Scale

The origin of this scale was the result of an actual study conducted by Schultz (2000) that assessed the environmental concern levels of university students. The respondents were asked

to complete an open-ended question as to what concerned them the most about environmental problems and from the answers obtained, three clear groups could be established, being egoistic, altruistic and biospheric concerns (Schultz, 2000, pp. 395-396). This scale initially consisted of 21 items but was thereafter reduced to the 12 most important concerns of individuals (Schultz, 2000, pp. 395-396). As compared to other scales, the EC scale has included the association with nature and has also included the importance of animals (Snelgar, 2006, p. 90). This scale consists of 12 items that relate to one's concern about environmental issues and respondents are required to rate their levels of concern for each item (Johansson *et al*., 2013, p. 300). These 12 items comprise the three categories of concern: egoistic, altruistic and biospheric. Under egoistic concerns are concerns relating to "me, my lifestyle, my future and my health", altruistic concerns comprises of concerns relating to "all people, people in my community, Children, My Children" and biospheric concerns relate to "plants, marine life, animals, birds" (Schultz, 2000, p. 396).

Previous studies that have utilized this scale have measured the level of concern by using a 7-point Likert scale from 1 (not important) to 7 (supreme importance) e.g. (Bruni *et al*., 2012; Johansson *et al*., 2013; Schultz, 2001; Snelgar, 2006). The EC scale has successfully determined the three categories of environmental concern in studies (e.g. Bruni *et al*., 2012; Schultz, 2000, 2001; Schultz *et al*., 2005). This scale has also been known to possess a better factor structure and more reliable sub-scales than other scales that measure environmental concern (Snelgar, 2006, p. 90). Due to this fact this scale is utilized in the current research to measure environmental values.

As mentioned earlier in order to present an in-depth examination of environmental concerns along with the analysis of environmental values, the environmental beliefs of individuals need to be assessed as well. According to Kilbourne and Pickett (2008, p. 887) the values of an individual pave the way for the beliefs that they possess and aid in the development of beliefs. As mentioned earlier, the Value-Belief-Norm theory developed by Stern *et al*. (1999) stipulates that one's values have an effect on one's beliefs and thereafter these beliefs will influence the individual's personal norms, which in turn will have an impact on their environmental behaviour (Stern *et al*., 1999, p. 83). It was also stated that an inconsistency or gap exists between ecological beliefs of people and their actual actions towards the environment therefore

the presence of this gap creates a need to understand the green beliefs held by individuals regarding environmentalism (Bertoldo *et al*., 2013, p. 437; Stern, 2000, p. 408). Due to the evident imbalance between nature and humankind it is of importance to understand why individuals behave the way they do (Hawcroft & Milfont, 2010, p. 143) Therefore the current study also analyses and examines the environmental beliefs of individuals as it clearly plays a pivotal role in determining and understanding one's environmental concern and environmental behaviour.

2.2.5. Environmental Beliefs

Jurin and Fortner (2002, p. 374) state that beliefs are deductions made about fundamental states of expectancy. According to Bang, Ellinger, Hadjimarcou, and Traichal (2000, p. 454) the source of one's beliefs is the knowledge that they possess and what they believe to be correct. Ecological beliefs could become more prevalent if environmental marketing materials such as advertisements highlighted the emotional and rational side of environmentalism to consumers (Mostafa, 2007a, p. 225).

Environmental beliefs in a general sense refers to the association between human beings and their environment and most of the time this is governed by traditional knowledge about the environment (Kilbourne & Pickett, 2008, p. 887). General beliefs can also be described as being made up of value indicators that individuals are grouped into (Olofsson & Öhman, 2006, p. 769) while specific beliefs relate to the presence of ecological issues such as global warming, the reduction of the ozone layer and the shortage of water (Kilbourne & Pickett, 2008, p. 887). The current study focuses on general beliefs of individuals. For the measurement of general beliefs the New Environmental Paradigm/New Ecological Paradigm (NEP) scale is regularly utilized by many researchers (Hawcroft & Milfont, 2010, p. 144; Kilbourne & Pickett, 2008, p. 887) and therefore the current study utilizes it as a measurement tool as well.

2.2.5.1. Measurement of Environmental Beliefs

The New Environmental/Ecological Paradigm

The New Environmental Paradigm, which has recently been updated to the New Ecological Paradigm (NEP), is probably the most widely employed scale in terms of environmentalism and the prediction of environmental behaviour (Stern *et al*., 1999, p. 85). Similar to the Norm Activation Theory (NAT), it is linked to altruistic values that individuals feel for the environment and towards nature (Bostrom, Barke, Turaga, & O'Connor, 2006, p. 26). It can also be viewed as a scale that assesses the biospheric values as it is utilized to measure the level of eco-centrism of individuals and it assesses the level of support that individuals have of an ecological worldview (Price, Walker, & Boschetti, 2014, p. 9; Snelgar, 2006, p. 88). Eco-centrism is a significant belief structure that involves the values associated with nature, the earth, and all living things, which is collectively known as the biosphere (Zelezny *et al*., 2000, p. 446). The NEP scale was developed by Dunlap and Van Liere in 1978 and focuses on the beliefs that people possess concerning mankind's ability to offset the balance of nature, the belief that humans have restrictions for growth and the belief that humans have the right to control nature (Dunlap, Van Liere, Mertig, & Jones, 2000, p. 427). It measures the awareness of a very broad range of adverse environmental consequences (Stern *et al*., 1999, p. 85). The aim of this scale is to determine the overall connection that is felt between mankind and the environment with a higher score representing a feeling of responsibility to preserve natural resources and a lower score representing a viewpoint that the abuse of natural resources is acceptable (Bostrom *et al*., 2006, p. 26; Hawcroft & Milfont, 2010, p. 144).

The NEP is frequently used as one of the measurement tools in the VBN theory and it sometimes serves a dual purpose, to measure environmental beliefs and also to measure environmental concerns of individuals (Hanson, 2013, p. 62; Hawcroft & Milfont, 2010, p. 144; Snelgar, 2006, p. 88). When incorporated into the VBN theory, the ecological worldview is thought to be the basis of beliefs that environmental problems will have a negative effect, or adverse consequences (AC) on valued objects (Snelgar, 2006, p. 88). Due to environmental threats that are increasing around the world it has become more common for people to acknowledge that human actions have an effect on ecosystems and on the balance of nature, on which we are dependent for survival, and therefore there has been a re-evaluation of the

worldview and the relationship that individuals have with the physical environment (Dunlap *et al*., 2000, p. 426). The NEP scale plays a significant role in measuring human beliefs as it reveals whether the relationship between humans and the environment is a harmonious one in which people are one with the world and try to protect it, or whether a dominating relationship exists in which humans believe they have the right to abuse and alter the earth (Hawcroft & Milfont, 2010, p. 144). The NEP is not a solitary paradigm but is rather thought of as also being closely associated with the values of individuals (Best & Mayerl, 2013, p. 694). When viewed in the context of the VBN theory, values are categorized as being phenomena that have internal origins in an individual, whereas the concept of beliefs is thought to be affected by external influences, for example the knowledge an individual possesses regarding whether their actions will ultimately have an impact on the situation under analyses (Gabler *et al*., 2013, p. 162) A detailed discussion outlining the questions in the NEP and their significance is discussed in the Methodology chapter.

It is stated by Royne *et al*. (2011, p. 331) that a gap exists between individuals who claim they are environmentally friendly and their actual behaviour and it is believed that if the environmental beliefs of individuals are stronger, this could increase their actual environmental behaviour and thus close this gap. According to Gabler *et al*. (2013, p. 160) the existence of this disparity increases the need to examine these constructs. The following section therefore highlights past research dealing with the environmental concerns, values, beliefs, and green behaviour of individuals in order to gain a better understanding of the relationship between these constructs.

2.3. Examination of Past Research on Environmental Concern (Environmental Values and Environmental Beliefs) and Environmental Behaviour

Introduction

This section firstly examines past research relating to the relationship between environmental concern and environmental behaviour and this is followed by an analysis of past research

relating to the association of the three environmental values (egoistic, altruistic and biospheric values) with environmental behaviour. Thereafter previous findings pertaining to the connection between environmental beliefs and environmental behaviour is discussed. The section concludes with an analysis of environmental studies that took place in South Africa or that relate to South African individuals so as to gain a greater understanding of environmentalism in a local context. The apparent gap in knowledge with regards to the relationship between environmental concern (values and beliefs) and environmental behaviour is identified within the past research analysed to provide evidence for the need for the current study.

2.3.1. Past Research relating to Environmental Concern and Environmental Behaviour

The following section critically discusses results of past studies that relate to environmental concern and behaviour in order to understand what is known about the relationships between these constructs. It also identifies the gaps in knowledge that still exist between environmental concern and behaviour and discusses how the current study aims to fill these gaps. Due to the fact that the present study utilizes university students as the sample population, this section is structured by dividing the past findings by results obtained from samples of the general population and thereafter by student samples to gain a better understanding of the differences between the two groups.

2.3.1.1. Research based on the General Population

It is believed that consumers who have a pre-existing concern towards environmental matters will already possess an internal drive to find and purchase ecological products and will naturally be more interested in environmentally friendly promotions (Davari & Strutton, 2014, p. 571). A concerned individual will also tend to search for environmental alternatives or green versions of regular products, will make the effort to visit certain stores to find green products and will be more willing to pay higher prices to obtain these green products (Davari & Strutton, 2014, p. 571). These results were confirmed in a study conducted by Davari and Strutton (2014, p. 582) that examined the general population of residents in the USA and illustrated that

ecological campaigns and promotions for products were better understood by consumers who were already concerned about environmental threats and those who search for solutions to protect the environment. Although this study utilized the NEP scale to measure the environmental concern of individuals, the researchers only focussed on behaviours relating to the branding and the purchasing of green products and did not analyse the everyday environmental activities of individuals. Therefore the current study examines these everyday green actions of individuals such as energy and water use to gain a greater understanding of these behaviours in relation to green concern. Another study that utilized the general population of American citizens was by Kilbourne and Pickett (2008, p. 891) that examined the relationships between environmental beliefs, environmental concern and green behaviour and found that there is a strong correlation between the environmental concern and green behaviour of individuals (Kilbourne & Pickett, 2008, p. 891). Even though this study used environmental concern and behaviour scales that were similar to those utilized in the current study, Kilbourne and Pickett (2008) conducted their study in a first world country therefore there is still the question of whether the results obtained by them would be the same in a developing country. The current study aims to determine this by utilizing individuals in South Africa.

The findings of the studies above are similar to a study conducted in Greece by Tsakiridou, Boutsouki, Zotos, and Mattas (2008, p. 163) who drew a sample from the Greek population and found that ecological concern as well as concerns towards one's health were convincing factors that contributed to the purchase of organic food products. However when analysed carefully the study revealed that a higher percentage of the sample were in fact more concerned about the safety of the food that they consume, the fact that organic food is free from harmful chemicals and that organic food is believed to be healthier, while a lower percentage indicated that the consumption of organic products protect the environment (Tsakiridou *et al*., 2008, p. 163). Therefore these findings can be viewed as illustrating a lack of concern towards the environment itself and more of a concern towards one's own well-being that leads to environmental behaviour. Therefore the current study examines several different green behaviours to determine the role that egoistic values and concerns play on the green actions of individuals.

The result above supports the findings of a study conducted by Said *et al*. (2003, p. 309) that analysed the levels of green concern amongst educators in Malaysia. The sample illustrated a reasonable level of concern, however within the spectrum of concerns tested the aspects relating to the health of individuals were the highest ranked while concern for waste in the environment ranked the lowest (Said *et al*., 2003, p. 309). Taking this into consideration, this study found that green behaviours such as water conservation, energy saving, the use of environmentally friendly fuel and the purchasing of ecological products were more common amongst the sample while recycling was the least common (Said *et al*., 2003, p. 309). This differs from the results found by Hanson (2013, p. 66) that utilized the general population of Canadian and American individuals as their sample, as their research found that green concern has a direct impact on the recycling habits of consumers as well as green purchasing behaviour. The results from the research mentioned above illustrates that egoistic values or concerns are a dominating factor that influences one's environmental behaviour. However there are limitations to these studies as Tsakiridou *et al*. (2008) concentrated solely on individuals' perspectives relating to organic products thus the results obtained do not deal with green concern in relation to other environmental activities. Said *et al*. (2003) dealt only with Malaysian educators as their sample population, and the study conducted by Hanson (2013) concentrated on individuals from the USA and Canada, both first world nations, as well as only measured three green behaviours of individuals to obtain results. Therefore there is still a need to understand the relationship between environmental concern and green behaviour more accurately and to identify whether egoistic elements are in fact dominant in individuals by analysing a wide range of factors that make up this concern with a variety of green behaviours. There is also a need to grasp this relationship in terms of a developing country, particularly in an African context. The current study measures and examines environmental concern by utilizing both values and beliefs and analyses 11 different green behaviours in order to gain a deeper understanding of the relationship between the two constructs in a South African context.

Although using the general population as sample individuals can create a representative sample for studies being conducted, the use of university students as research subjects has been a technique that has been employed around the world for many years due to students being easily accessible to the researcher and representing a consistent group of individuals (Mostafa, 2007a, p. 222). According to Vermeir and Verbeke (2008, p. 545) students are the next generation to have power to consume and they presently possess a great degree of influence in terms of

buying products in the household, therefore they are an important population to study. The research findings pertaining to the relationship between environmental concern and behaviour in student populations are discussed below.

2.3.1.2. Research from Student Samples

A study conducted by Alsmadi (2007, p. 339) found a relatively high level of green concerns for Jordian university students. Although green concern was considered to be high among the sample of students in Alsmadi's study this did not entirely translate into environmentally friendly behaviour due to factors such as students being loyal to non-green brands and the belief that ecological products have low credibility (Alsmadi, 2007, p. 339). This finding correlated with a study carried out on university students in Germany regarding environmental behaviour towards a brochure relating to green electricity and established that the general ecological concerns of individuals have a weak correlation with their specific environmental behaviours (Bamberg, 2003, p. 30). Therefore there is still much uncertainty as to the levels of actual commitment of consumers relating to green behaviours (Kim & Choi, 2005, p. 596). Not every individual who claims to show concern towards the environment actively participates in environmentally friendly behaviours (Kim & Choi, 2005, p. 596).

However there have also been many studies that have found a positive correlation between environmental concerns and green behaviour of university students. Kim and Choi (2005, p. 596) conducted research on university students in the USA measuring the relationship between ecological concern and environmental purchase behaviour. They measured concern with elements from the NEP and specifically tested different types of green purchase behaviour such as buying products that do not possess harmful chemicals and consist of recyclable materials, and established that green concern had a positive correlation with environmentally friendly purchasing behaviour (Kim & Choi, 2005, pp. 595-596). Similarly research conducted in Brazil by Borges *et al*. (2013, p. 2112) aimed to explain the ecological concern of university students by utilizing the Environmental Concerns (EC) scale that consisted of 17 items, and discovered that the overall levels of concern were low for undergraduate students and they were also not regarded as being ecologically friendly. Therefore a positive correlation was found between the two environmental constructs.

Although the results were found in the research studies mentioned above, there are still some gaps in knowledge that exist pertaining to the relationship between green concern and behaviour. The study conducted by Bamberg (2003) focussed mainly on concerns and behaviours dealing with one environmental aspect being green electricity and was performed in a first world context, and although the research conducted by Alsmadi (2007) took place in a developing country, it still leaves a gap in knowledge as to the concerns and behaviours of individuals from the African continent as the study was conducted in Jordan. The same gap in knowledge exists in the study conducted in Brazil by Borges *et al*. (2013). In the research conducted by Kim and Choi (2005) the researchers concentrated more on the effect that the Perceived Consumer Effectiveness (PCE) has on green behaviour with just five questions utilized from the NEP scale due to environmental concern being a secondary objective of the research, not a primary one. Therefore the current study aims to fill these gaps in knowledge by conducting the research on South African individuals in order to obtain results in an African context. The current study also aims to accurately comprehend the ecological concerns of individuals by utilising two scales of measurement to determine and understand environmental concern, being firstly one's ecological values and secondly one's green beliefs. With these findings the researcher aims to determine the relationships that exist between concern and several environmental behaviours.

Relating to both the general and student population was a study carried out by Gifford and Nilsson (2014, p. 141) which tested a total of 18 factors believed to have an influence on green concern and behaviour with these factors being divided into two groups, personal and social. This research analysed the results and outcomes of several other studies that dealt with environmental concern and behaviour. One of the studies analysed which took place in Canada was conducted by researchers Axelrod & Lehman in 1993 and utilized both the general population and student population. It was discovered that concerns originating from a moral perspective, that is altruistic values were a better indicator of green behaviour for students, while materialistic possessions and economic saving or rewards, that is egoistic values, were more accurate predictors of green behaviour for the general population (Gifford & Nilsson, 2014, p. 144). However the impact of biospheric values were not mentioned therefore the current study aims to determine the impact that these values have on the behaviour of students.

In contrast to the study above, it was found by Steg *et al*. (2005, p. 416) that values in general do not have a powerful direct influence on behaviour and the correlation between these two constructs is affected by other factors such as personal norms and particular beliefs. However results found by Schultz *et al*. (2005, p. 457) illustrated that the relationship between self-transcendent (altruistic) values and green behaviour were positive while they revealed a negative correlation between self-enhancement (egoistic) values and green behaviour. Salvaggio, Futrell, Batson, and Brents (2013) determined that in a desert environment such as Nevada in the USA quite the opposite was observed in terms of the influence of values on water conservation. It was found that all three value orientations (egoistic, altruistic and biospheric) were important predictors for the acceptance of water conservation policies by individuals in Las Vegas (Salvaggio *et al*., 2013, p. 588). Due to the importance of these value orientations the next section will examine the levels of importance of the three values and the relationships between these values with environmental behaviour in previous studies.

2.3.2. Egoistic Values and Environmental Behaviour

The following section is structured by firstly analysing the past research that determined a positive correlation between egoistic values and environmental behaviour and thereafter examines previous studies that found a weak, negative or no correlation between the two constructs.

2.3.2.1. Positive Relationship between egoistic values and environmental behaviour

According to Schultz *et al*. (2005, p. 471) there is a lack of proper data to support a possible positive correlation between egoistic concerns and green behaviour. This is understandable due to the fact that ecological behaviours tend to be designed and promoted in a manner that seems to be conflicting with one's egotism (Schultz *et al*., 2005, pp. 471-472). However there have been several studies that have found a positive relationship between egoistic values and environmental behaviour.

Hofmeister-Tóth *et al*. (2010) found that egoistic values tended to favour environmental actions that were visible to the public so as to communicate to the rest of their community the level of dedication that individuals possess for environmental causes (Hofmeister-Tóth *et al*., 2010, p. 11). Therefore behaviours such as the separation of waste for recycling and the purchase and consumption of locally produced food were practiced more often than other behaviours that are more private such as water conservation and energy saving in the household (Hofmeister-Tóth *et al*., 2010, p. 11). This illustrates that the motives behind individuals' environmental behaviour could be purely due to the need to be seen as ecologically friendly by their friends, colleagues or neighbours. According to Steg *et al*. (2014, p. 107) individuals who embody egoistic values of self-enhancement do not usually possess environmentally friendly beliefs and norms to behave in a green manner. Therefore this finding shows that it is in fact possible for egoistic individuals to perform green behaviours, even though it might be for the wrong reasons.

The above proposition supports the fact that a common egoistic concern is the attention one place's on one's own health (Magnusson, Arvola, Hursti, Åberg, & Sjödén, 2003, p. 109). Individuals who display these types of values will weigh up the costs and benefits to themselves that result from performing the ecological behaviours and only if the personal benefits of the action surpasses the costs will the green behaviour actually take place, if not then the individual will view the green behaviour in a negative light (Jakovcevic & Steg, 2013, p. 71; Ziaei-Bideh & Namakshenas-Jahromi, 2014, p. no page). Therefore this illustrates that individuals who possess egoistic values might still perform green behaviours if it benefits their own health.

The importance of one's own health was also highlighted in research conducted by Ojea and Loureiro (2007, pp. 808, 810) that investigated the motives behind Spanish individuals' willingness to pay to protect a species of marine bird that is near extinction (Ojea & Loureiro, 2007, pp. 808, 810). Results indicate that the egoistic values of an individual were positively correlated with willingness to pay for the environmental protection of wildlife (Ojea & Loureiro, 2007, p. 812). Egoistic values in this scale include protecting the environment to promote one's own life and health (Ojea & Loureiro, 2007, p. 810). Another study that focussed on Spanish individuals was performed by Fraj and Martinez (2006) that analysed the correlation between Spanish individuals' lifestyle, values and green behaviours. It was

determined that in terms of purchasing green products, recycling goods or using recyclable containers as well as making a special effort to support environmental organizations and campaigns, the respondents of the study all displayed a tendency towards self-fulfilment (Fraj & Martinez, 2006, p. 141). The respondents performed these behaviours on an infrequent level and whenever they did perform these behaviours it was due to the need to develop themselves personally and to take part in activities that pose new challenges for them instead of having the environment or the well-being of other people in mind (Fraj & Martinez, 2006, pp. 136, 141).

Egoistic values have also been found to have a positive influence on the acceptance of political environmental laws and campaigns (Aoyagi-Usui, Vinken, & Kuribayashi, 2003, p. 29). In a study relating to the environmental behaviours of sixteen woman from Australia and Canada conducted by Black and Cherrier (2010) it was found that in terms of environmental behaviours these women showed concern for themselves and their own families, with their own personal needs having a very strong influence on reducing, reusing and rejecting certain products (Black & Cherrier, 2010, p. 451). Therefore instead of the idea that sustainable behaviour is performed by responsible individuals who place importance on society and the earth, according to this study it is rather performed by individuals who take part in these behaviours to benefit themselves (especially their wallets), and who will not sacrifice their personal comforts (Black & Cherrier, 2010, p. 451). Hansla *et al*. (2008, p. 3) state that egoistic individuals will also most likely give particular attention to environmental problems that will have adverse consequences on issues that reduce employment opportunities, raise taxes and increase the cost of energy or fuel.

By analysing the results of the studies mentioned above one can understand that egoistic and self-fulfilling values might actually lead to pro-environmental behaviour. However in each study there were certain aspects of ecological information that were not examined or were analysed by using different scales of measurement. For instance although the study conducted by Black and Cherrier (2010) assessed many different green behaviours, the researchers utilized a small sample of 16 individuals, all of whom were women, to obtain their results instead of using a larger, more varied sample. Therefore it is difficult to make a generalization of the findings as it only relates to the opinions of 16 individuals. While Fraj and Martinez (2006, p. 134) utilized a large sample of 595 Spanish individuals in their study, the researchers

used different scales of measuring environmental concerns. Although values were included in the analyses of concern, a scale measuring lifestyle was the other form of measurement. The VALS scale was utilized to measure values of individuals and consisted of 35 statements that were general in nature and did not refer specifically to the environment (Fraj & Martinez, 2006, p. 136). It is therefore believed that the current study will add insight to this body of knowledge.

In contrast with the studies above, Ojea and Loureiro (2007, pp. 808, 810) did specifically measure an environmental issue; a biospheric element of willingness to pay for protecting an endangered species of bird in Spain. However the study only focussed on this one environmental behaviour and therefore offered no other information with regards to other green behaviours performed by individuals in their study. The study performed by Aoyagi-Usui *et al*. (2003) was conducted in parts of Asia and the Netherlands while Hofmeister-Tóth *et al*. (2010) conducted their research in Hungary, therefore the results obtained from these studies does not answer the question as to whether similar results will be found on the continent of Africa. Therefore the current study aims to fill these gaps in environmental knowledge by using a large sample of South African individuals as well as scales of measurement that specifically measure environmental values and beliefs to determine the relationship between green concern and behaviour.

Possibly a more intuitive finding is the negative relationship between egoistic values and green behaviours. There have been several studies that have found a negative relationship or no correlation between egoistic values and green behaviour. These are discussed below.

2.3.2.2. Negative relationship between egoistic values and environmental behaviour

Larson (2010, p. 902) states that egocentric values have a negative impact on environmental attitudes by highlighting self-absorbed interests and traditional practices and therefore does not encourage change in behaviour but rather promotes the current state. This notion is supported by Ibtissem (2010, p. 131) who states that when an individual possesses strong egoistic values, traditionally they will not favour environmentally friendly behaviours. Gilg *et al*. (2005, pp.

481, 494) agree with this view as their research produced results that show that UK households did not regularly perform everyday environmental activities and tended to possess egoistic views that there were no restrictions for growth in the UK and that humanity's role is to rule over the environment. This research concentrated on the frequencies of several green purchasing behaviours as well as everyday environmental behaviours. Firstly the study found that energy conservation such as buying energy saving light bulbs was the most prevalent while reusing materials such as glass and paper was also found to be common (Gilg *et al*., 2005, pp. 487, 488). However activities such as buying organic foods and purchasing recycled products was found to be performed very seldom although a greater number of people claimed to buy local products and support local stores (Gilg *et al*., 2005, pp. 487, 488). The conservation activity of utilizing one's own shopping bags instead of purchasing bags was found to not be common as well and therefore Gilg *et al*. (2005, p. 488) determined that overall the environmental behaviours were performed infrequently by individuals in the UK.

Similarly Nordlund and Garvill (2002, p. 740) conducted research on the general public in Sweden examining the influence that ecological values have on general green behaviour in a comprehensive questionnaire that measured the egoistic value structures and daily environmental behaviours such as recycling, purchasing of green products, energy conservation as well as environmentally friendly transportation. It was found that self-transcendence and eco-centrism had the highest means (5.34 and 5.30) respectively (Nordlund & Garvill, 2002, pp. 740, 747, 749). Self enhancement and anthropocentric values possessed considerably lower means (3.64 and 3.18) respectively (all values were measured on a scale from 1 – 7 with 7 indicating the most value) (Nordlund & Garvill, 2002, pp. 740, 749). As stated earlier in the chapter, self-transcendence values are closely linked to one's altruistic and biospheric values and self enhancement values to one's egoistic values (Johansson *et al*., 2013, p. 305). Eco-centric and anthropocentric values represent more of a belief structure that places importance on conservation of nature alone, and the importance of conservation of nature solely for the needs of mankind respectively (Nordlund & Garvill, 2002, p. 744). Therefore it can be concluded that for the Swedish sample altruistic and biospheric values were the most common while egoistic values were considerably uncommon. A weak negative, however significant correlation was found between egoistic concerns and green behaviours mentioned (Nordlund & Garvill, 2002, pp. 748-749). This illustrates that the more self-involved an

individual's concerns are towards the environment, the less likely they are to perform ecological behaviours.

A multinational study that examined the relationship between green concern and behaviour was conducted by Schultz *et al*. (2005, pp. 457, 461) and utilizes university students across six countries namely Brazil, the Czech Republic, Russia, India, Germany and New Zealand. For this study a wide group of green behaviours were analysed that included different types of recycling (cans, bottles and newspapers), reused items (bags, containers), buying products that used environmentally friendly packaging, picking up litter, walking or using a bicycle instead of a car and supporting or donating money or volunteering in environmental campaigns and groups (Schultz *et al*., 2005, p. 461). The behaviours were tested using a 5-point Likert scale that ranged from *1 – Never to 5 – Very Often*. The environmental concerns were investigated using Schultz's Environmental Concerns (EC) Scale as well as Schwartz Value Survey (Schultz *et al*., 2005, p. 462). For all of the environmental behaviours tested the overall mean that was the highest, indicating the most frequent environmental actions performed, was for Germany with a value of 3.29 and this value was followed by New Zealand with a value of 3.18 (Schultz *et al*., 2005, p. 466). The Czech Republic was next with a value of 2.94, then India with a mean of 2.87, Brazil with 2.27 and the country with the lowest frequencies of green behaviours was for Russia with a value of 1.87 (Schultz *et al*., 2005, p. 466). The study thereafter found egoistic concerns of the EC scale (me, my future, my health, my lifestyle) to be negatively related to the above mentioned green behaviours (Schultz *et al*., 2005, pp. 462, 469). These results show that the more concern an individual showed towards themselves, their future, their own health and their personal lifestyles the less inclined they were to perform the environmental behaviours listed above.

Van Riper and Kyle (2014, p. 291) found similar results to the studies mentioned above however a different set of environmental behaviours were measured that focused on the participation and volunteerism in eco-friendly campaigns of individuals concerning a national park in California and the factors that actually influence environmental behaviour of local individuals. These behaviours were closely linked to the environment as they included ecological activities such as volunteering to eradicate alien species of plants, supporting policies and campaigns that promote the aquatic environment, assisting in cleaning the

equipment found in the park and supporting campaigns to promote the animals such as the island fox in the region (Van Riper & Kyle, 2014, p. 291). Their research found biospheric/altruistic values to be more important to their sample as compared to egoistic values in performing environmental behaviours with means of 7.32 and 4.88 respectively (Van Riper & Kyle, 2014, p. 292). The impact of the three value orientations were examined and it was found that the egoistic value orientation negatively affected the performing of these behaviours (Van Riper & Kyle, 2014, p. 293).

Environmental campaigns were examined in a study conducted by Albayrak *et al*. (2013, p. 29) that analysed the success of an environmental campaign that promoted the use of electronic invoices for telephone and internet subscribers in Turkey. In this study egoistic values were not found to statistically impact behaviours (Albayrak *et al*., 2013, p. 36). The same result was discovered in terms of water conservation in Brazil in a study performed by Pinto *et al*. (2011) that examined the influence of respondents' values on water saving techniques in the home such as closing the tap while having a shower, washing the dishes or brushing teeth (Pinto *et al*., 2011, p. 124). No relationship existed between the personal value orientation (egoistic values) and water conservation behaviour, (Pinto *et al*., 2011, p. 128). However a possible reason for this unorthodox result could be due to the fact that Brazil contains the highest volume of fresh water in the world therefore water may not be viewed as a scarce resource that needs to be saved (Pinto *et al*., 2011, p. 128).

Although the studies mentioned above provide evidence that egoistic values are negatively related or not related at all to one's green behaviour by utilizing many different measures including the EC scale as well as varied environmental behaviours, it is also evident that none of these studies were conducted in an African context. Therefore a disparity still exists as to the relationship that exists between egoistic values and behaviour on the African continent. Due to this reason the current study aims to determine what effect self-centred values have on the behaviour of South African individuals.

The second value orientation under examination is the altruistic value orientation. The following section analyses the past findings pertaining to these values and their relationship with environmental behaviour.

2.3.3. Altruistic Values and Environmental Behaviour

According to Lee *et al*. (2014, p. 2099) individuals who possess altruistic values express more intense environmental beliefs and in turn are more keen to participate in a range of ecological behaviours than those individuals that favour an egoistic value orientation. Stern (2000, p. 411) agrees with this and states that these altruistic values seem to be more apparent in individuals who participate in environmentally friendly behaviours. When the motivation behind green activities stems from an innate drive within the consumer without monetary gain, altruistic motives are said to be the reason for the environmental behaviour (Coad, de Haan, & Woersdorfer, 2009, p. 2078).

Altruistic concerns have been found to be a consistent predictor of green behaviours and individuals are driven to perform these behaviours due to the personal satisfaction that arises from performing the deed as compared to monetary gain (Paladino & Ng, 2013, p. 123). Altruistic values where found to be prevalent in a study mentioned previously performed by Schultz (2001, p. 327) that assessed the distinction between egoistic, altruistic and biospheric values in American individuals by utilizing four studies as well as the Environmental Concerns (EC) scale. In the first study university students were utilized as the sample and altruistic values possessed the highest mean of 5.78 with egoistic values obtaining the second highest mean of 5.47 and biospheric values resulted in being the least common with a mean of 5.33 (Schultz, 2001, p. 329). In the second study the same research was performed but the sample population was chosen to be the general public and similar results were found as study one with the exception of biospheric values being lower in students than the general population (Schultz, 2001, p. 330). In the fourth study conducted the researcher gathered data from 10 Spanish speaking countries most of which were in South America and it was found that altruistic concerns were the most dominant in eight of the 10 countries (Schultz, 2001, p. 335). The results found in the Dominican Republic, Panama, Peru and Spain were similar to the findings in the US as altruistic values were the most prevalent with the highest means, egoistic values

having the second highest means and finally biospheric values being the least prevalent of all with the lowest means (Schultz, 2001, p. 335). Costa Rica, Ecuador, Paraguay and Venezuela also ranked altruistic concerns first on their list of importance however these four countries placed biospheric values as the second most important with egoistic values being the least common in the samples (Schultz, 2001, p. 335). Different results were found for individuals in the remaining two countries tested as biospheric concerns were the most important to people in Colombia and El Salvador with altruistic values coming in second and egoistic values being the least important to the samples (Schultz, 2001, p. 335).

Another study which found altruistic values to be the most significant to individuals in terms of the environment was conducted by Schultz, Shriver, Tabanico, and Khazian (2004, p. 31) which concentrated specifically on ecological concerns of students in the USA and used the EC scale for the measurement of concerns. Two studies were performed in this research and the findings of both studies illustrate that altruistic concerns were ranked at the top for importance to the students with regards to environmental problems while biospheric concerns were the second most important and egoistic concerns were the least important to the students (Schultz *et al*., 2004, pp. 36, 37). The same result was determined by Snelgar (2006, pp. 89, 92, 93) and this particular research utilized students from the UK. The means for the three types of concerns were found to be 6.21, 5.63 and 5.38 for altruistic, biospheric and egoistic concerns respectively (Snelgar, 2006, p. 92). Johansson *et al*. (2013, pp. 295, 301, 302) obtained similar findings in a study that assessed the moral responsibility felt by landowners in Sweden to protect the biodiversity of their area by use of the EC scale. Altruistic values even reign supreme in terms of the values held by children as Bruni *et al*. (2012, p. 6) performed research with the use of a slightly altered EC scale that was specifically designed for the children and it was found that the means were 6.22, 5.99 and 5.48 for altruistic, egoistic and biospheric values respectively.

According to Lindenberg and Steg (2007, p. 125) when people understand the problems of society then altruistic concerns will most probably affect behaviour. When deriving the causes of environmentalism some assume that since performing green behaviours may be difficult, costly and could decrease one's social status that it must be selfless altruistic values that encourage ecological activities (Monroe, 2003, p. 117). Therefore it is understandable that

altruistic values have a positive relationship with environmental behaviours. The following section highlights a few studies and particular situations where this result has been found. It is structured by firstly analysing past findings illustrating a positive relationship between altruistic values and environmental behaviour and thereafter examining the studies that have found a negative, weak or no correlation.

2.3.3.1. Positive Relationship between Altruistic values and Environmental Behaviour

A positive relationship between altruistic values and environmental behaviour was evident in a study by Stern *et al*. (1999) that paid particular attention to the support of social movements of individuals such as partaking in environmental demonstrations, environmental citizenship and policy support and approval (Stern *et al*., 1999, pp. 81, 88). It was in fact altruistic motives that had a direct influence on active participation in ecological causes and demonstrations (Stern *et al*., 1999, p. 89). A similar result was found by Aoyagi-Usui *et al*. (2003, p. 29). Van Riper and Kyle (2014, p. 293) also found that altruistic values increased the possibility of individuals taking part and supporting environmental campaigns while Albayrak *et al*. (2013, pp. 29, 36) obtained results that illustrate that these values also increase the use of electronic invoices for telephone and internet subscribers in Turkey. Ojea and Loureiro (2007, pp. 808, 810) found altruistic values to have a positive relationship with the willingness to protect an endangered species of bird while Nordlund and Garvill (2002, p. 748) found the same relationship to exist for green behaviours such as recycling, purchasing of green products, energy conservation and environmentally friendly transportation.

While many individuals would expect altruistic values to be positively related to all environmental behaviours, the studies mentioned above do possess certain discrepancies with regards to environmental issues. All of the research studies above, with the exception of the study by Nordlund and Garvill (2002), each focussed specially on one type of environmental behaviour therefore the analyses of a variety of ecological behaviours was limited in these studies. Although values were assessed in relation to many different environmental behaviours, the shortcoming present in the research conducted by Nordlund and Garvill (2002, p. 746) with

respect to the current research question, was the fact that it was performed in the first world country of Sweden. Therefore the results obtained cannot easily be generalized in a third world country and in particular, an African country. The current study analyses 11 different environmental behaviours in South Africa and aims to fill this gap in environmental knowledge that is present on the African continent.

Although one would imagine that the more selfless and philanthropic one's values are, the more environmentally friendly an individual will be, this is not always the case. The following section highlights studies that have actually found a negative relationship between altruistic values and ecological behaviour.

2.3.3.2. Negative Relationship between altruistic values and environmental behaviour

Paladino and Ng (2013) analysed factors that influence university students' purchasing of environmentally friendly electronic products in Australian. Their findings contradicted the expectation of altruistic orientations possessing a strong positive correlation with environmental behaviour, as altruistic concerns were found to have a negative correlation with eco-friendly purchase behaviour (Paladino & Ng, 2013, p. 137). The researchers state that this finding might be due to the fact that their sample consisted of young individuals who usually seem to place their own interests above the concerns of other people or the environment or that the student sample may not have possessed sufficient monetary resources to convert their altruistic concerns into ecological purchase behaviour (Paladino & Ng, 2013, p. 137).

Similarly a study conducted by Griskevicius, Tybur, and Van den Bergh (2010, p. 392) focussed on students and examined altruistic factors that lead to the purchase of green products and especially concentrated on the impact that social status and what others think have on environmental behaviour. The researchers state that the traditional approach to increasing one's social status was linked to individuals purchasing luxurious, expensive and non-green products that would display wealth and prestige to other individuals (Griskevicius *et al*., 2010, p. 394). However in recent years it could be said that if one purchases luxurious products that have a

negative impact on the environment over a lower quality green product, they would be thought of as selfish and unkind for not caring for the environment (Griskevicius *et al*., 2010, p. 394). The research used different scenarios, one promoting social status and the other not, with regards to purchasing green or non-green products. In the experiment where social status was not highlighted the majority of respondents chose higher performing non-green products instead of the lower quality environmental products, however when social status was incorporated in the experiment the majority of individuals chose the green products instead (Griskevicius *et al*., 2010, p. 396). This finding illustrates that by stimulating status motives in situations individuals will more likely purchase environmentally friendly products over luxurious non-green products, therefore it can be said that altruistic behaviour can actually be governed by the need for social status (Griskevicius *et al*., 2010, p. 396).

Griskevicius *et al*. (2010) also analysed the difference of individuals performing environmental behaviours in a private or in a public place. The green behaviour of individuals might be influenced by being in a public place as their actions are now visible to many other people such as cashiers, salespeople and fellow customers, and this behaviour might be different if one shops in private or shops online (Griskevicius *et al*., 2010, p. 396). The researchers combined the aspects of social status with the influence of public or private behaviour and found that the respondents showed preference for the non-green luxurious products in both a private and public setting where social status was not highlighted (Griskevicius *et al*., 2010, p. 397). However when triggers of status motives were added in both a public and private setting different results occurred. In public respondents chose preferred green products but in private they chose non-green products therefore illustrating that along with social status, the setting of the behaviour also has an impact on environmental actions (Griskevicius *et al*., 2010, p. 397). These results illustrate that altruistic values might not play a significant role or be the driver behind environmental behaviour at all.

Altruistic values have also been found to have no influence on pro-environmental vehicle use (De Groot & Steg, 2007, p. 326), environmental activism and support of ecological campaigns in South Korea along with a range of other green behaviours such as recycling cans, bottles and paper, purchasing products that have less of an impact on nature, cleaning the environment (Lee *et al*., 2014, pp. 2101-2102), and water conservation behaviour (Pinto *et al*., 2011, p. 128).

Although the results of the studies above indicate that altruistic values do not play a significant role on environmental behaviour, there are gaps in knowledge that are present in each study. For instance even though Paladino and Ng (2013, p. 130) focussed on altruistic values effect on ecological behaviour of students, the researchers concentrated on only one specific environmental behaviour being the purchasing of green mobiles. Therefore it is unclear what the results would have been if more green behaviours were examined with the sample of students. The same limitation could apply for the studies conducted by Griskevicius *et al*. (2010) and De Groot and Steg (2007). The researchers of the former study specifically focussed on the effect that social motives and public and private influences have on the purchasing of environmental products (Griskevicius *et al*., 2010, p. 394) and did not measure the effects on other ecological activities such as energy saving and water conservation. Although the researchers of the latter study measured the effect that all three value orientations had on environmental behaviour, they chose to solely concentrate of green vehicle use (De Groot & Steg, 2007, p. 321). Thus again it is unclear as to whether these factors will have the same effect on all environmentally related behaviours. While water conservation was examined by Pinto *et al*. (2011, p. 128), as mentioned previously this study was conducted in Brazil where fresh water can be found in abundance, therefore the results could vary if it were conducted in drought-prone countries in Africa. Research conducted by Lee *et al*. (2014, pp. 2099-2100) gave a thorough examination of altruistic values in relation to a wide variety of green behaviours, however the study did not specifically measure the impact that all three value orientations have on green activities and the study took place in South Korea, which is a developed country. Therefore the current study aims to fill in the limitations that were present in the studies mentioned above by firstly analysing 11 different environmental behaviours that include both purchase behaviour as well as everyday ecological activities to better understand the impact that concern has on these actions, and secondly the current study utilizes a South African population hence it aims to obtain results that relate to both an African and developing country.

Closely linked to altruistic values is the third value orientation namely biospheric values. Past research findings relating to the relationship between biospheric values and environmental behaviour are discussed next.

2.3.4. Biospheric Values and Environmental Behaviour

It is stated by Steg *et al*. (2014, p. 107) that of the three value orientations, biospheric concerns are known to be more clearly related to green attitudes, norms, beliefs and behaviour than altruistic and egoistic values. Steg *et al*. (2011, p. 350) state that biospheric values are positively related to environmentally friendly elements including policy approval and intentions. Supporting this notion is Salvaggio *et al*. (2013, p. 589) who state that the more an individual is in tune with their biospheric values the greater is the possibility that they will participate in pro-environmental behaviours such as water conservation. The structure of this section is similar to the previous two sections (egoistic and altruistic past research) with the analyses of past findings relating to a positive relationship between biospheric values and environmental behaviour being presented first, and afterwards results pertaining to a negative relationship between these constructs are presented.

2.3.4.1. Positive Relationship between biospheric values and environmental behaviour

A positive correlation was found between biospheric values and environmental behaviour in studies mentioned previously (e.g. Albayrak *et al*., 2013; Aoyagi-Usui *et al*., 2003, p. 29; De Groot & Steg, 2007, p. 326; Salvaggio *et al*., 2013; Schultz *et al*., 2005, pp. 462, 469; Van Riper & Kyle, 2014, p. 291).

Gilg *et al*. (2005, p. 494) found that conservationists do not seem to value egoistic aspects such as wealth and personal influence but believe that humans and nature are equal and the environment has limits of consumption. Therefore this illustrates that these individuals possess more biospheric values than egoistic values. A positive correlation was also found between biospheric concerns and environmental behaviours such as recycling, purchasing of green products, energy conservation and environmentally friendly transportation (e.g Nordlund & Garvill, 2002, p. 748; Ziaei-Bideh & Namakshenas-Jahromi, 2014, p. no page). Therefore these findings illustrate that individuals who are concerned about the earth tend to perform ecological behaviours. However, Jansson *et al*. (2011, p. 54) also analysed the adoption of eco-friendly

transportation and vehicles and found that biospheric values were greater than egoistic and altruistic values for both adopters and non-adopters of environmental vehicles. This result shows that there are some discrepancies present in terms of a clear cut positive relationship between biospheric values and environmental behaviour. The studies mentioned above also possess gaps in knowledge in terms of analysing the relationship between biospheric values and its impact on green behaviour. For instance, some of the studies above only measured one ecological behaviour such as the acceptance of electronic invoices, adoption of green vehicles, or water conservation (e.g. Albayrak *et al*., 2013; De Groot & Steg, 2007; Salvaggio *et al*., 2013) respectively. Other studies mentioned above utilized different scales when measuring biospheric values (e.g. Aoyagi-Usui *et al*., 2003, p. 26) while all studies mentioned above took place outside of the African continent. Therefore many questions still exist as to whether a biospheric values are positively related to environmental actions in an African context. The current study aims to fill these gaps in knowledge.

Not all findings of past research demonstrate a positive relationship between biospheric values and environmental behaviour. Negative relationships do exist between these constructs.

2.3.4.2. Negative Relationship between biospheric values and environmental behaviour

In a study conducted by Raymond, Brown, and Robinson (2011, p. 323) environmentally friendly behaviour was analysed by examining the planting of native vegetation in Australia along with the influence of human values and concerns such as the egoistic, altruistic and biospheric concerns of individuals. The EC scale was one of the tools utilized to assess these values and it was found that biospheric values did not have a significant effect on the planting of native vegetation and therefore did not have an influence on pro-environmental behaviour (Raymond *et al*., 2011, p. 330).

However Raymond *et al*. (2011) concentrated solely on green activities that were directly linked to the earth. Therefore it is difficult to draw the same conclusions with regards to all environmental behaviours, especially those that affect the earth indirectly such as energy saving

and water conservation. Hence the current study analyses a variety of green behaviours that affect the earth directly and indirectly to gain a more accurate understanding of the relationship between biospheric values and behaviour.

By analysing the results of past research studies with regards to the relationship between the egoistic, altruistic and biospheric values of individuals and their green behaviour, it can be seen that although there is evidence of the existence of both positive and negative relationships between these constructs, there are also many discrepancies that still exist. The most common gaps in knowledge found in this section include firstly the fact that some of the past research mentioned focussed only on one or a few environmental behaviours instead of analysing many different ecological actions to gain a greater understanding of the impact of the value orientations. Secondly some studies measured these value orientations with the use of different scales and did not examine these with the EC and NEP scales together and thirdly none of the studies mentioned took place in Africa or utilized an African sample. The current study aims to fill in these discrepancies.

As stated previously, in the current study environmental concern is divided into two groups of analyses firstly the three value orientations and secondly the environmental beliefs. The following section examines the past research findings of the second group of environmental concerns, environmental beliefs, and its relationship with environmental behaviour.

2.3.5. Past Research relating to Environmental Beliefs and Environmental Behaviour

It has been stated that it is difficult to illustrate that a strong correlation between general beliefs and environmental actions exist (Olofsson & Öhman, 2006, p. 771). Therefore this section has been structured by the sample populations used to conduct the past research studies, with the results of studies utilizing the general population as a sample being analysed first, and student samples being analysed thereafter.

2.3.5.1. Analyses of past results from the General Population

Results found by Van Riper and Kyle (2014, p. 292) illustrate that a high level of environmental beliefs were felt by the general population in the USA. As mentioned previously this study dealt with the concerns and behaviours of individuals in terms of the protection of a national park and utilized six items from the NEP scale to measure environmental beliefs (Van Riper & Kyle, 2014, p. 288). The findings of the study show that the highest environmental beliefs were felt towards the NEP statement of, "Plants and animals have as much right as humans to exist" with a mean score of 4.11 (a score of 5 indicates the highest green beliefs), with the statement of, "When humans interfere with nature if often produces disastrous consequences" receiving the second highest mean of 4.03 (Van Riper & Kyle, 2014, p. 292). The next four statements tested were, "The balance of nature is very delicate and easy to upset", "Humans were meant to rule over the rest of nature", "We are approaching the limit of the number of people the earth can support" and "The earth is like a spaceship with very limited room and resources" and these received means of 4.02, 3.90, 3.76 and 3.74 respectively. The overall NEP score of this particular study was 3.95 which indicates that the sample felt a high level of environmental beliefs (Van Riper & Kyle, 2014, p. 292).

Similarly Bostrom *et al*. (2006, pp. 25, 28) found a high level of environmental beliefs in a study that measured green concerns of the general public in Bulgaria. Six items of the older NEP scale (New Environmental Paradigm) were utilized and the results illustrate, just as the findings of Van Riper and Kyle (2014, p. 292), that the statements, "The balance of nature is very delicate and easily upset by human activities", "Plants and animals do not exist primarily to be used by humans" and "Earth is like a spaceship with only limited room and resources" exhibited the highest levels of pro-environmental beliefs (Bostrom *et al*., 2006, p. 33). Negative NEP items such as "Modifying the environment for human use seldom causes serious problems" and "Mankind was created to rule over the rest of nature" received low levels of support from the individuals indicating that the sample held pro-environmental beliefs in terms of these items (Bostrom *et al*., 2006, p. 31).

As mentioned above Bostrom *et al*. (2006) utilized the New Environmental Paradigm for their research however the majority of other studies now employ the newer version of the scale, the

New Ecological Paradigm (NEP). This newer version of the scale was initially developed and measured in a study conducted by Dunlap *et al*. (2000, p. 425) and aimed to improve on the older version of the scale. The study was performed on the general public in the state of Washington in the USA and the results of the revised NEP scale indicated that the individuals in the research tended to express pro-ecological beliefs (Dunlap *et al*., 2000, p. 434). The researchers give a detailed account of the percentages and frequencies of the findings for each of the 15 items of the scale however the current study only analyses eight items from this scale, therefore only these items are examined further here. These results are presented in the table below and are illustrated in order from the most pro-environmental beliefs found to the least pro-environmental beliefs found by Dunlap *et al*. (2000). Numbers 1, 3, 4 and 5 are *positively worded* beliefs therefore the higher the percentage of *agreement* the more pro-environmental the beliefs are. Numbers 2, 6, 7 and 8 are *negatively worded* environmental beliefs therefore the higher the level of *disagreement* the more pro-environmental the beliefs are.

Table 2.3.5.1. Results of NEP scale, Dunlap (2000)

Environmental Belief	**% Agreement/ Disagreement**
1. When humans interfere with nature it produces disastrous consequences	82.2% agreement
2. *The balance of nature is strong enough to cope with the impacts of modern industrial nations	80.3% disagreement
3. The balance of nature is very delicate and easily upset	78.7% agreement
4. Plants and animals have as much right as humans to exist	76.9% agreement
5. If things continue on their present course, we will soon experience a major ecological catastrophe	65.3% agreement
6. *The so-called ecological crisis facing humankind has been greatly exaggerated	64.4% disagreement
7. *Humans have the right to modify the natural environment to suit their needs	58.2% disagreement
8. *Humans were meant to rule over the rest of nature	57.9% disagreement

(Dunlap *et al*., 2000, p. 433) **negatively worded beliefs*

These results above illustrate that the belief that serious consequences will result if humans tamper with nature received the highest pro-environmental beliefs and held the most significance for American citizens. The current study analyses these eight statements in terms of young adults in South Africa.

Another study that was conducted in the USA was by Stern *et al*. (1999, p. 81) dealing with the assessment of the VBN theory, the acceptance and support of social movements were tested on the general population of the USA. As the VBN stipulates, the second component to the theory is the measurement of environmental beliefs and the researchers tested the impact of these beliefs by utilizing five items of the original NEP scale (Stern *et al*., 1999, p. 95). The results illustrated that environmental citizenship behaviour was affected by high scores on the NEP and the researchers also concluded that various forms of support can be obtained from individuals according to the beliefs that they possess (Stern *et al*., 1999, pp. 91, 92).

Similar results were found in Spain by López and Cuervo-Arango (2008, p. 623) who assessed the influence of several ecological constructs on environmental behaviour which were drawn from the general population of Spain and the results obtained illustrated that ecological beliefs had the greatest influence on green behaviour, with these beliefs being measured with the use of the NEP scale (López & Cuervo-Arango, 2008, p. 623). According to the outcome of the study, values and beliefs were the only constructs to have a direct effect on environmental behaviour (López & Cuervo-Arango, 2008).

Chang (2013, p. 702) obtained similar results in a study conducted on a sample of the general population of China that analysed the impact that environmental beliefs related to local water resources have on actual water conservation behaviour. It was found that a significant positive relationship existed between these beliefs and water saving habits (Chang, 2013, p. 702). However research conducted by Harlan *et al*. (2009, p. 704) that also assessed the impact of water saving beliefs on actual water conservation behaviour of the general population of Phoenix, USA, found that the environmental beliefs held by their respondents had no relationship with water conservation behaviour performed in the home.

Similarly in Missouri, USA research performed by Ohler and Billger (2014, p. 6) on a sample of the general population assessed the impact of environmental variables on energy saving behaviour and found that the environmental beliefs that related to social responsibility to fellow human beings did not have an impact on their behaviour with the exception of decreasing the heat in one's home. Beliefs also did not feature strongly in Australia, as Lea and Worsley (2008, p. 207) performed research on a sample of the general population regarding the effect that environmental beliefs have on purchasing and consuming organic and locally produced food and found that only a moderate consistency was found between green beliefs and actual behaviour. In terms of recycling behaviour it was found by McCarty and Shrum (2001, p. 93) that green beliefs have both a direct and an indirect influence on recycling in terms of the general population in the Midwest of USA. It was found that the beliefs relating to the importance of recycling had a direct effect on recycling behaviour and the beliefs relating to the inconvenience of recycling had an indirect influence on recycling actions (McCarty & Shrum, 2001, p. 100).

By analysing the results of the research mentioned above it can be concluded that many studies that tested the general population of individuals found a high level of pro-environmental beliefs. However there are still some questions that arise as to whether green beliefs have a positive, negative or any effect on one's environmental behaviour. For instance all of the studies mentioned above, with the exception of López and Cuervo-Arango (2008), only focussed on one environmental behaviour each. Therefore the results discussed in the studies above might differ from a study that analyses the impact of ecological beliefs on several environmental behaviours. Although López and Cuervo-Arango (2008) examined many green behaviours in terms of environmental beliefs, the study took place in Spain which is a developed country outside of Africa. Therefore the current study aims to answer the question of whether environmental beliefs have an influence on several green behaviours in an African country.

Other researchers have also tested the influence of ecological beliefs on green behaviour on student samples, thus being similar to the current study. The following section highlights these findings.

2.3.5.2. Analyses of past results from Student populations

Wray-Lake, Flanagan, and Osgood (2010, p. 61) conducted a study that focussed specifically on the environmental beliefs held by young individuals, adolescents in particular, and the effect that these beliefs have on their environmental behaviour. This study was performed across several decades on students during their final year of high school in the USA (1976-2005) to discover any differences in the levels of ecological beliefs held by young people. The study found that, with the exception of the 1990's, there was a decline in environmental beliefs over the rest of the decades (Wray-Lake *et al*., 2010, p. 61). The results of this study illustrate that the belief that there are limited amounts of resources that the earth possesses for human consumption has been on a rapid decrease all through the 1980's, and from 1992-1995, with the belief levels plateauing after that (Wray-Lake *et al*., 2010, p. 73). This pattern of beliefs was extremely similar to the trends found with regards to environmentally friendly behaviour demonstrating that as ecological beliefs of young adults increased, so did their green behaviour and as beliefs decreased, their green behaviour did too (Wray-Lake *et al*., 2010, pp. 73, 74). These environmentally friendly behaviours included lowering the heat and electricity used at home and opting to use greener transport (Wray-Lake *et al*., 2010). This indicates a positive correlation between environmental beliefs and green behaviour. The low levels of environmental beliefs might be a cause for concern as it was stated earlier by Vermeir and Verbeke (2008, p. 545) that students are the next generation to have power to consume and they presently possess a great degree of influence in terms of buying products in the household.

Similar findings were determined in a study conducted by Jurin and Fortner (2002, pp. 384, 385) that also indicated a positive relationship between green beliefs and ecological behaviour as well as low levels of environmental beliefs. It was found that university students' environmental beliefs matched their actions such as switching off lights and decreasing the heat or air conditioning at home. It was determined that students that did not regularly participate in environmental behaviours possessed a lower level of support for NEP concepts and students who took part in green behaviour had a high level of support for the NEP, indicating a positive relationship between green beliefs and behaviours (Jurin & Fortner, 2002, p. 389). However overall it was found that most of the students had anthropocentric beliefs (a belief that emphasizes human importance in relation to nature) which illustrates that the

students favoured beliefs in the NEP scale that were not considered to be environmentally friendly (Jurin & Fortner, 2002, p. 389).

However results differ in a multinational research study conducted by Schultz and Zelezny (1999, p. 255) that analysed the relationship between values and attitudes that also utilized students but across 14 countries with the use of the 15 items of the NEP scale. It was found that Canada, Costa Rica and Colombia possessed the highest NEP values with means being 4.11, 4.08 and 4.01 respectively (a score of 5 indicated the highest environmental beliefs) and Ecuador and the United States possessing the lowest values of 3.69 and 3.67 respectively (Schultz & Zelezny, 1999, p. 261). The remaining countries of Panama, El Salvador, Venezuela, Paraguay, Mexico, Argentina, Spain, Dominican Republic and Peru received overall NEP means between 3.94 and 3.75 indicating that the students in the majority of the countries possessed high to relatively high environmental beliefs (Schultz & Zelezny, 1999, p. 261). It is evident that all of the countries tested in this study were outside of the African continent therefore it is difficult to draw accurate conclusions from these findings in relation to African students. Hence the current study analyses the green beliefs of students in South Africa to gain this gap in knowledge.

It is evident that many studies found low levels of environmental beliefs with regards to student samples. Gabler *et al*. (2013) conducted research relating specifically to the relationship that exists between ecological beliefs and green behaviour of students in the United States through in-depth interviews and discovered that the majority of respondents held beliefs that were not environmentally inclined (Gabler *et al*., 2013, pp. 165, 170). Possible explanations put forward by the researchers with regards to the non-ecological beliefs found dealt with two of the constructs of the Theory of Planned Behaviour (TPB) discussed earlier being the subjective norms and perceived behavioural control (Gabler *et al*., 2013, p. 163). It was found that subjective norms did not have a major impact on the sample population as the results reveal that individuals felt very low levels of social pressure to act in an ecologically friendly manner (Gabler *et al*., 2013, p. 163). In terms of perceived behavioural control the majority of the sample believed that their individual environmental actions did not make a great enough difference to the environment as a whole (Gabler *et al*., 2013, p. 165). The views of these two constructs led to the sample possessing non-ecological beliefs.

More recently Faver (2013, p. 149) performed a study with students regarding the relationship between the environmental variables present in the NEP scale with animal welfare. It was found that three dimensions of the NEP scale stood out the most as having an effect on animal welfare campaigns the first being the belief that the balance of nature is delicate, secondly the belief that an environmental crisis will result if no ecological changes are made, and lastly the belief that humans have no right to dominate and have total control over nature (Faver, 2013, p. 149). The current study utilizes all three of these statements in the NEP scale to determine whether an animal welfare campaign named 'Save the Rhino' which relates to the protection of rhinos in South Africa is affected by these elements of the NEP scale.

Bertoldo *et al*. (2013, p. 440) performed a study on Brazilian university students dealing with the assessment of whether environmental beliefs and green behaviour change according to their context in order to determine if ecological beliefs and behaviour possess a positive social value. The findings demonstrate that the students illustrated a higher level of green beliefs and behaviour when they were portraying a positive self-image and a lower level when they were presenting a negative self-image, therefore according to the researchers this demonstrates that supporting environmentalism is socially valued (Bertoldo *et al*., 2013, pp. 441, 442). However it also showed that the image relating to beliefs and behaviour are still context sensitive, as the differences between the positive and negative image was only noted with regard to the environmental organization (Bertoldo *et al*., 2013, p. 442). This finding raises many questions as to the main reasons for possessing environmental beliefs and performing green behaviours therefore the current study also aims to determine whether one's social status is the cause of environmental behaviour.

By examining the research mentioned above it is evident that many studies determined a low level of environmental beliefs for student populations around the world. However these studies all depict results that were gathered in countries outside of Africa. Therefore the current study examines the levels of environmental beliefs and measures the impact that this construct has on the green behaviour of students in South Africa.

While it is of great importance to analyse past research that took place across the world and in an international context, it is also necessary to highlight the relevant studies that examined local citizens of South Africa in order to gain a proper perspective of environmental concern and environmental behaviour. Environmental research in a South African context is rather scarce and no studies have been performed that mirror the current study. Therefore the following section outlines, discusses and analyses the environmental research that has been conducted in South Africa in relation to environmental concern and green behaviour.

2.3.6. Environmental research in Africa and South Africa

There has been minimal research performed relating to environmental concern and behaviour in Africa as compared to the rest of the world. However according to Simon (2010, p. 235) poorer cities of the world will be affected the most by environmental problems and climate change and the continent of Africa, with coastal cities such as Cape Town and Dakar, is considered to be at great risk. Soyez (2012, p. 640) states that in terms of environmental research, researchers ought to concentrate more on examining emerging economies that have an effect on the environment such as South Africa in order to understand the actions of consumers better. Therefore the studies mentioned below analyse the results of articles in terms of green concerns and behaviour of consumers in Africa and South Africa. Due to the scarce environmental research that has been conducted in Africa, the researcher of the current study also included research on local environmental awareness. Therefore this section firstly examines the green awareness of individuals in Africa, and specifically in South Africa. Secondly the environmental concerns of African individuals will be assessed and thereafter the ecological actions and behaviour of African consumers will be analysed. The need for the current research is also highlighted.

2.3.6.1. Environmental Awareness in Africa

A study that took place in Cape Town found that there is a low level of awareness in terms of energy saving techniques (Nkomo, 2005, p. 15). One of the leading reasons for this was found to be that there is a lack of information relating to electricity efficiency and many households in South Africa are unaware of the manner in which their electrical sources are accounted for

in the monthly electricity bill therefore this creates a barrier for consumers to improve their energy usage (Nkomo, 2005, p. 15). Nkomo also states that material relating to energy efficient technologies is not extensive and is inappropriately dispersed throughout the country so while it does exist, many South Africans do not have access to it (Nkomo, 2005 p. 15). Several attempts have been made recently to increase the awareness of energy efficient practices in the country and most of these attempts have taken place in the form of advertisements through media such as television, radio and print media at both a local and national level (Nkomo, 2005, p. 16). However this study by was conducted in the year 2005 and during the 11 years that have passed since then there have been many changes in the energy levels of South Africa. As mentioned previously the country is presently experiencing an energy crisis and this has led to the primary energy provider of South Africa, Eskom, to implement scheduled power cuts known as 'Load Shedding' to consumers. This has also led to an increase in energy awareness campaigns throughout the country. Therefore the knowledge and awareness of individuals in South Africa may have changed since the study conducted by Nkomo (2005). This low level of awareness found by Nkomo (2005) could be due to the fact that although media is frequently utilized to relay information about the environment it has been determined that of all the sources of environmental information one of the most influential sources among South Africans were in fact people, in particular close family members of individuals (Palmer *et al*., 2012, p. 454). However despite the low levels of energy efficiency awareness Nkomo (2005) determined that the trend of purchasing compact florescent lamps (CFL's) was on the rise as compared to the incandescent light bulbs (Nkomo, 2005, p. 16). Along with environmental awareness, environmental concerns also play a significant role in establishing green behaviour (Bamberg, 2003, p. 21).

2.3.6.2. Environmental Concerns in Africa

Another research study carried out in Cape Town relates to consumer concerns about organic products found that the general attitude surrounding these products is linked to health issues as well as environmental concern indicating a high level of egoistic concerns (Du Toit & Crafford, 2003, p. 9). Similarly in 2001 a study was conducted in the Eastern Cape that measured the environmental attitudes and concern of South African individuals across different cultural groups that resided in Port Elizabeth and the research yielded results that suggest that the level

of ecological concern is high among citizens in this area especially with regards to the levels of pollution and waste (Rousseau & Venter, 2001, p. 4). More recently, research conducted by Sonnenberg, Erasmus, and Donoghue (2011) also dealt with the motivations and environmental concerns behind consumers purchasing green appliances and it was discovered that the main concerns for South African consumers were the functionality, durability and running costs of the appliances (Sonnenberg *et al*., 2011, p. 153), which according to the researcher of the current study, are all egoistic concerns. However Berndt and Petzer (2011, p. 7905) conducted environmental research on individuals in Johannesburg and found that environmental concern was relatively high with the greatest concern for individuals being air and water, which are both biospheric elements. However these studies did not focus on the younger population of the country therefore the current study aims to determine if the same results occur for young adults as well. One of the reasons behind conducting the current research is to determine which factors influence environmental behaviour in an African context. In addition to this, the study also determines which of the three value orientations (egoistic, altruistic or biospheric values) plays the greatest role in influencing environmental behaviour. Furthermore this research differentiates the value orientations from environmental beliefs as possible predictors of green behaviour. Therefore the next section examines green behaviour in an African context.

2.3.6.3. Environmental Behaviour in Africa

Berndt and Gikonyo (2012, p. 5) conducted a study that aimed to determine the environmental purchase and non-purchase behaviours of individuals in Nairobi and Johannesburg and yielded findings that illustrate that African citizens are willing to purchase environmentally friendly alternatives if these alternatives are of a similar price to the regular items that they purchase. Of all the non-purchase behaviours the most common among the individuals in the study was the act of reusing shopping bags at stores instead of purchasing them (Berndt & Gikonyo, 2012, pp. 5-6). Other behaviours such as the act of encouraging recycling behaviour in others and purchasing environmentally friendly and organic products were common as well (Berndt & Gikonyo, 2012, p. 6).

The above finding is in line with a research that was conducted across nine countries including South Africa where the overall results indicated that a high level of environmental behaviour

is evident with the most common behaviours among respondents being reading about ecological issues, buying environmentally friendly products and performing conservation acts such as recycling (Palmer *et al*., 2012, p. 451).

A study that also dealt with recycling was performed by Amutenya, Shackleton, and Whittington-Jones (2009) on the academic staff of Rhodes University, investigated the paper usage of university staff members in terms of recycling and the reuse of paper and illustrated that egoistic concerns such as saving money for the university was the highlight for increasing the frequency of recycling (Amutenya *et al*., 2009, p. 240). Recycling is also found to be common in the Cape Peninsula as the findings of research conducted by Oliver, Volschenk, and Smit (2011) discovered that individuals stated that they regularly recycle and that this was also an indication of future recycling behaviour (Oliver *et al*., 2011, p. 549). The following section examines the relationships that exist between the two constructs of environmental concern and environmental behaviour in research conducted in Africa.

2.3.6.4. Environmental Concern and Environmental Behaviour in Africa

In a study conducted by Mostafa (2007b, p. 445) the emotional elements and values of Egyptian consumers were assessed in terms of their environmental actions. It was found that the individuals in Egypt possess a high level of environmental concern and indicated that they are prepared to purchase environmentally friendly products to combat environmental problems (Mostafa, 2007b, p. 445). However the study also determined that this green concern is not properly demonstrated in terms of green behaviour (Mostafa, 2007b, p. 445). Therefore an environmental belief-behaviour gap exists.

Another African country where the relationship between consumer environmental values and behaviour was examined, was Tunisia. Ibtissem (2010) conducted research that focused on sustainable behaviour and household energy saving and discovered that in terms of household energy conservation awareness and behaviour, individuals in Tunisia were mostly affected by their altruistic values while their egoistic values had no effect on their awareness and behaviour

(Ibtissem, 2010, p. 133). Ibtissem (2010, p. 133) states that the most surprising result was that, although environmental awareness seems to be on the rise, the eco-centric (biospheric) values have no effect on Tunisian individuals. This was explained to possibly be due to Tunisian consumers believing that it is the responsibility of the government and businesses to protect the environment, therefore the biospheric values of individuals do not create any feelings of moral obligations to promote the environment themselves (Ibtissem, 2010, p. 133).

A study most closely related to the current research, was by Carlson and van Staden (2006) who sought to determine whether green concerns of individuals of the Western Cape and Gauteng provinces were more anthropocentric (egoistically inclined) or eco-centric (biospheric) in relation to participation in an eco-friendly club (Carlson & van Staden, 2006, p. 3). It was found that there was a significant positive correlation between individuals performing environmental activities for the ecological organization and the anthropocentric, eco-centric and general green concern that they expressed (Carlson & van Staden, 2006, p. 19).

2.4. Conclusion

Throughout this literature review it is evident that environmental behaviour is a multifaceted construct that may be influenced by many factors. However by reviewing the literature in this chapter it is still unclear as to whether environmental concern plays a significant role in predicting behaviour. In order to understand green concern more accurately the construct was divided into two groups being firstly value orientations and secondly environmental beliefs. By analysing previous research (covering both foreign and local studies) that relate to values and beliefs, it is found that a gap in knowledge is still apparent as to whether the three value orientations (egoistic, altruistic and biospheric values) and environmental beliefs have a direct clear-cut relationship with environmental behaviour. This is especially evident in an African context. It is evident that environmental research is rather scarce in Africa and the studies that have taken place in South Africa have not specifically focussed on the levels and influence of egoistic, altruistic and biospheric values of individuals and on young adults in particular. Environmental beliefs have also not been tested with the use of the NEP scale in this context. Many of the studies mentioned in this chapter have focused on a particular environmental behaviour and were conducted some time ago. Therefore the current study aims to fill these

gaps in knowledge and determine whether values and beliefs have an impact on the environmental behaviour of young consumers in an African context. The next chapter states and outlines the methods and sources utilized to obtain the primary data for the present study.

Chapter 3: Research Methodology

Introduction

This chapter describes the specific methods used to conduct the primary research of the study. Firstly it provides the research problem of the study then outlines the problem statement of the research. Thereafter the research objectives are stated. This is followed by an examination of the research design and research approach/paradigm utilized for this study. The location or study site of the primary research is then stated, followed by an analysis of the target population chosen for the study. The sample utilized for the research is then outlined, examining the sample design, sample size and sample techniques that were employed for the research. Thereafter the design of the questionnaire used to gather the primary data for the study is discussed in detail. Afterwards an examination of the method employed to collect the primary data is examined. Thereafter the statistical methods used to analyse this data is outlined. The chapter then concludes by discussing the reliability and validity of the primary data and questionnaire and lastly examines the ethical considerations that were taken into account.

3.1. The Research Problem

As mentioned in Chapter 1 there have been many research studies conducted with regards to the relationship between green concern and ecological behaviour with the majority of the findings of these studies producing contradictory or ambiguous results. This has given rise to the concern-behaviour gap which is still an unsolved subject in the field of ecological research. Furthermore it was established that the majority of research associated with the relationship between environmental concern and green behaviour have been conducted in developed countries (Bamberg, 2003; Kim & Choi, 2005; Schultz, 2001; Young *et al*., 2010) with scarce research of this nature being performed in 3rd world countries. In order for marketers, organizations and even government sectors (especially within developing countries) to create appropriate environmental products, services and strategies it is important that they have a greater understanding of ecological behaviour of consumers and the factors that influence this behaviour. Therefore the current research study intended to fill the concern-behaviour gap by

focussing particularly on the construct of environmental concern being the egoistic, altruistic and biospheric concerns of individuals, and the influence of these concerns on green behaviour.

3.2. Problem Statement

The state of the environment is dependent on individuals behaving in an environmentally friendly manner. Understanding the factors that influence ecological behaviour is important. The effect that environmental concern has on green behaviour has surfaced contradictory results. This research aimed to determine the relationships between environmental concern and environmental behaviour by analysing the three types of environmental values (egoistic, altruistic and biospheric), and environmental beliefs, and their relationships with the environmental behaviour of young adults.

3.3. Research Objectives

In order for the current study to address the above research problem and problem statement the following objectives were developed. The objectives of the research guide the researcher and are directly linked to the rest of the research in terms of the specific questions in the questionnaire, as well as the findings and conclusions of the study (Churchill, Brown & Suter, 2010, p. 68). Due to the fact that the main focus of the current research is to analyse the environmental concerns of young adults (and in the case of the present study these concerns were divided into two groups being environmental values and beliefs), the first objective deals with determining environmental values of young adults while the second objective deals with determining environmental beliefs of young adults. The third objective relates to determining the environmental behaviour of the target population and finally the fourth objective deals with determining the relationships that exist between the two constructs of environmental concern (values and beliefs) and environmental behaviour. Thus the research objectives for this study were:

1. To determine which group of environmental values (egoistic, altruistic or biospheric) are most important to young adults
2. To determine the environmental beliefs of young adults

3. To establish the extent of their environmental behaviour
4. To determine the relationship between the three types of environmental values (egoistic, altruistic and biospheric) and environmental beliefs with environmental behaviour.

3.4. Research Design

The research design for this study was descriptive. A descriptive research design has two primary aims: firstly to explain phenomena and secondly to predict behaviour (Welman, Kruger & Mitchell, 2005, p. 23). Since the overall objective of this research was to better understand environmental concern of young consumers in order to more accurately predict green behaviour, this research design was appropriate. This design allows a researcher to determine if relationships exist between the variables in question as well as what effect one variable has on the other (Welman *et al*., 2005, p. 23) and in the case of this study these variables were environmental concern and green behaviour.

3.5. Research Approach/Paradigm

Since the research aimed to assess objective data that consists of numbers and the use of empirical and inferential methods (Welman *et al*., 2005, p. 9) this research applied a quantitative approach. The researcher utilized a structured questionnaire to obtain the necessary information and according to Welman *et al*. (2005, p. 9) researchers use structured methods of data collection to enable them to recognize and isolate variables in quantitative research. The research paradigm utilized in the study is a positivistic research paradigm. This paradigm is usually employed in quantitative research and views the observation and examination of people as entities in a similar manner to how scientists treat physical phenomena (Johnson & Onwuegbuzie, 2004, p. 14). This paradigm also views the researcher (observer) as independent from the entities that are under observation (Johnson & Onwuegbuzie, 2004, p. 14). A positivist paradigm was chosen to be employed as it involves the researcher removing their biases towards the study, maintaining emotional detachment with regards to the entities of the

research, and to support their hypotheses/objectives with empirical tests (Johnson & Onwuegbuzie, 2004, p.14).

3.6. Study site

Initially data was intended to be collected from all four campuses of the University of KwaZulu-Natal (UKZN), South Africa, however due to a very poor response rate obtained from the first method of data collection, a second method was then employed and this took place solely on the Pietermaritzburg campus of UKZN. It is of significance to examine the environmental concerns and behaviour of South African individuals as, due to the importance of agriculture, the country's economy as well as the livelihood of many individuals depends on the condition of the environment and it is particularly sensitive to climate change. (Bryan *et al*., 2009, p. 413).

3.7. Target Population

The target population of this study is the students of the University of KwaZulu-Natal. The reason this particular population has been chosen is because young adults are a pivotal aspect of the transformation of the environment as it is this group of people that will have the ability to make a difference in sustainability and be able to continue and improve on the environmental movement (Barrett, Kuroda, & Miyamoto, 2002, p. 238; McDougle *et al*.,2011, p. 325). The younger generation of consumers are also an ideal target for this study as they are currently in their final phases of developing their values and personal opinions about the world that they live in and it is highly probable that they will keep these values throughout their lives and into old age (Vermeir & Verbeke, 2008, p. 545). The study dealt with the students of the University of KwaZulu-Natal as young adults that have received or are currently receiving tertiary education tend to have a pre-existing knowledge of environmental terms and notions such as sustainability, therefore the results of the research should be more accurate and less speculative (Vermeir & Verbeke, 2008, p. 545). The nature of the study and its objectives deal with determining relationships between constructs, as well as environmentally friendly behaviours that will be applicable to students in their everyday lifestyles. All of these objectives are not

dependent on an individuals' income, occupation or age. Therefore the researcher determined this particular population of individuals to be fit to obtain the required data. There have been many studies that have opted to utilize university students for their sample in order to measure environmental values, concern and behaviour. Some of these studies include research conducted by Steg *et al*. (2011) that examined the impact that values and environmental concern have on energy saving behaviour while Snelgar (2006) used a student sample in her research in order to determine the impact of the EC scale. Other environmental studies that have utilized student samples include Schultz (2001) and Zelezny *et al*. (2000). Most of the research conducted dealing with environmental concern and environmental behaviour have taken place in first world countries outside of Africa. Therefore the current study addresses these environmental issues from the perspective of a developing country, an African country and in South Africa in particular.

3.8. Sample Design

3.8.1. Sample Size

The size of the sample was calculated to be 384 students by utilizing a sample size calculator (Macorr Research Solutions, 2015) with a confidence level of 95% and a confidence interval of 5%. Initially the researcher intended to obtain the required responses from a probability sample of students via the Notice system of UKZN. Under instruction of the UKZN Ethics Committee, in order for the researcher to obtain a random sample, a census data collection approach was taken. Therefore the total population of 43134 students at UKZN were included in the study with the hopes that the required 384 students would respond. Due to the extremely poor response rate obtained from the Notice system (12 responses) the balance of the responses required were obtained from classes of students (374 responses). Therefore in total 386 responses were obtained for the study.

3.8.2. Sample Technique

Under instruction from the registrar, the questionnaire was initially placed on the UKZN Notice system. Thus while this appears to be attempting to use a census approach, it was anticipated that only a small sample of students would respond. It was hoped that the required 384 students

would respond. This is the closest the researcher could get to a random sample. Random sampling is considered to be the most appealing type of probability sampling and is also a precise and easily accessible method to allocate sample members (Welman *et al.*, 2005, p. 59, 67). However due to the incredibly low response rate to the questionnaire on the Notice system, a second technique had to be put into place. It was decided that the balance of the responses would be obtained from classes of students at the UKZN Pietermaritzburg campus during lectures. Therefore the second sample of students was a non-probability sample and the technique employed was convenience sampling. The advantages of utilizing non-probability sampling in research is that it is more cost effective and time saving as well as not very complex to carry out as compared to probability sampling (Welman *et al*., 2005, p. 68). However according to Kothari (2004, p. 15) non-sampling procedures such as convenience sampling may give rise to results that are biased and not representative of the population. To combat this drawback the researcher made certain that a wide variety of students were selected to participate in the study in order to gain as much of a representative sample as possible. This was done by strategically selecting classes of students based on the modules that they studied as well as their year of study and this ensured that a good range of demographics was attained. This included a reasonable percentage of both males and females and all race groups were represented as well. This also ensured that none of the classes of students overlapped and this safeguarded against any student answering the questionnaire more than once. Multiple classes of students were tested that included classes in Economics, Supply Chain Management, Marketing, Entrepreneurship and Management and it was ensured that students from all years of study were chosen (1st, 2nd, 3rd and postgraduate students). Due to the range of classes chosen the ages of respondents also differed and included individuals from ages 18 to over 22 years. The researcher stipulated to all students that participation in the study was voluntary and they could withdraw at any time as per the UKZN Ethics requirements.

To better understand the target population and sample utilized for the study Figure 3 below illustrates the target population, sample units, sample elements and actual sample size utilized in terms of the initial sampling technique. As mentioned above this technique consisted of the probability sample that was obtained via the UKZN Notice System.

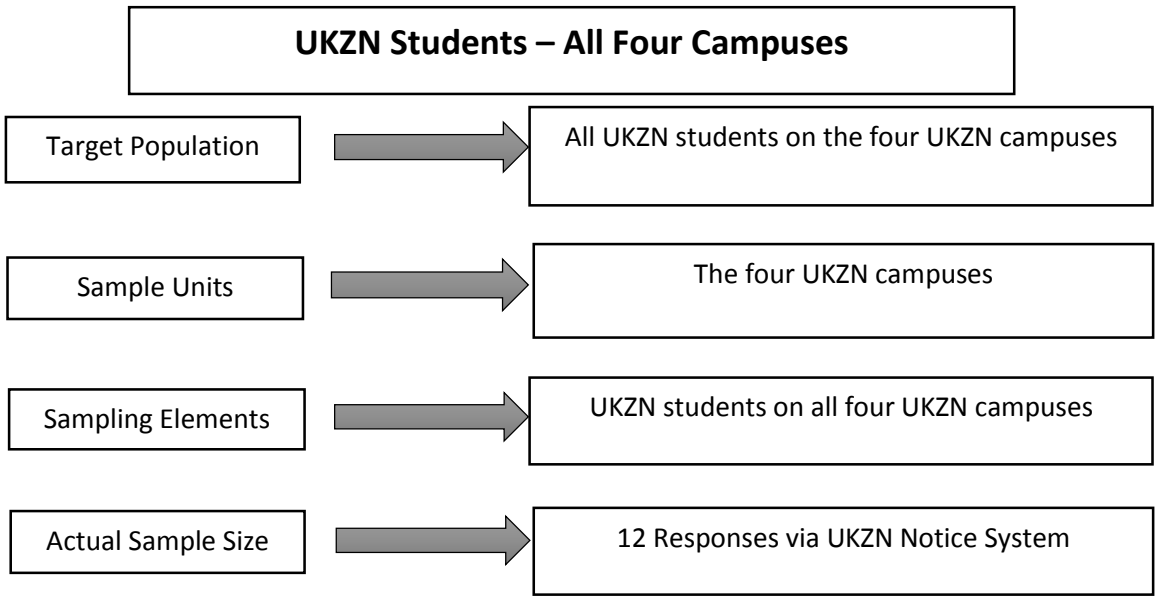


Figure 3: Target Population, Sample Units, Sample Elements and Actual Sample Size of Study (Probability Sample: Via UKZN Notice System)

Figure 4 below illustrates the target population, sample units, sampling elements and actual sample size obtained in relation to the second sampling technique. As mentioned above this technique consisted of a non-probability sample obtained via hand-delivered questionnaires.

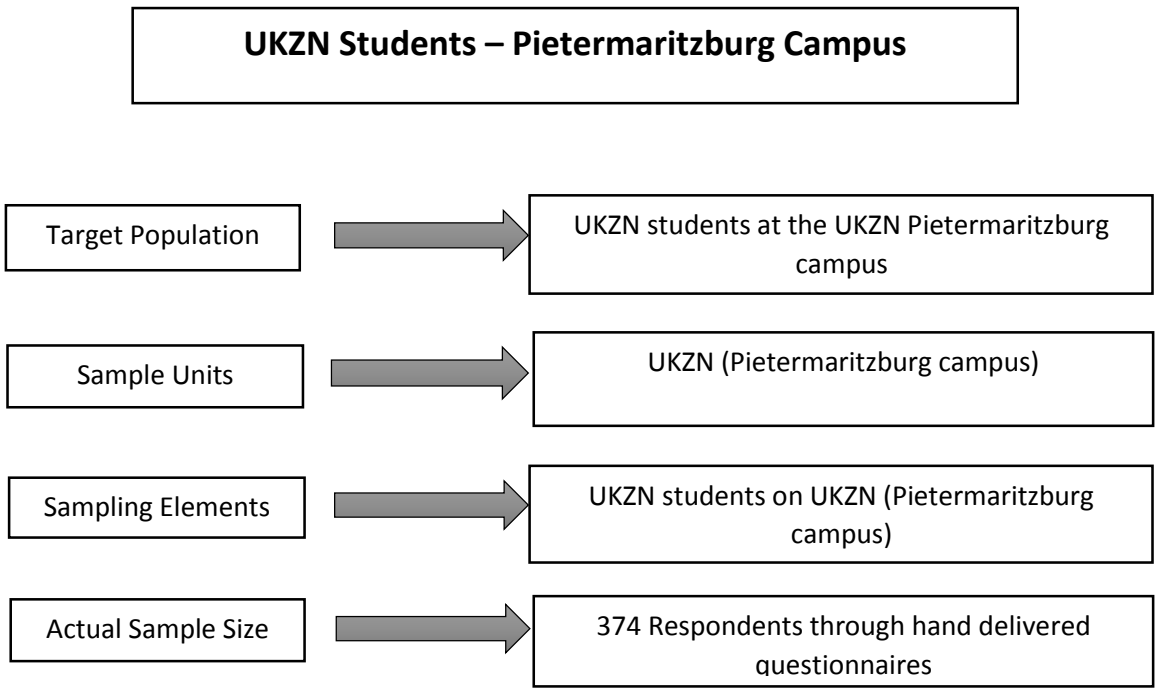


Figure 4: Target Population, Sample Units, Sample Elements and Actual Sample Size of Study (Non-Probability: Via Hand Delivered Questionnaires)

3.9. Questionnaire Design

The data collection instrument designed for the study was a highly structured questionnaire consisting of closed-ended Likert scale questions. A highly structured questionnaire is preferred in this study as the analysis and data coding of information is easier as compared to an unstructured questionnaire (Churchill *et al*., 2010, p. 195). It is usually related to a higher level of reliability, and it is normally easier and less time consuming for individuals to respond to the questions (Churchill *et al*., 2010, p. 196). Therefore it was a suitable data collection tool for the study in question.

Since the aim of this research was to determine the levels and types of environmental concern (by assessing environmental values and beliefs) and environmental behaviour, as well as the relationship between these constructs, the questionnaire consisted of three main sections. Section 1 measured the extent of environmental concern in terms of egoistic, altruistic and biospheric values, Section 2 measured the extent of participation in eleven environmental behaviours and Section 3 measured respondents' environmental beliefs. Section 4 asked participants for their demographic information. The Environmental Concerns (EC) scale by Schultz (2000) was chosen as the best measurement tool to utilize in Section 1 while the New Ecological Paradigm (NEP) by Dunlap *et al*. (2000) was used in Section 3. The questionnaire is found in Appendix 3 of the research.

3.9.1. Section 1: Environmental Values and Concern

According to Snelgar (2006, p. 88) Schultz's EC scale was created to assess the concern for objects of value that symbolize the egoistic, altruistic and biospheric value orientations of an individual and this scale is one of the most recent measurements of environmental concern. Studies that employed the EC scale have yielded empirical findings that illustrate that individuals construct their ecological concerns in line with the value orientations of the Value-Belief-Norm (VBN) Theory (e.g. Hansla *et al*., 2008; Schultz, 2000, 2001; Schultz *et al*., 2004; Snelgar, 2006).

The original EC scale begins with an introductory paragraph about the environmental situation that we are all currently in and the fact that individuals differ in the environmental threats that concern them the most (Schultz, 2000, p. 395). It thereafter asks the respondents to rate their levels of concern for various aspects on a 7-point Likert scale ranging from 1 (not important) to 7 (supreme importance) (Schultz, 2000, p. 395). As mentioned previously the scale consists of 12 items altogether, with 4 items representing each of the three value orientations. The variables that make up the egoistic factor are "my health", "my future", "my lifestyle" and "me"; the altruistic factor consists of "children", "people in my community", "all people" and "my children"; and the biospheric factor is made up of the items "marine life", "birds", "animals" and "plants" (Schultz, 2000, p. 396). When utilizing this scale some researchers chose to change the wording of some of the items mentioned above. For example in another study conducted by Schultz along with several other researchers, two of the altruistic items, "all people" and "my children" were substituted with the items "humanity" and "future generations", while the biospheric item of "plants" was substituted with the item "trees" instead (Schultz *et al*., 2005, p. 462). However Snelgar (2006) utilized the most comprehensive EC scale as it consisted of a total of 15 items that measured the three value orientations. The researcher of the current study therefore opted to also employ a 15 item scale with 14 of the 15 value items being adapted from Snelgar (2006) namely: My Health, My Future, My Prosperity, My Lifestyle and Me (egoistic concerns); Children, Humanity, People in the Community and Future Generations (altruistic concerns); and Marine Life, Plants, Animals, Trees and Birds (biospheric concerns) (Snelgar, 2006, p. 92). The 15th item that the researcher utilized was the altruistic value item "My Children" which was adapted from the EC scales in studies conducted by Steg *et al*. (2011), Onur *et al*. (2012) and Schultz (2001). Therefore each of the three value orientations being measured consists of 5 items each. They are as follows:

Egoistic Values

- My Health
- My Future
- My Lifestyle
- My Prosperity
- Me

Altruistic Values

- Children

- Humanity
- People in the Community
- Future Generations
- My Children

Biospheric Values

- Marine Life
- Plants
- Animals
- Trees
- Birds

This scale has been successfully applied to many studies that sought to determine the environmental concerns of different types of individuals. Bruni *et al*. (2012) conducted research that dealt with establishing the ecological concerns of children and stated that previous studies that have used the EC scale have reported a good fit for the three factor structure of egoistic, altruistic and biospheric value orientations (Bruni *et al*., 2012, p. 1). Similar to the studies mentioned above, Bruni *et al*. (2012, p. 1) also adapted the scale slightly to ensure that the language was understandable to children and the results that were produced by the study illustrate that the scale was still a good fit even with a younger population being used as a sample. Another study conducted by Onur *et al*. (2012) also employed the EC scale on younger individuals with primary school students being the sample population. Therefore the scale should be effective on the university student population as well.

Along with Bruni *et al*. (2012) the scale has been used to distinguish between the three value orientations (e.g. Hansla *et al*., 2008; Schultz, 2001) and it has been used to compare the effectiveness of measurement with different scales (e.g. Ryan & Spash, 2012; Snelgar, 2006). It has also been used to determine the relationships between one's values, environmental attitude, concern and green behaviour (e.g. Schultz *et al*., 2005; Steg *et al*., 2011). Previous research that has utilized this scale indicated the measure to be reliable and valid with Cronbach's alpha reliability scores for egoistic concerns ranging from 0.83 to 0.91, altruistic concerns ranging from 0.73 to 0.92 and biospheric concerns ranging from 0.81 to 0.94 (e.g. Onur *et al*., 2012; Schultz, 2000, p. 398; Schultz, 2001, p. 39; Steg *et al*., 2011). The alpha

values of Snelgar (2006) are of special importance as 14 of the 15 value items that the questionnaire utilizes originate from this version of the EC scale. The alpha values are 0.912 for the egoistic items, 0.857 for the altruistic items and 0.911 for the biospheric items, therefore this scale was considered reliable (Snelgar, 2006, p. 92). Therefore the EC scale was utilized in this study to measure the egoistic, altruistic and biospheric concerns of consumers.

3.9.2. Section 2: Environmental Behaviour

Section 2 of the questionnaire concentrated on measuring the extent of 11 specific environmental behaviours being:

2.1. Recycling glass, paper etc.

2.2. Reusing empty bottles or containers

2.3. Using your own shopping bag instead of buying plastic shopping bags

2.4. Closing the tap while washing dishes or brushing teeth

2.5. Having a shower rather than a bath

2.6. Switching off unnecessary lights at home

2.7. Switching off electrical appliances that are not being used

2.8. Supporting the 'Save the Rhino' environmental campaign

2.9. Purchasing organic products

2.10. Purchase green products e.g. energy saving light bulbs

2.11. Purchasing locally produced products.

All of the green behaviours above, with the exception of item 2.8. were adapted from a study by Gilg *et al*. (2005) that assessed the frequency of environmental behaviours. Gilg *et al*. (2005) divided the behaviours into three groups, the first dealing with all environmental behaviours that involved the purchasing of any goods, the second being environmental activities or habits that are performed by individuals and the third group being any form of recycling. The Cronbach alpha values for the first group of behaviours was 0.83, the second

0.81 and the third 0.78 (Gilg *et al*., 2005, p. 487). Given the good reliability of these measures and the fact that most other studies focus on 1 or a few behaviours, the researcher decided to employ the items utilized by Gilg *et al*. (2005) in this research study.

Statement 2.8., the only additional item of the current study's questionnaire dealt with the support of the environmental campaign of 'Save the Rhino'. This statement was adapted from a study conducted by Schultz *et al*. (2005) that tested the importance of environmental campaigns and causes. Schultz *et al*. (2005) assessed the frequency of respondents taking part or supporting environmental campaigns and causes in the form of writing letters supporting environmental problems, voting for political members who promote environmental issues and finally by donating money and volunteering time to assist environmental groups (Schultz *et al*., 2005, p. 461). Therefore taking the range of support of environmental campaigns and groups measured, the researcher of the current study chose to measure the frequency of support of respondents for an environmental campaign named 'Save the Rhino'. This particular ecological campaign was chosen as it has a special significance to the people of South Africa as rhino poaching is currently one of the most serious problems facing South African wildlife with poaching levels drastically increasing since the year 2008 (Save the Rhino, 2015, paragraph 7). Due to this the concern of South Africans has also increased drastically with regards to this particular environmental issue (Save the Rhino, 2015, paragraph 10).

To measure the frequency of the environmental behaviours Gilg *et al*. (2005) opted to use a 5-point Likert scale from 1 (Never), 2 (Rarely), 3 (Sometimes), 4 (Usually) to 5 (Always). Schultz *et al*. (2005) also utilized a 5-point Likert scale in their study dealing with environmental behaviour and this scale differed slightly in wording as instead of using scale items 4 and 5 as being Usually and Always respectively, Schultz chose to word them as Often and Very Often respectively (Schultz *et al*., 2005, p. 462). The researcher of the current research chose to utilize both scales that were used by the two studies mentioned above but adapted it slightly in order for easier understanding and answering for the respondents of the research. Instead of a 5-point Likert scale the researcher chose to employ a 4-point Likert scale that ranged from 1 (Never), 2 (Sometimes), 3 (Often) to 4 (Always). This was also chosen to be done due to the fact that previous items of "Rarely" and "Sometimes" are very similar in meaning and might be confusing for respondents to answer accurately.

3.9.3. Section 3: Environmental Beliefs

Section 3 of the questionnaire measured the environmental beliefs of the student population with the use of the NEP scale. Due to the fact that individuals were seeking greater changes in terms of environmental problems and the knowledge of the presence of the Dominant Social Paradigm (DSP) in individuals, in the 1970's researchers Dunlap and Van Liere debated that there was also a connection between nature and humans that guided environmentalism (Dunlap *et al*., 2000, pp. 426-427). They developed the New Environmental Paradigm (NEP) to measure three aspects of environmental beliefs namely:

- The ability of mankind to disturb the balance of nature
- The belief that there are limits of growth and development for societies
- The belief that it is just for mankind to have total control and rule over nature (Dunlap *et al*., 2000, p. 427).

The original NEP scale consisted of 12 items which were all measured by using a 4-point Likert scale that ranged from 'Strongly Agree' to 'Strongly Disagree'. Although the New Environmental Paradigm scale has been utilized in many studies around the world and is considered the most extensively used form of measurement of environment concern (Dunlap & Van Liere, 2008, p. 3; Dunlap *et al*., 2000, p. 427), significant flaws were detected in the scale (Lalonde & Jackson, 2002, p. 28). As time passed it became evident that the original NEP scale was in need of updating in order to assess the current understanding of ecological problems (Lalonde & Jackson, 2002, p. 28). Lalonde and Jackson (2002) examined the impact of the original NEP scale and discovered that some of the issues associated with the scale included the use of outdated terminology and wording of the questions as well as being limited in gaining accurate information concerning individuals' views about nature and ecological issues (Lalonde & Jackson, 2002, p. 28). Therefore in order to remedy the above mentioned flaws present in the scale, Dunlap *et al*. (2000, p. 431) conducted research to develop a new updated NEP scale. This revised scale was named the New Ecological Paradigm (NEP) scale and now consists of 15 items (see Dunlap *et al*., 2000, p. 433) that measured both the beliefs surrounding human dominance over nature and beliefs associated with the eco-crisis (Dunlap *et al*., 2000, p. 432). The new scale has updated wording, took into consideration recent environmental issues such as climate change and ozone depletion, and added an 'Unsure' category to the Likert scale measurement making it a 5-point Likert scale (Dunlap *et al*., 2000,

p. 432). According to Dunlap *et al*. (2000, p. 432) the New Ecological Paradigm scale measures five aspects of the ecological worldview namely:

- The truth about restrictions to growth
- Anti-Anthropocentrism
- The belief that the balance of nature is delicate
- Dismissing the notion that humans should rule over nature
- The belief of the possibility of an environmental crisis

The Cronbach's alpha of the revised NEP was found to be 0.83 therefore this scale holds internal consistency that validates it being a measure of a logical belief system and of an ecological worldview (Dunlap *et al*., 2000, pp. 434, 435). Eight of the 15 statements reflect a pro-ecological view with the remaining seven items indicating an anti-ecological view (Dunlap *et al*., 2000, p. 432).

There have been several studies in the past that have utilized the NEP to assess beliefs and measure environmental concern in relation to green behaviours and in other manners as well. Due to the problems mentioned above associated with the original NEP scale, the majority of newer studies have opted to use the revised NEP scale as a measurement tool. There have been some studies which have utilized the scale to better understand environmental concern with regards to individual green behaviours such as recycling (e.g. Best & Mayerl, 2013, p. 698), animal welfare (e.g. Faver, 2013, p. 149) and the adoption of green electricity and acceptance of energy policies (e.g. Clark, Kotchen, & Moore, 2003, p. 242; Steg *et al*., 2011, p. 353 respectively) while there have been others that have employed this scale to gain more knowledge of green concern in relation to a multitude of environmental behaviours. Examples of these studies include Zelezny *et al*. (2000, pp. 447-450) that used both the revised and original versions of the NEP to assess concern with regards to political activism, recycling, energy saving, water conservation, environmental transportation and purchasing green products. Lee *et al*. (2014, p. 2100) employed the NEP to assess the relationship between environmental concern and three behaviours namely green purchase behaviour, environmental activism and good citizenship. Whitmarsh and O'Neill (2010, pp. 308-309) utilized the revised NEP to measure the levels of environmental values of individuals in relation to a wide spectrum of environmental behaviours such as turning off unwanted lights, purchasing green products,

buying organic and locally-grown food, recycling, reusing items, water conservation (closing tap while brushing teeth) and protesting to support an environmental issue (Whitmarsh & O'Neill, 2010, p. 309). Therefore the researcher of the current study chose to employ this scale to assess the environmental beliefs of individuals in relation to 11 environmental behaviours.

Although many researchers have utilized the revised NEP scale to either measure environmental beliefs, values or concerns, some researchers did not employ the entire 15 item scale but chose to use just a portion of the scale. Some of these studies include the above mentioned research by Faver (2013, p. 158) and Whitmarsh and O'Neill (2010, p. 308) which only used 6 items from the scale while Lee *et al*. (2014, p. 2101) opted to use just 4 items of the scale. Clark *et al*. (2003, p. 242) employed 10 items from the revised NEP and stated that the reason why some of the items were omitted was to reduce the length of the questionnaire (Clark *et al*., 2003, p. 241). For the same reason, the researcher of the current study chose to utilize only 8 items from the NEP scale. The scale was used in exactly the same manner in which Dunlap *et al*. (2000) developed it. Due to the length of the questionnaire for the current study, the researcher opted to use eight ecological statements from the 15 items and all were measured with the 5-point Likert scale ranging from 'Strongly Agree' to 'Strongly Disagree'. The eight statements are as follows:

1. When humans interfere with nature it often produces disastrous consequences.
2. The balance of nature is strong enough to cope with the impacts of modern industrial nations.
3. Plants and animals have as much right as humans to exist.
4. The so-called "ecological crisis" facing humankind has been greatly exaggerated.
5. The balance of nature is very delicate and easily upset.
6. Humans have the right to modify the natural environment to suit their needs.
7. If things continue on their present course, we will soon experience a major ecological catastrophe.
8. Humans were meant to rule over the rest of nature.

According to Dunlap *et al*. (2000) statements 2, 7 and 12 measure anti-anthropocentrism, statements 3, 8 and 13 assess the beliefs about the balance of nature, and finally statements 10 and 15 examine the belief of the possibility of an environmental crisis, however all of the

statements combined measure the general ecological beliefs of individuals (Dunlap *et al*., 2000, p. 432). Since the aim of the current research is to determine the environmental concerns of individuals by assessing their egoistic, altruistic and biospheric values, the researcher chose to examine anti-anthropocentrism as it closely resembles an egoistic belief system, while the balance of nature deals with humankind's interaction with nature and could symbolise an altruistic and biospheric belief system. Measuring the possibility of an environmental crisis could expose whether individuals believe that the earth (or biosphere) is in danger.

Overall the reliability of the NEP scale across all studies mentioned above revealed a high internal consistency with Cronbach's alpha values ranging from 0.70 to 0.85. The NEP has also been utilized frequently on student populations to measure environmental beliefs and concern with regards to environmental behaviour (e.g. Faver, 2013, p. 149; Mayer & Frantz, 2004, p. 507; Schultz, 2001, p. 331; Schultz *et al*., 2005, p. 461; Schultz *et al*., 2004, p. 33) therefore the researcher of the current study decided that this scale would be an ideal measurement to use on university students to assess environmental beliefs with regards to different environmental behaviours.

There have also been a few studies that possessed a similar structure to the current study in that they utilized the Environmental Concerns (EC) scale in conjunction with the revised NEP scale to better understand environmental behaviours (e.g. Schultz, 2001, p. 331; Schultz *et al*., 2005, p. 462; Schultz *et al*., 2004, p. 34; Steg *et al*., 2011, p. 353). Therefore this structure was also employed in the current study.

In total the beliefs scale in Section 3 consisted of 12 items. As mentioned above the first eight were adapted from the revised NEP scale. The remaining four items were added by the researcher and were developed from issues discussed in the Literature Review. These beliefs are as follows:

1. Degradation of the environment has negative consequences for humanity
2. It is important to be seen to be caring for the environment
3. Caring for the environment is a private responsibility
4. Being active with regards to environmental protection gains you social status

The first environmental belief was developed by analysing literature by Ibtissem (2010, p. 131) and Wynveen *et al.* (2013, p. 31) that dealt with the two broad aspects that the NEP scale measures being anthropocentric values and eco-centric values of individuals. Anthropocentric values views humanity as separated and independent to the environment and this viewpoint may result in environmental degradation as the overuse of natural resources and pollution are viewed as being merely an ordinary consequence of economic growth (Ibtissem, 2010, p. 131). Therefore the first of the four belief statements above was added in the scale to determine whether individuals believe that the deterioration of the environment has an adverse effect on humanity. The other three belief statements were derived from the study conducted by Griskevicius *et al*. (2010) discussed in Chapter 2. This study examined the effect that one's social status has on an individual's environmental behaviour as well as how green behaviour may differ in a public or private setting (Griskevicius *et al*., 2010, pp. 394, 396). Therefore based on this study the last three belief statements were added to the beliefs scale in Section 3 bringing the total belief statements to 12 items.

3.9.4. Section 4: Demographics

Section 4 of the questionnaire of the study dealt with the demographics of the respondents. It consisted of five questions relating to demographic items such as age, race, and gender. Since university students were the target population the last question asked respondents their degree being studied.

3.10. Data Collection Method

Two data collection methods were employed in the duration of this study. The questionnaire was initially administered via the University of KwaZulu-Natal student website on the Notice System of the university. The questionnaire was posted in the format of a Microsoft Word document on the Notice System and all four sections were formatted into tables for easy answering by the students. An informed consent form that explained the purpose of the study accompanied the questionnaire which the students were required to read prior to answering the questionnaire. The informed consent form can be found in Appendix 2 of this dissertation.

Once the students completed the questionnaire they were asked to email the questionnaire back to the researcher. This method of data collection was also utilized by De Groot and Steg (2007) in a study that concentrated on the distinction of the three value orientations egoistic, altruistic and biospheric orientations and the impact these have on environmental behaviour.

This method of administration was chosen due to the following advantages stated by Wright (2005) that are associated with using the internet as a form of collecting data:

- Firstly this form of data collection allows the researcher to find unique populations of individuals that might be difficult to access by face to face interviews and it proves to be useful in accessing a large number of individuals with similar characteristics (Wright, 2005, paragraph 4)
- Secondly internet questionnaires take very little time to administer and to reach the respondents involved. It is stated that a researcher can access large populations of individuals by placing requests for participation on chat rooms, newsgroups and on message board communities (Wright, 2005, paragraph 6)
- Cost is the third major advantage of utilizing the internet to administer questionnaires to a population of individuals as traditional paper questionnaires can be very costly especially when used as mail questionnaires. Instead internet administration is associated with an electronic medium and therefore removes the costs of printing and posting etc. (Wright, 2005, paragraph 8)

Due to the above advantages many researchers believe that the internet is a productive place to conduct research and this has resulted in many organizations and groups moving to this style of collecting data (Wright, 2005, paragraph 1). Therefore due to time and financial constraints, the researcher of the current study adopted this form of administrating questionnaires in order to access a large number of students of UKZN in a timely and cost-effective manner.

However there are some disadvantages associated with administering questionnaires via an online community or in this case a message board community (UKZN Notice System) such as access issues and poor response rates (Wright, 2005, paragraph 16, 21, 22). Access problems may arise when the web administrators are unaware of the research taking place and tend to

believe it to be a form of 'spam' on their websites. This issue has been combatted by the researcher of the current study due to the fact that the Research Ethics Committee of UKZN suggested utilizing the UKZN Notice System as a form of administrating questionnaires as this is a common way many research students conduct studies at the university. Since the target population was the students of UKZN the researcher believed that these individuals would express more of an interest in participating in research as compared to the general population as many students have been involved in conducting studies themselves and it is more likely that they would be enthusiastic about contributing to the development of knowledge.

However there is always a risk of a low response rate with online administration of questionnaires and one way to combat this risk is for researchers to offer some form financial incentive to boost response rates, such as a lottery (Wright, 2005, paragraph 16). Therefore the researcher of the current study chose to include an incentive of a gift voucher to be awarded to one lucky student who participated in the research to increase response rates. Unfortunately despite the financial incentive being offered to the students this method of data collection still obtained an extremely low response rate with only 12 students responding. Therefore a second data collection method had to be employed. It was decided that due to time constraints the balance of the questionnaires needed would be handed out to classes of students by the researcher during lectures. As mentioned previously this method of collection yielded a non-probability sample and this sample was obtained by utilizing convenience sampling. This method was employed as non-probability convenience sampling is known to be cheaper and less time consuming than other methods of collection (Welman *et al.*, 2005, p. 68). However this method does have a major limitation of biased responses that may not be representative of the population (Kothari, 2004, p. 15). To remedy this the researcher made certain that a wide variety of students were selected to participate in the study in order to gain as much of a representative sample as possible. This was done by strategically selecting classes of students based on the modules that they studied as well as their year of study and this ensured that a good range of demographics was attained. This also ensured that none of the classes of students intersected and this prevented any student answering the questionnaire more than once. Furthermore the researcher stipulated verbally to the students that if any student answered the questionnaire previously then they were not required to answer it again to further safeguard against multiple responses from students. Each student was also required to sign an informed consent form. Several classes of students were chosen that ranged from 1st year classes up to

postgraduate classes. The researcher also stipulated to all students that participation in the study was voluntary and they could withdraw at any time as per the UKZN Ethics requirements.

All students that were a part of the first method of data collection which was done via the Notice system of UKZN received an informed consent form attached to the questionnaire. Since it is difficult to obtain a signature via the internet it was assumed that consent was given if the respondent emailed a completed questionnaire back to the researcher. The researcher tracked the email addresses used by the students to email back the online questionnaire therefore this ensured that no duplication of responses took place.

As stated previously each respondent a part of the second method of data collection (non-probability convenience sampling) were given the questionnaire with the informed consent form attached at the front. All students were instructed to read and sign the informed consent form before proceeding with the questionnaire.

3.11. Data Analysis

The methods employed in the current study for data analyses were gathered by examining the methods utilized in past research of a similar nature to the present study. Firstly it was evident that almost all previous studies employed descriptive statistics to evaluate the environmental results obtained from primary research to determine frequencies, means and standard deviation values (e.g. Schultz, 2001; Schultz *et al*., 2004). Objectives 1, 2 and 3 of the present study aim to establish the levels of egoistic, altruistic and biospheric values, environmental beliefs and environmental behaviour. Therefore descriptive statistics including means and standard deviations were used to analyse all questions to determine which items received the most responses. Thereafter three separate factor analyses were conducted on the value items, behaviour items and belief items. The aim of a factor analysis is to arrange a large collection of variables into fewer groups called *factors* (Kothari, 2004, p. 322). The present study dealt with many variables (15 values, 12 beliefs and 11 behaviours) therefore factor analyses were conducted for each set of constructs in order to determine if all items significantly loaded onto a factor and to also assess the groupings of the items. Factor analyses were also employed by

several past studies that dealt with environmental concern and environmental behaviour especially when distinguishing between the value items in the Environmental Concerns (EC) scale (e.g. Schultz, 2000, 2001; Schultz *et al*., 2005; Schultz *et al*., 2004) Since objective 4 of the present study aims to determine relationships that exist between environmental values and environmental behaviour as well as between environmental beliefs and environmental behaviour, inferential analysis such as Pearson correlation tests were utilized to establish individual relationships between these constructs. These tests were employed due to the fact that Kothari (2004, p. 139) states that the Pearson's correlation test is the most common method utilized by researchers to measure the level of relation between two variables. Correlation tests were also used in past research to determine relationships between environmental values, beliefs and behaviour (e.g. De Groot & Steg, 2007; De Groot & Steg, 2010; Schultz, 2001; Schultz *et al*., 2005; Schultz *et al*., 2004). Predicting which variables have an influence on environmental behaviour plays a major role in objective 4. According to Pallant (2010, p. 104) multiple regression analysis is a complex correlation test. The principle aim of utilizing this method of analysis is to predict the level of influence the independent variables of a study have on the dependent variable (Kothari, 2004, p. 318). In the case of the present study the dependent variable is environmental behaviour and the independent variables are the egoistic values, altruistic values and biospheric values of individuals, and the environmental beliefs of individuals. Other studies have also employed multiple regression analysis to determine the relationship and predicting power of environmental variables (e.g. De Groot & Steg, 2007; De Groot & Steg, 2008; De Groot & Steg, 2010) Therefore multiple regression analyses is utilized to predict the influence of the independent variables on the dependent variable in this study. The tests and analyses above were utilized due to the study being quantitative in nature. All analyses were conducted with the use of SPSS.

3.12. Reliability

The reliability of a research illustrates whether the findings of the primary research conducted are credible (Welman *et al*., 2005, p. 145). It is used to determine whether the scale utilized in the research can produce similar results each time the same scale is employed (Nargundkar, 2008, p. 64). For the measurement scale of a research study to be considered reliable it has to attain a Cronbach's Alpha score of 0.7 and above (Nargundkar, 2008, p. 64). The Cronbach's

Alpha of the Environmental Concerns (EC) scale utilized in Section 1 of the questionnaire was determined to be 0.892, therefore this scale was considered to be reliable to use. The scale that measured environmental behaviour in Section 2 of the questionnaire obtained a Cronbach's Alpha value of 0.690. Although this value is lower than the reliability value of 0.7, it is very close to it. Additionally all 11 green behaviours were adapted from previous studies of Gilg *et al*. (2005, p. 487) and Schultz *et al*. (2005, p. 461) therefore it was decided not to exclude any behaviours from the analysis as all activities held significant importance to the research.

The initial Cronbach's Alpha value determined for all 12 items in the scale in Section 3 of the questionnaire that measured the environmental beliefs of individuals was 0.624. This value was lower than the recommended score of 0.7 therefore it was decided that **Belief 10** and **Belief 11** be excluded from further data analyses such as correlation tests using total scores of variables and regression analyses. It was also determined that these two beliefs did not load onto a factor during the Factor Analysis performed on the 12 statements of environmental beliefs. With **Belief 10** and **Belief 11** excluded, the final Cronbach's Alpha value was found to be 0.687. Again this score is very close to the recommended value of 0.7. As mentioned previously **Beliefs 1 - 8** were adapted from the study conducted by Dunlap *et al*. (2000, p. 433) and were direct statements from the NEP scale therefore it was decided to keep these beliefs for further analysis in the study. Although **Beliefs 9** and **12** were created by the researcher they were also retained in the study due to the fact that these beliefs loaded strongly onto a factor during the Factor Analysis run on the environmental beliefs utilized in this study.

3.13. Validity

In order to prove the face validity of a measurement scale a pilot test can be conducted (Laroche *et al*., 2002, p. 270). Therefore a pilot study was conducted prior to the actual data collection of the research. Ten individuals were given a questionnaire to complete. These respondents were asked if they had any difficulties with the understanding or answering of any of the questions in the questionnaire as well as if the questionnaire was easy to answer overall. No difficulties were experienced by any of the pilot respondents with all ten individuals answering the entire questionnaire appropriately and with ease. The results of the pilot study were analysed to determine if any corrections or alterations were required relating to the wording,

phrasing or structure of the questionnaire as well as to determine whether the findings of the questionnaire satisfied the objectives of the research. All questions yielded appropriate results. Therefore the researcher proceeded to utilize the questionnaire on the actual sample of the study and the questionnaire was deemed valid.

As mentioned previously three scales are utilized in the questionnaire. The first is the Environmental Concerns (EC) scale developed by Schultz (2000) and according to Snelgar (2006, p. 95) and Bruni *et al*. (2012, p. 2) this scale was considered valid to use to measure environmental concern. Many previous studies have also utilized this scale to measure environmental concerns (e.g. Hansla *et al*., 2008; Schultz, 2000, 2001; Schultz *et al*., 2004; Snelgar, 2006). The scale used to measure environmental beliefs is the New Ecological Paradigm (NEP) scale and was developed by Dunlap *et al*. (2000). This scale was adapted from the original NEP (New Environmental Paradigm) scale mentioned previously and this original scale was analysed and tested rigorously in past research and was determined to possess substantial validity (Dunlap *et al*., 2000, p. 436). As mentioned previously the Cronbach's alpha of the revised NEP was found to be 0.83 therefore this scale holds internal consistency that validates it being a measure of a logical belief system and of an ecological worldview (Dunlap *et al*., 2000, pp. 434, 435). Therefore according to Dunlap *et al*. (2000, p. 436) the revised scale is also valid to use in research. This scale has been frequently used in past research to measure environmental beliefs (e.g. Dunlap *et al*., 2000; Faver, 2013; Lee *et al*., 2014; Whitmarsh & O'Neill, 2010). The scale utilized to measure environmental behaviour in the present study was mainly adapted from Gilg *et al*. (2005, pp. 485, 486). Gilg *et al*. (2005, p. 486) performed a factor analysis on all the behaviours utilized in their study and it was deemed valid. Therefore all three scales (EC scale, NEP scale and the environmental behaviours scale) were deemed valid to include in the questionnaire of the present study.

3.14. Ethical Considerations

Ethical clearance was applied for from the University of KwaZulu-Natal Research Office. Several measures were taken to ensure that ethics were upheld during the study. Every questionnaire was accompanied by an informed consent form (found in Appendix 2) that

explained to each respondent what the research was dealing with and who the researcher and supervisor were. For the students that filled out the questionnaire via the Notice system, by the act of the students emailing back a completed questionnaire to the researcher it was assumed that they gave consent to participate in the study. For the balance of the students who filled out the questionnaire during their lecture, the researcher was present at all lectures and administered the questionnaires to the students, explained the details of the research, and stipulated that each student was required to sign the informed consent form before completing the questionnaire. The students were informed that each respondent participated in the study voluntarily and could choose at any time to withdraw from the research. They were ensured that their information would be private and confidential and they had the right to answer only the questions that they felt comfortable responding to. The questionnaires completed via the Notice system was in the form of a Microsoft Word document and the respondent was asked to email the questionnaire back to the researcher, therefore any participant that wished to remain anonymous could do so if they pleased as their student email addresses consisted of only their student number and not their name. It was not possible for the researcher to establish student names from their numbers. In that way the only information the researcher had of the anonymous online participants is the year that these students registered to study in the University. If the convenience sample of students wished to remain anonymous then they were given the option to leave out their name and details or simply replace their name with their student number. However again all students of the convenient sample were required to sign the informed consent.

3.15. Conclusion

In summation, this chapter has outlined the methods that were utilized to measure the data collected from respondents. Due to contradictory results found in past literature in terms of the effect that environmental concern has on green behaviour, a gap in knowledge exists with regards to the relationship between these two constructs. This has led to the research problem and problem statement of the study. In order to fill this gap in knowledge the objectives of this research aimed to determine the environmental values, beliefs and behaviour of young adults and the relationships that exist between these values and beliefs with green behaviour. This study is quantitative in nature and employs a descriptive research design and a positivistic

research paradigm. The study sites of the research were the UKZN campuses and in particular the UKZN Pietermaritzburg campus and the target population were young adults. The size of the sample obtained was 394 students and these responses were gathered by utilizing the UKZN Notice system, and by hand-delivered questionnaires to students at the UKZN Pietermaritzburg campus. The questionnaire employed for the study consisted of four sections, firstly measuring environmental values by utilizing the Environmental Concerns (EC) scale, secondly by measuring 11 environmental behaviours, thirdly by assessing the environmental beliefs of individuals with the use of items from the NEP scale and lastly by measuring the demographics of the sample. The questionnaires were initially posted on the UKZN Notice system for students from all UKZN campuses to answer. However due to a very poor response rate the majority of the questionnaires were hand-delivered to students during classes at UKZN (PMB Campus). Statistical tests such as descriptive statistics, correlation tests, factor analyses and multiple regression analyses were employed to examine the primary data. The actual findings of these statistical tests are presented in the next chapter.

Chapter 4: Findings

Introduction

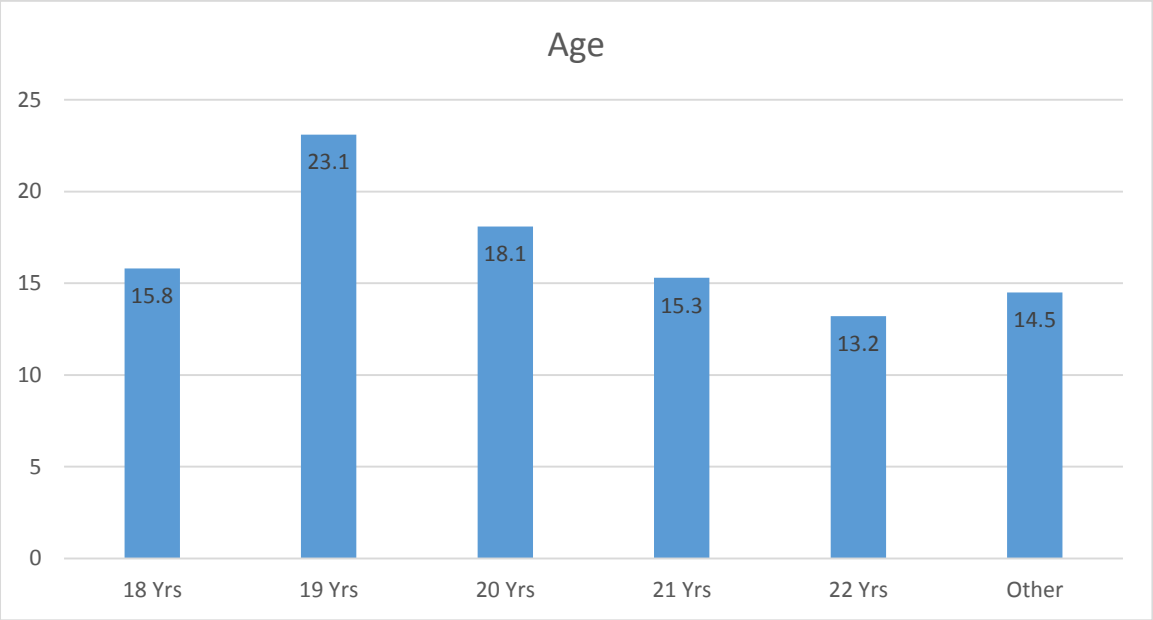
This chapter presents the primary research results. These are discussed and interpreted in relation to past research and to the objectives, in the following chapter. This chapter firstly presents the sample profile describing the demographic characteristics of the respondents of the research and thereafter the findings of the descriptive statistics of section 1 (egoistic, altruistic and biospheric values), section 2 (environmental behaviour) and section 3 (environmental beliefs) are presented respectively. This is followed by the results found in terms of the principal component factor analyses that were performed on the three value orientations, environmental behaviour and environmental beliefs. Afterwards the results of the correlations found between green values and beliefs with environmental behaviour are presented. The chapter concludes by displaying the findings of the multiple regression analyses performed.

4.1. Sample Profile

This section presents the demographic characteristics of the respondents in the research study. In total 386 responses were obtained from UKZN students. As stated in the previous chapter, the required sample size for the study as stipulated by the sample size calculator was 384, therefore the sample was deemed acceptable.

4.1.1. Age

Graph 4.1.1. Age



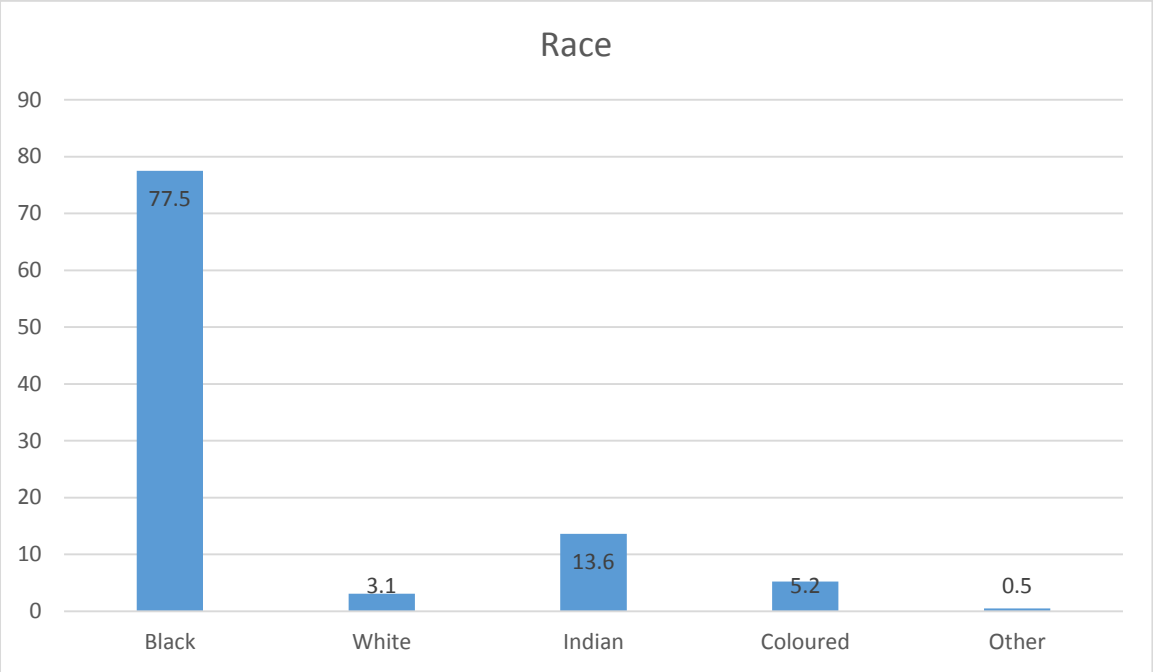
Due to the focus of the research study being centred on the students of UKZN, 85.5% of the sample were aged from 18 years to 22 years with only 14.5% of the sample being older than 22 years. The Deputy Minister of Higher Education and Training in 2013 stated that the age groups that were present in universities in South Africa were from 18 years to 24 years (Parliamentary Monitoring Group, 2013, paragraph 46). Therefore the age distribution in the sample can be viewed as being similar to the national university population.

4.1.2. Gender

The gender distribution of the sample was skewed as there was a significantly higher percentage of females as compared to males. In total 62.4% of the sample was female and 37.6% males. In Kwa-Zulu Natal there are 0.04% more females than males in the general population of the province (Statistics South Africa, 2015, p, 15).

4.1.3. Race

Graph 4.1.3. Race



In terms of racial distribution of the sample it is evident that the Black/African population had the highest percentage with 77.5% of the sample population. According to the mid-term population statistics from Statistics South Africa (2015, p. 9) there are 10426619 individuals in the country that are between the ages of 15 to 24 years and 83.96% of this population are made up of Black/African individuals. Coloured individuals in this age bracket make up 8.28%, Indians make up 1.99% and Whites 5.78% (Statistics South Africa, 2015, p. 9). With regards to the Black/African percentage found in the current study it can be seen as being reflective of the population of young adults in South Africa. The percentages found for the other race groups differ slightly from the population statistics of young adults in South Africa.

4.1.4. Degree studied

From the responses received it was evident that most of the students were either from a business background and studying towards a Bachelor of Commerce (Bcom) Degree or were from a social science background and studying towards obtaining a Bachelor of Social Science (BSS)

Degree. In total 52.85% of the respondents were studying a Bcom Degree while 24.1% of the sample were studying a BSS Degree. However law and science students were also present in the sample.

The following section presents the findings determined in terms of Section 1 in the questionnaire that dealt with the egoistic, altruistic and biospheric values of individuals.

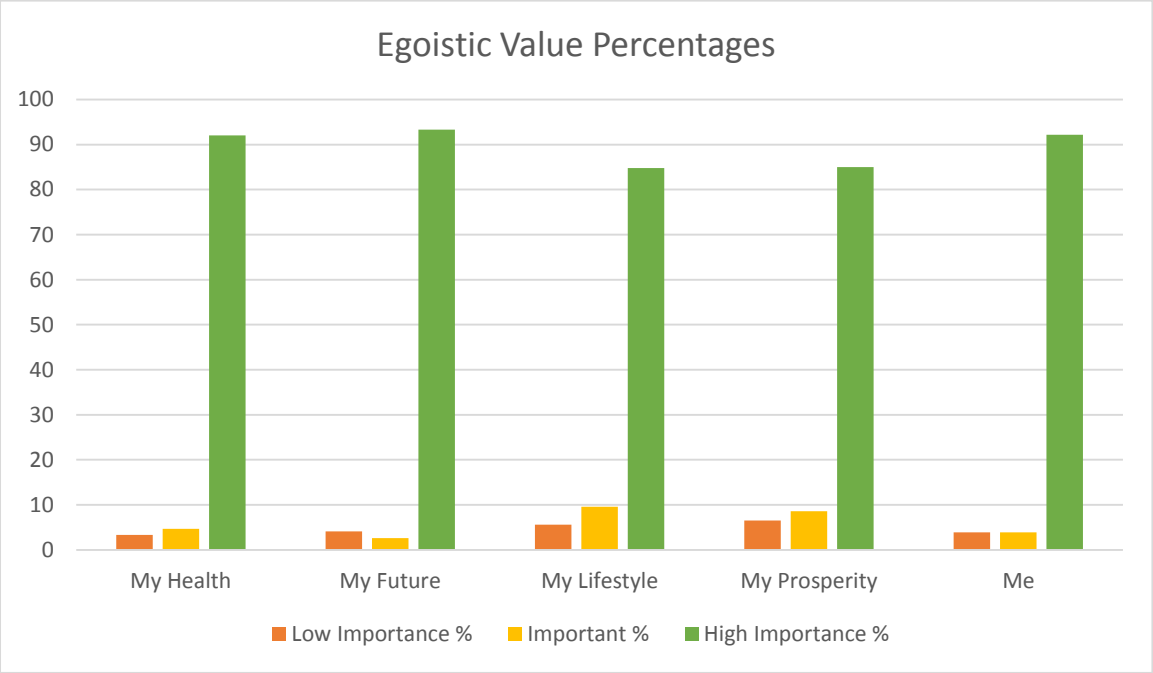
4.2. Section 1: Egoistic, Altruistic and Biospheric Values

This section presents the findings in terms of the responses given by the respondents with regards to the first section of the questionnaire that dealt with the level of importance of egoistic, altruistic and biospheric values in one's life. As stated in the Research Methodology chapter this section was made up of 15 questions from the Environmental Concerns (EC) Scale. Each question has a 7-point Likert scale type response that asked students to rate the level of importance in terms of five egoistic items (My Health, My Future, My Lifestyle, My Prosperity and Me), five altruistic items (Children, Humanity, People in the community, Future Generations and My Children) and five biospheric items (Marine Life, Plants, Animals, Trees and Birds). The findings are illustrated below.

4.2.1. Egoistic Values

The following section represents the findings of the levels of importance of the five egoistic values tested in the study.

Graph 4.2.1.1 Egoistic Value Percentages



Section 1 comprised of 7-point Likert scales that ranged from 1 = No Importance to 7 = Supreme Importance. The graph above was plotted by dividing the 7-point Likert scale into a lower spectrum and an upper spectrum of importance, with the fourth option (4 – Importance) being the midsection, Therefore the scores 1 – 3 on the scale make up the lower spectrum of overall importance and the scores of 5 - 7 make up the upper spectrum of overall importance for each question. The full raw data for these items is provided in Appendix 1.1.

In response to the overall question of: *"I am concerned about environmental problems because of the consequences for"…*the results are as follows

The first egoistic value that was measured was the importance of one's own health in the face of environmental problems. As the graph above illustrates the majority of the sample placed a very high level of importance on their own health and it can be seen that the responses are sharply skewed towards the upper level of importance. Taking a cumulative percentage of the upper spectrum of importance it is found that 92% of the sample highly value their health in terms of environmental problems. 3.3% of individuals place low importance on this egoistic value.

The second egoistic value that was measured was the level of importance that the sample placed on their own futures in terms of negative consequences caused by environmental problems. The graph displayed above illustrates a very high level of importance in terms of the future of the individuals in the sample and is sharply skewed towards the upper level of importance. Together 93.3% of respondents placed high importance on this value while only 4.1% placed a low level of importance on this item demonstrating that the sample highly value their future in terms of negative ecological issues.

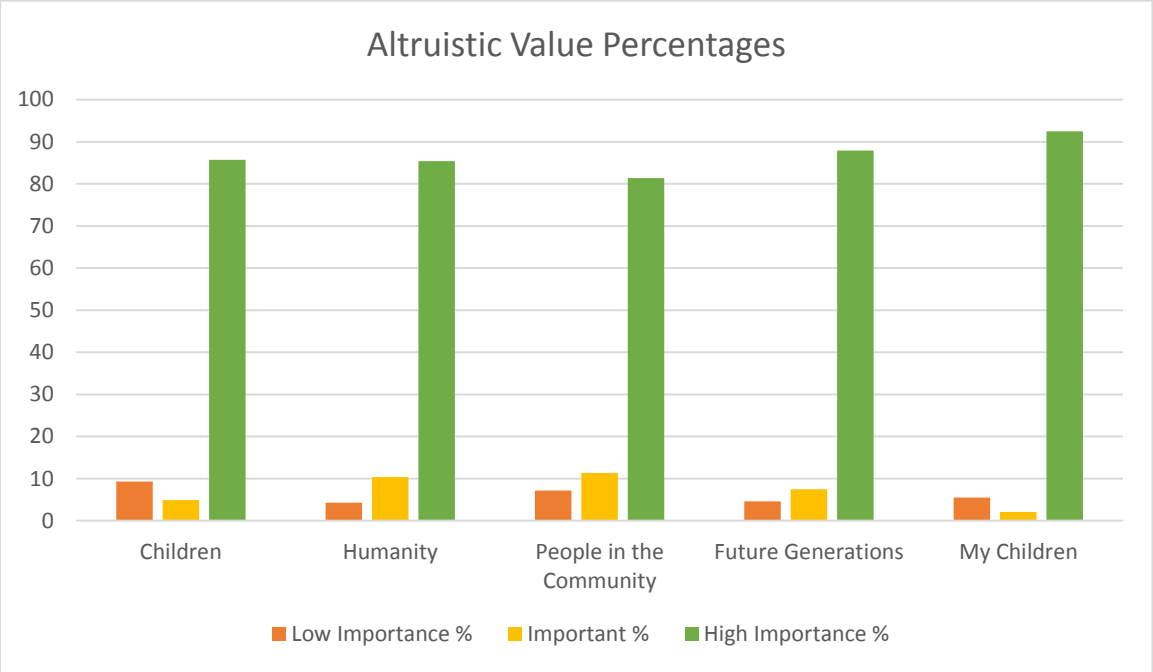
The third egoistic value item tested the level of importance that was placed on the respondents own lifestyles in terms of environmental issues. The percentage of the upper spectrum for this question is 84.8%, with the percentage of the lower spectrum being 5.6%. In terms of the fourth egoistic item, *My Prosperity*, the findings are similar to the previous egoistic item. Together the upper spectrum accounts for 85% of the responses with the lower spectrum of importance accounting for 6.5%.

The results of the fifth and final egoistic item in Section 1, *Me*, measured the significance that the sample placed on themselves in particular in terms of negative effects caused by ecological problems. By analysing the graph above it is evident that the findings are sharply skewed toward the upper spectrum of importance. In total the upper spectrum accounts for 92.2% of the responses with only 3.9% of the sample being in the lower spectrum of importance.

4.2.2. Altruistic Values

This section illustrates the levels of importance found for the five altruistic values tested in the study in terms of ecological problems. The full raw data of these values can be found in Appendix 1.2.

Graph 4.2.2.1. Altruistic Value Percentages



The first altruistic item in this section deals with the significance placed on *children* in general. Together the cumulative percentage of the upper spectrum of importance is 85.7% and the lower spectrum is 9.3% in total. In terms of the responses to the second altruistic item of *Humanity* the upper three categories of importance make up 85.4% of the responses with only 4.3% making up the lower three categories.

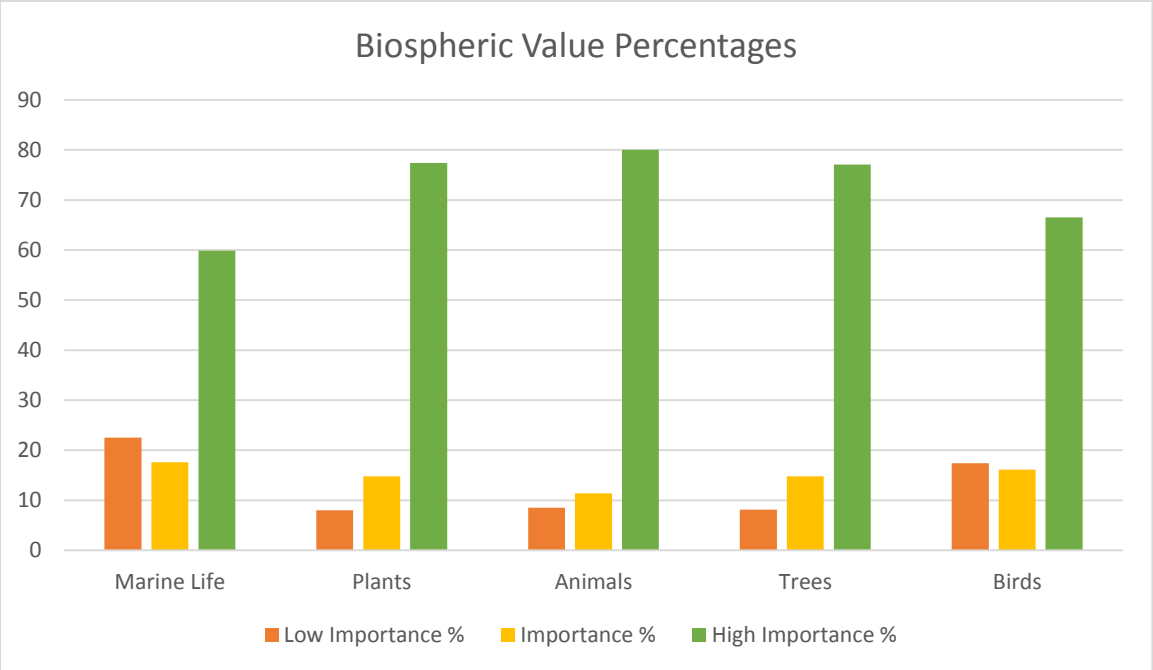
With regards to the third altruistic item, *People in the Community*, the sample's responses were gradually skewed towards the upper spectrum of importance. Together the upper three categories of importance make up 81.4% of the responses with the lower three importance categories making up 7.2%. However the midsection of the graph that illustrates an average level of importance is relatively high at 11.4%. The results obtained from the sample for the fourth altruistic item were skewed toward the upper level of importance. A cumulative percentage of 87.9% of individuals thought future generations was highly important with only 4.6% placing low importance on this value. 7.5% of individuals thought of future generations having an average level of importance in terms of ecological problems.

The fifth and final altruistic item in the Environmental Concern (EC) Scale utilized in this study is *My Children*. This value measured the level of importance that the sample placed on the livelihoods of their own children with regards to environmental problems. The results of this particular value differs slightly from the rest of the altruistic values in this section as the graph is sharply skewed towards the upper end of the importance spectrum. The cumulative percentage of the upper three categories is 92.5% with 71% of that total being individuals that held the lives of their children in supreme importance, 14% believing their children were extremely important and 7.3% feeling their children's future was very important. The lower three categories of the spectrum added up to a total of 5.5% with 2.1% rating an average level of importance in terms of the future of their children. This result also differs from the first altruistic value of children in general as only 85.7% of respondents placed a high level of importance on this item as compared to the 92.5% that placed a high importance on the lives of their own children.

4.2.3. Biospheric Values

The following section analyses the findings of the levels of importance placed on the five biospheric values tested in the study. The full raw data for these values can be found in Appendix 1.3

Graph 4.2.3.1. Biospheric Value Percentages



The first biospheric item in the EC scale utilized in this research is the importance that individuals place on species of aquatic life found in oceans, rivers and seas (together taken as *Marine Life*) in the face of environmental problems. The cumulative percentage for the upper three categories of the spectrum is 59.9%. The lower three categories taken together is 22.5%, which is a higher value than the other lower spectrum values found in the previous items in the EC scale.

The second item in the biospheric section measured the importance the respondents placed on the lives of plants in terms of ecological problems. The graph illustrates a gradual skew towards the upper end of the importance spectrum and together the upper spectrum of importance totalled to 77.4%. The lower end of the spectrum totalled to 8%, a considerably lower percentage than the previous biospheric item indicating that the sample placed a higher importance on plants than marine life.

The third biospheric item tested were the lives of animals in general. Since aquatic life was tested as the first biospheric item, the item of *Animals* was assumed to be terrestrial animals that occupy land. The graph above shows that once again the responses of the students are gradually skewed towards the upper level of the importance spectrum. Cumulatively the upper spectrum totals to 80% and the lower spectrum adds up to 8.5%. Of all the respondents 11.4% believed that animals held an average level of importance in terms of environmental issues.

The fourth biospheric item in the EC scale measured the level of importance that students placed on the lives of trees in the face of environmental problems. The cumulative percentage of the upper three categories is 77.1% and the cumulative lower percentage is 8.1%. A relatively high percentage of individuals (14.8%) thought of trees to have an average importance.

The fifth and final biospheric item tested the level of importance that individuals hold towards birds in terms of ecological problems. The graph above is unique from the rest of the 14 items in the EC scale as although it is skewed towards the upper level of importance, the difference

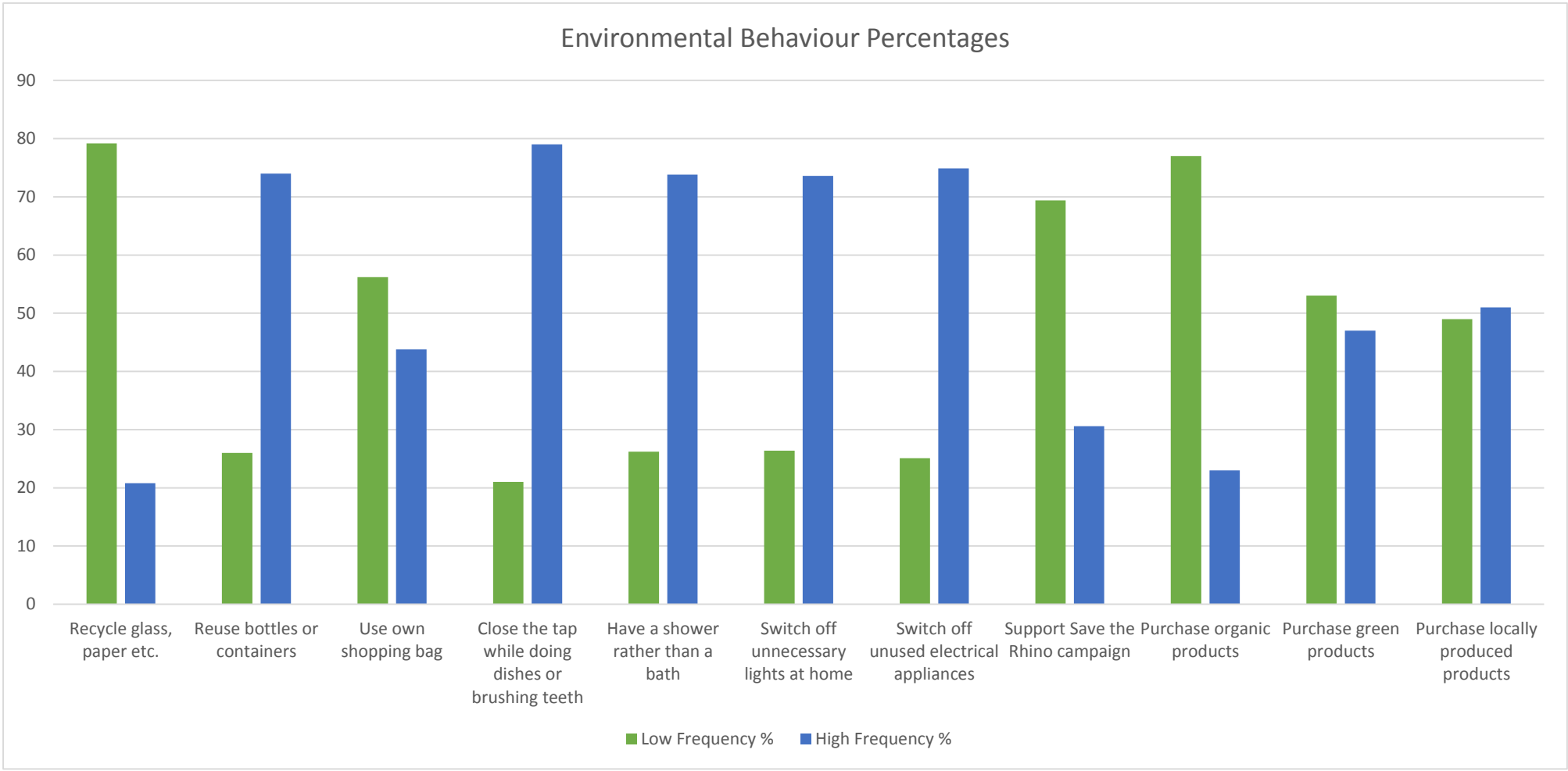
between the three upper categories is almost the same. Supreme Importance, Extremely Important and Very Important all share very similar percentages being 23.1%, 21.6% and 21.8% respectively. A high percentage of individuals also stated that birds hold an average level of importance to them at 16.1%. The cumulative value of the upper end of the spectrum is 66.5%. The cumulative value of the lower end is 17.4%, which is the second highest of all 15 values.

The next section in the questionnaire tested the frequencies of 11 environmental behaviours of the young adults in the study. The findings are presented below.

4.3. Section 2: Environmental Behaviour

This section presents the results found in terms of the frequency of environmental behaviours performed by the sample. The section comprises of 11 questions in total and each question has a 4-point Likert scale type response that asked respondents to specify the frequency of the 11 environmental behaviours tested. The scale ranged from Always to Never, and was coded as 1= Never to 4 = Always, for data analysis purposes. To depict the results more effectively the response categories of *Never* and *Sometimes* were combined to represent **Low Frequency** of green behaviour, while the categories of *Often* and *Always* were combined to illustrate a **High Frequency** of green behaviour. These findings are illustrated in the graph below. The full raw data pertaining to environmental behaviours can be found in Appendix 1.4.

Graph 4.3.1. Environmental Behaviour Percentages



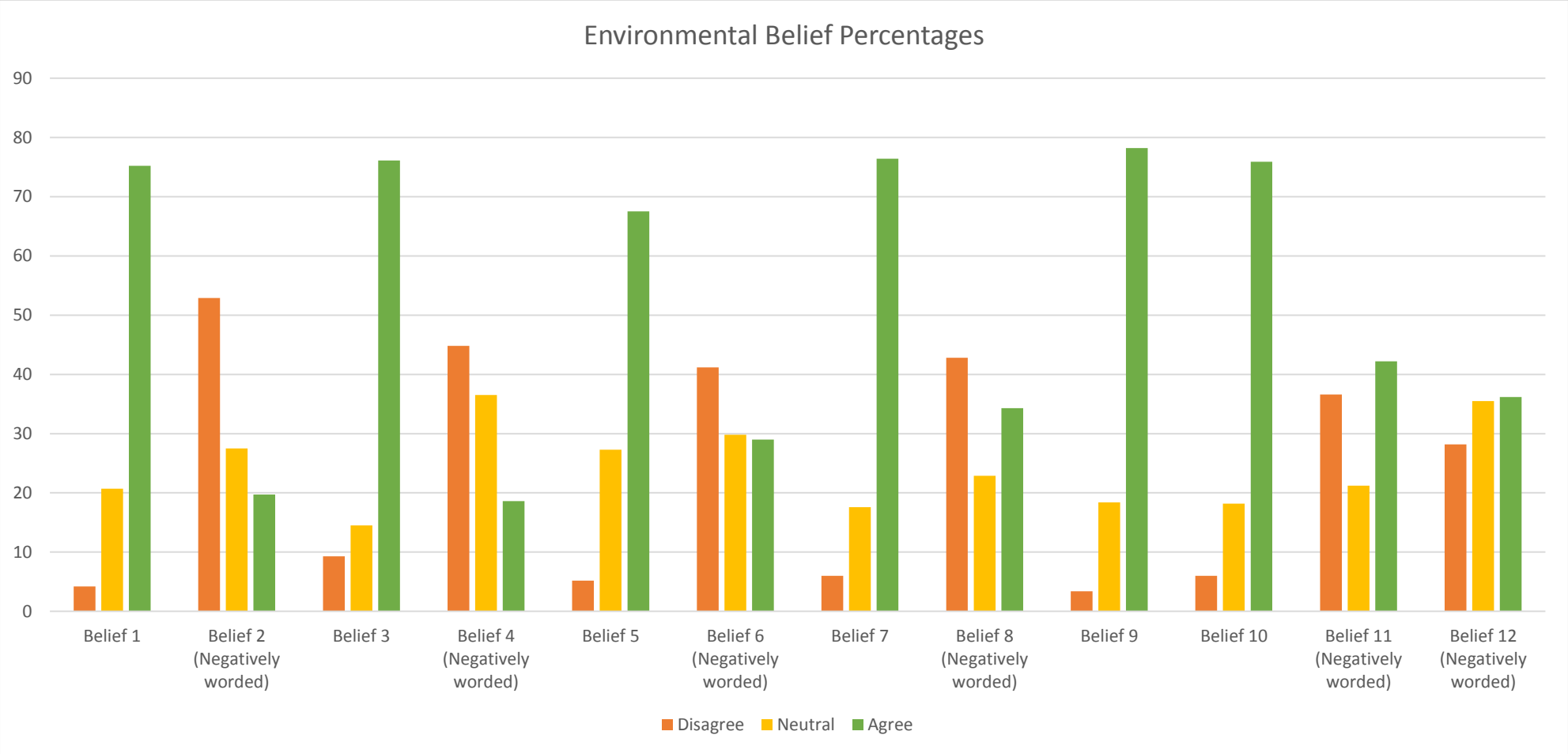
From the graph illustrated above it can be deduced that water conservation, energy saving, reusing bottles and containers and purchasing local products received higher frequencies of behaviour, with the a large percentage of respondents performing these behaviours often or always. Recycling, using own shopping bags, supporting the 'Save the Rhino' environmental campaign, and purchasing of organic and green products received lower frequencies of behaviour indicating that a large percentage of the respondents sometimes perform these behaviours or do not perform these actions at all.

Section 3 in the questionnaire analysed the environmental beliefs of the respondents. The findings are presented below.

4.4. Section 3: Environmental Beliefs (The New Ecological Paradigm Scale)

This section aimed to measure the nature of beliefs that students hold in terms of the environment. It is made up of 12 questions, eight of which were taken directly from the New Ecological Paradigm (NEP) scale. Each of the 12 questions comprise a 5-point Likert scale that ranged from strongly agree to strongly disagree. The findings of these questions are as follows. Just as in Section 1 this section divides the responses into three segments. The first represents the combination of respondents that disagreed and strongly disagreed with the belief statements tested, the second represents the percentage of students that possessed neutral beliefs, and the third represents the combined percentages of those respondents that agreed and strongly agreed with the beliefs. The results are illustrated in the graph below. The full raw data relating to environmental beliefs can be found in Appendix 1.5.

Graph 4.4.1. Environmental Belief Percentages



Key:

Belief 1: When humans interfere with nature it often produces disastrous consequences.

Belief 2: The balance of nature is strong enough to cope with the impacts of modern industrial nations.

Belief 3: Plants and animals have as much right as humans to exist.

Belief 4: The so-called "ecological crisis" facing humankind has been greatly exaggerated.

Belief 5: The balance of nature is very delicate and easily upset.

Belief 6: Humans have the right to modify the natural environment to suit their needs.

Belief 7: If things continue on their present course, we will soon experience a major ecological catastrophe.

Belief 8: Humans were meant to rule over the rest of nature.

Belief 9: Degradation of the environment has negative consequences for humanity

Belief 10: It is important to be seen to be caring for the environment

Belief 11: Caring for the environment is a private responsibility

Belief 12: Being active with regards to environmental protection gains you social status.

As illustrated above, six belief statements were negatively worded therefore the more one disagrees with these statements the more pro-environmental beliefs they possess. In terms of the remaining five positively worded statements, the more one agrees the more pro-environmental beliefs they possess.

From the graph above it is evident that the agreement level was high for **Beliefs 1, 3, 5, 7, 9** and **10** as these graphs are sharply skewed while the balance of the statements received responses that were more evenly distributed between agreement, disagreement and a neutral response. With regards to the six negatively worded statements it is evident that higher percentages of respondents disagreed with **Beliefs 2, 4, 6,** and **8** while **Beliefs 11** and **12**

received mixed responses. It is also noted that the neutral response category was also relatively high with many of the belief statements especially for **Belief 4, 6** and **12.**

The data presented in the above section illustrated the frequencies of the three value orientations, green behaviour and environmental beliefs. However in order to analyse the data effectively and be able to compare the relative importance of the different values, frequency of behaviours and strength of the beliefs, the means and standard deviations of each item needs to be examined. Table 4.1. below illustrates these findings.

Table 4.1. Summary of Means and Standard Deviation Values

Values	***Mean (Max 7)***	***Std. Dev***
My Health	6.32	1.221
My Future	6.45	1.184
My Lifestyle	5.82	1.338
My Prosperity	5.88	1.402
Me	6.42	1.182
Overall Egoistic Values	***6.18***	
Children	5.99	1.614
Humanity	5.88	1.307
People in the Community	5.69	1.375
Future Generations	6.08	1.283
My Children	6.36	1.351
Overall Altruistic Values	***6.00***	
Marine Life	4.75	1.676
Plants	5.55	1.408
Animals	5.58	1.447
Trees	5.62	1.455
Birds	5.04	1.661
Overall Biospheric Values	***5.31***	
Overall Values mean	***5.83***	
Behaviour	***Mean (Max 4)***	***Std. Dev***
1. Recycle glass, paper etc.	2.00	.807
2. Reuse empty bottles and containers	3.05	.844
3. Use your own shopping bag instead of buying plastic shopping bags	2.47	.996
4. Close the tap while washing dishes or brushing teeth	3.32	.837
5. Have a shower rather than a bath	3.26	.989

6. Switch off unnecessary lights at home	3.16	.872
7. Switch off electrical appliances that are not being used	3.20	.859
8. Support the Save the Rhino environmental campaign	2.06	1.094
9. Purchase organic products	2.10	.779
10. Purchase green products e.g. energy saving light bulbs	2.54	.929
11. Purchase locally produced products	2.65	.796
Overall Behaviour	***2.71***	
Beliefs	***Mean (Max 5)***	***Std. Dev***
1. When humans interfere with nature it often produces disastrous consequences	4.00	.871
2. The balance of nature is strong enough to cope with the impacts of modern industrial nations	3.43	1.028
3. Plants and animals have as much right as humans to exist	4.08	1.078
4. The so-called "ecological crisis" facing humankind has been greatly exaggerated	3.34	.970
5. The balance of nature is very delicate and easily upset	3.83	.838
6. Humans have the right to modify the natural environment to suit their needs	3.15	1.152
7. If things continue on their present course we will soon experience a major ecological catastrophe	4.07	.948
8. Humans were meant to rule over the rest of nature	3.15	1.356
9. Degradation of the environment has negative consequences for humanity	4.13	.875
10. It is important to be seen to be caring for the environment	4.05	.938
11. Caring for the environment is a private responsibility	3.07	1.281
12. Being active with regards to environmental protection gains you social status	2.91	1.077
Overall Beliefs	***3.60***	

To begin with the coding and interpretation of the means is explained. As mentioned previously, the first set of means which describe the results in Section 1 on the values, utilized a 7-point Likert scale. Therefore this indicates that the closer the means are to 7, the more importance the respondents assigned to the value. Green behaviours were measured by a 4-point Likert scale ranging from Always to Never. This scale was coded as 1 = Never to 4 = Always. Therefore the higher the mean and the closer it is to the score of 4 for each behaviour, the more frequently the respondents performed these behaviours. The environmental beliefs were measured with a 5-point Likert scale ranging from Strongly Agree Strongly Disagree, however for data analysis purposes this scale was coded as 1 = Strongly Disagree to 5 = Strongly Agree for positively worded statements (Statements 1,3,5,7,9 and 10) and 5 = Strongly Disagree to 1 = Strongly Agree for negatively worded statements (Statements 2,4,6,8,11 and

12). This was necessary in order to determine the extent of pro-environmental beliefs. Therefore the higher the mean and the closer it is to 5, the more pro-environmental the belief was found to be.

From the table above it can be seen that certain values held more importance than others, certain green behaviours were performed more often than other behaviours, and certain environmental beliefs were felt more strongly than other beliefs. Firstly it is evident that the item of *My Future* obtained the highest mean being 6.45 and possessed a relatively low standard deviation of 1.184 of the five egoistic values tested. In fact this item possessed the highest mean of the 15 values tested and obtained the second lowest standard deviation. This indicates that many of the respondents placed a very high level of importance on the prospects of their own future. The low standard deviation depicts that most of the responses were not dispersed greatly around the mean which illustrates that not many individuals thought of their own futures to be unimportant. The egoistic value of *Me* also obtained a high mean of 6.42 and a standard deviation of 1.182, also being the second highest mean and the lowest standard deviation of the 15 values tested. This illustrates that the respondents also placed a very high level of importance on the livelihoods and well-being of themselves in terms of environmental problems. *My Health* possessed the third highest mean of the egoistic items, followed by *My Prosperity* and the egoistic value which possessed the lowest mean was *My Lifestyle* with a value of 5.82 and a standard deviation of 1.338. Overall the mean for the egoistic items was 6.18.

The altruistic value that possessed the highest mean was *My Children* with a mean of 6.36 and a standard deviation of 1.351. When compared to the rest of the 15 values, this item possessed the third highest mean indicating that many of the respondents also placed a very high level of importance on the well-being of their own children. As mentioned previously this could be due to the fact that the respondents associated the altruistic value of *My Children* as being one that illustrated more of an egoistic value. *Future Generations* received the second highest altruistic mean, followed by *Children* (in general), *Humanity* and lastly *People in the Community* with means of 6.08, 5.99, 5.88 and 5.69 respectively. Therefore the respondents placed the lowest level of importance on the people living in their communities in terms of altruistic values. Overall the mean for the altruistic items was 6.00.

In terms of the biospheric values of individuals it was evident from the table above that the biospheric item that possessed the highest mean and therefore held the most importance to the respondents was *Trees* with a mean of 5.62 and standard deviation of 1.455. This was followed by *Animals, Plants* and *Birds*. The biospheric value that possessed the lowest mean and held the lowest level of importance was *Marine Life* and this item also possessed the lowest mean and highest standard deviation of the 15 items tested with a mean of 4.75 and standard deviation of 1.676. Overall the mean for the biospheric items was 5.31.

If the means and standard deviations are examined it is evident that the egoistic values possessed the highest overall mean (6.18), while biospheric values possessed the lowest overall mean (5.31). This finding indicates that the respondents of the study placed a higher level of importance on egoistic values and the well-being of themselves and a much lower level of importance on biospheric values that relate to the well-being of the earth. Altruistic values fell in the middle of the other two value orientations with an overall mean of 6.00 indicating that respondents thought the well-being of other people were the second most important to them. It was also evident that the values that received the most importance were the significance of one's well-being, one's own future and one's own children in the face of environmental problems. The significance of aquatic creatures and birds received the lowest levels of importance. Overall the mean for all 15 values combined amounted to 5.83.

As mentioned previously the green behaviours were measured by a 4-point Likert scale coded as ranging from 1 = Never to 4 = Always. Therefore the closer the mean is to the score of 4 for each behaviour, the more frequently the respondents performed these behaviours. As the table above illustrates the highest means were found for **Behaviour 4 –** *Close the tap while washing dishes or brushing teeth* (3.32) and **Behaviour 5 –** *Have a shower rather than a bath* (3.26). This was followed closely by **Behaviour 7 –** *Switch off electrical appliances that are not being used* (3.20) and **Behaviour 6 –** *Switch off unnecessary lights at home* (3.16). This indicates that the respondents in the study performed these green behaviours the most frequently. The standard deviations for these four behaviours were relatively low depicting that most of the responses were similar to the means. The lowest mean was found for **Behaviour 1 –** *Recycle glass, paper etc.* with a mean of 2.00. The standard deviation was low as well, being 0.807 indicating consistency of the responses. Low means were also found for **Behaviour 8 –** *Support*

the Save the Rhino environmental campaign and **Behaviour 9 –** *Purchase organic products***.** From these results it can be deduced that water conservation and energy saving behaviours were performed the most by the respondents while recycling, supporting environmental campaigns and purchasing organic products were not performed often at all. The overall mean for green behaviour was moderate at a value of 2.71.

As mentioned above, the negatively worded statements were reverse scored so that the higher the mean and the closer it is to 5, the more pro-environmental the belief was found to be. As the table above illustrates, **Belief 9** possessed the highest mean of 4.13 and a relatively low standard deviation of 0.875. This indicates that most of the respondents believed that *degradation of the environment has negative consequences for humanity* and therefore possessed pro-environmental beliefs in terms of this statement and the low standard deviation reveals that most of the responses were similar to the mean. **Belief 3 –** *Plants and animals have as much right as humans to exist* and **Belief 7 –** *If things continue on their present course we will soon experience a major ecological catastrophe,* also possessed high means and this reveals that many of these respondents possessed pro-environmental beliefs in terms of these statements. The belief that possessed the lowest mean was **Belief 12** with a value of 2.91. This finding indicates that there was marginally more agreement that "*Being active with regards to environmental protection gains you social status*". The reader is reminded that for negatively worded statements 1 = Strongly agree. With means close to 3, **Belief 11 –** *Caring for the environment is a private responsibility*, **Belief 6 –** *Humans have the right to modify the natural environment to suit their needs* and **Belief 8 –** *Humans were meant to rule over the rest of nature* all exhibited fairly neutral responses indicating that respondents neither agreed nor disagreed strongly with these statements**.** The overall mean for the environmental beliefs was 3.60 which can be viewed as marginally pro-environmental.

Overall the means and standard deviations illustrate that egoistic values held the most importance to the respondents, followed by altruistic values, and lastly biospheric values held the least importance to the individuals. In general green behaviour was performed at a reasonable rate however water conservation and energy saving behaviours were performed the most frequently, while recycling was performed the least by the respondents. Overall the

respondents possessed marginally pro-environmental beliefs, although many individuals held neutral beliefs.

Three separate principal components factor analyses were conducted on the items of each section in the questionnaire (values, behaviour and beliefs) in order to determine the number of factors detected and the manner in which items loaded onto these factors.

4.5. Principal Components Factor Analyses Findings

4.5.1. Egoistic, Altruistic and Biospheric Values

In order to reduce the data being analysed as well as to organise the data so that further inferential statistical analyses could be undertaken, a principal components factor analysis was performed on the value variables in Section 1, the behaviours in Section 2 and on the belief variables in Section 3. The findings for Section 1 are discussed first. To test that the data set is suitable for factor analysis a Kaiser-Meyer-Olkin Measure of Sampling Error and Bartlett's Test of Sphericity need to be calculated. The results are presented in the table below:

Table 4.5.1.1. KMO and Bartlett's Test (Values)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.904
Bartlett's Test of Sphericity	Approx. Chi-Square	2714.125
	Df	105
	Sig.	.000

To be suitable for factor analysis, the Kaiser-Meyer-Olkin value should be 0.6 and over (Rahman, Haque, & Ahmad, 2011, p. 53) so as the table above illustrates, the Kaiser-Meyer-Olkin value is .904 and indicates that a factor analysis can be run. The Bartlett's Test of Sphericity value must be 0.05 or below to be considered significant (Rahman *et al*., 2011, p. 53). In this case the significance is .000 therefore supporting the use of factor analysis.

The 15 values from Section 1 were subjected to a principal components analysis with Varimax rotation. One of the most widely utilized methods to establish which factors to include in a study is known as the eigenvalue rule. The eigenvalues of the factor analysis signify the relative importance held by each factor in explaining the sets of variables under examination (Kothari, 2004, p. 323). If one sets the eigenvalue to 1, by applying the eigenvalue rule only factors with an eigenvalue of 1.0 and above are used for further analysis (Pallant, 2010, p. 184). The analysis of the present study revealed two factors with eigenvalues exceeding 1.

The first factor accounts for 41% of the total variance while the second factor explains 15% of the variance. The Rotated Components Matrix below illustrates how the 15 values loaded onto the two factors.

Table 4.5.1.2. Rotated Components Matrix (Values)

Rotated Component Matrix		
	Component	
	1	2
My Health	**.596**	**.342**
Marine Life	.019	**.741**
Children	**.473**	**.358**
My Future	**.798**	.177
Humanity	**.605**	**.378**
Plants	.202	**.800**
People in the community	**.456**	**.482**
My Lifestyle	**.726**	.086
Animals	.120	**.821**
Future Generations	**.425**	**.577**
My Prosperity	**.772**	.001
Trees	.259	**.765**
Me	**.789**	.061
My Children	**.662**	.138
Birds	.062	**.820**

The method of utilizing Varimax rotation amplifies the variance of the factor loadings in each factor. In order for the variance of a factor to be strong the factor's lowest loadings should be close to zero and its highest loadings should be close to 1 (Kothari, 2004, p. 336). A coefficient

in the Rotated Components Matrix of 0.3 and above it is considered to load on that specific factor. If the above table is analysed it can be seen that some values load clearly and strongly on one of the two factors while a few seem to load weakly on both factors and thus cross loading occurs. A simplified version is presented below:

Factor 1:	**Factor 2:**
My Health*	My Health *
Children*	Marine Life
My Future	Children*
Humanity*	Humanity*
People in the Community*	Plants
My Lifestyle	People in the Community*
Future Generations*	Animals
My Prosperity	Future Generations*
Me	Trees
My Children	Birds

Loaded on both factors

By analysing the table and list above it can be determined that most of the Egoistic values loaded strongly onto Factor 1 while all of the Biospheric values loaded strongly onto Factor 2. However four of the five altruistic values loaded onto both Factor 1 and Factor 2. The egoistic value of My Health also loaded onto both Factors. Therefore **Factor 1** can be described as measuring **Egoistic Values** of individuals and **Factor 2** can be described as measuring the **Biospheric Values** of individuals. The altruistic values could not be clearly distinguished on each Factor however all values did load successfully onto the factors with Rotated Component

Matrix values of above 0.3. Therefore none of the values were excluded from further analysis in the study but further analysis also included analysis using just the two factors:

Factor 1 – *Egoistic Values*

Factor 2 – *Biospheric Values*

A reliability analysis was also run for the two factors mentioned above and the result yielded Cronbach's Alpha values of 0.853 for the Egoistic Factor 1 and 0.872 for the Biospheric Factor 2. If compared to the alpha values of the original sets of the three value orientations it was found that the five egoistic values yielded a reliability score of 0.831, the five altruistic values possessed a score of 0.762 and the five biospheric values had a score of 0.871. Therefore it is evident that the Egoistic Factor and Biospheric Factor yielded in the factor analysis were found to be more reliable scales than the original three value orientation scales.

4.5.2. Environmental Behaviour

Again a principal components factor analysis with Varimax rotation was run on the 11 green behaviours tested in the study to determine whether the behaviours loaded onto different factors. The results are illustrated below.

Table 4.5.2.1. KMO and Bartlett's Test (Behaviour)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.788
Bartlett's Test of Sphericity	Approx. Chi-Square	558.203
	Df	55
	Sig.	.000

As the table above illustrates, the Kaiser-Meyer-Olkin value of .788 and the Bartlett's Test of Sphericity value of .000 and suggest that factor analysis is considered appropriate. By applying the eigenvalue rule mentioned previously three factors were found to have eigenvalues of 1 or

more. Therefore a three-component solution was found and accounted for 47.8% of the variance, with the first factor accounting for 26.7% of the variance, the second factor 10.7% and the third factor 10.4%. The Rotated Components Matrix is illustrated in the table below:

Table 4.5.2.2. Rotated Component Matrix (Behaviour)

Rotated Component Matrix			
	Component		
	1	2	3
Beh 1: Recycling Glass, paper etc.	**.380**	.177	**.373**
Beh 2: Reusing empty bottles or containers	.188	.097	**.660**
Beh 3: Using own shopping bag instead of plastic bags	.159	.062	**.562**
Beh 4: Closing tap while washing dishes or brushing teeth	.208	**.573**	.237
Beh 5: Having a shower rather than a bath	-.243	.019	**.596**
Beh 6: Switching off unnecessary lights at home	.092	**.838**	.103
Beh 7: Switching off electrical appliances that are not being used	.153	**.826**	-.034
Beh 8: Supporting Save the Rhino campaign	**.619**	.235	-.105
Beh 9: Purchasing organic products	**.635**	.087	.218
Beh 10: Purchasing green products e.g. energy saving light bulbs	**.667**	.175	.220
Beh 11: Purchasing locally produced products	**.643**	.041	-.030

Overall the environmental behaviours loaded distinctively and separately onto one of three factors except **Behaviour 1 – Recycling glass, paper etc.** which loaded onto two factors. Below is a simplified list of which behaviours loaded onto which factors.

Factor 1	Factor 2	Factor 3
Behaviour 1*	Behaviour 4	Behaviour 1*
Behaviour 8	Behaviour 6	Behaviour 2
Behaviour 9	Behaviour 7	Behaviour 3
Behaviour 10		Behaviour 5
Behaviour 11		

Loaded on more than one factor

If the three factors and their respective loadings are analysed carefully it can be deduced that Factor 1 of the behaviours could be describing green behaviours that take place outdoors and in public. Due to the cross-loading, if Behaviour 1 (Recycling) is excluded from the factors above, Factor 1 can also be viewed as describing environmental activities that involve spending money on the purchasing of environmental products and supporting environmental campaigns. Factor 2 could be explaining the ecological activities that take place predominantly inside the home that also deal with money or resource saving. And lastly Factor 3 could be describing all the green behaviours that mainly involve reusing materials. However the fact that Behaviour 5 (Having a shower rather than a bath) loaded onto Factor 3 would need further investigation. Therefore the three Factors can be named as follows:

Behaviour Factor 1: *Outdoor Environmental Activities*

Behaviour Factor 2: *Indoor Environmental Activities*

Behaviour Factor 3: *Reusing Environmental Activities*

4.5.3. Environmental Beliefs

A third principal components factor analysis with Varimax rotation was run to determine whether all beliefs in Section 3 of the questionnaire actually loaded successfully onto a factor. As a reminder **Beliefs 2, 4, 6, 8, 11** and **12** were negatively worded and were thus reverse scored. The following tables illustrate the findings.

Table 4.5.3.1. KMO and Bartlett's Test (Beliefs)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.717
Bartlett's Test of Sphericity	Approx. Chi-Square	484.646
	Df	45
	Sig.	.000

As the table above illustrates, the Kaiser-Meyer-Olkin value is .717 which indicates that the sample is adequate. The Bartlett's Test of Sphericity value is .000 therefore the factor analysis is considered appropriate.

By applying the eigenvalue rule mentioned previously three factors were found to have eigenvalues of 1 or more. Therefore the principal component analysis yielded a three-component solution that accounts for 50% of the variance with the first factor accounting for 27% of the variance, the second 12% and the third factor 11%. The Rotated Components Matrix illustrates how the 12 beliefs are divided between the three factors.

Table 4.5.3.2. Rotated Components Matrix (Beliefs)

Rotated Component Matrix			
	Component		
	1	2	3
Bel 1: Human interference with nature produces disastrous consequences	.292	**.515**	.016
Bel 2_Recode: Balance of nature is strong enough to cope with the impacts of modern industrial nations	.200	.271	**.599**
Bel 3: Plants and animals have as much right as humans to exist	**.631**	**.348**	-.205
Bel 4_Recode: The ecological crisis facing humankind has been greatly exaggerated	.138	.262	**.643**
Bel 5: Balance of nature is very delicate and easily upset	**.359**	.450	.086
Bel 6_Recode: Humans have the right to modify the natural environment to suit their needs	**.653**	.154	.252
Bel 7: If things are unchanged there will be an ecological catastrophe	-.004	**.763**	.084
Bel 8_Recode: Humans were meant to rule over the rest of nature	**.814**	-.164	.258
Bel 9: Environmental degradation has negative consequences for humanity	-.043	**.612**	.267
Bel 12_Recode: Being active in environmental protection gains you social status	.013	-.071	**.673**

As the table above illustrates 10 environmental beliefs loaded successfully onto one of the three factors with coefficients above 0.3. However two environmental beliefs of the initial 12 did not load successfully onto any of the three factors and these beliefs were **Belief 10** (It is important to be seen to be caring for the environment) **and Belief 11** (Caring for the

environment is a private responsibility). Therefore these two beliefs were not included in any further analyses of the study. Below is a simplified list of which beliefs loaded onto which factor.

Factor 1	**Factor 2**	**Factor 3**
Belief 3*	Belief 1	Belief 2
Belief 5*	Belief 3*	Belief 4
Belief 6	Belief 5*	Belief 12
Belief 8	Belief 7	
	Belief 9	

Loaded on more than one factor

When the Rotated Components Matrix values are analysed in the table above it can be seen that two beliefs exhibited cross loadings. These two beliefs were **Belief 3** – "Plants and animals have as much right as humans to exist", and **Belief 5** – "The balance of nature is very delicate and easily upset" that loaded on both Factor 1 and Factor 2. The remaining eight beliefs loaded strongly on their factors shown above. Since eight of the 10 beliefs illustrated in the table above are derived from the New Ecological Paradigm Scale (NEP) one can compare the results of this factor analysis to the findings relating to the NEP. As stated in the previous chapters the original 15 items of the NEP scale can be divided into measuring three factors namely:

1. The belief that humans do not have the right to control nature
2. Mankind's ability to offset the balance of nature
3. Humans have restrictions for growth (Dunlap *et al*., 2000, p. 427)

By analysing the nature of the beliefs that were divided into the three factors of the current study, the factors of this study can also be divided into the three factors of the NEP mentioned above. **Belief 3** – "Plants and animals have as much right as humans to exist", **Belief 6** – Humans have the right to modify the natural environment to suit their needs", and **Belief 8** –

"Humans were meant to rule over the rest of nature" all loaded onto the first NEP factor of *The belief that humans do not have the right to control nature.* **Belief 1** – "When humans interfere with nature it often produces disastrous consequences", **Belief 5** – "The balance of nature is very delicate and easily upset", **Belief 7** – "If things continue on their present course we will soon experience a major ecological catastrophe" and **Belief 9** – Degradation of the environment has negative consequences for humanity" loaded onto the second NEP factor of *Mankind's ability to offset the balance of nature.* Finally **Belief 2** – "The balance of nature is strong enough to cope with the impacts of modern industrial nations", **Belief 4** – The so-called ecological crisis facing humankind has been greatly exaggerated", and **Belief 12** – Being active with regards to environmental protection gains you social status" loaded onto the third NEP factor of *Humans have restrictions for growth*. Although **Belief 9 and 12** were not derived from the NEP scale these beliefs still loaded clearly and strongly on Factor 2 and 3 respectively.

In order to determine possible connections and linkages between the constructs of environmental values and green beliefs with environmental behaviour multiple correlation tests were conducted. The results of these tests are illustrated and discussed below.

4.6. Relationship between Values, Beliefs and Environmental Behaviour

This section firstly displays results found for correlation tests that were performed to determine if relationships existed between the egoistic, altruistic and biospheric values tested in Section 1 of the questionnaire with each of the 11 environmental behaviours measured in Section 2. Thereafter results are displayed in terms of relationships that exist between the environmental beliefs tested in Section 3 with each of the environmental behaviours in Section 2. The Pearson's correlation test was utilized in order to determine relationships between all of the items.

4.6.1. Relationships found between individual egoistic values and environmental behaviour

Table 4.6.1. Relationships found between individual egoistic values and environmental behaviour

		My Health	My Future	My Lifestyle	My Prosperity	Me
1: Recycling Glass, paper etc.	Pearson Correlation	.041	.026	.036	.058	.070
	Sig. (2-tailed)	.418	.617	.475	.259	.172
	N	386	386	386	385	386
2: Reusing empty bottles or containers	Pearson Correlation	.088	**.140****	.070	.064	.042
	Sig. (2-tailed)	.084	.006	.169	.208	.412
	N	386	386	386	385	386
3: Using own shopping bag instead of plastic bags	Pearson Correlation	-.001	.003	-.028	**-.114***	.027
	Sig. (2-tailed)	.984	.956	.580	.025	.602
	N	386	386	386	385	386
4: Closing tap while washing dishes or brushing teeth	Pearson Correlation	.007	.004	.029	-.008	.000
	Sig. (2-tailed)	.889	.936	.572	.878	.995
	N	386	386	386	385	386
5: Having a shower rather than a bath	Pearson Correlation	-.076	-.003	.066	.041	-.020
	Sig. (2-tailed)	.135	.958	.197	.420	.691
	N	386	386	386	385	386
6: Switching off unnecessary lights at home	Pearson Correlation	.034	-.001	.044	-.014	-.041
	Sig. (2-tailed)	.511	.977	.393	.784	.422
	N	386	386	386	385	386
7: Switching off electrical appliances that are not being used	Pearson Correlation	.059	-.003	.001	-.082	-.032
	Sig. (2-tailed)	.245	.955	.988	.109	.530
	N	386	386	386	385	386
8: Supporting Save the Rhino campaign	Pearson Correlation	.035	.015	.007	.021	.002
	Sig. (2-tailed)	.495	.776	.888	.678	.974
	N	386	386	386	385	386
9: Purchasing organic products	Pearson Correlation	.093	.076	.088	.064	.057
	Sig. (2-tailed)	.067	.136	.084	.212	.262
	N	386	386	386	385	386
10: Purchasing green products e.g. energy saving light bulbs	Pearson Correlation	.030	.053	**.115***	.025	.031
	Sig. (2-tailed)	.553	.300	.024	.623	.542
	N	385	385	385	384	385
11: Purchasing locally produced products	Pearson Correlation	**.156****	.033	-.007	-.049	.012
	Sig. (2-tailed)	.002	.521	.892	.337	.816
	N	386	386	386	385	386

**Correlation is significant at the 0.01 level (2-tailed)

**Correlation is significant at the 0.05 level (2-tailed)

Of the five egoistic values measured in this study, it was found that four of these values possessed a significant relationship with four environmental behaviours illustrated in the table above. The egoistic value of ***My Future*** possessed a weak positive relationship that was significant at the 0.01 level with the green behaviour of *Reusing Bottles or Containers* with a value of .142. This indicates that the more individuals are concerned about their future the more they will reuse items. The egoistic value of ***My Prosperity*** possessed a weak negative relationship that was significant at the level of 0.05 with the behaviour of respondents *Using their Own Shopping Bags instead of Purchasing Plastic Shopping Bags*, as illustrated in the table above. The Pearson's correlation value is -.117. This indicates that the more one values their prosperity in terms of environmental problems, the less they would opt to use their own shopping bags. The third relationship found between egoistic values and green behaviour was between the value of ***My Lifestyle*** and *Purchasing Green Products*. The Pearson's correlation value is .114 indicating that a weak positive relationship existed that was significant at the 0.05 level. This suggests that the more one is concerned about their lifestyles in the face of ecological problems the more they will purchase environmentally friendly products. Finally the last relationship found between egoistic values and ecological behaviour is between the value of ***My Health*** and the behaviour of *Purchasing Locally Produced Products*. The Pearson's value is .156 indicating that a weak, positive relationship existed that was significant at the level of 0.01. This value implies that the more concern one shows towards their own health, the more locally produced products they will purchase. There were no significant relationships that existed between the egoistic value of ***Me*** and any of the environmental behaviours. This suggests that the concern that individuals show towards themselves bears no influence on any of the green behaviours tested in this study.

4.6.2. Relationships found between individual altruistic values and environmental behaviour

Table 4.6.2. Relationships found between individual altruistic values and environmental behaviour

		Children	Humanity	People in the community	Future Generations	My Children
1: Recycling Glass, paper etc.	Pearson Correlation	.006	**.116***	.036	**.100***	**.106***
	Sig. (2-tailed)	.907	.023	.481	.049	.037
	N	386	386	386	386	386
2: Reusing empty bottles or containers	Pearson Correlation	.042	**.130***	.053	.088	-.006
	Sig. (2-tailed)	.407	.010	.296	.086	.899
	N	386	386	386	386	386
3: Using own shopping bag instead of plastic bags	Pearson Correlation	-.051	.070	.074	.016	-.059
	Sig. (2-tailed)	.320	.169	.148	.755	.248
	N	386	386	386	386	386
4: Closing tap while washing dishes or brushing teeth	Pearson Correlation	-.024	.095	.022	.018	-.055
	Sig. (2-tailed)	.633	.063	.668	.722	.281
	N	386	386	386	386	386
5: Having a shower rather than a bath	Pearson Correlation	.037	.063	-.040	-.041	.050
	Sig. (2-tailed)	.470	.218	.438	.426	.329
	N	386	386	386	386	386
6: Switching off unnecessary lights at home	Pearson Correlation	.008	**.127***	.074	.095	-.048
	Sig. (2-tailed)	.882	.013	.148	.061	.349
	N	386	386	386	386	386
7: Switching off electrical appliances that are not being used	Pearson Correlation	.042	.059	.021	.068	-.054
	Sig. (2-tailed)	.414	.248	.683	.181	.291
	N	386	386	386	386	386
8: Supporting Save the Rhino campaign	Pearson Correlation	.043	**.103***	.046	**.112***	-.005
	Sig. (2-tailed)	.401	.043	.366	.028	.920
	N	386	386	386	386	386
9: Purchasing organic products	Pearson Correlation	-.019	.097	.046	**.117***	-.036
	Sig. (2-tailed)	.710	.058	.364	.022	.486
	N	386	386	386	386	386
10: Purchasing green products e.g. energy saving light bulbs	Pearson Correlation	.041	.089	.048	**.120***	.035
	Sig. (2-tailed)	.423	.081	.348	.018	.489
	N	385	385	385	385	385
11: Purchasing locally produced products	Pearson Correlation	-.001	.071	.020	.050	.001
	Sig. (2-tailed)	.986	.162	.694	.331	.977
	N	386	386	386	386	386

*Correlation is significant at the 0.05 level (2-tailed).

As the table above illustrates there were more significant relationships found between altruistic values and behaviour as compared to egoistic values and behaviour. However only three of the five altruistic values possess a significant relationship with several of the environmental behaviours. Firstly the value of ***Humanity*** possessed relationships with four environmental behaviours namely *Recycling Glass, Paper etc., Reusing Empty Bottles or Containers, Switching off Unnecessary Lights at Home,* and *Supporting the 'Save the Rhino" Environmental Campaign* with Pearson Correlation values of .116, .130, .127, .103 respectively. These values indicate weak, positive relationships that are significant at the 0.05 level that exist between the environmental behaviours mentioned and ***Humanity*.** This implies that the more one is concerned about the welfare of humanity in terms of environmental issues, the more they will perform the environmental behaviours stated above.

Secondly the value of ***Future Generations*** also possessed relationships with four green behaviours namely *Recycling Glass, Paper etc., Supporting the 'Save the Rhino' Environmental Campaign, Purchasing Organic Products,* and *Purchasing Green Products* with Pearson Correlation values of .100, .112, .117, .120 respectively. These values reveal that weak, positive relationships that are significant at the 0.05 level exist between the value of ***Future Generations*** and the behaviours mentioned. This suggests that the more one is concerned about the well-being of future generations in terms of environmental problems the more they will perform the environmental behaviours mentioned.

The third and final altruistic value that possessed a relationship with environmental behaviour was ***My Children***. As the table above illustrates this value was correlated with only one environmental behaviour being *Recycling Glass, Paper etc*. with a Pearson's Correlation value of .106. This reveals that once again, a weak positive relationship that is significant at the 0.05 level exists between these two items. Therefore this suggests that the more one is concerned about the welfare of their own children in the future the more they will tend to recycle materials. The remaining two altruistic values of *Children* in general and *People in the Community* did not possess any significant relationships with any of the environmental behaviours.

4.6.3. Relationships found between individual biospheric values and environmental behaviour

Table 4.6.3. Relationships found between individual biospheric values and environmental behaviour

		Marine Life	Plants	Animals	Trees	Birds
1: Recycling Glass, paper etc.	Pearson Correlation	**.135****	**.143****	**.154****	**.180****	**.143****
	Sig. (2-tailed)	.008	.005	.002	.000	.005
	N	386	386	386	386	385
2: Reusing empty bottles or containers	Pearson Correlation	**.119***	.086	.062	.062	.062
	Sig. (2-tailed)	.020	.090	.225	.226	.227
	N	386	386	386	386	385
3: Using own shopping bag instead of plastic bags	Pearson Correlation	**.119***	**.156****	.073	**.127***	**.171****
	Sig. (2-tailed)	.019	.002	.154	.013	.001
	N	386	386	386	386	385
4: Closing tap while washing dishes or brushing teeth	Pearson Correlation	**.154****	.085	**.141****	**.128***	**.163****
	Sig. (2-tailed)	.002	.097	.005	.012	.001
	N	386	386	386	386	385
5: Having a shower rather than a bath	Pearson Correlation	-.028	-.037	-.011	-.001	**-.105***
	Sig. (2-tailed)	.578	.465	.829	.977	.040
	N	386	386	386	386	385
6: Switching off unnecessary lights at home	Pearson Correlation	**.120***	**.163****	**.119***	**.166****	**.134****
	Sig. (2-tailed)	.018	.001	.019	.001	.008
	N	386	386	386	386	385
7: Switching off electrical appliances that are not being used	Pearson Correlation	**.101***	**.195****	**.107***	**.161****	**.130***
	Sig. (2-tailed)	.047	.000	.036	.002	.011
	N	386	386	386	386	385
8: Supporting Save the Rhino campaign	Pearson Correlation	**.224****	**.173****	**.193****	**.216****	**.256****
	Sig. (2-tailed)	.000	.001	.000	.000	.000
	N	386	386	386	386	385
9: Purchasing organic products	Pearson Correlation	.087	**.113***	**.131****	**.126***	**.166****
	Sig. (2-tailed)	.087	.026	.010	.013	.001
	N	386	386	386	386	385
10: Purchasing green products e.g. energy saving light bulbs	Pearson Correlation	**.131****	**.210****	**.235****	**.178****	**.254****
	Sig. (2-tailed)	.010	.000	.000	.000	.000
	N	385	385	385	385	384

11: Purchasing locally produced products	Pearson Correlation	**.120***	**.157****	**.119***	.072	.099
	Sig. (2-tailed)	.018	.002	.020	.160	.052
	N	386	386	386	386	385

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

As the table above illustrates there were many significant relationships found between the five biospheric values and the 11 environmental behaviours measured in this study. With the exception of the one negative correlation found between the environmental behaviour of *Having a shower rather than a bath* and the biospheric value of ***Birds*** (-.106), the rest of the correlations found between the behaviours and biospheric values were positive and weak. These correlations were significant at either a 0.05 or 0.01 level. The relationships suggest that the more one places importance and values the biospheric elements of the earth mentioned, the more they will perform the environmental behaviours measured.

By analysing the three correlation tables measuring the individual relationships between each value and each environmental behaviour it can be seen that the most significant individual correlations exist between biospheric values and the environmental behaviours with the least significant relationships existing between egoistic values and behaviours. Almost all of the relationships found between the three types of values and green behaviour were weak and positive.

4.6.4. Relationships found between total egoistic values and environmental behaviour

In order to further investigate the relationships between the egoistic values and green behaviour a Pearson's correlation test was run using the total egoistic value and total environmental behaviour value. The total egoistic value was calculated by simply adding the five egoistic values together (*My Health, My Future, My Lifestyle, My Prosperity* and *Me).* The same procedure was applied to calculate the total value for environmental behaviour as all 11 behaviours were added together to create a total score. The results are illustrated below.

Table 4.6.4. Relationships found between Total egoistic values and Total environmental behaviour

Correlations			
		Total Egoistic Values	Total Green Behaviour
Total Egoistic Values	Pearson Correlation	1	.062
	Sig. (2-tailed)		.229
	N	385	384
Total Green Behaviour	Pearson Correlation	.062	1
	Sig. (2-tailed)	.229	
	N	384	385

The Pearson correlation is .062 and the test indicated that this is not a significant relationship. Therefore this suggests that there is no correlation between the egoistic values in total and total environmental behaviours and therefore indicates that there is no relationship between an individual's value for themselves and the elements of their well-being with performing environmental behaviours.

4.6.5. Relationships found between Total altruistic values and Total environmental behaviour

A Pearson's correlation test was performed on the total score for altruistic values and the total score for environmental behaviour by adding the five altruistic values together as well as the 11 environmental behaviours together and utilizing the two total scores to obtain results. The results are illustrated below.

Table 4.6.5. Relationships found between total altruistic values and environmental behaviour

Correlations			
		Total Altruistic Values	Total Green Behaviour
Total Altruistic Values	Pearson Correlation	1	**.108***
	Sig. (2-tailed)		.034
	N	386	385
Total Green Behaviour	Pearson Correlation	**.108***	1
	Sig. (2-tailed)	.034	
	N	385	385

*. Correlation is significant at the 0.05 level (2-tailed).

A positive correlation of 0.108 is significant at the 0.05 level. This suggests that a significant, weak and positive relationship exists between the total altruistic score and the total value for green behaviour indicating that overall the more an individual is concerned about, and places importance on altruistic values and other people, the more likely they are to perform environmental behaviours.

4.6.6. Relationships found between total biospheric values and total environmental behaviour

A Pearson's correlation test was performed by utilizing the total biospheric values (by adding the five biospheric items of *Marine Life, Plants, Animals, Trees* and *Birds* together) and the total environmental behaviour (by adding the 11 green behaviours together). The results are illustrated below.

Table 4.6.6. Relationships found between total biospheric values and environmental behaviour

Correlations			
		Total Biospheric Values	Total Green Behaviour
Total Biospheric Values	Pearson Correlation	1	**.316****
	Sig. (2-tailed)		.000
	N	385	384
Total Green Behaviour	Pearson Correlation	**.316****	1
	Sig. (2-tailed)	.000	
	N	384	385

**. Correlation is significant at the 0.01 level (2-tailed).

When the Pearson's Correlation test was run with the total biospheric values and the total green behaviour a moderate relationship was found that was significant at the 0.01 level with a value of .316. This value however indicates the strongest relationship and correlation of the three total values tested with total green behaviour. It suggests that the more individuals are concerned about, and place importance on overall biospheric values the more they will tend to perform environmental behaviours.

Pearson's Correlation tests were also conducted by using the Factors found during the Factor Analyses mentioned previously i.e. the Egoistic Factor 1 and the Biospheric Factor 2 and Total Green Behaviour.

4.6.7. Relationships found between Egoistic Factor 1, Biospheric Factor 2 and Total Green Behaviour

A Pearson's correlation was also performed on the total scores of the two factors found during the factor analysis namely the Egoistic Factor (which consisted of the addition of the items *My Health, Children, My Future, Humanity, My Lifestyle, My Prosperity, Me* and *My Children*) and the Biospheric Factor (which consisted of the combination of the items *Marine Life, Plants,*

People in the Community, Animals, Future Generations, Trees and *Birds*) with the total environmental behaviour score. The results are illustrated below.

Table 4.6.7. Relationships found between Egoistic Factor 1, Biospheric Factor 2 and Total Green Behaviour

Correlations				
		Egoistic Factor Score	Biospheric Factor Score	Total Green Behaviour
Egoistic Factor	Pearson Correlation	1	.000	-.010
	Sig. (2-tailed)		1.000	.839
	N	384	384	383
Biospheric Factor	Pearson Correlation	.000	1	**.309****
	Sig. (2-tailed)	1.000		.000
	N	384	384	383
Total Green Behaviour	Pearson Correlation	-.010	**.309****	1
	Sig. (2-tailed)	.839	.000	
	N	383	383	385

**. Correlation is significant at the 0.01 level (2-tailed).

As displayed above no significant relationships were found between the Egoistic Factor 1 and Total Green Behaviour while a moderate and positive relationship that is significant at the 0.01 level was found between the Biospheric Factor 2 and Total Green Behaviour with a value of .309.

As determined during the factor analysis, five values loaded weakly on both Factor 1 and Factor 2 namely *My Health, Children, Humanity, People in the Community and Future Generations*. In order to clearly analyse the correlations found in the table above the researcher concentrated only on the remaining 10 values that loaded strongly onto one of the two factors. Therefore the findings above suggest that the values that loaded strongly on Egoistic Factor 1 (*My Future, My Lifestyle, My Prosperity, Me and My Children*) are not related to the environmental behaviours tested. This shows that the importance and concern individuals place on these specific values does not affect their environmental behaviour. On the other hand the test also

indicates that the values that loaded strongly on Biospheric Factor 2 (*Marine Life, Plants, Animals, Trees and Birds*) and possess a moderate positive significant relationship with Total Green Behaviour which indicates that the more individuals place importance on and show concern for these specific values, the more likely they are to perform the green behaviours tested.

4.6.8. Relationships found between individual environmental beliefs and environmental behaviour

Pearson's Correlation tests were also performed for the 12 individual environmental beliefs and the 11 individual environmental behaviours. The results are illustrated below.

Table 4.6.8. Relationships found between individual environmental beliefs and environmental behaviour

		Belief 1	Belief 2_Recode	Belief 3	Belief 4_Recode	Belief 5	Belief 6_Recode	Belief 7	Belief 8_Recode	Belief 9	Belief 10	Belief 11_Recode	Belief 12_Recode
Behaviour 1	***PC***	.085	.027	**.179****	.035	**.147****	**.100***	.047	**.130***	-.015	**.147****	**.128***	-.009
	Sig.	.096	.599	.000	.489	.004	.049	.354	.011	.766	.004	.012	.865
	N	386	386	386	386	385	386	386	385	386	385	386	386
Behaviour 2	***PC***	.060	.026	**.101***	**.167****	**.149****	.091	-.027	**.130***	.079	.003	.004	.068
	Sig.	.239	.604	.047	.001	.003	.073	.599	.010	.122	.946	.939	.183
	N	386	386	386	386	385	386	386	385	386	385	386	386
Behaviour 3	***PC***	.096	**.101***	.065	.011	.095	.096	.049	**.140****	.013	.039	.063	-.010
	Sig.	.060	.048	.202	.824	.062	.058	.339	.006	.794	.444	.219	.849
	N	386	386	386	386	385	386	386	385	386	385	386	386
Behaviour 4	***PC***	.068	.032	**.190****	.018	.075	.083	**.117***	**.123***	.052	**.129***	-.014	-.019
	Sig.	.184	.533	.000	.726	.144	.105	.021	.016	.311	.011	.781	.709
	N	386	386	386	386	385	386	386	385	386	385	386	386
Behaviour 5	***PC***	-.018	**.111***	**.121***	.007	**.146****	**.104***	**.120***	.098	**.121***	-.011	-.085	.086
	Sig.	.723	.029	.017	.885	.004	.040	.019	.055	.017	.825	.097	.090
	N	386	386	386	386	385	386	386	385	386	385	386	386
Behaviour 6	***PC***	.092	.061	**.171****	-.026	**.103***	**.105***	.100	**.112***	.083	**.152****	-.008	-.036
	Sig.	.070	.235	.001	.614	.043	.040	.050	.028	.102	.003	.871	.477
	N	386	386	386	386	385	386	386	385	386	385	386	386
Behaviour 7	***PC***	.069	-.010	**.195****	-.030	.013	.058	**.101***	.082	**.112***	**.156****	.020	-.033
	Sig.	.173	.838	.000	.563	.801	.252	.047	.107	.027	.002	.700	.519
	N	386	386	386	386	385	386	386	385	386	385	386	386
Behaviour 8	***PC***	.046	.001	**.159****	.016	.028	.036	.049	.073	-.019	**.165****	.056	**-.134****
	Sig.	.364	.981	.002	.754	.585	.475	.338	.152	.711	.001	.269	.008
	N	386	386	386	386	385	386	386	385	386	385	386	386

Behaviour 9	***PC***	**.111***	-.030	**.169****	.091	.072	.087	.092	.059	.006	.004	-.023	-.022
	Sig.	.029	.559	.001	.075	.161	.089	.070	.246	.904	.943	.650	.660
	N	386	386	386	386	385	386	386	385	386	385	386	386
Behaviour 10	***PC***	**.166****	.050	**.215****	.099	.055	**.129***	**.132****	**.164****	.052	.077	-.007	.012
	Sig.	.001	.326	.000	.051	.281	.011	.009	.001	.309	.133	.891	.817
	N	385	385	385	385	384	385	385	384	385	384	385	385
Behaviour 11	***PC***	.011	-.006	.070	-.041	.068	-.076	.035	-.068	-.052	.086	-.054	**-.162****
	Sig.	.826	.904	.169	.422	.181	.138	.496	.181	.313	.093	.290	.001
	N	386	386	386	386	385	386	386	385	386	385	386	386

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Beliefs 2, 4, 6, 8, 11, 12 are negatively worded statements therefore they have been recoded

Key:

Belief 1: When humans interfere with nature it often produces disastrous consequences.

Belief 2: The balance of nature is strong enough to cope with the impacts of modern industrial nations.

Belief 3: Plants and animals have as much right as humans to exist.

Belief 4: The so-called "ecological crisis" facing humankind has been greatly exaggerated.

Belief 5: The balance of nature is very delicate and easily upset.

Belief 6: Humans have the right to modify the natural environment to suit their needs.

Belief 7: If things continue on their present course, we will soon experience a major ecological catastrophe.

Belief 8: Humans were meant to rule over the rest of nature.

Belief 9: Degradation of the environment has negative consequences for humanity

Belief 10: It is important to be seen to be caring for the environment

Belief 11: Caring for the environment is a private responsibility

Belief 12: Being active with regards to environmental protection gains you social status.

Behaviour 1: Recycle glass, paper etc.

Behaviour 2: Reuse empty bottles or containers

Behaviour 3: Use your own shopping bag instead of buying plastic shopping bags

Behaviour 4: Close the tap while washing dishes or brushing teeth

Behaviour 5: Have a shower rather than a bath

Behaviour 6: Switch off unnecessary lights at home

Behaviour 7: Switch off electrical appliances that are not being used

Behaviour 8: Support the 'Save the Rhino' environmental campaign

Behaviour 9: Purchase organic products

Behaviour 10: Purchase green products e.g. energy saving light bulbs

Behaviour 11: Purchase locally produced products

The table above illustrates the significant correlations that exist between the 12 environmental beliefs tested in Section 3 of the questionnaire with the 11 green behaviours in Section 2. The table displays many significant relationships that exist between individual beliefs and behaviours. The correlations found for each behaviour are simplified in the list below.

Behaviour	*Belief*
1. Recycling	**3, 5, 6, 8, 10, 11**
2. Reusing items	**3, 4, 5, 8**
3. Using own shopping bag	**2, 8**
4. Closing the tap	**3, 7, 8, 10**
5. Shower instead of bath	**2, 3, 5, 6, 7, 9**
6. Switching off lights	**3, 5, 6, 8, 10**
7. Switching off appliances	**3, 7, 9, 10**
8. Supporting 'Save the Rhino'	**3, 12*, 10**
9. Purchasing organic products	**1, 3**
10. Purchasing green products	**1, 3, 6, 7, 8**
11. Purchasing local products	**----------**

*negative relationship

All of the correlations found between green behaviour and environmental beliefs were weak positive and significant with one exception being the relationship found between Behaviour 8 and Belief 12, which indicated a weak negative significant correlation. As the simplified list above shows, the most correlations were found with **Behaviour 5** (showering instead of bathing) as it correlated with six beliefs and the least correlations were found with **Behaviour**

11 (purchasing local products) as no relationships were found with any of the beliefs measured. As previously stated one negative correlation was found and that was between *Supporting the 'Save the Rhino' campaign* and the belief that *Being active with regards to environmental protection gains you social status*. This indicates that the more one believes that performing environmental behaviour gains them social status the less they will be inclined to support environmental campaigns such as 'Save the Rhino'. The rest of the correlations found were positive indicating that the more one possesses the environmental beliefs tested, the more they perform the green behaviours measured in the study.

4.6.9. Relationships found between Total environmental beliefs and Total environmental behaviour

Just as with the values in Section 1 of the questionnaire, correlation tests were also performed on the total score for environmental beliefs along with the total value for green behaviour. Just as the other total scores were calculated, the total score of environmental beliefs was computed by adding all 12 beliefs together.

Table 4.6.9. Relationships found between total environmental beliefs and total environmental behaviour

Correlations

		Total Environmental Beliefs	Total Green Behaviour
Total Environmental Beliefs	Pearson Correlation	1	**.271****
	Sig. (2-tailed)		.000
	N	383	382
Total Green Behaviour	Pearson Correlation	**.271****	1
	Sig. (2-tailed)	.000	
	N	382	385

**. Correlation is significant at the 0.01 level (2-tailed).

As mentioned above **Belief 2, 4, 6, 8, 11** and **12** were recoded due to the statements being negatively worded. The table above shows the findings of the Pearson's Correlation test performed on the two variables and it illustrates a weak positive relationship that is significant at the 0.01 level between Total Environmental Beliefs and Total Green Behaviour with a value of .271. The Pearson's Correlation value indicates that the more an individual holds these environmental beliefs the more likely they are to perform green behaviours.

Just as Value Factors found during the factor analyses (Egoistic Factor 1 and Biospheric Factor 2) were utilized to conduct correlation tests with Total green behaviour, the three Belief Factors found were also used in Pearson Correlation tests with Total green behaviour in order to further explore the relationships between the constructs.

4.6.10. Relationships found between Belief Factor 1, Belief Factor 2 and Belief Factor 3 with Total Green Behaviour

A Pearson's correlation test was conducted on the three factors that were found for the Beliefs that were tested in the study. As noted above in the Factor Analysis the 12 beliefs measured in this research loaded onto three Belief factors and this correlation test was run in order to determine if any relationships existed between the three factors and total environmental behaviour.

Table 4.6.10. Relationships found between Belief Factor 1, Belief Factor 2 and Belief Factor 3 with Total Green Behaviour

Correlations					
		Belief Factor 1	Belief Factor 2	Belief Factor 3	Total Green Behaviour
Belief Factor 1	Pearson Correlation	1	.000	.000	**.280****
	Sig. (2-tailed)		1.000	1.000	.000
	N	384	384	384	383
Belief Factor 2	Pearson Correlation	.000	1	.000	**.185****
	Sig. (2-tailed)	1.000		1.000	.000
	N	384	384	384	383
Belief Factor 3	Pearson Correlation	.000	.000	1	-.066
	Sig. (2-tailed)	1.000	1.000		.199
	N	384	384	384	383
Total Green Behaviour	Pearson Correlation	**.280****	**.185****	-.066	1
	Sig. (2-tailed)	.000	.000	.199	
	N	383	383	383	385

**. Correlation is significant at the 0.01 level (2-tailed).

The results found for the Pearson Correlation test run for the three Belief factors that were determined during the Factor Analysis, and Total Green Behaviour are illustrated in the table above. Of the 12 environmental beliefs tested, 10 statements loaded onto each of the three factors and these were the same as the original factors that the NEP measures which are the following:

Factor 1: Belief that humans do not have the right to control nature

Factor 2: Mankind's ability to offset the balance of nature

Factor 3: Humans have restrictions for growth

As stated previously Beliefs 3 and 5 loaded onto both Factor 1 and 2 therefore just as in the previous analysis of the egoistic and biospheric factors and behaviour, the researcher

concentrated on the remaining eight beliefs that loaded strongly onto **Factor 1** (*Belief 6 and 8*), **Factor 2** (*Belief 1, 7 and 9*) and **Factor 3** (*Belief 2, 4 and 12*). The table above illustrates the findings obtained from the correlation test run between Belief Factor 1, Belief Factor 2, Belief Factor 3 and the Total value of Green Behaviour. As the table illustrates the Pearson Correlation value for Belief Factor 1 and Total Green Behaviour is .280 indicating that a weak positive relationship that is significant at a 0.01 level exists between these two variables. This finding suggests that the more one holds the belief that humans do not have the right to control nature, the more likely the individual is to perform the environmental behaviours tested.

The Pearson Correlation value for Belief Factor 2 and Total Green Behaviour is .185 which indicates that once again a weak, positive relationship, but which is significant at the 0.01 level exists between these two variables. This value implies that the more an individual holds the belief that mankind has the ability to offset the balance of nature, the more likely they are to perform the environmental behaviours measured in the study. In terms of the third and last factor of belief and its relationship with Total Green Behaviour, the Pearson Correlation value found is -.066 and this value is not significant. Therefore this indicates that the belief that humans have restrictions for growth has no effect on environmental behaviours performed.

In summary, by analysing the results of the correlation tests it is evident that most of the relationships found were between biospheric values and green behaviour as well as between environmental beliefs and green behaviour with most of these correlations being weak and positive. Therefore biospheric values and environmental beliefs appear to have the most impact on one's green behaviour.

4.7. Multiple Regression Analyses

In order to determine if the different values and beliefs that were measured in the study have any predicting power in terms of performing the green behaviours tested, a multiple regression analysis was conducted. According to Pallant (2010, p. 104) multiple regression analysis is a more complex form of correlation and Kothari (2004, p. 130) states that the purpose of

conducting this test is to predict which independent variables have an influence on one continuous dependent variable of a study. In the case of the present study the dependent variable is environmental behaviour and the independent variables are the egoistic, altruistic and biospheric values along with environmental beliefs. Objective 4 of the research deals with determining the relationships that exist between the values and environmental behaviour and between environmental beliefs and environmental behaviour. Therefore multiple regression analyses were carried out to determine which independent variables predict environmental behaviour the most. Each test determines two aspects of prediction, firstly the Model Summary Table and the Anova Table and secondly the Coefficients Table. Two multiple regression analyses were performed. The first utilized the Totals of the three types of Values along with the Total of Environmental Beliefs with the Total value of the Green Behaviours. The results are illustrated below.

4.7.1. Multiple Regression on Total Egoistic, Altruistic and Biospheric Values, Total Environmental Beliefs and Total Green Behaviour

A multiple regression analysis was conducted on the total egoistic, altruistic and biospheric values, the total environmental beliefs and total green behaviour in order to find the predictors of green behaviour. The results are illustrated below.

Table 4.7.1.1. Model Summary (Totals)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.377[a]	.142	.133	4.550	.142	15.557	4	376	.000

a. Predictors: (Constant), Total Environmental Beliefs, Total Egoistic Values, Total Biospheric Values, Total Altruistic Values

For the purpose of the first regression analysis the **dependent variable** was taken as the *Total Green Behaviour* and the **independent variables** or **predictors** were taken as the *Total Environmental Beliefs, Total Egoistic Values, Total Altruistic Values and Total Biospheric Values.*

The Model Summary table of the regression analysis test illustrates how the predictors as a group predict the dependent variable (Total Green Behaviour). The value that determines this relationship is the R square value illustrated above. With a value of .142 this indicates that as a set, the predictors account for 14.2% of the variance in Green Behaviour.

Table 4.7.1.2. Anova Table (Totals)

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1288.408	4	322.102	15.557	.000[b]
	Residual	7784.825	376	20.704		
	Total	9073.234	380			

The Anova Table displayed above illustrates whether the R square value is significantly greater than zero, and the P value (or Sig value above) determines this. If the P value is less than .05 then the test is considered significant and the regression is significant. In this case the P value is .000 indicating that the regression is significant.

The overall regression model is significant and can be written as follows:

$F(4, 376) = 15.56, p<.001, R^2 = .142$

Therefore the predictors as a group can account for a significant amount of variance in Green Behaviour.

Table 4.7.1.3. Coefficients Table (Totals)

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	18.493	1.203		15.376	.000
	Total Egoistic Values	.034	.066	.033	.518	.605
	Total Altruistic Values	-.132	.073	-.131	-1.800	.073
	Total Biospheric Values	.263	.047	.337	5.602	.000
	Total Environmental Beliefs	.173	.046	.187	3.734	.000

a. Dependent Variable: Total Green Behaviour

The Coefficients Table illustrates the degree to which the predictors or independent variables in the study individually predict green behaviour. If the P values in the table above are less than 0.05 then that individual predictor is a significant predictor of the dependent variable green behaviour. The results above are as follows:

Coefficients Table (test each predictor at alpha = .05)

Total Egoistic Values	**Not Significant**	(p =.605)
Total Altruistic Values	**Not Significant**	(p =.073)
Total Biospheric Values	**Significant**	(p <.001)
Total Environmental Beliefs	**Significant**	(p <.001)

The findings above indicate that two of the four independent variables or predictors possess p values less than 0.05 and are significant. These variables are **Total Biospheric Values** and **Total Environmental Beliefs**, both with a P value of .000. Therefore this illustrates that the unique variance biospheric values and environmental beliefs account for is statistically

significant, meaning that these two variables predict green behaviour in a unique way than the other non-significant variables measured above.

Multiple regression analyses were also conducted utilizing the two factors of values and the three factors of beliefs found during the factor analyses mentioned previously with total green behaviour.

4.7.2. Multiple Regression on Factor 1 and 2 of Values, Factor 1, 2 and 3 of Beliefs, and Total Green Behaviour

Table 4.7.2.1. Model Summary (Factors)

Model Summary									
					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.413[a]	.170	.159	4.480	.170	15.405	5	375	.000

a. Predictors: (Constant), Egoistic Factor, Biospheric Factor, Belief Factor 1, Belief Factor 2, Belief Factor 3

For the purpose of the second regression analysis the **dependent variable** stayed constant as *Total Green Behaviour* however the **independent variables** or **predictors** were now taken to be the Egoistic Factor (Factor 1), Biospheric Factor (Factor 2), and Factor 1, 2 and 3 of Beliefs which represented the *Belief that humans do not have the right to control nature, Mankind's ability to offset the balance of nature,* and *Humans have restrictions for growth* respectively.

The R Square value illustrated in the table above is .170. This indicates that as a set the five factors or predictors account for 17% of the variance in Green Behaviour.

Table 4.7.2.2. Anova Table (Factors)

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1546.095	5	309.219	15.405	.000[b]
	Residual	7527.138	375	20.072		
	Total	9073.234	380			

a. Dependent Variable: Total Green Behaviour

b. Predictors: (Constant), Belief Factor 1, Belief Factor 2, Belief Factor 3, Egoistic Factor, Biospheric Factor

The overall regression model is significant and can be written as follows:

$F(5, 375) = 15.41, p<.001, R^2 = .170$

Therefore the predictors of the five factors can also account for a significant amount, 17% of variance in Green Behaviour. This is slightly more than the model using the theoretical construct measure.

Table 4.7.2.3. Coefficients Table (Factors)

Coefficients[a]								
		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	25.169	.230		109.642	.000		
	Egoistic Factor	-.121	.242	-.024	-.502	.616	.983	1.017
	Biospheric Factor	1.154	.240	.237	4.814	.000	.915	1.092
	Belief Factor 1	1.131	.235	.232	4.822	.000	.954	1.048
	Belief Factor 2	.683	.235	.140	2.910	.004	.956	1.046
	Belief Factor 3	-.357	.231	-.073	-1.547	.123	.985	1.015

Dependent Variable: Total Green Behaviour

As mentioned previously if the P values in the table above are less than 0.05 then that individual predictor is a significant predictor of the dependent variable green behaviour. The results above are as follows:

Coefficients Table (test each predictor at alpha = .05)

Egoistic Factor	**Not Significant**	(p =.616)
Biospheric Factor	**Significant**	(p <.001)
Belief Factor 1	**Significant**	(p <.001)
Belief Factor 2	**Significant**	(p < 0.05)
Belief Factor 3	**Not Significant**	(p = .123)

The findings above indicate that three of the five independent variables or predictors possess p values less than 0.05 and are significant. These variables are the **Biospheric Factor of Values** (p = .000)**, Belief Factor 1** (p = .000) and **Belief Factor 2** (p = .004). Therefore this illustrates that the unique variance that the Biospheric Factor, Belief Factor 1 (*Belief that humans do not have the right to control nature*), and Belief Factor 2 (*Mankind's ability to offset the balance of nature*) account for is statistically significant, meaning that these three variables individually significantly predict green behaviour.

4.8. Conclusion

In summary the results in this chapter indicate firstly that the individuals in the study place the most importance on their egoistic values as compared to altruistic and biospheric values. In other words individuals tended to place more importance on themselves and their well-being in terms of environmental problems as compared to the welfare of other people or the health of the earth. The individuals in the study performed environmental behaviours at a moderate rate with water conservation and energy saving behaviours being performed the most. Overall the sample possessed marginally environmentally friendly beliefs although many beliefs received predominantly neutral responses. The correlation tests indicate that biospheric values

and environmental beliefs possess the most positive relationships with green behaviour and the multiple regression analyses support this by illustrating that the best predictors of green behaviour are biospheric values and environmental beliefs.

Some of the results that are presented in this chapter are similar to the findings of other environmental studies discussed earlier in Chapter 2. However the current results also differ in some ways to past research. It is important to understand the reasons as to why the current results were found and these reasons could be gathered from analysing and comparing past research with the study at present. Therefore the next chapter discusses the findings of the current study in relation to other environmental research conducted.

Chapter 5: Discussion

Introduction

The aim of this chapter is to expand on the findings obtained from the data collection and discuss these results in relation to the four main objectives of the research. This chapter consists of an in-depth discussion of the relevant results in terms of each objective and also connects these findings to past literature that was examined in the literature review chapter. The chapter develops logical and meaningful conclusions with regard to each objective based on the primary research that was conducted and support from secondary research. Firstly objective one which dealt with determining the environmental values of young adults is discussed and is divided into three sections which presents discussions of egoistic values, altruistic values and biospheric values respectively. The findings and past literature of objective two that dealt with determining the environmental beliefs of young adults are discussed thereafter and this is followed by an examination of objective three that established the extent of green behaviour in young adults. Lastly an in-depth discussion is provided in terms of objective four that dealt with determining the relationships between environmental values and environmental beliefs with environmental behaviour. Each of the three value orientations (egoistic, altruistic and biospheric values) are discussed individually with regards to their relationship with environmental behaviour and this is followed by a discussion of the relationship between environmental beliefs and green behaviour. The chapter concludes with a table illustrating a summary of the research objectives, main findings and results of the study.

5.1. Objective 1: To determine which group of environmental values (egoistic, altruistic or biospheric) are most important to young adults

As stated previously in the Literature Review, if adverse consequences befall objects of value due to ecological problems then the main sources of environmental concern are the egoistic, altruistic and biospheric values of individuals (Snelgar, 2006, p. 87). Due to this Schultz (2001, p. 335) states that ecological concern is a direct product of these three types of values. Taking this into account the first section of the questionnaire dealt with measuring the egoistic, altruistic and biospheric values of individuals by utilizing the elements of the Environmental

Concerns (EC) scale. Fifteen items were tested in total in Section 1 with five items measuring each of the three types of values. Each item aimed to measure the level of concern and importance placed on either oneself and on one's own well-being (egoistic), the concern for the welfare and lives of other people (altruistic), and the importance placed on earthly elements such as animals and plants (biospheric). A 7-point Likert scale ranging from 1 (*No Importance*) to 7 (*Supreme Importance*) was used.

The findings obtained in the previous chapter illustrated that the overall mean score for all 15 values tested was 5.83. This mean score is relatively low for the overall importance of values of the respondents. Results from 11 countries (10 being Spanish-speaking nations) found by Schultz (2001, p. 335) illustrated that of the 11 countries tested, nine countries (Colombia, Costa Rica, El Salvador, Dominican Republic, Ecuador, Panama, Paraguay, Spain and Venezuela) placed a higher level of overall importance on values as compared to the current study with overall means ranging from 6.03 to 6.35. The only nations that possessed lower overall values than South Africa were firstly the USA, with an overall mean score of 5.53 (student sample) and 5.59 (general population sample), and secondly Peru with a mean score of 5.81. This indicates that in relation to the results of other countries, South Africa possesses a low mean for overall values suggesting that South African individuals place a low level of importance on environmental values overall. It must also be noted that the USA is the most developed country of all those mentioned above however it possessed the lowest mean which illustrates that developed countries might place lower levels of importance on environmental values as compared to developing countries. According to Hertsgaard (1999, cited in Schultz, 2001, p. 336) many individuals who live in urban areas or cities, especially in America and Europe, tend to become separated from the natural environment and they seem to believe that they can exist without it. Therefore it can be assumed that individuals in more developed countries tend to possess low levels of values pertaining to the environment (Schultz, 2001, p. 336). This may be a reason for the low means found in the USA.

The key findings from the previous chapter of this study illustrate that for the three value orientations egoistic values were found to hold the most importance in the face of environmental problems with an overall mean of 6.18, with the item of *My Future* being the

most important egoistic item. Altruistic values were found to be the second most important with an overall mean of 6.00 and within this set of values *My Children* held the most importance. Lastly biospheric values held the least importance to the respondents with an overall mean of 5.31 and the item of *Trees* was found to be the most important item within this value set. Overall the top five individual values according to their mean scores were:

1. My Future (egoistic value)
2. Me (egoistic value)
3. My Children (altruistic value, but possibly interpreted as egoistic by the sample. This is discussed later)
4. My Health (egoistic value)
5. Future Generations (altruistic value)

It can be seen that the top five individual values consists of three egoistic values and two altruistic with none being biospheric.

In terms of biospheric values the results of the current study correspond to the findings determined by Schultz (2001, pp. 329, 330) with regards to the American sample populations tested in the first two studies of his research. In both studies it was found that biospheric values were the least important with both students and the general public in the USA as this value orientation received the lowest means in comparison to egoistic and altruistic values (Schultz, 2001, p. 329). The results found in the current research also correspond to the findings of the fourth study conducted by Schultz (2001, p. 335) as it was determined that of the 10 Spanish-speaking countries tested, two countries namely Colombia and El Salvador obtained results that illustrate that altruistic values of individuals were the second most important in these samples and possessed the second highest means of the three value orientations tested (6.16 and 6.36) respectively. Although if analysed further it is evident that these means are higher than the altruistic mean found for the current study indicating that these South American countries place a greater level of importance towards values overall as compared to individuals in South Africa.

However the two American studies conducted by Schultz (2001, p. 329) also did not correspond to the findings of the present study as it was concluded that these individuals place the second highest level of importance on egoistic values in terms of the environment with

altruistic values possessing the most importance. This result was also evident in several other countries as the fourth study of Schultz (2001, p. 335) found that the Dominican Republic, Panama, Peru and Spain all placed egoistic values as the second most important in relation to the environment and behaviour, with altruistic values being the most important.

The results of Nordlund and Garvill (2002, pp. 740, 749) also did not correspond to the findings of the present study as egoistic values in the form of self enhancement values were found to be the least important amongst Swedish individuals in relation to altruistic and biospheric values. A similar result was found by Van Riper and Kyle (2014, p. 292) who tested the green behaviours relating to the protection of a national park on the general population of California, USA. Egoistic concerns and values were also ranked the lowest in the studies conducted by Schultz *et al*. (2004, pp. 36,37) and Snelgar (2006, p. 92). The sample populations utilized for these studies were American students and English students respectively. This result was also evident in the study conducted by Schultz (2001, p. 335) mentioned above as the egoistic values in Costa Rica, Ecuador, Paraguay, Venezuela, Colombia and El Salvador all ranked the lowest in levels of importance in relation to altruistic and biospheric values.

As stated above the present study found biospheric values to possess the lowest mean and therefore hold the least importance to the respondents of the research. However this finding does not correspond with the results of other studies that include those found by Schultz (2001) as individuals in two Spanish speaking countries rated biospheric values to be most important to them (Colombia and El Salvador) while four countries ranked biospheric values to be the second most important to individuals in relation to egoistic and altruistic values (Schultz, 2001, p. 335). Biospheric values also ranked in second place in terms of levels of importance in studies conducted by Van Riper and Kyle (2014, p. 292), Schultz *et al*. (2004, pp. 36, 37) and Snelgar (2006, p. 92) with the latter study possessing a biopsheric mean of 5.63.

The results presented in this section indicate that of the egoistic, altruistic and biospheric values tested in the present study, egoistic values were the most important, followed by altruistic values, while biospheric values were the least important and possessed a low mean. However

these findings do not resemble the results of most of the studies discussed in this section as most studies found altruistic values or biospheric values to hold high importance to individuals and egoistic values to possess the least importance in the face of environmental problems. Therefore the findings of this study illustrate that in terms of environmental issues the students in South Africa were more concerned about their own well-being and their own livelihoods than the lives of other people and they are the least worried about the protection and conservation of the elements of the earth such as wildlife and plants.

5.1.1. Discussion of Egoistic Values

The egoistic items of the EC scale that were utilized in this study included the importance placed on '*My Health', 'My Future', 'My Lifestyle', 'My Prosperity'* and *'Me'*. As stated above the most important egoistic item was found to be *My Future* with the majority of the sample placing an extremely high importance on this value as it possessed a mean of 6.45. In total 93.3% of individuals were very concerned about their future and placed a high level of importance on this item (chose 5 – 7 on the Likert scale in the questionnaire). The standard deviation (SD) for this item was the second lowest of the 15 value items at 1.184 and this indicates that there was a fair amount of agreement that the future of individuals is highly important.

The second most important egoistic item was the importance placed on the individual themselves in the face of environmental problems. It was found that the item of *Me* had the second highest mean of 6.42 and 92.2% of the sample considered the well-being of themselves to be of high importance. The SD was the lowest of all the values at 1.182 therefore indicating a fair amount of agreement that respondents held themselves in high importance. The egoistic item that was the third most important was the value of *My Health* as it possessed a mean of 6.32 and 92% of the individuals indicated that their health was of high importance to them in the face of environmental problems. This result is in line with the findings of the study by Tsakiridou *et al*. (2008, p. 163) that determined that a large percentage of Greek individuals placed a high level of concern on their own health in terms of the environmental behaviour of purchasing organic products. This result was also evident in the developing country of Malaysia where concern relating to one's health was the most important to educators in the

country as compared to other concerns tested (Said *et al*., 2003, p. 309). The importance of one's own health was also found in Swedish individuals by Magnusson *et al*. (2003, p. 109) and in Spanish individuals by Ojea and Loureiro (2007, p. 810). Therefore it can be seen that the importance of one's health is evident in both developed and developing countries.

The importance of the prosperity of the individuals in the face of ecological issues was found to be the fourth most important egoistic value with the item of *My Prosperity* obtaining a mean of 5.88. In total 85% of the sample were very concerned about their own prosperity and placed a high importance on it. Finally the egoistic value that received the least importance was *My Lifestyle* and the results show that of all five egoistic items this value possessed the lowest mean of 5.82 and in total 84.8% of the sample placed a high importance on their lifestyle in terms of environmental problems.

Taken together the total of the five means of the egoistic values amounts to 30.89 and therefore the average value is 6.18. This indicates that overall the individuals in the current study possess a very high level of egoistic values and place great importance on themselves and their own well-beings. A study that found self-centred values to have a high level of importance to individuals was the research conducted by Black and Cherrier (2010, p. 451) that examined the green behaviours of sixteen women from Australia and Canada and found that values that placed importance on themselves and their own families were clearly evident and was the reason why these women performed environmental behaviours.

Egoistic values were also evident and significantly felt in the research study conducted by Schultz (2001, pp. 327, 330) that measured the values of individuals that affect environmental behaviour with the EC scale. It was found that the importance of egoistic values was moderately high for two of these studies, the first being conducted on American students and the second being conducted on the general population of the USA, with means of 5.47 and 5.48 respectively. As stated previously the egoistic mean for the current study is 6.18 and is found to be the highest mean from the other values tested and this value was also found to be greater than the means found in the USA and Peru and Spain (Schultz, 2001, p. 335).

Nordlund and Garvill (2002, pp. 740, 749) also utilized a 7-point Likert scale just as the current study does (with 1 indicating the least importance and 7 indicating the most importance) to measure the level of different values held by individuals and it was found that self enhancement values only received a mean of 3.64. This value in comparison to the egoistic mean of the current study (6.18) reveals a considerably large gap between the values felt by the students in South Africa and the individuals in Sweden as it is illustrates that South African individuals possess high levels of self-centred values.

Therefore it is evident that South African individuals may hold the most egoistic values of many other countries and populations across the world. Although it is stated above that other nations also possess a high level of self-centred values, it can be seen that the current research is the only study that has found egoistic values to be the most important to the population tested by such a degree as compared to altruistic and biospheric values. Pinto *et al*. (2011, p. 126) stated that self enhancement values or self-centred values are more evident in individuals who are independent and are not easily influenced by other people. According to Lindeman and Verkasalo (2005, p. 171) individuals who place a high priority on personal benefits and individual happiness tend to hold egoistic values. Schultz (2001, p. 336) agreed with this finding as it was determined in his study that individuals that embody egoistic and selfish values prefer to be unique and distinctive, and also mentions that competitiveness might also play a role in being more egoistic. These could be reasons that explain why young adults and students in particular possess a high level of egoistic values as university life tends to be the first time many individuals are independent and their new found adulthood may be influencing the objects that they value. This transitional phase into adulthood might also create a level of competitiveness in individuals. It has also been stated by Steg, Bolderdijk, Keizer, and Perlaviciute (2014, p. 107) that selfish tendencies and values allow individuals to focus on protecting or enhancing their own resources. This could be evident in South Africans as many individuals were disadvantaged in the past due to apartheid and therefore they may have the propensity to protect what they have and to do all that is possible to increase their livelihoods.

5.1.2. Discussion of Altruistic Values

The altruistic items of the EC scale that were utilized in this study included the importance placed on '*Children', 'Humanity', 'People in the Community', 'Future Generations'* and *'My Children'*. Of the five values that were tested the level of concern felt towards the respondents own children in the face of ecological problems (*My Children*) received the highest mean of all five items. It possessed a mean of 6.36 and 92.5% of the sample placed a high level of importance on this value (chose options 5 – 7 on the Likert scale in the questionnaire).

The second most important altruistic value of *Future Generations* measured the concern felt towards the lives of the future generations of individuals with regards to environmental issues and this item received a mean of 6.08. In total 87.9% of the sample placed high importance and concern on the livelihoods of future generations and it possessed the lowest SD of the altruistic items (1.283), indicating that individuals responded relatively similarly to the mean. The third most important altruistic item was *Children* and tested the importance placed on children in general in terms of environmental problems. It possessed a mean of 5.99 and in total 85.7% of the individuals placed a high level of importance on this item. However this item possessed the highest SD of the five altruistic items (1.614) therefore many of the responses were spread out around the mean.

The fourth most important altruistic value was *Humanity* and received a mean of 5.88 and 85.4% of the individuals placed a high importance on this item. The lowest mean of the five items was found for the altruistic value *People in the Community* with a mean of 5.69 and 81.4% of the sample thought that the lives of the individuals living in their community are of high importance.

The total mean for all five altruistic items is 30 therefore the overall mean for the altruistic items is 6, which is the second highest mean of the three value orientations being tested and indicates a relatively high level of concern towards the lives and well-being of other people in terms of environmental problems.

Nordlund and Garvill (2002, pp. 740, 747, 749) found similar results to the present study that state that self-transcendence values received a high mean and were important to individuals in their study. The researchers found that the individuals who gave precedence to self-transcendent values possessed a greater level of awareness of ecological problems and felt a greater ethical obligation to safeguard the environment (Nordlund & Garvill, 2002, p. 740). As stated previously self-transcendence values are very closely related to altruistic values. Altruistic values were also found to be important by Schultz *et al*. (2004, p. 31) and Snelgar (2006, pp. 89, 92, 93) where students were once again examined in the USA and England respectively with the altruistic mean in the study of Snelgar (2006, p. 92) being 6.21, which is higher than the altruistic mean of the present study (6). In terms of the study conducted by Schultz (2001) all 10 Spanish-speaking countries possessed altruistic means that were higher than the altruistic mean of the current study (Schultz, 2001, p. 335). Therefore it is evident that although the present study obtained a reasonably high altruistic mean of 6, in relation to other studies this mean is found to be low.

The concerns felt towards their fellow man was also the most evident in Swedish farmers and landowners and it was found that these landowners possess awareness of the negative consequences of environmental damage, believe that they are responsible for taking care of their environment and possess an ethical obligation to protect the environment (Johansson *et al*., 2013, pp. 295, 301, 302). This is an interesting finding as it is possible that the lower levels of altruistic values by South African individuals might be due to the fact that they do not possess the proper awareness of their actions or feel that they have a responsibility to protect the environment.

From the current results it can be seen that the altruistic item of *My Children* received an unusually high amount of importance in relation to the other altruistic values. If compared to the acceptance of egoistic values mentioned in the previous section it is possible that the individuals of the current study interpreted the item of *My Children* as an egoistic item that emphasized the importance of their own children, in other words, something that belonged to themselves, instead of viewing this item as one that highlighted the importance of other people. Therefore this item may have increased the altruistic mean higher than it should have been.

Therefore it can be stated that although the current study found a relatively high level of altruistic values, when compared to other research it is evident that the majority of studies found altruistic values to be the most important to their sample populations. Schultz (2001, p. 336) proposes that the level of altruistic as well as biospheric values present in an individual depends on what degree these values are included in the way an individual represents themselves. Thus the more an individual feels interconnected to other people or the environment the more altruistic and biospheric values they possess. Therefore there is a possibility that South African students do not feel as connected to the lives of other individuals as compared to the respondents of the studies mentioned above.

According to Schultz *et al*. (2005, p. 460) if an individual is concerned about the well-being of another person, if they are knowledgeable that this person can be possibly harmed and if the individual believes he is accountable for this harm, then there is a greater chance that the individual possesses altruistic values. It is possible that another reason as to why the altruistic values in the present study possessed a lower level of importance relative to most of the previous research mentioned is the fact that South African students might not possess the appropriate knowledge with regards to the harm being caused to other individuals due to environmental problems. It is possible that in terms of ecological problems, the plight of other people in the community or around the country has not been emphasized sufficiently to allow the focus of individuals to be shifted towards satisfying the altruistic needs of other people. Honkanen *et al*. (2006, p. 421) state that the basis of the Norm Activation Model (NAM) is that ecological actions of individuals are governed by their ethical obligation and these are activated by the realization that they have the responsibility to protect their fellow man from harmful environmental conditions (Honkanen *et al*., 2006, p. 422). It is possible that this moral obligation is not being felt strongly by the young adults in South Africa.

5.1.3. Discussion of Biospheric Values

The final value type measured in Section 1 of the questionnaire was Biospheric values of the individuals in the study. The researcher tested the level of importance held by the students in the sample with regards to the lives of aquatic animals (*Marine Life*), the preserving of vegetation (*Plants*), the safety and protection of terrestrial animals (*Animals*), the conservation

of *Trees* and the protection of *Birds.* The biospheric value that was found to be the most important to the respondents was *Trees.* This item in particular received the most concern of the five biospheric values with the highest mean of 5.62. Of the sample, 77.1% placed a high level of importance on the protection of trees with regards to environmental problems (chose options 5 - 7 on the Likert scale in the questionnaire). The second most important biospheric value was *Animals* with a mean of 5.58 and 80% of the sample placing a high level of importance on the lives of animals.

The biospheric item that was the third most important was the concern felt towards *Plants* with a mean of 5.55 and 77.4% of the sample holding a high level of concern and placing importance on the lives of plants. This item possessed the lowest SD of the five biospheric values (1.408) therefore a large number of the responses were similar to the mean. The concern felt towards *Birds* in terms of ecological problems was determined to be the fourth most important biospheric item and it was also found to be the second least important item of the 15 values tested with a mean of 5.04 and 66.5% of the sample placing a high level of importance on this item. This item obtained a high SD of 1.661 indicating that a wide spread of responses were around the mean. Finally the importance of *Marine Life* possessed the lowest mean of the 15 items tested and therefore was the most unimportant to the respondents with a value of only 4.75. 59.9% of the individuals believed that this item was of high importance to them in the face of ecological issues. It also possessed the highest SD of the 15 values tested (1.676) therefore it is evident that many of the responses were scattered around the mean and many respondents did not agree with the mean score. Overall the total of the five means of the biospheric values amounted to 26.54 therefore the mean of the biospheric items is 5.31, which is rather low.

Schultz (2001, p. 330) also determined low levels of biospheric values in the USA and in fact these values were found to be lower in American students than the American general public with means of 5.33 and 5.46 respectively. However the biospheric means of all 10 Spanish-speaking countries tested by Schultz (2001) were found to be higher than the biospheric mean of the present study (5.31) (Schultz, 2001, p. 335). If all of the biospheric means of Schultz (2001) are analysed and compared to the biospheric mean of the current study it can be stated that this finding is most in line with students in the USA and perhaps the American general

public. This could be evidence that in terms of biospheric values South African students and American students share the same sentiments. However the biospheric mean is rather low in comparison to the other countries tested.

Therefore it can be deduced that South Africans possess the lowest biospheric values as compared to the other studies. As mentioned previously the study conducted by Schultz (2001, p. 336) determined that along with altruistic values, the level of biospheric values is influenced by the degree that an individual believes that earthly elements are a part of themselves and feels interconnected with the environment. This theory could indicate that South African individuals and particularly students do not feel entirely connected to nature or feel that the environment plays a significant role in the way in which they view themselves. This could be due to a lack of awareness of the role that nature plays in the everyday lives of human beings. Another possible reason for the low biospheric levels could be due to the fact that South Africa possesses other serious social issues that include high crime, unemployment and HIV/Aids rates that may be viewed as more important to the population and therefore may take up more of the time and effort of South African individuals.

By analysing the results of the three value orientations it is evident that young South African adults hold a very high level of egoistic values as compared to other nations around the world while altruistic values were relatively low when compared to past studies. Biospheric values of the present study were also found to be very low in relation to other countries. As discussed above the reasons for these results could be due to the fact that students could possess individualistic and competitive values that focus on personal benefits that accentuate egoistic and selfish values. It is also very possible that the results of the present study are in line with the viewpoint of Steg *et al*. (2014, p. 107) that stated that individuals who possess selfish tendencies focus on protecting and enhancing their own resources. Due to South Africans being disadvantaged in the past because of apartheid many individuals might possess this tendency of protecting their possessions and trying their best to uplift their own lives. The lack of proper environmental awareness might have led to the relatively low level of altruistic values and the low biospheric values could be due to a lack of connectedness between individuals and the environment.

5.2. Objective 2: To determine the environmental beliefs of young adults

As mentioned previously the environmental beliefs of an individual are linked to green concern (Kim, 2011, p. 68; Kim & Choi, 2005, p. 593) and it is these beliefs that have an effect on one's environmental behaviour (Stern *et al*., 1999, p. 83). Therefore the second objective of the research aimed to determine the environmental beliefs of young adults in South Africa and this was measured in Section 3 of the questionnaire. In order to measure this construct, 8 of the 12 questions in Section 3 were adapted from the New Ecological Paradigm (NEP) scale. According to Stern *et al*. (1999, p. 85) this scale is the most popular amongst researchers to measure environmentalism and predict green behaviour. As mentioned in the previous chapters the NEP measures three sets of beliefs of individuals being firstly the beliefs that people possess the ability to offset the balance of nature, secondly the belief that humans have the right to control nature and thirdly the belief that humans have restrictions for growth (Dunlap *et al*., 2000, p. 427). The purpose of the NEP is to establish the overall connection that is felt between human beings and the environment with a higher score representing a feeling of responsibility to preserve natural resources and a lower score representing a viewpoint that the abuse of natural resources is acceptable (Bostrom *et al*., 2006, p. 26; Hawcroft & Milfont, 2010, p. 144).

The initial study conducted by Dunlap *et al*. (2000, p. 433) that developed the revised version of the NEP scale (the New Ecological Paradigm) utilized a 5-point Likert scale ranging from *Strongly Agree* to *Strongly Disagree* . The same Likert scale was used in the current study with the coding to reflect 1 – Strongly Disagree to 5 – Strongly Agree. Therefore the higher the mean the more pro-environmental the beliefs of the respondents. Three statements aimed to measure the beliefs that humans have the right to control nature (*Plants and animals have as much right as humans to exist, Humans have the right to modify the natural environment to suit their needs* and *Humans were meant to rule over the rest of nature*). Three statements assessed the belief about mankind's ability to offset the balance of nature (*When humans interfere with nature it often produces disastrous consequences, The balance of nature is very delicate and easily upset* and *If things continue on their present course we will soon experience a major ecological catastrophe*). Finally two statements examined the belief that humans have restrictions for growth (*The balance of nature is strong enough to cope with the impacts of*

modern industrial nations and *The so-called ecological crisis facing humankind has been greatly exaggerated*). Beliefs 9, 10, 11 and 12 were added on by the researcher. Due to **Beliefs 2, 4, 6, 8, 11** and **12** being negatively worded these statements were reverse coded during the data analysis.

Of the 12 beliefs tested **Belief 9** was found to be the most pro-environmental belief for the respondents. This belief measured the level of agreement felt towards the statement "*Degradation of the environment has negative consequences for humanity"* and had a mean of 4.13. This illustrates that the respondents felt very strongly that damage to the environment will in turn have a negative effect on humans and 78.2% of the sample agreed with this. This belief possessed a low Standard Deviation (SD) of 0.875. This illustrates that many of the respondents felt this way towards the environment. As mentioned in Chapter 3 this question was added by the researcher and was developed by analysing literature by Ibtissem (2010, p. 131) and Wynveen *et al.* (2013, p. 31) that dealt with the two broad aspects that the NEP scale measured (anthropocentric values and eco-centric values) of individuals. Anthropocentric values views humanity as separated and independent to the environment and this viewpoint may result in environmental degradation as the overuse of natural resources and pollution are viewed as being merely an ordinary consequence of economic growth (Ibtissem, 2010, p. 131). Therefore this belief statement was added to the scale to determine whether individuals believe that the deterioration of the environment has an adverse effect on humanity.

The belief that received the second most pro-ecological responses was **Belief 3** which asked respondents if "*Plants and animals have as much right as humans to exist".* The results show that 76.1% of the respondents agree to some extent with the NEP statement and it possessed a mean of 4.08. This indicated that a large proportion of the respondents felt strongly about the statement and possessed environmentally inclined beliefs. This result is in line with the findings of Van Riper and Kyle (2014, p. 292) that found that this particular NEP item received a response that was the most pro-environmental of all the items tested in their study. This item also received a pro-environmental response from individuals in Bulgaria as found by Bostrom *et al*. (2006, p. 33) and America as determined by Dunlap *et al*. (2000, p. 433). This indicates that in relation to the belief that humans are not the only species that have the right to exist, the

general public in the USA, Bulgaria and South African students share the same environmental beliefs.

Belief 7 possessed the third most pro-environmental response and measured the belief that "*If things continue on their present course, we will soon experience a major ecological catastrophe".* This item obtained a mean of 4.07 which was the third highest mean. Together 76.4% of the sample agreed to some extent with this statement with the SD being relatively low at 0.948, therefore most of the responses gained from the individuals were similar to the mean. This result differs from the findings of Dunlap *et al*. (2000, p. 433) as although the majority of the sample showed pro-environmental beliefs towards this statement, a lower percentage of individuals agreed with this item (65.3%) as compared to the current study.

The belief statement that received the fourth highest eco-friendly response was **Belief 10.** This belief dealt with the statement of *"It is important to be seen to be caring for the environment"* and the response to this question also revealed a very positive view towards the environment. It obtained a mean of 4.05 and a low SD of 0.938 indicating that most of the respondents agreed to some extent with this statement (75.9%). This belief statement was derived from the study conducted by Griskevicius *et al*. (2010) discussed in Chapter 2. This study examined the effect of how green behaviour may differ in a public or private setting and concentrated on students (Griskevicius *et al*., 2010, pp. 394, 396). The green behaviour of individuals might be influenced by being in a public place as their actions are now visible to many other people such as cashiers, salespeople and fellow customers, and this behaviour might be different if one shops in private or shops online (Griskevicius *et al*., 2010, p. 396). The result of the present study indicates that the respondents believe that it is important to be openly environmentally friendly and behave in an environmental manner in public settings. This corresponds with the results of Griskevicius *et al*. (2010, p. 397) as it was found that the students in the study preferred green products in a public setting. Therefore this illustrates that the green behaviour of individuals, particularly students, are influenced by their external surroundings.

The first NEP statement or **Belief 1** received the fifth most pro-environmental response from the students and consisted of the statement, "*When humans interfere with nature it often*

produces disastrous consequences". It possessed a mean of 4.00 and a low SD of 0.871 indicating that most of the respondents held pro-environmental beliefs towards this statement. This finding is similar to the results obtained by Van Riper and Kyle (2014, p. 292) as this particular NEP item received a response that was highly pro-environmental with a mean of 4.03. The NEP statement was also found to possess pro-ecological responses by Dunlap *et al*. (2000, p. 433). Therefore it is evident that the same green beliefs are shared between the USA public and young adults in South Africa.

Belief 5 received the sixth most eco-friendly response and measured the level of agreement with the statement "*The balance of nature is very delicate and easily upset*". This belief had a mean of 3.83. In total 67.5% of the individuals agreed to some extent that the balance of nature is indeed delicate and can be easily upset and this item possessed the lowest SD (0.838) of the 12 beliefs. This illustrates that most of the responses were similar to the mean and indicate pro-environmental beliefs. This finding is similar to American (Dunlap *et al*., 2000, p. 433; Van Riper & Kyle, 2014, p. 292), and Bulgarian (Bostrom *et al*., 2006, p. 33) samples as well.

"*The balance of nature is strong enough to cope with the impacts of modern industrial nations"* was ranked seventh in terms of pro-ecological responses. As mentioned previously **Beliefs 2, 4, 6, 8, 11** and **12** were negatively worded and reversed in their coding for data analysis purposes. Therefore the more disagreement felt towards these beliefs the more pro-environmental the responses are. **Belief 2** possessed a mean of 3.43 with 52.9% of the sample disagreeing with the statement. Therefore many respondents possessed an environmentally friendly view towards this statement however the disagreement level was not particularly high. This was not in line with the results found by Dunlap *et al*. (2000, p. 433) as this statement received a high level of disagreement from the general public of the USA.

The belief positioned at eighth place in terms of eco-friendly responses was the statement of "*The so-called ecological crisis facing humankind has been greatly exaggerated"* and was reversed in coding. The mean for this item (**Belief 4**) was relatively low with a score of 3.34 with many respondents showing a high level of neutral responses for this particular statement. The SD was also relatively low for this belief at 0.970 therefore many responses were similar

to the mean. In total 44.8% of the individuals disagreed with this statement. This result varies from the findings of Dunlap *et al*. (2000, p. 433) as they determined that a higher percentage of individuals in their research (64.4%) disagreed with this statement and thus held higher pro-environmental beliefs as compared to the current research.

It was determined that **Belief 6** and **Belief 8** received the same amount of pro-environmentalism with both beliefs possessing a mean score of 3.15. However the SD's for both beliefs were relatively high (1.152 and 1.356 respectively) with **Belief 8** receiving the highest SD of the 12 items. Therefore the responses deviated to quite an extent from the means. **Belief 6** dealt with the statement, *"Humans have the right to modify the natural environment to suit their needs".* Together only 41.2% disagreed with the statement. This differs from the result obtained by Bostrom *et al*. (2006, p. 31) that found high pro-environmental beliefs in terms of this NEP item. Dunlap *et al*. (2000, p. 433) also found results that indicate a higher environmental viewpoint in terms of this statement as a percentage of 58.2% of individuals in their research disagreed with this statement. **Belief 8** measured the level of agreement for the statement "*Humans were meant to rule over the rest of nature*" and the findings indicate that 42.8% of the individuals disagree with this belief, however there was still a large proportion of respondents who possessed a neutral view towards this statement. This result differs from the findings of Van Riper and Kyle (2014, p. 292), Bostrom *et al*. (2006, p. 31) and Dunlap *et al*. (2000, p. 433) as their research found that the beliefs held towards this NEP statement were pro-environmental with means and percentages that were closer to the environmentally friendly optimum as compared to the current study.

Belief 11 measured the beliefs of the respondents in terms of whether "*Caring for the environment is a private responsibility"* and this item was reversed in coding. The mean of this question was considered low in comparison to the rest of the statements as it was the second lowest mean of the 12 items tested with a value of 3.07. It possessed the second highest SD at 1.281 therefore the responses from the research did deviate to some extent from the mean in comparison to the rest of the belief items. This statement was added by the researcher to determine if individuals believed that caring for the environment should only be the responsibility of private entities or whether environmental protection should be the responsibility of the masses of people and the general public. It was derived from the study

conducted by Griskevicius *et al*. (2010, pp. 394, 396) that analysed the importance of social status and the influence of external settings on green behaviour.

Finally **Belief 12** measured the belief that "*Being active with regards to environmental protection gains you social status"* and this particular item obtained the lowest mean of 2.91. A relatively high percentage of the respondents (35.5%) possessed a neutral point of view towards the statement and did not have a clear cut belief. Altogether 36.2% agreed with the fact that environmental behaviour increases social status, 28.2% disagreed with this. This finding corresponds to the results of Griskevicius *et al*. (2010, pp. 394, 396) as this study found that in the experiment where social status was not highlighted the majority of respondents chose higher performing non-green products instead of the lower quality environmental products, however when social status was incorporated in the experiment the majority of individuals chose the green products instead (Griskevicius *et al*., 2010, p. 396). This finding illustrates that by stimulating status motives in situations individuals will more likely purchase environmentally friendly products over luxurious non-green products (Griskevicius *et al*., 2010, p. 396). This result also correlates to a certain extent with the findings of Bertoldo *et al*. (2013, pp. 441, 442) as it was determined that Brazilian students relate pro-environmental beliefs with portraying a positive self-image and non-environmental beliefs with a negative self-image. Therefore it is evident that promoting environmentalism is valued socially in South African individuals as well.

Taken together, the means of the 12 belief items added up to 43.21 therefore the overall mean for Section 3 is 3.60. This value reveals that overall the respondents possessed marginally pro-environmental beliefs however a neutral point of view was also found to be evident with some of the beliefs. This is similar to an extent with the findings obtained by Van Riper and Kyle (2014, p. 292) as it was found that overall the American public possessed pro-environmental beliefs, however the American sample were more environmentally inclined as compared to the current study. If the overall beliefs are compared to the studies conducted by Schultz and Zelezny (1999, p. 261) it is evident that of the 14 different countries tested, all obtained an overall NEP belief mean of 3.67 and above, with the lowest values (least environmentally friendly) being held by Ecuador and the United States. Therefore it can be seen that South African students exhibit marginally pro-environmental beliefs but it is found to be less

environmentally friendly than the sample of Van Riper and Kyle (2014, p. 292) or any of the 14 countries tested by Schultz and Zelezny (1999, p. 261).

The current study utilized just 8 items of the NEP scale and four additional belief statements in the questionnaire as opposed to the other 14 studies of Schultz and Zelezny (1999, p. 261) that employed the entire 15 item NEP scale for analyses. The reason as to why the present study employed just 8 of the 15 items of the NEP scale was due to reducing the length of the questionnaire used to obtain the primary data of the research. This decision was also made by Clark *et al*. (2003, p. 241) that utilized just 10 NEP items to shorten the length of the questionnaire used. As mentioned previously in Chapter 3 other studies had also opted to not use the entire 15 items in the scale (e.g. Faver, 2013, p. 158; Lee *et al*., 2014, p. 2101; Whitmarsh & O'Neill, 2010, p. 308). Although omitting some of the belief statements from the 15 item scale could have led to a difference in overall belief values found, the 8 item scale utilized for the present study employed an equal number of eco-centric (environmental) statements and anthropocentric (human dominant) statements. Therefore both aspects of the NEP were given equal attention and thus environmental beliefs were represented equally.

Another possible reason for the difference in the levels of beliefs found is that according to Givens and Jorgenson (2013, p. 421) environmental concerns are mostly evident in developed countries as individuals tend to concentrate on environmental issues once their own personal material needs are met, which will be met easier in more affluent countries. This could support the findings of the current study as only marginal pro-ecological beliefs were found in South African students with South Africa being a developing country. However results found from a study conducted by Mostafa (2007a, p. 225) illustrate that the level of environmental concern found in Egypt was high despite it being a developing country. Similarly findings of Rousseau and Venter (2001, p. 4) determined that the levels of environmental concern possessed by individuals in Port Elizabeth in South Africa were in fact high, however this particular study firstly tested environmental concerns in general and not by utilizing the NEP scale and secondly the respondents were the general public. Therefore this could indicate the disparity between the results in Port Elizabeth and the current study. It is therefore also possible that the scale and sample used in a study might lead to different levels of green concern in South Africans.

The views of Givens and Jorgenson (2013, p. 421) contradicts results determined by Gabler *et al*. (2013, p. 165) that also measured environmental beliefs of students however the study took place in the USA and through in-depth interviews, and it was found that the majority of the respondents did not possess environmental friendly beliefs. Similar results were found by Wray-Lake *et al*. (2010, p. 61) as environmental beliefs of adolescents in the USA were measured over a time period of several decades (1976-2005) and it was found that with the exception of the 1990's, the rest of the decades showed a decrease in pro-environmental beliefs. Another study which found a low level of ecological beliefs in American students was conducted by Jurin and Fortner (2002, pp. 385, 389) and it was determined that these individuals held more anthropocentric beliefs as opposed to eco-centric beliefs of the NEP scale. This indicated that the sample held stronger beliefs that humans have the right to dominate over nature. If compared to the results obtained from the four anthropocentric items of the NEP scale tested in the current study, it is evident that students of South Africa also hold a reasonable level of anthropocentric beliefs as all four statements received moderate means.

According to Bang *et al*. (2000, p. 454) an individual's beliefs stem from their knowledge and what they believe is true and correct. Kilbourne and Pickett (2008, p. 887) propose that ecological beliefs deal with the connection between human beings and the environment and this association is determined by the traditional knowledge that one possesses of the environment. Gabler *et al*. (2013, p. 162) state that the concept of beliefs is thought to be affected by external influences, for example the knowledge an individual possesses regarding whether their actions will ultimately have an impact on the situation under analyses. Therefore it is clear that one's knowledge and awareness of the environment as well as the knowledge of the association between humans and nature plays a significant role in determining one's environmental beliefs. Thus the results of the present study that illustrate only marginal pro-environmental beliefs might be due to the fact that young adults in South Africa do not possess the awareness and the correct knowledge pertaining to the issues of the environment and how they are connected to these issues. As mentioned previously the beliefs found in the NEP scale also determine the overall connection that is felt between mankind and the environment with a higher score representing a feeling of responsibility to preserve natural resources and a lower score representing a viewpoint that the abuse of natural resources is acceptable (Bostrom *et al*., 2006, p. 26; Hawcroft & Milfont, 2010, p. 144). Therefore it is

evident that this connection with nature and the environment is not felt strongly by young adults in South Africa as only marginally pro-environmental beliefs were found.

It was stated that possible reasons for the non-environmental opinions held by American students could be due to two aspects related to the Theory of Planned Behaviour (TPB) namely the subjective norms and the perceived behavioural control felt by students (Gabler *et al*., 2013, p. 163). As mentioned in Chapter 2 subjective norms refer to the amount of social pressure felt by an individual to take part in behaviours and the perceived behavioural control refers to the ease or difficulty that is involved in performing a certain activity (Ajzen, 1991, p. 188). Gabler *et al*. (2013, p. 165) discovered that the majority of the individuals in their study felt that their individual behaviour did not have a great enough impact on the environment overall. These two aspects could also be the reasons for the mixed responses found for **Beliefs 11** and **12.**

Belief 11 of the present study found that many respondents believe that environmental protection should not be the responsibility of the general public and this result could be due to the fact that the respondents believe that ecological behaviour of average individuals of the general public might not have a great enough effect on the environment. **Belief 12** found that the respondents believe that green behaviour increases the social status of individuals and therefore subjective norms could be playing a significant role in green behaviour of the respondents. Therefore these could be possible reasons as to why some individuals possess non-ecological beliefs and might also explain why South African individuals possess just marginal pro-environmental beliefs.

To conclude, from analysing the current findings with the results of past research it is evident that South African students could be seen as possessing a marginal level of pro-environmental beliefs, however when compared to past findings it is evident that the mean of the beliefs are relatively low.

5.3. Objective 3: To establish the extent of green behaviour in young adults

Section 2 of the questionnaire measured the frequency of 11 environmental behaviours of the students in the study and included mostly everyday activities such as energy saving and water conservation that do not require a high level of income to perform. However some questions also tested the green purchasing behaviours of the sample to gain an all-round perspective of environmental behaviours. This section in the questionnaire measured the occurrence of green behaviours by utilizing a 4-point Likert scale that ranged from 1 – Never, 2 – Sometimes, 3 – Often to 4 – Always. Therefore the higher the means the more frequently the behaviours were performed. To represent a high frequency for behaviour performed, the frequencies for *Always* and *Often* were combined to get a cumulative percentage that represents a **high frequency**. The frequencies for *Sometimes* and *Never* were combined to represent a **low frequency.**

As stated in the previous chapter the ecological behaviours that were performed the most frequently were **Behaviours 4** and **5** and these dealt with water conservation behaviours. The respondents were asked how often they "*Close the tap while washing dishes or brushing teeth"* (**Behaviour 4**) and this obtained the highest mean of 3.32 with 79% of respondents possessing a high frequency for this behaviour. The Standard Deviation (SD) was relatively low at 0.837 therefore the responses did not differ greatly from the mean. Following closely behind was **Behaviour 5** which tested how frequently respondents "*Have a shower rather than a bath".* This behaviour had a mean of 3.26 with 73.8% of respondents indicating that they performed this behaviour often or on a regular basis. This indicates that of all the behaviours tested, water conservation behaviour was the most common with these students in South Africa. This result is similar to findings of Barr and Gilg (2007, p. 367) that determined that decreasing the frequency of showers and baths were not performed as much as closing the tap whilst doing the dishes.

The findings above could have been due to the fact that South Africa was and still is, going through a severe drought and this has led to some areas receiving water restrictions. Due to the effects of the drought water campaigns were established around the country, an example being the "Be the Hero" campaign that focussed on raising awareness of the importance of conserving

water as it was stated that the demand for water in SA will surpass the supply by the year 2025 (Mogale City Local Municipality, 2015, paragraph 1, 2). Therefore the increase in water saving campaigns could have raised the awareness of the respondents and led to an increase in these water conservation behaviours. It is also possible that since the water restrictions would affect the individual themselves they would be more willing to perform water saving behaviours.

The two behaviours that describe energy saving activities (**Behaviour 6** and **7**) were also performed frequently. **Behaviour 7** asked individuals how often they "*Switch off electrical appliances that are not being used"* and it was determined that this environmental behaviour was performed the third most often with a mean of 3.20 and 74.9% of the sample stating they perform this behaviour always or often (high frequency). **Behaviour 6** followed closely behind and tested how often the individuals "*Switch off unnecessary lights at home"* and it was found that this behaviour was the fourth most frequently performed with a mean of 3.16 and 73.6% of the individuals stated that they perform this green behaviour at a high frequency. The SD values for both behaviours were low at 0.859 and 0.872 respectively, therefore these results indicate that most of the respondents take part in energy conservation behaviours on a regular basis. Just as South Africa has been facing a water crisis in 2015, there has also been a serious energy crisis in the country over the past few years that has led to frequent scheduled power cuts (Load Shedding). Due to this crisis, communication about energy conservation has been a popular topic around South Africa and since most of the individuals in the country have also been affected by Load Shedding this could be one of the reasons as to why energy saving behaviours are performed on a frequent basis.

It is therefore evident that of all the behaviours tested, household water saving and energy conservation seem to be the most common and frequently performed amongst these young adults in South Africa. This was also found to be true amongst Malaysian individuals as both water conservation and energy saving behaviours were also found to be the most common environmental behaviours performed (Said *et al*., 2003, p. 309).

The environmental activity that was performed the fifth most frequently by young adults in South Africa was **Behaviour 2** that measured the rate that individuals "*Reuse empty bottles or*

containers". It was found that most of the students perform this green behaviour frequently as the mean of this item is 3.05. In total 74% of respondents stated that they reuse items often or on a regular basis. This illustrates that this environmental behaviour proved to be common with the respondents. This finding is similar with the results of Gilg *et al*. (2005, pp. 487, 488) as reusing materials was also a common practice in the UK.

The green behaviour that was ranked in sixth place in terms of frequency is **Behaviour 11** that measured the rate that young adults "*Purchase locally produced products"*. It was found that this green behaviour was reasonably common with the respondents as it obtained a mean of 2.65, however the difference between the high frequency and the low frequency percentages of performing this green activity was marginal. 51% of the respondents performed this behaviour often or on a regular basis (high frequency) while 49% purchased local products sometimes or never (low frequency). This green behaviour possessed the second lowest SD value at 0.796 indicating that many of the responses did not differ from the mean. Gilg *et al*. (2005, pp. 487, 488) found results very similar to the current study as it was also established that individuals in the UK tend to purchase local products more often than they buy organic products. This was also evident in a study conducted by Lea and Worsley (2008, p. 211) that analysed the green behaviours of Australian individuals.

Behaviour 10 tested how often students "*Purchase green products e.g. energy saving light bulbs"* and it was determined that performing this environmental behaviour was not very common with the respondents as it obtained the seventh highest mean of 2.54. A higher percentage of respondents performed this behaviour on a low frequency (53%) while 47% of individuals indicated that they performed this activity on a high frequency. This finding was in line with the results obtained by Fraj and Martinez (2006, p. 141) that also determined that buying environmentally friendly products were not performed very often by their Spanish sample. This result however differed from those found by Gilg *et al*. (2005, pp. 487, 488) as the behaviour of buying environmentally friendly products such as energy saving light bulbs was determined to be the most common with the sample of UK households. One of the possible reasons for the relatively low rates of green purchasing behaviours could be due to the findings of Berndt and Gikonyo (2012, p. 5) that determined that African individuals are more willing to buy green products if the products are of a similar price to regular products. In South Africa

energy efficient light bulbs are more expensive than regular light bulbs. Another reason could stem from the fact that students may not have the finances to purchase green products or that these purchases are made by their parents.

Behaviour 3 tested how often the respondents "*Use their own shopping bag instead of buying plastic shopping bags"* and the results illustrate that this behaviour was not very common with the sample either with a mean of 2.47 and 56.2% of the respondents stated that they take part in this green activity sometimes or not at all. This corresponds with the results found by Gilg *et al*. (2005, pp. 487, 488) that illustrate that using one's own shopping bag is also not very common among individuals in the UK. This was also true in Australia with Lea and Worsley (2008, p. 211) observing that only 27% of their Australian sample used their own shopping bags often, while 26%, 23% and 2% indicated that they sometimes, rarely and never used them respectively showing a mixed response towards this behaviour. However it was found by Berndt and Gikonyo (2012, pp. 5-6) that reusing shopping bags instead of purchasing them was found to be the most common among young individuals in Johannesburg and Nairobi. This could be due to the fact that both Johannesburg and Nairobi are big cities and Johannesburg is the financial hub of South Africa therefore individuals who live in these cities might possess different views as compared to those in a smaller city such as Pietermaritzburg (the location of the current study).

Behaviour 9 tested how often students "*Purchase organic products"* and the findings show that this behaviour is not performed on a regular basis as it obtained the third lowest mean of 2.10 with 77% of individuals indicating that they sometimes or never purchase these items (low frequency). It possessed the lowest SD of the 11 behaviours at 0.779 therefore many of the responses were similar to the mean. This result is similar to the findings of Gilg *et al*. (2005, pp. 487, 488) as it was also determined that purchasing organic products was performed rarely by English individuals. However Berndt and Gikonyo (2012, p. 6) found that purchasing organic products was a common environmental behaviour performed by African individuals. Therefore since this is a purchasing behaviour it is possible that students may not have the necessary finances to buy these organic products. It was also stated by Monroe (2003, pp. 115-116) that the purchasing of local organic food is influenced by the advantages and disadvantages of the organic food, the ease of preparing this food and the knowledge that other

individuals support this purchase. The individual would also have to have an overall positive view of their purchase, and finally the belief that their action will benefit the environment more than it will cost themselves the extra effort to make the purchase (Monroe, 2003, pp. 115-116). Therefore it is possible that South African students do not possess these views and this could be the reason for the low frequency of organic purchases by the respondents in the study.

The environmental activity that received the second lowest mean and highest SD of the 11 behaviours was **Behaviour 8** and it measured the popularity of supporting a well-known wildlife campaign in South Africa called 'Save the Rhino'. The results show that in fact the support of this environmental campaign was poor with a mean of 2.06 and with 69.4% of the respondents stating that they have sometimes or never supported this campaign (low frequency). Due to the relatively high SD value of 1.094 this illustrates that there was more variance in the responses to this behaviour compared to others. Overall this indicates that the environmental behaviour of supporting green campaigns, in particular wildlife campaigns, was not common amongst young adults in South Africa. This result is in line with the findings of Fraj and Martinez (2006, p. 141) that also discovered that support for environmental campaigns and organizations were not common green behaviours performed by Spanish individuals. One of the reasons for the low levels of support for environmental campaigns in South Africa could be due to the costs that are required for the campaign. According to Child (2012, p. 1) in recent years the costs of protecting the rhino for the 'Save the Rhino' campaign have surpassed the advantages of private landowners keeping these animals. Therefore this indicates that one of the main needs of this campaign is financial aid and perhaps this is one of the reasons why the students in the present study did not take part in this behaviour often as their financial resources are limited.

Lastly **Behaviour 1** measured the frequency of recycling of any material by the respondents by asking them how often they "*Recycle glass, paper etc."* and it was found that of all 11 behaviours tested in this section, this particular item proved to be the least common with the respondents with the lowest mean of 2.00. The sample performed any form of recycling sometimes (52.8%) and not at all (26.4%). The SD was low at 0.807 therefore many of the responses were close to the mean. This result clearly illustrates that recycling is not a very common environmental behaviour performed by these South African students. This was also

found by Said *et al*. (2003, p. 309) as their results indicated that recycling was the least common environmental behaviour performed by Malaysian individuals and was also not found to be common by Spanish individuals (Fraj & Martinez, 2006, p. 141). However in a study conducted by Palmer *et al*. (2012, p. 451) that included results from South African individuals it was found that recycling was prevalent with the individuals in the sample. This was also found to be true for the staff of Rhodes University, as well as with the individuals in the Cape Peninsula (Amutenya *et al*., 2009, p. 240; Oliver *et al*., 2011, p. 549). According to Said *et al*. (2003, p. 311) some of the causes that influence recycling behaviour depends on whether the individual is receiving a financial gain from the behaviour, whether this action is a habit for the individual or if this behaviour is convenient to perform. Therefore it is possible that the students utilized in the present study do not participate in recycling often due to the fact that there are no direct benefits to the student themselves such as monetary gains, or it is possible that recycling facilities or recycling bins are not common around the areas where the students live and therefore students have to put in a lot of effort to recycle materials.

When all 11 means were added together the value found was 29.81, therefore the overall mean of Section 2 was 2.71. This value indicates that overall the rate of performing environmental behaviour was reasonable. This result differs slightly from the findings of Gilg *et al*. (2005, p. 488) that determined that of all the environmental behaviours, overall individuals in the UK did not perform ecological behaviours on a frequent basis. Schultz *et al*. (2005, p. 466) found similar results to the current study in that individuals from the Czech Republic, India and Brazil did not perform environmental behaviours such as recycling, purchasing green products and supporting environmental campaigns on a frequent basis.

The results found in the current study do not correspond with the findings of Hofmeister-Tóth *et al*. (2010, p. 11) that found that individuals tended to perform public environmental activities such as separating recycling waste and purchasing locally produced food more often than private indoor activities such as saving water and energy conservation behaviours and this could have been due to the need to be seen as environmentally conscious by one's friends and colleagues (Steg *et al*., 2014, p. 107). It is clear that the current study has found contradicting results as it was determined that young adults in South Africa prefer to perform water and energy saving behaviours above all other green behaviours tested and activities such as

recycling and purchasing green and local products proved to be less common with the sample. Furthermore it was stated in the previous section that 75.9% of the respondents of the present study agreed that it was important to be seen caring for the environment (**Belief 10**) and the mean of this belief was found to be relatively high. This indicates that the belief of respondents in terms of the importance to be seen caring for the environment does not correlate with the types of behaviour that are most commonly performed by them.

It is evident that young adults in South Africa perform green behaviours at a reasonable rate, with the most common behaviours being water conservation and energy saving behaviours. This result could be due to the fact that presently in South Africa there have been electricity restrictions in the form of "Load Shedding" that have been implemented due to a shortage of energy in the country. At the moment South Africa is also experiencing a severe drought across the country and water restrictions have also been implemented across several areas of the nation. However at the time this study took place there were no restrictions implemented for the city of Pietermaritzburg. Water and energy conservation behaviours have been frequently promoted to the South African public in recent times and this increase in awareness could be a vital reason as to the frequent adoption of these behaviours. The behaviours that were the least performed included recycling, supporting environmental campaigns and purchasing organic products. As mentioned above Monroe (2003, pp. 115-116) stated that the popularity of organic food is influenced by how advantageous the food is, how easy it is to prepare, whether other individuals also buy these products, and the fact that the environmental benefits will outweigh the personal costs of the individual. Therefore the lack of these factors could be the reason for the low frequency of organic purchases by the respondents in the study. However these factors could also play a role in explaining the low adoption rates of other environmental behaviours.

In terms of environmental campaigns since students were the sample population of the study this could have impacted on the popularity of the 'Save the Rhino' environmental campaign due to the monetary limitations. With regards to recycling, it is possible that due to recycling facilities being inconvenient for the students and the fact that recycling materials do not benefit the student directly in terms of monetary value could have led to the low levels of this environmental behaviour. According to Wang *et al*. (2013, p. 982) environmental awareness, knowledge as well as social responsibility also have an effect on green behaviour. Therefore it

is also possible that once again, just as concluded with the previous objectives, awareness, knowledge and an ethical obligation or responsibility might be important factors that determine the frequencies of environmental behaviour.

5.4. Objective 4: To determine the relationship between the three types of environmental values (egoistic, altruistic and biospheric) and environmental beliefs with environmental behaviour

5.4.1. The relationship between egoistic, altruistic and biospheric values and environmental behaviour

5.4.1.1. Egoistic Values and Environmental Behaviour

As illustrated in the previous chapter, a Pearson's Correlation test was run between the individual egoistic values of the Environmental Concerns (EC) scale with the 11 environmental behaviours measured in the study. Of the 11 green behaviours included in the questionnaire the individual egoistic values correlated significantly with only four of these behaviours. All of the relationships found were weak with three correlations being positive and one being negative. Four significant correlations were found out of a possible 55 correlations between the individual egoistic values and the environmental behaviours. Therefore 7.27% correlations were significant. This indicates that there were very few relationships found between the egoistic values of the EC scale and the green behaviours of the study and therefore not many links were found between the two constructs on an individual basis. To further analyse these two constructs a Pearson Correlation test was also run between Total Egoistic Values and Total Green Behaviour and it was found that no significant relationship existed between one's self-centred values and their actual environmental behaviour. The results from the multiple regression analysis show that when the Total Egoistic Values are incorporated with the other constructs (altruistic values, biospheric values and environmental beliefs), together they explain only 14% of the green behaviour however the Total Egoistic Values are not a significant predictor of ecological behaviour.

The findings mentioned above are in line with the views of Larson (2010, p. 902) who states that emphasizing selfish interests and conventional practices do not inspire a change in one's behaviour but instead promote the same state of actions. The results from some of the past research mentioned in the previous chapters correspond to the findings of the current study. Albayrak *et al*. (2013, p. 36) found that in terms of using green electronic invoices in Turkey, egoistic values were determined to have no significant relationship with environmental behaviour. Pinto *et al*. (2011, p. 124) found similar results in Brazil with regards to water conservation as it was found that no relationship existed between water conservation behaviours such as closing the tap while washing dishes, brushing teeth or having a shower, and egoistic values.

However the results obtained with regards to the relationship between egoistic values and behaviour did not correspond with some of the findings of past research. For instance the study mentioned previously by Tsakiridou *et al*. (2008, p. 163) found that the importance of one's own health influenced Greek individuals to purchase organic foods. However the results of the current study indicate that there is no relationship between one's health and the buying of organic products. *My Health* only had a relationship with **Behaviour 11 (purchasing locally produced products)**. These findings were also not in line with the results determined by Gifford and Nilsson (2014, p. 144) that illustrated that in fact egoistic values were more accurate predictors of green behaviour, however this was found for the general population of Canada. The current findings also do not support the past studies that have found a positive relationship between egoistic values and behaviour such as research conducted by Aoyagi-Usui *et al*. (2003, p. 29) that found self-centred values to have a positive influence on the acceptance of political environmental laws and campaigns. It is evident that even the individual egoistic values tested in the current study did not possess any correlations with **Behaviour 8** which dealt with the support of an environmental campaign.

Many studies also found a significant negative relationship between egoistic values and green behaviour and therefore did not match the results of the current study (e.g. Nordlund & Garvill, 2002, pp. 748, 749; Schultz *et al*., 2005, pp. 462, 469; Van Riper & Kyle, 2014, p. 293).

A possible reason for no significant relationship existing between egoistic values and green behaviour that was found in the current study could be due to the reasons stipulated by Hansla *et al*. (2008, p. 3) that individuals that hold selfish points of views and values will more likely participate in environmental behaviours that might have adverse consequences on issues that reduce employment opportunities, raise taxes and increase the cost of energy or fuel if not performed. In other words these individuals are only likely to participate in environmental behaviours if they are negatively impacted when these behaviours are not performed. Perhaps the particular green behaviours tested in the current study do not relate to these adverse consequences thus leading to no significant relationship existing. Despite the relative importance of egoistic values established earlier in objective 1 and the fact that water and energy conservation behaviours were performed frequently by the individuals, the findings related to this objective indicate that these environmental behaviours are not linked to or driven by egoistic motivations.

5.4.1.2. Altruistic Values and Environmental Behaviour

The same tests that were run for egoistic values were also run for the altruistic values. Firstly the Pearson's Correlation test illustrated that a few significant relationships existed between the five individual altruistic values of the EC scale and the 11 green behaviours tested and all of these relationships were found to be weak and positive. Only three values correlated significantly with the behaviours (*Humanity*, *Future Generations* and *My Children*) and just nine significant individual correlations existed out of a possible 55 correlations. Therefore 16.36% of the correlations were significant. Therefore this illustrates that the individual altruistic values have only a reasonable link with one's environmental behaviours.

A Pearson's Correlation test was run between the Total Altruistic Values and Total Green Behaviour and it was determined that a weak, positive and significant relationship existed between the two constructs. This indicates that the more one possesses values that emphasize the needs of other people the more one will tend to perform the environmental behaviours measured. The multiple regression analysis showed that when Total Altruistic Values are incorporated with the other constructs of the study they explain a significant amount of the

variance in green behaviours, however it was evident that individually, Total Altruistic Values was not strong enough to significantly predict environmental behaviour. Therefore although Total Altruistic Values were found to be weakly and positively related to Total Green Behaviour, it was not found to be a significant predictor of green behaviour.

The above findings are partially in line with the results of past studies conducted by De Groot and Steg (2007, p. 326) who found no significant relationship between altruistic values and green transportation behaviour and Lee *et al*. (2014, pp. 2101 - 2102) who determined no relationship between altruistic values and environmental behaviours such as environmental activism and support of ecological campaigns, recycling materials, purchasing environmentally friendly products, and cleaning the environment in South Korea. Pinto *et al*. (2011, p. 128) also found no significant relationship between altruistic values and water conservation behaviour. Although the current study found a weak, positive and significant correlation between the Total Altruistic Values and Total Green Behaviour, of 55 possible correlations only 9 correlations (16.3%) were significant therefore the majority of the individual green behaviours tested possessed no relationship with the altruistic values. Ultimately altruistic values do not significantly predict behaviour therefore it can be stated that this result is in line with the findings of the studies above.

In terms of analysing only the correlation between altruistic values and environmental behaviour there have been several past studies that have found similar results. Schultz *et al*. (2005, p. 457) found that altruistic values possessed a positive and significant relationship with green behaviour. The current altruistic results were partially correlated with the findings of Stern *et al*. (1999, p. 89) and Van Riper and Kyle (2014, p. 293) in terms of **Behaviour 8** as the researchers determined that altruistic values had a direct effect on active participation of environmental issues such as campaigns. The findings of the current research did find positive individual correlations between two altruistic values (*Humanity* and *Future Generations*) and **Behaviour 8** (supporting the Save the Rhino campaign). However three of the altruistic values possessed no relationship with this behaviour.

The findings of Nordlund and Garvill (2002, p. 748) were also found to be similar however not the same as the current results as these researchers found a positive correlation to exist between altruistic values and green behaviours such as recycling, purchasing of green products and energy conservation. If the individual correlations of the current study are analysed it can be seen that three values (*Humanity, Future Generations* and *My Children*) possess positive, although weak, relationships with recycling behaviour (**Behaviour 1**), *Future Generations* was positively correlated with the purchasing of green products (**Behaviour 10**) and *Humanity* was positively related to one of the energy saving behaviours (**Behaviour 6**). However all of the behaviours mentioned above were only related to some or only one altruistic value and all of the correlations were very weak. The findings of the current study conflict with Paladino and Ng (2013, p. 123) who state that altruistic values have been found to be constant predictors of green behaviour and that people who act environmentally do so because of the personal satisfaction that comes about from performing the activities. Yet Paladino and Ng (2013, p. 137) also deduced from the results of their research that it is possible that young individuals place more importance on themselves and their own needs rather than on the needs of other people and the environment.

Therefore the researcher of the current study has to deduce that overall, altruistic values do not have an influence on overall green behaviours as they were not found to be significant predictors of green behaviour.

5.4.1.3. Biospheric Values and Environmental Behaviour

The results obtained relating to the relationship between biospheric values and environmental behaviour differed substantially from the previous two value types as it was evident that the individual biospheric values possessed the most correlations with the green behaviours. A high number of individual positive correlations were found between the biospheric values and the 11 environmental behaviours (77.54%) however these correlations were weak. When the Pearson's Correlation test was run between the Total Biospheric Value and the Total Green Behaviour value it was found that a positive, significant and moderate relationship existed between the two constructs, and this correlation value was significantly higher than the relationship found between Total Altruistic Values and Total Green Behaviour. This indicates

that the more a person possesses biospheric values the more likely they will be to perform the environmental behaviours tested. The multiple regression analysis found that the Total Biospheric Values played a role in the prediction of Total Green Behaviour when it was incorporated with the other independent variables measured. However, unlike the egoistic and altruistic values tested, the biospheric values also played a significant role in predicting green behaviour on an individual basis. This shows that on its own biospheric values have enough power and significance to predict environmental behaviour.

The Factor Analysis that was performed on the values in Section 1 of the questionnaire found that the 15 values tested loaded onto two factors, one measuring mainly Egoistic Values and the other measuring mainly Biospheric Values. According to Schultz (2001, p. 329) there are three possible outcomes in terms of factor loadings of the EC scale items. Firstly a one factor model is possible and will present ecological concern as a construct with only one dimension that measures a low level of concern at one end and a high level of concern at the other (Schultz, 2001, p. 329). Secondly a two factor model is possible that has biospheric items loading on one factor and egoistic and altruistic items loading onto the second factor with the notion that concern is either felt towards all living things or towards humans in particular (the respondent included) (Schultz, 2001, p. 329). Thirdly, a three factor model is possible where green concerns are grouped into valued objects (Schultz, 2001, p. 329). A four factor model was also found by Snelgar (2006, p. 95) to be a better fit than the three factor model and divided the biospheric items into two groups namely *Animal Life* and *Plant Life.* Therefore the four factor structure was made up of Egoistic Values, Altruistic Values, Animal Life Values and Plant Life Values. The results of the current study indicate that the EC items loaded onto two factors and it is similar to the two factor model described above by Schultz (2001, p. 329) as the biospheric items loaded strongly onto Factor 2 while the egoistic items loaded strongly onto Factor 1. However it does differ slightly as the altruistic items loaded onto both Factor 1 and Factor 2.

When the Pearson's Correlation test was run between these two factors and Total Green Behaviour it was found that the factor holding Biospheric Values was correlated moderately, positively and significantly with Total Green Behaviour. The Egoistic Factor did not possess a significant correlation with Total Green Behaviour. From this it can be deduced that Biospheric

Values have an impact on Environmental Behaviours while Egoistic Values (along with many altruistic values that also loaded on this factor) has no influence on one's ecological behaviour.

The above results correlate with the views of Steg *et al*. (2014, p. 107) that stated that biospheric concerns are more distinctly related to environmental behaviour as compared to egoistic and altruistic concerns. Steg *et al*. (2011, p. 350) also stated that biospheric values tend to be positively correlated with green intentions and the approval of environmental policies. There have been many studies that also determined a positive relationship between biospheric values and environmental behaviours (e.g. Albayrak *et al*., 2013; Aoyagi-Usui *et al*., 2003; De Groot & Steg, 2007; Nordlund & Garvill, 2002; Salvaggio *et al*., 2013; Schultz *et al*., 2005; Van Riper & Kyle, 2014; Ziaei-Bideh & Namakshenas-Jahromi, 2014, no page).

The findings of the current study correlate partially with the results obtained by Steg *et al*. (2005, p. 416) that found that values in general do not possess a direct impact on one's behaviour due to other factors having a greater influence such as personal norms and beliefs. As can be seen by the results of the current study only one type of value (biospheric) has an influence on the prediction of environmental actions while egoistic and altruistic values do not predict environmentally friendly behaviour (in terms of total values taken).

5.4.1.4. Environmental Beliefs and Environmental Behaviour

It has been stated that the relationship between ecological concerns and green behaviour also deals with the gap that exists between environmental beliefs and green behaviour and that in order to deal with the present ecological crisis one should concentrate on changing the beliefs of individuals (Bertoldo *et al*., 2013, p. 437; Gabler *et al*., 2013, p. 160).

When the correlation tests were run with the individual environmental beliefs and individual environmental behaviours it was found that a reasonably high number of relationships existed between the individual beliefs and behaviours (30.3%) with all correlations (with the exception

of two) being weak, positive and significant. The two negative relationships found were between **Belief 12 –** Being active with regards to environmental protection gains you social status and **Behaviour 8** – Supporting the 'Save the Rhino' campaign and **Behaviour 11 –** Purchasing locally produced products**.** When the Pearson's Correlation test was run between the Total Environmental Beliefs (without **Belief 10 and 11** due to these two beliefs not loading onto any factors during the factor analysis) and Total Green Behaviour, a weak, positive and significant relationship was found between the two constructs. Therefore it can be deduced that the more an individual possesses pro-environmental beliefs (especially from the NEP scale), the more likely they are to take part in ecological behaviours. The multiple regression analysis illustrated that Total Environmental Beliefs played a role in explaining the variance of environmental behaviour when it was incorporated with the other three values, however it was also found to significantly predict behaviour on its own. Therefore it can be concluded that environmental beliefs alone can predict environmental behaviour.

In terms of utilizing environmental beliefs as a measure of ecological concern just as many previous studies have done, it could be concluded that the environmental concerns/beliefs have a positive correlation with the green behaviours tested. This was also found by Kim and Choi (2005, pp. 595-596) and Borges *et al*. (2013, p. 2112) for students in America and Brazil respectively. Stern *et al*. (1999, pp. 91, 92) also determined that one's environmental beliefs from the NEP scale had an effect on environmental citizenship behaviour in the USA while López and Cuervo-Arango (2008, p. 623) found that the green beliefs of the NEP had the greatest influence on environmental behaviour for the general population in Spain. This relationship was also evident in terms of water conservation in China (Chang, 2013, p. 702) and recycling in America (McCarty & Shrum, 2001, pp. 96, 98). The results of the current study closely resemble those found by Wray-Lake *et al*. (2010, pp. 73, 74), Gabler *et al*. (2013, p. 165) and Jurin and Fortner (2002, pp. 384, 385) that found a relatively low level of environmental beliefs among young individuals however a positive relationship between these beliefs and green behaviour. Therefore it is evident that the young adults of South Africa behave in a similar manner to other developed and developing nations in terms of environmental behaviours.

For the purposes of the current study environmental concern was measured by taking both the values of the EC scale (egoistic, altruistic and biospheric) and the environmental beliefs together. Therefore by analysing the results stated above it is clear that two of the four measures actually have an individual effect on one's environmental behaviour (Biospheric values and Environmental Beliefs). Davari and Strutton (2014, p. 571) stated that an individual that shows environmental concern will tend to be more willing to purchase green products and alternatives. This is partially true for the individuals in the current study as of the 10 beliefs tested, only five of these beliefs are correlated with **Behaviour 10** (purchasing of green products) while one altruistic value (*Future Generations*) and one egoistic value (*My Lifestyle*) were correlated with this behaviour. However all biospheric values were correlated with **Behaviour 10**. Therefore it can be seen that not all values and beliefs have an impact on green purchasing behaviour of individuals.

The results found in the current study are similar to the findings of Bamberg (2003, p. 30) who also determined that general environmental concerns possess a weak relationship with specific green behaviours for students in Germany. Kilbourne and Pickett (2008, p. 891) found that among American individuals there is a strong correlation between environmental concern and green behaviour. These findings do not entirely match the results of the current study as the outcomes of the present research illustrate that only environmental beliefs and biospheric values have an impact on behaviour and the correlations found were weak or moderate. However this is in line with the results found by Alsmadi (2007, p. 339) that determined that Jordanian students' environmental concern did not fully translate into their environmental behaviour due to elements such as loyalty to non-environmental brands and the view that green products have low credibility. These could be possible reasons as to the relatively low levels of green purchase behaviour in South African students but would need further study to investigate.

5.5. Conclusion

Therefore it can be concluded that the constructs that possessed the most individual relationships with the individual environmental behaviours were biospheric values and

environmental beliefs. When the total values were taken in terms of the three value orientations and environmental beliefs it was found that Total Altruistic Values, Total Biospheric Values and Total Environmental Beliefs possessed a weak or moderate, positive and significant relationship with Total Green Behaviour. However only Biospheric Values and Total Environmental Beliefs were found to be significant predictors of Total Green Behaviour. From this it can be concluded that biospheric values and environmental beliefs are the only constructs that predict the environmentally friendly behaviour of this sample of South African students. Low levels of environmental awareness, a lack of moral obligation to perform green behaviours, and a disconnection between the lives of human beings and nature were found to be possible reasons for the low levels of biospheric values and environmental beliefs. To better illustrate the content gathered the table below provides a summary of the research objectives, main findings and results of the research study.

Table 5.5. Summary of Research Objectives, Main Findings and Results

Objective	***Main Finding***	***Results***
1.To determine which group of environmental values (egoistic, altruistic or biospheric) are most important to young adults	Mean - Egoistic Values: 6.18 (Scale 1-7)	Overall respondents possess a very high level of egoistic values and place great importance on themselves and their own well-beings
	Mean - Altruistic Values: 6 (Scale 1-7)	Respondents possess a relatively high level of concern towards the lives and well-being of other people in terms of environmental problems
	Mean - Biospheric Values: 5.31 (Scale 1-7)	Respondents possess rather low levels of concern towards the elements of the earth with regards to environmental problems
2.To determine the environmental beliefs of young adults	Mean: 3.60 (Scale 1-5)	Overall the respondents possessed marginally pro-environmental beliefs however a neutral point of view was also found to be evident with some of the beliefs.
3.To establish the extent of green behaviour in young adults	Mean: 2.71 (Scale 1-4)	Overall the rate of performing environmental behaviour by respondents was reasonable.

4.To determine the relationship between the three types of environmental values (egoistic, altruistic and biospheric) and environmental beliefs with environmental behaviour	**Egoistic Values and Environmental Behaviour:** <u>*Pearson Correlation*</u>: 7.27% individual correlations were significant. No significant correlation between Total Egoistic Values and Green Behaviour	This indicates that there were very few relationships found between the egoistic values and green behaviours. No relationship between total egoistic values and environmental behaviour
	<u>*Multiple Regression*</u> When included with the other constructs Total Egoistic Values explain 14% of green behaviour. However it is not an individual predictor of green behaviour	Egoistic Values are not a significant predictor of ecological behaviour
	Altruistic Values and Environmental Behaviour: <u>*Pearson Correlation*</u>: 16.36% of the individual correlations were significant. Weak, positive and significant correlation between Total Altruistic Values and Green Behaviour	Indicates that individual altruistic values have only a reasonable link with one's environmental behaviours. The more one possesses values that emphasize the needs of other people the more one will tend to perform the environmental behaviours measured.
	<u>*Multiple Regression*</u> When Total Altruistic Values are included with the other constructs they explain a significant amount of the variance in green behaviour. However it was not an individual predictor of green behaviour	Although Total Altruistic Values were found to be weakly and positively related to Total Green Behaviour, it was not found to be a significant predictor of green behaviour.
	Biospheric Values and Environmental Behaviour: <u>*Pearson Correlation*</u>: 77.54% of positive but weak correlations between individual biospheric values and green	Indicates that individual biospheric values have a strong link with one's environmental behaviours. The more a person possesses biospheric values the

	behaviour. Positive, significant and moderate relationship between Total Biospheric Values and Green Behaviour (significantly higher in relation to altruistic and egoistic values) *Multiple Regression* Total Biospheric Values played a role in the prediction of Total Green Behaviour when it was incorporated with the other independent variables measured. Biospheric values also played a significant role in predicting green behaviour on an individual basis. **Environmental Beliefs and Environmental Behaviour:** *Pearson Correlation*: 30.3% of individual environmental belief correlations were weak, positive and significant with green behaviour. Weak, positive and significant correlation between Total Environmental Beliefs and Green behaviour *Multiple Regression* Total Environmental Beliefs played a role in explaining the variance of environmental behaviour when it was incorporated with the other three values. Environmental Beliefs were also found to significantly predict behaviour on its own	more likely they will be to perform the environmental behaviours tested. This shows that on its own biospheric values have enough power and significance to predict environmental behaviour. Therefore it can be deduced that the more an individual possesses pro-environmental beliefs (especially from the NEP scale), the more likely they are to take part in ecological behaviours Therefore if can be concluded that environmental beliefs alone can predict environmental behaviour

Based on these main findings, results and discussion of the present study the next chapter outlines and presents possible recommendations that governments, policy makers and businesses can utilize in order to increase the frequencies of environmental purchases or general green behaviour in individuals.

Chapter 6: Recommendations, Limitations and Recommendations for Future Research

Introduction

This chapter uses the findings of this research to propose possible guidelines and strategies that governments, policy makers, businesses and marketers can adopt in order to increase the emphasis on green marketing activities as well as enhance the public's perceptions and adoption of green behaviour. Firstly general recommendations are provided in terms of the research gathered and this is followed by more specific recommendations. These specific recommendations are presented in terms of the factor analyses groupings of the environmental behaviours tested, therefore recommendations are outlined in terms of outdoor environmental activities, indoor environmental activities and reusing environmental activities. Within each of the three groups of green behaviours the overall marketing strategy is recommended as well as specific marketing tactics. Thereafter recommendations for green behaviour are presented based on the results in terms of environmental beliefs of the study. This chapter also states the limitations of the research and lastly recommendations for future research is provided.

As the previous chapter stated, egoistic values pertaining to one's own well-being held the most importance to young adults in South Africa. This was followed by altruistic values that emphasized the importance of other people, and lastly it was found that biospheric values relating to the importance of plants and animals held the least importance to the individuals. It was also found that egoistic values were not related to one's environmental behaviour and was also not found to be a significant individual predictor of green behaviour, while biospheric values possessed the highest positive correlation with ecological actions and was found to be an individual predictor of green behaviour. This result therefore led to a reasonable level of actual environmental behaviour performed. Altruistic values did not possess a distinct result as it was found that although these values have a weak positive relationship with behaviour they were not found to be an individual predictor of environmental behaviour. In terms of environmental beliefs this was found to be marginally pro-environmental, however relatively low when compared to other studies. Yet this construct was also found to be positively related to green behaviour and was determined to be an individual predictor of ecological actions.

Therefore it is evident that biospheric values and environmental beliefs have the most impact on green behaviour.

Based on the main findings discussed in previous chapters, the following recommendations have been developed in terms of businesses and governments marketing environmental products and services to consumers as well as attempting to increase the everyday green behaviour of individuals.

6.1. General Recommendations

Based on the results of the research the following section outlines the general recommendations suggested to companies and governments to increase green purchasing behaviour and everyday environmental behaviour.

6.1.1. Increase the Importance of Biospheric Elements in Individuals by Creating Awareness Campaigns

It was noted that of the three value orientations measured, the biospheric items received a considerably lower level of importance as compared to the egoistic and altruistic values. It is clear that the more an individual possesses biospheric values the more they will take part in environmental behaviours. Therefore a possible strategy would be to increase the significance and importance of these biospheric items in order to raise the frequency of green activities of individuals. Schultz *et al*. (2005, p. 460) state that in terms of altruistic values (or self-transcendent values) if a person is concerned about other individuals, if they possess the awareness and understanding that these individuals can be harmed, and if this person knows that he/she is responsible for this harm, then this person possesses altruistic values. However one of the results that Schultz *et al*. (2005, p. 470) determined was that altruistic values did not only encompass other people but also included all living things (biospheric elements). Therefore the statements mentioned above by Schultz *et al*. (2005, p. 460) could be true for biospheric values too.

Therefore one way to accomplish greater biospheric values in individuals would be to create more awareness for the need for protecting elements of the earth and how this will impact on human existence, as it is possible that many people do not understand the effect that ecological problems have for the earth. Along with marketing a brand, product or service, companies can also develop awareness campaigns to try and increase the knowledge of these biospheric effects and once again link them to how their product or service can counter these problems. It is important to develop marketing strategies that have a holistic view as many campaigns at present might only be emphasizing personal benefits or benefits to other people in the community. Companies instead should also generate more importance in terms of protecting the earth.

Along with increasing one's awareness of biospheric elements, according to Schultz *et al*. (2005, p. 460) it is also important to develop the awareness that the actions of the individuals directly impact the aspects of the earth, thus creating the knowledge that the individual has a responsibility to protect the environment. The connection of this personal norm or moral obligation to environmentalism was also highlighted by Honkanen *et al*. (2006, p. 421). This could be achieved by creating government sponsored awareness campaigns perhaps through mass media channels such as television advertisements. A more modern approach to creating awareness of the importance of the earth is through social media networks such as Facebook or Twitter. This might be an effective strategy as it will also target the younger generation of individuals that use these social networks on a daily basis. Once this awareness and sense of moral obligation is instilled in younger individuals, there is a greater chance that environmental consciousness will remain in these individuals throughout their adult lives. Increasing the awareness of biospheric elements will also be beneficial to businesses in promoting and marketing their green products and services as if individuals are fully aware of the environmental consequences of their actions and the role that they play in protecting the environment, green products will seem more necessary in their lives. Companies can also use the route of social media networks to create and enhance this awareness however it is also recommended that companies should include environmental messages and facts in all of their promotional channels that they utilize such as their stores, print media such as magazines or pamphlets or on the products themselves. Businesses could go a step further and hold environmental promotions regularly in their stores that could include demonstrations, free samples and green competitions.

6.1.2. Link Biospheric Elements to Egoistic needs when Marketing Environmental Products, Services or Behaviour

It is evident that of the constructs tested, elements pertaining to the earth held the strongest relationships with green behaviour. Therefore it is recommended that businesses and organizations take advantage of this finding and implement marketing strategies that highlight the importance of the earth to their consumers. Since it was found that individuals in this study favour their self-centred values in terms of the environment and the protection of their own well-being, perhaps a possible marketing strategy could be to link the elements of the earth such as plant life, trees, water and land to enhancing the lives and welfare of individuals. This recommendation is linked to the findings of Schultz (2001, p. 336) and Schultz *et al*. (2004, pp. 36, 37) that state that the more an individual feels interconnected with nature and believes that the environment is needed in order to represent themselves, the more biospheric values they possess, and therefore the more environmental behaviours will be performed. For instance, businesses, organizations or even governments can emphasize the importance of protecting and conserving trees (*Trees* was found to be the most important biospheric item in the study) as the more trees present on earth, the less likely will there be an excess of greenhouse gases that will lead to a decreased standard of living in the future (preferably during the lifetimes of consumers). This directly links a biospheric element to the egoistic needs of individuals. As stated by Pinto *et al*. (2011, p. 126) and Lindeman and Verkasalo (2005, p. 171) individuals who embody egoistic values are independent and only focus on individual happiness. Therefore it is important that businesses and governments create a holistic view in terms of one's life and the interconnectedness of the environment. An environmental product or service could be placed at the beginning of this green chain and it could be stated that it aims to protect the biospheric elements of the earth that in turn satisfy the self-centred needs of individuals. This might increase the importance of biospheric elements in the minds of individuals and therefore lead to an increase in everyday environmental behaviours as well as purchase behaviours.

6.1.3. Emphasize Pro-Environmental Beliefs and Increase the Importance of Pro-Environmental Beliefs when Marketing Green Products, Services or Behaviour

It was found that environmental beliefs of individuals possesses a positive relationship with green behaviour and together are also an individual predictor of this behaviour. Therefore it is recommended that businesses and governments create marketing strategies that concentrate on promoting the green beliefs of individuals (specifically in terms of the NEP scale). Bang *et al*. (2000, p. 454) and Kilbourne and Pickett (2008, p. 887) state that the more accurate knowledge and awareness of environmental issues that an individual possesses the more environmental beliefs they will hold. Gabler *et al*. (2013, p. 162) also stated that the concept of beliefs is thought to be affected by external influences, for example the knowledge an individual possesses regarding whether their actions will ultimately have an impact on the situation under analysis. Since green beliefs could be easily changed and influenced by the facts and information that individuals possess in terms of environmental issues and behaviour it is vital that accurate information is relayed to individuals and more importantly to consumers concerning ecological issues. It was evident that many individuals held neutral beliefs in terms of the environmental beliefs tested and this illustrated that a good proportion of young adults were indifferent to many of the beliefs. A possible explanation for this could be the fact that not enough accurate information relating to environmentalism is being communicated to consumers and the link between ecological issues (especially relating to the earth) and the livelihoods of individuals is not being made in a strong manner. Governments can increase the environmental knowledge of individuals by including information relating to environmental issues and the role that human beings play in the degradation of the environment in their regular conservation campaigns. The South African government in particular can take advantage of this as at present the country is experiencing a very serious water shortage as well as an energy crisis. Therefore it is recommended that along with promoting the conservation of water and energy, important information about the environment in general and how nature directly impacts on the lives of people should be included in these campaigns. Since the water and energy crisis is affecting the personal lives of individuals they might be more willing to take heed to these campaigns and therefore remember the green information as well. Governments should also implement compulsory environmental education courses at schools that educate children on the current green problems facing the earth and teach these students ways in which

they themselves can make a positive difference to the environment. It is important that these courses have of a practical element as well so that students can understand green actions such as how recycling is done and how organic products are produced. All of the advantages of green behaviour should be highlighted in these courses.

Businesses could create green campaigns or promotions that focus on relaying accurate and essential environmental facts to their consumers and it is also important that these campaigns make consumers aware that their individual actions can indeed impact the environment. These campaigns can be on a wide scale with advertisements being communicated through mass media channels such as television. Alternatively these campaigns could be on a smaller scale with businesses possibly implementing interactive promotions to their consumers that include ecological knowledge competitions that enlighten consumers about green issues while rewarding them for their environmental knowledge as well. Environmental facts could also appear on the green products themselves or ecological pamphlets could be included with all purchases. It is important to also display this environmental information near conventional products of the company that show energy saving tips or alternative uses for these conventional products in order to enlighten consumers who do not purchase green products. This could create an incentive for these consumers to pay attention to environmental issues.

According to Gabler *et al*. (2013, p. 163) there are two possible reasons for low environmental beliefs that are linked to the Theory of Planned Behaviour (TPB) being firstly one's subjective norms and secondly one's perceived behavioural control. As stated previously one's subjective norms refer to the pressure from society felt by an individual to perform certain behaviours (Ajzen, 1991, p. 188). If there is an increase in general awareness of environmental issues and if awareness campaigns label environmentally unfriendly people in a negative light then this could increase social pressure to be green in individuals and lead to environmentally friendly behaviour. One question dealing with the belief that being pro-environmental gains one social status was tested in the present study and the results illustrated a mixed response from the sample. This issue would need more research to accurately understand the relationship between one's status or social pressure and green behaviour. As with the previous recommendation marketing campaigns could also concentrate on creating awareness and a sense of

connectedness between the environment and other people with the way an individual views themselves.

In terms of one's perceived behavioural control (the ease or difficulty in performing a task) it is recommended that companies and governments make certain of two aspects. Firstly they should investigate whether the business or state is making it as simple as possible for individuals to perform environmental behaviours, whether it be purchasing green products, or recycling goods etc. If not then these businesses or governments should create easier avenues for these behaviours to take place such as increasing the availability and accessibility of their products or services. If however all is being done by the company or state in terms of this then it is suggested that greater communication is needed for consumers to be aware of the different ways they can perform certain activities. If this is incorporated with creating awareness of the plight of the environment and connecting nature with the personal well-being of individuals, this will in turn increase one's environmental beliefs and ultimately green behaviour.

6.2. Specific Recommendations

By analysing the Findings Chapter of this study it was evident that although, as mentioned previously, biospheric values and environmental beliefs were the only predictors of green behaviour, many other individual correlations existed between the individual values and beliefs with individual behaviours. Therefore this section breaks down these correlations and discusses the recommendations that businesses and governments could utilize in order to increase the popularity of green products or services or even enhance everyday green behaviours. The section is thus divided according to the groups of environmental behaviours and the most evident individual correlations found.

The Factor Analysis conducted on the 11 behaviours led to three factors of behaviours being established. The first behaviour factor was named ***Outdoor Environmental Activities*** which consisted of **Behaviours 1 –** *Recycle glass, paper etc.,* **8** – *Support the 'Save the Rhino' environmental campaign,* **9 –** *Purchase organic products,* **10 –** *Purchase green products,* and **11 –** *Purchase locally produced products*.

The second behaviour factor was named ***Indoor Environmental Activities*** and was made up of **Behaviours 4 –** *Close the tap while washing dishes or brushing teeth,* **6 –** *Switch off unnecessary lights at home* and **7 –** *Switch off electrical appliances that are not being used.*

Lastly the third behaviour factor was named ***Reusing Environmental Activities*** and consisted of **Behaviours 2 –** *Reuse empty bottles or containers,* **3 –** *Use your own shopping bag instead of buying plastic shopping bags*, and **5 –** *Have a shower rather than a bath.*

Therefore this section presents recommendations based on these three groups or factors of behaviour. Firstly the overall marketing strategy for each behaviour factor is stated and thereafter the specific marketing tactics for each factor are discussed in detail.

6.2.1. Recommendations for Outdoor Environmental Activities (Behaviours 1, 8, 9, 10 and 11)

The following section outlines the recommendations suggested in terms of recycling, supporting green campaigns and buying organic, green and locally produced products.

6.2.1.1. Recommendation for Overall Marketing Strategy for Outdoor Environmental Activities

By analysing the individual correlations found in the study it was determined that three items held the most influence on the Outdoor Environmental Activities. Firstly all five biospheric values held the most individual positive correlations with the environmental behaviours in the Outdoor Environmental Activities group therefore it has been included in these recommendations. Of the five altruistic values, two items possessed the next highest number of individual positive correlations with Outdoor Environmental Activities and these were *Future Generations* and *Humanity*. Therefore these values are included in the recommendations for these activities as they could influence these behaviours. Therefore it is recommended that marketing campaigns for recycling, supporting environmental campaigns, and purchasing organic, green and locally produced products should focus on the following:

1. **Biospheric Values**
2. **Future Generations**
3. **Humanity**

6.2.1.2. Recommendations for Specific Marketing Tactics for Outdoor Environmental Activities

Recycling

Biospheric values: As stated in the general recommendations, the importance of biospheric values should be highlighted in terms of marketing products or services because the findings of the present research determined these values to have the most influence on environmental behaviour and it is a predictor of environmental behaviour. In order to improve the green behaviour of recycling, businesses and governments should emphasize the fact that recycling decreases water and land pollution (biospheric elements). Companies and governments could concentrate on the adverse effects that excess waste will have on water bodies such as rivers, streams and even oceans as this will be life threatening for the biospheric item of marine life. Marketing campaigns must ensure that consumers are well aware of the adverse effects on the earth that are the result of recycling. According to McDonald and Oates (2006, p. 370) for the act of recycling to have an effective outcome, the general public need to take part in this ecological behaviour. Therefore marketing campaigns need to reach as far of an audience as possible as individuals from every background should practice the ecological behaviour of recycling. In terms of the perceived behavioural control mentioned earlier by Gabler *et al*. (2013, p. 163) governments and municipalities should create easy and accessible recycling areas and bins.

Future Generations and Humanity: Due to the fact that the concern for future generations and humanity were both found to hold individual correlations with recycling these values are included in the following recommendations to increase the frequency of recycling. Recycling reduces the amount of overall waste in communities and cities and also provides materials for companies to utilize when manufacturing products. Therefore it is recommended that recycling

campaigns should link these two advantages to the benefits that they will bring to future generations and to humanity on the whole. These campaigns should highlight that non-recycling can lead to the pollution of water sources that will directly affect the drinking water of individuals in the country, decrease the beauty of the land and increase soil erosion. These will impact humans directly and the effects can be felt relatively quickly therefore future generations including the children of consumers will definitely feel the impact. Another tactic would be to inform consumers that recycling will benefit companies that will use recycled materials to manufacture their products and therefore will ultimately lead to less industrial activity in factories. This will lead to reduced air pollution.

Supporting Environmental Campaigns (Save the Rhino)

Biospheric Values: To capitalise on the correlation found between biospheric values and the support of the 'Save the Rhino' campaign found in this research, it is recommended that this campaign focus solely on the livelihood of the animal itself and how it's possible extinction would impact other aspects of the earth and its ecosystems such as other forms of wildlife, birds and plant life. Environmental organizations could emphasize how the eco-systems of other areas in other countries around the world have deteriorated or even collapsed due to the extinction of a species and what harmful effects it had on other forms of nature.

Future Generations and Humanity: It is possible that future generations of individuals will not have the opportunity to see certain creatures as they might become extinct. Again, it is vital for accurate information relating to the facts and statistics of rhino poaching to be communicated to individuals in order for them to know how dire the current situation for rhinos is. Thereafter the environmental campaign could perhaps include other extinct animals that fell prey to human poaching and exploitation and emphasize the fact that our generation does not have the privilege to view these animals. It is also recommended that along with promoting the financial needs of the campaign, the need for volunteers that are not required to contribute financially should also be emphasized in order to attract the younger population who are not earning a high income. According to Thøgersen and Crompton (2009, p. 142) green campaigns have the greatest influence when the initial cause of the campaign also creates other residual environmental effects that individuals take part in. Therefore it is also suggested that along with the promotion of the specific cause of an environmental campaign, businesses,

governments or NGO's should also highlight how other ecological behaviours such as purchasing environmentally friendly products and preserving vegetation are linked to the initial cause. Again this holistic viewpoint will encourage other environmental behaviours to take place.

Purchasing of Organic, Green and Locally Produced Products

Biospheric Values: Businesses that wish to market their environmental products should highlight the fact that the elements of the earth are being protected when consumers buy these products. Companies can focus their campaigns on the fact that conventional products use harmful substances and pesticides in their production processes that damage the soil, land and animals. It should highlight the fact that organic, green and local products work in harmony with nature and do not pose a threat to any creature or plant. The marketing tactics that could be utilized for locally produced products could be similar to those used for organic and green products, however the health and protection of local eco-systems, plants and local animals should be highlighted.

Future Generations and Humanity: It is recommended that businesses should emphasize the fact that organic products are made or produced with natural materials which do not contain harmful chemicals or substances. By promoting these points companies can emphasize the importance of the lives and health of future generations by creating campaigns that highlight the safety element of purchasing organic products. Since no harmful substances are utilized, these products pose no long term negative effects for the individuals in the future. Therefore this is a link to the importance of future generations and humanity. In terms of green products it is recommended that businesses concentrate on emphasizing the overall effects of using environmental products. For example, marketing campaigns should illustrate that utilizing energy saving light bulbs will provide more energy for individuals in the future and the creation of solar powered products will last through generations. If consumers at present were given ample warning of the energy crisis that South Africa faces at the moment then it is possible that there would have been no need for energy restrictions as the country would have had enough energy in the first place.

6.2.2. Recommendations for Indoor Environmental Activities (Behaviours 4, 6 and 7)

The following section outlines the recommendations suggested in terms of energy and water conservation in the household.

6.2.2.1. Recommendation for Overall Marketing Strategy for Indoor Environmental Activities

By analysing the individual correlations found in the study it was determined that two items held the most influence on the Indoor Environmental Activities. There were 14 positive correlations found out of a possible 15 correlations between the five biospheric values tested and the three behaviours of Indoor Environmental Activities. Biospheric values clearly have an effect on these green behaviours and therefore they are included in the recommendations to increase green activities that take place indoors. Apart from biospheric values there was only one other value (*Humanity)* that correlated significantly with one of the three indoor behaviours (**Behaviour 6** – Switching off unnecessary lights at home). Therefore this value was also included in the recommendations for indoor behaviours. Thus it is recommended that marketing campaigns for water and energy saving in the household (Indoor Environmental Activities) should focus on the following:

1. **Biospheric Values**
2. **Humanity**

6.2.2.2. Recommendations for Specific Marketing Tactics for Indoor Environmental Activities

Water Conservation

Randolph and Troy (2008, p. 441) state that water conservation behaviours can be either Macro or Micro saving. The following recommendations aim to promote Micro water saving in the

household that consist of reusing and saving household water, using water conservation fittings as well as adapting one's gardening activities (Randolph & Troy, 2008, p. 441).

Biospheric Values: In terms of classifying indoor environmental activities, one of the two water conservation behaviours (*Behaviour 4 – Closing the tap while washing dishes or brushing teeth*) fell into this category. Municipalities' and governments' marketing campaigns could focus on the fact that biospheric elements such as aquatic life and terrestrial animals will be affected by water shortages and ensure that consumers are educated about the harmful effects that result from wasting household water. They could demonstrate how the shortage of water would affect biospheric elements by illustrating pictures in local newspapers and magazines or perhaps a brochure filled with the relevant information could be included with the monthly water bill consumers receive. Accounting for the technological boom, these municipalities and organizations could also reach consumers on social networking sites such as Facebook and Twitter or perhaps work in conjunction with NGO's to post pictures, information or even upload videos illustrating the devastating outcome on nature that might result from wastage of household water.

Energy Conservation

According to Sütterlin *et al*. (2011, p. 8138) household energy can be conserved in one of two ways firstly reducing or limiting the use of electricity in the home and secondly to utilize energy saving equipment. Therefore the following recommendations aim to promote either one or both of these behaviours in individuals.

Biospheric Values: From the results of the present study it is clear that the most effective marketing strategies and tactics that could be used to increase energy conservation should be linked to the importance of biospheric elements of the earth. Municipalities, governments or businesses should base their marketing campaigns on the fact that household energy saving will eventually lead to fewer natural resources of the earth being utilized to produce energy. Therefore ecosystems and all earthly elements of ecosystems will be protected. Once again it is recommended that the importance of these biospheric elements be linked to the egoistic

needs of individuals. Thus it can also highlighted that the ecosystems that are being conserved will also enhance the lives of individuals.

Humanity: Although the altruistic value of Humanity was only correlated with one of the three behaviours of the Indoor Environmental Activities group (*Behaviour 6 – Switching off unnecessary lights at home*), the relationship was worth creating recommendations for. A possible marketing tactic for municipalities, governments and organizations would be to focus on the importance of saving energy in order for other people in the country to also have enough energy to live comfortably. In South Africa in particular there are still many rural areas that do not have access to electricity therefore a marketing strategy that consists of two stages is recommended. Firstly it is vital that all South Africans (especially those living in urban areas) are informed about the many rural communities that do not have the basic electricity needs. Just as with water conservation behaviours, these knowledge campaigns can be communicated to consumers via print media such as newspapers and magazines, social media such as Facebook and Twitter, and pamphlets educating individuals of the plight of rural individuals should be added with the consumers' monthly electricity bill. Secondly it should be stated in what particular ways consumers can save energy that is the most convenient and time saving for them such as using energy efficient appliances or even installing a pre-paid electricity meter.

6.2.3. Recommendations for Reusing Environmental Activities (Behaviours 2, 3 and 5)

The following section outlines the recommendations suggested in terms of reusing household materials and shopping bags and saving water by opting to have a shower instead of a bath

6.2.3.1. Recommendation for Overall Marketing Strategy for Reusing Environmental Activities

By analysing the individual correlations found in the study it was determined that three items had an influence on the Reusing Environmental Activities. Firstly five significant correlations

existed between the biospheric values and Reusing Environmental Activities therefore these values were included the recommendations for these behaviours. Secondly the only other value items that held any correlations with the behaviours in this group were the egoistic value of *My Future* and the altruistic value of *Humanity* (both correlated significantly with **Behaviour 2** – Reusing empty bottles or containers). Therefore these two values were also included in the recommendations made to increase the frequencies of Reusing Environmental Activities. Thus it is recommended that marketing campaigns for reusing empty bottles/containers, using one's own shopping bag and choosing to have a shower rather than a bath should focus on the following:

1. **Biospheric Values**
2. **My Future**
3. **Humanity**

6.2.3.2. Recommendations for Specific Marketing Tactics for Reusing Environmental Activities

Reusing Bottles or Containers

Biospheric Values, My Future and Humanity: A positive correlation was found between the egoistic item of *My Future* and the behaviour of reusing empty bottles or containers indicating that perhaps individuals perform this behaviour in order to better protect their own livelihoods in the decades to come. Firstly as mentioned in the general recommendations above, a link can be made between the importance of biospheric elements and the well-being of individuals. According to Green and DeMeo (2013, p. 17) waste accumulated by not reusing items causes water and land pollution. Therefore a green product that possesses a reusable bottle or container can use a campaign that highlights the environmental benefit by stating that this product will decrease the levels of these types of pollution and thus benefit the futures of individuals and increase their standard of living. By highlighting this fact in green campaigns it will also create awareness that reusing these materials will positively impact the living conditions of humanity. This might increase the reusing of items in individuals as *Humanity* correlated positively with this behaviour. Of course in order to successfully implement this campaign companies and businesses need to make certain that their product provides a worthy reusable item for consumers, perhaps by modifying the product if needed to boost new uses such as creating

microwavable containers with air tight lids. It is possible that some consumers will purchase this product solely to use the reusable item instead of purchasing more expensive alternatives.

Reusing One's Own Shopping Bag

Biospheric Values: Presently the government in South Africa is charging a levy on the purchasing of plastic bags in stores. However in Bainbridge in the state of Washington in the USA, the government has gone a step further to issue a levy for the use of paper bags (Green & DeMeo, 2013, p. 17). Therefore it is recommended that the South African government opt to replace all plastic bags in stores with paper bags and charge a levy to purchase these paper bags. This will eventually stop the circulation of plastic bags altogether and lead to less pollution which will in turn benefit the lives of individuals.

Behaviour 5 – *Having a shower rather than a bath,* did not possess any positive or significant correlations with the three value orientations. Therefore it is recommended that this behaviour be classified as being a water conservation behaviour and the same marketing strategies and tactics could be employed that were suggested for **Behaviour 4** previously mentioned in the Indoor Environmental Activities group.

6.3 Recommendations for Green Behaviour Based on Correlations with Environmental Beliefs

From the individual correlations found it is evident that there are relatively few individual relationships between environmental beliefs and the green behaviours. However as mentioned earlier these ecological beliefs were found to be a significant individual predictor of environmental behaviour therefore it is important that marketers utilize the information based on these beliefs when promoting ecological products, environmental campaigns or to encourage every day green behaviour.

Although many beliefs received a large proportion of neutral responses and mixed results, overall it was found that the individuals possess marginally pro-environmental beliefs. In terms of individual correlations it was determined that most correlations were found for the beliefs that dealt with **the belief that humans do not have the right to control nature**. Therefore it is recommended that green marketers focus on this idea when promoting environmental products, services or behaviour. Businesses and governments should firstly provide accurate information about the importance of nature and living in harmony with it. It should be communicated to consumers that the balance of the earth as well as humankind lies in the health and stability of nature. It is vital in this case to emphasize that both humans and nature rely on each other to co-exist and therefore are on equal levels or perhaps nature is on a higher level than humans. This will also incorporate the interconnectedness between nature and humans that was discussed previously in the general recommendations. This information can be included in the actual pitch for campaigns on the various communication channels that businesses and governments may use (e.g. television, print media) or can be included on the products themselves. Thereafter the link should be made about how the specific green offering will benefit the environment and nature and highlight how the individuals behind the production of the offering are respecting nature. Due to the drastic increase of popularity of the internet and social networks, this information can also be shared with consumers on the company's website, Facebook page or on Twitter and can be broadcast to a very large audience at a minimal cost. This will also aim to target the younger population of individuals.

The second highest individual correlations were found for **the belief that mankind has the ability to offset the balance of nature**. Similar marketing tactics can be utilized by companies and governments as the recommendations mentioned above however, in this case it is suggested that while providing information to consumers about the importance of nature, it is recommended that businesses show examples of ecosystems (including the livelihoods of individuals either in South Africa or across the world) that have collapsed or been affected by an imbalance in nature. It is also important to emphasize that mankind is responsible and has the power to permanently dismantle the health and well-being of nature and humans. Again thereafter the green products, services and behaviour can be linked to preventing this fate from happening and encouraging mankind to respect the balance of nature.

As the recommendations stated above illustrate, overall it is important for marketers of green products, services and behaviour to concentrate on emphasizing the significance of biospheric elements and nature when promoting their environmental offerings. Even when businesses, organizations, municipalities or even governments focus on the specific egoistic and altruistic relationships mentioned above, they should also try and incorporate the protection and conservation of biospheric elements as well. It is clear that a common thread throughout the recommendations, both general and specific, is the fact that businesses or governments need to increase the levels of biospheric importance as well as raise the levels of pro-environmental beliefs by improving the knowledge of the significance of nature to individuals in order to boost the importance of biospheric elements. Providing accurate facts about the importance of nature in relation to mankind is also vital to create more pro-environmental beliefs in individuals. This will thereafter lead to more environmental behaviour taking place.

6.4. Limitations of the Research

All research is subject to limitations therefore this section outlines the limitations that were experienced throughout the duration of the research

6.4.1. Sample Limitation

Since the sample utilized for this study was university students, the results obtained from the research could differ in terms of the values, beliefs and behaviour of the general population. The researcher was limited to a young age group that were all from an educated background as they were students in a tertiary education institution. This is not fully representative of South Africa's population of individuals. The researcher was also limited in terms of location of the study as it took place only in the city of Pietermaritzburg and included a sample taken from only one university namely the University of KwaZulu-Natal (Pietermaritzburg Campus). While the university draws students from across the country, the results gained may not be fully representative of individuals in South Africa.

6.4.2. Data Collection Method

There was a major limitation with the initial data collection method of the study. At first the questionnaire was required by the UKZN registrar to be posted on the UKZN Notice System and all students were requested to complete the questionnaire on their computers and email it back to the researcher. This method would have led to a probability sample being collected. However due to the extremely poor response rate the researcher was forced to collect responses from students during their lectures. Therefore this led to a non-probability sample being collected. The low response rates also delayed the progress of the research. Non-probability samples do have a major limitation of biased responses that may not be representative of the population as compared to probability samples (Kothari, 2004, p. 15).

6.4.3. Availability of Students

During the time of data collection for this study the University of KwaZulu-Natal was going through a time of unrest as student protests were taking place on campus. These protests sometimes became violent and this forced students to not attend lectures and caused the academic programme for the entire university to be suspended for a few days. Thereafter attendance for lectures was still low therefore the researcher had to visit many classes in order to get the required sample size for the study. These events also delayed the process of data collection for the research. The researcher made certain that a wide variety of students were selected to participate in the study in order to gain as much of a representative sample as possible. This was done by strategically selecting classes of students based on the modules that they studied as well as their year of study and this ensured that a good range of demographics was attained. This also ensured that none of the classes of students intersected and this prevented any student answering the questionnaire more than once. Furthermore the researcher stipulated verbally to the students that if any student answered the questionnaire previously then they were not required to answer it again to further safeguard against multiple responses from students. Each student was also required to sign an informed consent form. Several classes of students were chosen that ranged from 1st year classes up to postgraduate classes.

6.4.4. Limitations of the Questionnaire

Since the researcher wanted to allow for easy answering of the questionnaire by the students, seven items of the NEP scale were not added into Section 3 of environmental beliefs. Therefore the results obtained from this section may not have represented the NEP scale fully. However this is a common practice as some researchers did not employ the entire 15 item scale in their studies but chose to use just a portion of the scale. Some of these studies include research by Faver (2013, p. 158) and Whitmarsh and O'Neill (2010, p. 308) which only used 6 items from the scale while Lee *et al*. (2014, p. 2101) opted to use just 4 items of the scale. Clark *et al*. (2003, p. 242) employed 10 items from the revised NEP and stated that the reason why some of the items were omitted was to reduce the length of the questionnaire (Clark *et al*., 2003, p. 241). For the same reason, the researcher of the current study chose to utilize only 8 items from the NEP scale.

Also due to the length of the questionnaire the researcher only tested 11 green behaviours of the individuals. Therefore there were still many environmental behaviours not tested.

6.5. Recommendations for Future Research

The current research determined the importance of the value orientations, environmental beliefs and green behaviour however the analysis of the findings brought to light the specific areas which perhaps need more in-depth research conducted in the future to increase levels of understanding. The recommendations for future research are as follows:

- In order to gain accurate findings that are more representative of the population of South Africa it is recommended that similar studies be performed on the general population of individuals in the country so that all age groups are included in the analysis as well as people from different educational backgrounds. It is also recommended that if possible, the research utilize probability sampling and take place in different locations all over the country to get precise results. The present study took place in the relatively small city of Pietermaritzburg therefore it is suggested that similar research take place

in larger, progressive cities in the country (e.g. Johannesburg and Cape Town) to determine if the same results are found.

- It is suggested that future research include the entire NEP scale when analysing environmental beliefs to assess if the results would be different if the full NEP scale was used.
- It would be beneficial to determine the reasons as to why individuals place more importance on egoistic values i.e. they express concern for the environment due to their concern for themselves rather than other people (altruistic values) and nature (biospheric values). Also further research should examine why environmental beliefs are only marginally pro-environmental and why neutral responses were common. It would be useful to find out whether this is due to lack of accurate facts and information about the environment, or due to individuals knowing ecological facts but merely not caring or showing interest towards the environment.
- When analysing the findings of the present study (South Africa) against the results found in the USA it is evident that there are many similarities between the two nations in terms of environmental values. It would therefore be recommended that further research dealing with ecological values of individuals seek to determine why such similarities exist between the two countries.
- Future research might consider comparing the scales used in this study with different scales for measuring values such as the Schwartz Value scale.
- It is also suggested that future environmental research concentrate on the reason why recycling behaviour is relatively uncommon with individuals in South Africa despite other studies of South African samples finding this behaviour to be common (e.g. Berndt & Gikonyo, 2012, p. 6; Palmer *et al*., 2012, p. 451; Oliver *et al*., 2011, p. 549)
- Based on the views of Honkanen *et al*. (2006, p. 422) it should also be examined whether one's moral obligation or personal norms have an impact on one's ecological values, beliefs and behaviour.

6.6. Conclusion

Recommendations presented in this chapter were based on the findings of the present study and were aimed at governments, policy makers and businesses. They include increasing the importance of biospheric elements in individuals by creating awareness campaigns, linking

biospheric elements to egoistic needs when marketing environmental products, services or behaviour and emphasizing and increasing the importance of pro-environmental beliefs when marketing green products, services or behaviour. Specific recommendations were also made that possessed a common thread of increasing environmental awareness and importance of biospheric values and environmental beliefs. This research experienced limitations in terms of the sample utilized, the data collection method, the availability of students and limitations of the questionnaire. Recommendations for future research include examining other sample populations of individuals preferably in many cities in South Africa and should include individuals from different educational backgrounds, utilizing the entire NEP scale on South African individuals when measuring green beliefs and determining the reasons for low frequencies of certain environmental behaviours e.g. recycling. The next chapter presents an overall conclusion to the research.

Chapter 7: Conclusion to the Dissertation

It is clear that environmental problems are a serious issue on a global scale. In order for drastic improvements to occur on earth a change in consumer environmental behaviour needs to take place. Increasing the understanding of the factors that influence ecological behaviour is important. Environmental values and beliefs can play a significant role in influencing green behaviour.

Therefore this research aimed to determine the relationships between environmental concern and environmental behaviour by analysing the three types of environmental values (egoistic, altruistic and biospheric), and environmental beliefs and their relationship with the environmental behaviour of young adults. In order to determine this, four objectives were set out for the study:

1. To determine which group of environmental values (egoistic, altruistic or biospheric) are most important to young adults
2. To determine the environmental beliefs of young adults
3. To establish the extent of their environmental behaviour
4. To determine the relationship between the three types of environmental values (egoistic, altruistic and biospheric) and environmental beliefs with environmental behaviour.

Objective 1 consisted of three aspects that dealt with determining the importance of environmental values of the three value orientations being egoistic, altruistic and biospheric values. The results of this study found that of the three values, egoistic values held the most importance to the respondents. When analysed with previous research it was established that other nations around the world also possess a high level of self-centred values, however the egoistic values of South African individuals surpass the importance placed on the other two value orientations by a large degree. According to Pinto *et al*. (2011, p. 126) and Schultz (2001, p. 336) individuals who embody egoistic values tend to be more independent, are not easily persuaded by other people and prefer to be unique and different, while Lindeman and Verkasalo

(2005, p. 171) stated that self-centred individuals place their priority on their own individual benefits and happiness. These could be possible reasons as to the high levels of egoistic values found in the research as young adults may specifically possess these qualities due to their age and their new found freedom being university students. However an interesting finding was stated by Steg *et al*. (2014, p. 107) that deduced that individuals who are self-centred may be concentrating on protecting and increasing their resources. This could be very true in terms of South African young adults as the effects of apartheid may have disadvantaged many of the individuals in the past therefore accentuating their need to protect and enhance their present day resources.

Altruistic values were found to hold the second most importance to the respondents and although a relatively high level of altruistic values were found in this study, when compared to other research it is evident that the majority of studies found altruistic values to be the most important to their sample populations (e.g. Bruni *et al*., 2012, p. 6; Schultz, 2001, pp. 329-335). This was a distinct finding in developed countries, however developing countries also placed a high level of importance on altruistic values. Schultz *et al*. (2005, p. 460) stated that an individual who is worried about the well-being of another person, if they possess the knowledge that this person can be possibly harmed and if the individual knows he is responsible for this harm, then there is more of a possibility that the individual embodies altruistic values. Other studies also emphasized the influence that the awareness of ecological problems as well as an ethical obligation felt towards other individuals have on the level of one's altruistic values (e.g. Honkanen *et al*., 2006, p. 422; Johansson *et al*., 2013, pp. 295, 301, 302; Nordlund & Garvill, 2002, p. 740). However linked to awareness and moral obligations of individuals were results found by Schultz (2001, p. 366) that suggest that the degree of altruistic and also biospheric values that an individual possesses depends on the extent that these values are included in the way the individual represents themselves and if the individual feels interconnected to other people or the environment. Therefore South African individuals may not possess enough awareness about the harmful effects of environmental problems and the effects they have on other people. These individuals also might not feel interconnected to the lives of their fellow man and due to their age might have a greater sense of independence as students.

Biospheric values were found to hold the least importance to the respondents in the study. However when compared with results from previous research it was found that South African individuals are not the only population that ranked biospheric values as the least important to them in times of environmental stress. It was noted that some of the results obtained by Schultz (2001, pp. 329, 335) were similar to the findings of the present study with the results from the United States being the most similar to the results of the present study. Although biospheric values were also found to be the least important in some nations, the mean found for the current study was much lower in relation to the previous studies analysed illustrating that South Africans possess the lowest biospheric values as compared to the other studies. As previously stated this could be due to many factors that were mentioned by Schultz (2001, p. 366) such as the possibility that South African individuals do not feel that the environment and nature are a part of the way they represent themselves and perhaps do not feel connected with nature. This could be due to a lack of awareness of the role that nature plays in the everyday lives of human beings.

Therefore the overall conclusion that can be established for Objective 1 is that egoistic values reigned supreme in terms of importance to young adults in South Africa and this may be due to the need to be individualistic, independent as well as to protect and increase the personal resources of individuals. Altruistic values were ranked second most important and this could be due to a lack of environmental awareness and knowledge of harm to other people as well as a lack of interconnectedness between individuals and the lives of other people. Biospheric values were found to be the least important and this could also be due to the fact that individuals do not connect themselves and their lives with the importance of nature.

Objective 2 dealt with determining the level of environmental beliefs held by young adults in South Africa and it was found that the ecological beliefs that these individuals possess are only marginally pro-environmental. The importance and the link between awareness, knowledge and environmental beliefs were emphasized by Bang *et al*. (2000, p. 454) and Kilbourne and Pickett (2008, p. 887) that state that the more accurate knowledge and awareness of the issues of the environment that an individual possesses the more environmental beliefs they will hold. Thus the results of the present study that illustrate only marginal pro-environmental beliefs of young adults in South Africa might be due to the fact that these individuals do not possess the

awareness and the correct knowledge pertaining to the problems of the environment and how they as individuals are connected to these issues. Other possible explanations as to the relatively low levels of pro-environmental beliefs found in the present study could be due to the subjective norms and perceived behavioural control of individuals as stated by Gabler *et al*. (2013, p. 163).

Objective 3 determined the extent of environmental behaviour of young adults and it was found that the level of green behaviour of these individuals was reasonable. Water and energy conservation were determined to be performed the most frequently by the respondents while recycling, supporting the 'Save the Rhino' environmental campaign and purchasing organic products were found to be performed the least. The possible reasons for the results were due to the water and energy crisis that South Africa is experiencing that has led to water and energy restrictions across the country. The factors stated by Monroe (2003, pp. 115-116) that applied to the purchase of organic food might actually be possible factors that influence environmental behaviour in general as well. These include the advantages and disadvantages felt towards environmental behaviour, how easy these green behaviours are to perform, whether other people also perform these behaviours, and the fact that individuals might perform these environmental behaviours if the benefits to the environment are greater than the costs associated with performing the behaviour. Other possible factors affecting green behaviour could be the levels of environmental awareness, knowledge and social responsibility felt by individuals as stated by Wang *et al*. (2013, p. 982). Therefore a possible reason for the low frequencies of some of the behaviours might be due to individuals in the current research believing that these behaviours are difficult to perform, are more costly and do not create enough benefits for the environment relative to the costs of performing them. Also individuals may not possess enough information about the environment and they might not have felt a personal responsibility towards the environment to perform these behaviours.

Objective 4 aimed to determine the relationship between the three types of environmental values (egoistic, altruistic and biospheric) and environmental beliefs with environmental behaviour. Only four individual correlations were determined between the five egoistic values and 11 green behaviours. It was found that total egoistic values did not possess a significant correlation with total green behaviour indicating that overall, self-centred values have no

influence on environmental behaviour. It can also be deduced from multiple regression analyses that egoistic values are not a significant predictor of green behaviour. Larson (2010, p. 902) stated that egoistic values have a negative effect on one's ecological attitudes by emphasizing selfish interests and conventional practices and do not inspire a change in one's behaviour but instead promote the same state of actions. Therefore this relationship is somewhat understandable with some past studies possessing similar results (e.g. Albayrak *et al*., 2013, p. 36; Pinto *et al*., 2011, p. 124). The fact that there was no significant relationship found between egoistic values and green behaviour may be due to points raised by Hansla *et al*. (2008, p. 3) that state that individuals that possess self-centred points of views and values will more likely take part in environmental behaviours that might have adverse consequences on issues that decrease opportunities in employment, increase taxes and increase the cost of energy or fuel if not performed. It is possible that the ecological behaviours tested in the current study do not lead to these negative effects therefore no significant relationship existed between egoistic values and behaviour.

A reasonably low level of individual correlations were also found between the five altruistic values and 11 green behaviours. However a positive but very weak correlation was found between total altruistic values and total green behaviour although altruistic values were not found to be an individual predictor of green behaviour. According to Paladino and Ng (2013, p. 137) one of the reasons for this finding could be that young individuals place a higher priority on themselves and their own needs rather than on the needs of other people and the environment. Of the three value orientations the biospheric value set was the value set to possess the most individual correlations with green behaviour, possess a positive relationship with total green behaviour and also be an individual predictor of green behaviour. Many past studies also found similar results and Steg *et al*. (2014, p. 107) state that that when compared to egoistic and altruistic values, biospheric values are more clearly related to ecological behaviour. A similar result was found in terms of environmental beliefs that were tested in the present study as many individual correlations were found between individual beliefs and behaviours, total environmental beliefs were positively related to total green behaviour and these beliefs were found to be an individual predictor of green behaviour. Similar results were also found in past research (Gabler *et al*., 2013, p. 165; Jurin & Fortner, 2002, pp. 384, 385; Wray-Lake *et al*., 2010, pp. 73, 74) that found reasonably low levels of ecological beliefs in young individuals but also determined a positive correlation between these environmental

beliefs and green behaviour depicting that young adults in both developed and developing countries possess similar beliefs and behaviour.

By analysing the conclusions made above, the overall conclusion for this research is that biospheric values and environmental beliefs have the greatest impact on environmental behaviour, however the level of importance of biospheric values was the lowest of the value orientations and ecological beliefs were only found to be marginally pro-environmental. However egoistic values were found to be the most evident of all constructs tested.

Based on these findings it is recommended that companies, governments and marketers focus their attention and resources on trying to establish the connection between an individual's own well-being and the importance of nature and the environment. It is also recommended that greater environmental information and knowledge be communicated to consumers in order to increase the awareness and accurate facts about environmental issues in order to increase pro-ecological beliefs. Therefore recommendations include increasing the importance of biospheric elements in individuals by creating awareness campaigns, linking biospheric elements to egoistic needs when marketing environmental products, services or behaviour and emphasizing and increasing the importance of pro-environmental beliefs when marketing green products, services or behaviour.

This research experienced limitations in terms of the sample utilized, the data collection method, the availability of students and limitations of the questionnaire. Recommendations for future research include examining other sample populations of individuals preferably in many cities in South Africa and should include individuals from different educational backgrounds, utilizing the entire NEP scale on South African individuals when measuring green beliefs and determining the reasons for low frequencies of certain environmental behaviours e.g. recycling.

It is hoped that this research will contribute to the field of environmental marketing add significant information to the body of knowledge of green behaviour in developing countries and in South Africa in particular. The findings of this research aim benefit and assist green

businesses, governments and environmental organizations that aim to increase environmentally friendly behaviour in individuals to promote sustainability and a healthier world to live in.

Chapter 8: References

Abrahamse, W., & Steg, L. (2009). How do socio-demographic and psychological factors relate to households' direct and indirect energy use and savings? *Journal of Economic Psychology, 30*(5), 711-720.

Abrahamse, W., Steg, L., Vlek, C., & Rothengatter, T. (2005). A review of intervention studies aimed at household energy conservation. *Journal of Environmental Psychology, 25*(3), 273–291.

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

Ajzen, I. (2011). The theory of planned behaviour: Reactions and reflections. *Psychology & Health, 26*(9), 1113-1127. doi: 10.1080/08870446.2011.613995

Albayrak, T., Aksoy, S., & Caber, M. (2013). The effect of environmental concern and scepticism on green purchase behaviour. *Marketing intelligence & planning, 31*(1), 27-39.

Alsmadi, S. (2007). Green Marketing and the Concern over the Environment: Measuring Environmental Consciousness of Jordanian Consumers. *Journal of Promotion Management, 13*(3-4), 339-361. doi: 10.1080/10496490802306905

Amutenya, N., Shackleton, C., & Whittington-Jones, K. (2009). Paper recycling patterns and potential interventions in the education sector: A case study of paper streams at Rhodes University, South Africa. *Resources, Conservation and Recycling, 53*(5), 237-242.

Anderson, H., & Brodin, M. (2005). The consumer's changing role: The case of recycling. *Management of Environmental Quality: An International Journal, 16*(1), 77-86.

Aoyagi-Usui, M., Vinken, H., & Kuribayashi, A. (2003). Pro-environmental Attitudes and Behaviors: An International Comparison. *Research in Human Ecology, 10*(1), 23-31.

Arnocky, S., Stroink, M., & DeCicco, T. (2007). Self-construal predicts environmental concern, cooperation, and conservation. *Journal of Environmental Psychology, 27*(4), 255–264.

Autio, M., Heiskanen, E., & Heinonen, V. (2009). Narratives of 'green' consumers – the antihero, the environmental hero and the anarchist. *Journal of Consumer Behaviour, 8*(1), 40-53.

Bamberg, S. (2003). How does environmental concern influence specific environmentally related behaviors? A new answer to an old question. *Journal of Environmental Psychology, 23*(1), 21-32.

Bamberg, S., & Moser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of Environmental Psychology, 27*(1), 14-25.

Bang, H.-K., Ellinger, A. E., Hadjimarcou, J., & Traichal, P. A. (2000). Consumer Concern, Knowledge, Belief, and Attitude toward Renewable Energy: An Application of the Reasoned Action Theory. *Psychology & Marketing, 17*(6), 449-468.

Barr, S., & Gilg, A. W. (2007). A conceptual framework for understanding and analyzing attitudes towards environmental behaviour. *Geografiska Annaler: Series B, Human Geography, 89*(4), 361-379.

Barr, S., & Gilg, A. (2006). Sustainable lifestyles: Framing environmental action in and around the home. *Geoforum, 37*(6), 906-920.

Barrett, B. F. D., Kuroda, A., & Miyamoto, K. (2002). Ecological Modernisation, Environmental Knowledge and Societal Change: Attitudes and Behaviour of Young People in Japan. *International Research in Geographical and Environmental Education, 11*(3), 237-261.

Batson, C. D., Ahmad, N., & Tsang, J.-A. (2002). Four Motives for Community Involvement. *Journal of Social Issues, 58*(3), 429-445.

Becker, T., & Stevens, B. (2014). Climate and climate sensitivity to changing CO2 on an idealized land planet. *Journal of Advances in Modeling Earth Systems, 6*(4), 1205-1223. doi: 10.1002/2014MS000369

Berndt, A., & Gikonyo, L. (2012). Environmental concern behaviours in Africa: An exploratory study. *Journal of Management and Sustainability, 2*(2), p1.

Berndt, A., & Petzer, D. (2011). Environmental concern of South African cohorts: An exploratory study. *African Journal of Business Management, 5*(19), 7899-7910.

Bertoldo, R., Castro, P., & S. Bousfield, A. B. (2013). Pro-environmental beliefs and behaviors: two levels of response to environmental social norms. *Creencias y comportamientos proambientales: dos niveles de respuesta a las normas sociales ambientales., 45*(3), 437-448. doi: 10.14349/rlp.v45i3.1485

Best, H., & Mayerl, J. (2013). Values, Beliefs, Attitudes: An Empirical Study on the Structure of Environmental Concern and Recycling Participation Values, Beliefs, Attitudes: An Empirical Study on the Structure of Environmental Concern and Recycling Participation. *Social Science Quarterly (Wiley-Blackwell), 94*(3), 691-714. doi: 10.1111/ssqu.12010

Black, I. R., & Cherrier, H. (2010). Anti-consumption as part of living a sustainable lifestyle: daily practices, contextual motivations and subjective values. *Journal of Consumer Behaviour, 9*(6), 437-453.

Borg, I., Groenen, P. J. F., Jehn, K. A., Bilsky, W., & Schwartz, S. H. (2011). Embedding the Organizational Culture Profile into Schwartz's Theory of Universals in Values. *Journal of Personnel Psychology, 10*(1), 1-12. doi: 10.1027/1866-5888/a000028

Borges, A. F., Cunha Silva Borges, M. d. A., de Rezende, J. L. P., Neto, A. F., da Silva, S. C., & de Macedo, M. A. A. (2013). Environmental concern of university students in the federal education institute in rural Goiás, Brazil. *Preocupação ambiental de estudantes universitários de instituto federal de educação da zona rural de Goiás, Brasil., 43*(11), 2109-2114.

Bostrom, A., Barke, R., Turaga, R. M. R., & O'Connor, R. E. (2006). Environmental Concerns and the New Environmental Paradigm in Bulgaria. *The Journal of Environmental Education, 37*(3), 25-40.

Bruni, C. M., Chance, R. C., & Schultz, P. W. (2012). Measuring Values-Based Environmental Concerns in Children: An Environmental Motives Scale. *The Journal of Environmental Education, 43*(1), 1-15.

Bryan, E., Deressa, T. T., Gbetibouo, G. A., & Ringler, C. (2009). Adaptation to climate change in Ethiopia and South Africa: options and constraints. *Environmental Science & Policy, 12*(4), 413-426.

Byravan, S., & Rajan, S. C. (2015). Sea level rise and climate change exiles: A possible solution. *Bulletin of the Atomic Scientists, 71*(2), 21-28. doi: 10.1177/0096340215571904

Carlson, D. H., & Van Staden, F. (2006). Environmental concern in South Africa: The development of a measurement scale. *New voices in psychology, 2*(1), 3-30.

Chan, R. Y. K. (1999). Environmental Attitudes and Behavior of Consumers in China. *Journal of International Consumer Marketing, 11*(4), 25-52.

Chang, G. (2013). Factors influencing water conservation behavior among urban residents in China's arid areas. *Water Policy, 15*(5), 691-704. doi: 10.2166/wp.2013.093

Child, B. (2012). The sustainable use approach could save South Africa's rhinos. *South African Journal of Science, 108*(7/8), 1-4. doi: 10.4102/sajs.v108i7/8.1338

Cho, M., Kang, S.-R., & Bonn, M. A. (2015). The Moderating Effects of Retailers' Green Practices upon Customer Environmental Values and Organic Food Purchasing Intention. *Journal of Distribution Science, 13*(11), 5-13.

Churchill, G.A., Brown, T.J. and Suter, T.A. (2010) *Basic Marketing Research,* 7th edition. China: South-Western Cengage Learning

Cieciuch, J., Döring, A. K., & Harasimczuk, J. (2013). Measuring Schwartz's values in childhood: Multidimensional scaling across instruments and cultures. *European Journal of Developmental Psychology, 10*(5), 625-633. doi: 10.1080/17405629.2012.707779

Clark, C. F., Kotchen, M. J., & Moore, M. R. (2003). Internal and external influences on pro-environmental behavior: Participation in a green electricity program. *Journal of Environmental Psychology, 23*(3), 237–246.

Coad, A., de Haan, P., & Woersdorfer, J. S. (2009). Consumer support for environmental policies: An application to purchases of green cars. *Ecological Economics, 68*(7), 2078–2086.

Datta, S. K. (2011). Pro-environmental concern influencing green buying: A study on Indian consumers. *International Journal of Business and management, 6*(6), p124.

Davari, A., & Strutton, D. (2014). Marketing mix strategies for closing the gap between green consumers' pro-environmental beliefs and behaviors. *Journal of Strategic Marketing, 22*(7), 563-586. doi: 10.1080/0965254X.2014.914059

De Barcellos, M. D., Krystallis, A., Saab, M. S. d. M., Kügler, J. O., & Grunert, K. G. (2011). Investigating the gap between citizens' sustainability attitudes and food purchasing behaviour: empirical evidence from Brazilian pork consumers. *International Journal of Consumer Studies, 35*(4), 391-402.

De Groot, J. I. M., & Steg, L. (2007). Value orientations and environmental beliefs in five countries: Validity of an Instrument to Measure Egoistic,Altruistic and Biospheric Value Orientations. *Journal of Cross-Cultural Psychology, 38*(3), 318-332.

De Groot, J. I. M., & Steg, L. (2008). Value Orientations to Explain Beliefs Related to Environmental Significant Behavior: How to Measure Egoistic, Altruistic, and Biospheric Value Orientations. *Environment and Behavior, 40*(3), 330-354.

De Groot, J. I. M., & Steg, L. (2010). Relationships between value orientations, self-determined motivational types and pro-environmental behavioural intentions. *Journal of Environmental Psychology, 30*(4), 368-378.

Delorme, D. E., Hagen, S. C., & Stout, I. J. (2003). Consumers' Perspectives on Water Issues: Directions for Educational Campaigns. *The Journal of Environmental Education, 34*(2), 28-35.

Dolnicar, S., & Hurlimann, A. (2010). Australians' water conservation behaviours and attitudes. *Journal of Water Resources, 14*(1), 43-53

Du Toit, L., & Crafford, S. (2003). Beliefs and purchasing practices of Cape Town consumers regarding organically produced food. *Journal of Family Ecology and Consumer Sciences= Tydskrif vir Gesinsekologie en Verbruikerswetenskappe, 31*(1), 1-11.

Duffy, R., & Humphreys, J. (2014). Mapping Donors: Key Areas for Tackling Illegal Wildlife Trade (Africa and Asia). 1-36.

Dunlap, R. E., & Van Liere, K. D. (2008). The New Environmental Paradigm Scale: From Marginality to Worldwide Use. *The Journal of Environmental Education, 40*(1), 3-18.

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). Measuring Endorsement of the New Ecological Paradigm: A Revised NEP Scale. *Journal of Social Issues, 56*(3), 425-442.

eNCA, (2015) SA must prevent water crisis: Maimane, eNCA. Available at https://www.enca.com/south-africa/sa-must-prevent-water-crisis-maimane, 12 paragraphs. [Accessed 4 August 2015].

Faver, C. A. (2013). Environmental Beliefs and Concern about Animal Welfare: Exploring the Connections. *Journal of Sociology & Social Welfare, 40*(4), 149-168.

Follows, S. B., & Jobber, D. (2000). Environmentally Responsible Purchase Behaviour: A Test of a Consumer Model. *European Journal of Marketing, 34*(5/6), 723-746.

Fraj, E., & Martinez, E. (2006). Environmental values and lifestyles as determining factors of ecological consumer behaviour: an empirical analysis. *Journal of Consumer Marketing, 23*(3), 133-144.

Fraj, E., & Martinez, E. (2006). Influence of personality on ecological consumer behaviour. *Journal of Consumer Behaviour, 5*(3), 167–181.

Fransson, N., & Garling, T. (1999). Environmental concern: Conceptual definitions, measurement methods, and research findings. *Journal of Environmental Psychology, 19*(4), 369-382.

Gabler, C. B., Butler, T. D., & Adams, F. G. (2013). The environmental belief-behaviour gap: Exploring barriers to green consumerism. *Journal of Customer Behaviour, 12*(2/3), 159-176. doi: 10.1362/147539213X13832198548292

Gadenne, D., Sharma, B., Kerr, D., & Smith, T. (2011). The influence of consumers' environmental beliefs and attitudes on energy saving behaviours. *Energy Policy, 39*(12), 7684-7694.

Garling, T., Fujii, S., Garling, A., & Jakobsson, C. (2003). Moderating effects of social value orientation on determinants of proenvironmental behavior intention. *Journal of Environmental Psychology, 23*(1-9).

Gifford, R., & Nilsson, A. (2014). Personal and social factors that influence pro-environmental concern and behaviour: A review. *International Journal of Psychology, 49*(3), 141-157.

Gilg, A., Barr, S., & Ford, N. (2005). Green consumption or sustainable lifestyles? Identifying the sustainable consumer. *Futures, 37*(6), 481-504.

Givens, J. E., & Jorgenson, A. K. (2013). Individual environmental concern in the world polity: A multilevel analysis. *Social Science Research, 42*(2), 418-431. doi: http://dx.doi.org/10.1016/j.ssresearch.2012.10.005

Godin, G., Conner, M., & Sheeran, P. (2005). Bridging the intention–behaviour 'gap': The role of moral norm. *British Journal of Social Psychology, 44*(4), 497-512.

Green, K. P., & DeMeo, E. (2013). The crusade against plastic BAGS. *Fraser Forum*, 16-26.

Griskevicius, V., Tybur, J. M., & Van den Bergh, B. (2010). Going Green to Be Seen: Status, Reputation, and Conspicuous Conservation. *Journal of Personality and Social Psychology, 98*(3), 392-404.

Hamilton, L. C., & Safford, T. G. (2014). Environmental Views from the Coast: Public Concern about Local to Global Marine Issues. *Society & Natural Resources, 28*(1), 57-74. doi: 10.1080/08941920.2014.933926

Hansla, A., Gamble, A., Juliusson, A., & Garling, T. (2008). The relationships between awareness of consequences, environmental concern, and value orientations. *Journal of Environmental Psychology, 28*(1), 1-9.

Hanson, C. B. (2013). Environmental concern, attitude toward green corporate practices, and green consumer behavior in the United States and Canada. *ASBBS eJournal, 9*(1), 62-70.

Harlan, S. L., Yabiku, S. T., Larsen, L., & Brazel, A. J. (2009). Household Water Consumption in an Arid City: Affluence, Affordance, and Attitudes. *Society & Natural Resources, 22*(8), 691-709. doi: 10.1080/08941920802064679

Hart, C. (1998). *Doing a literature review: Releasing the social science research imagination*: Sage.

Hawcroft, L. J., & Milfont, T. L. (2010). The use (and abuse) of the new environmental paradigm scale over the last 30 years: A meta-analysis. *Journal of Environmental Psychology, 30*(2), 143-158.

Hofmeister-Tóth, A., Kelemen, K., & Piskóti, M. (2010). The shades of green living in Hungary. *International Journal of Management Cases, 13*(2), 5-14.

Honkanen, P., Verplanken, B., & Olsen, S. O. (2006). Ethical values and motives driving organic food choice. *Journal of Consumer Behaviour, 5*(5), 420-430.

Ibtissem, M. H. (2010). Application of Value Beliefs Norms Theory to the Energy Conservation Behaviour. *Journal of Sustainable Development, 3*(2), 129-139.

Jakovcevic, A., & Steg, L. (2013). Sustainable transportation in Argentina: Values, beliefs, norms and car use reduction. *Transportation Research Part F, 20*, 70-79.

Jansson, J., Marell, A., & Nordlund, A. (2011). Exploring consumer adoption of a high involvement eco-innovation using value-belief-norm theory. *Journal of Consumer Behaviour, 10*(1), 51-60.

Johansson, M., Rahm, J., & Gyllin, M. (2013). Landowners' Participation in Biodiversity Conservation Examined through the Value-Belief-Norm Theory. *Landscape Research, 38*(3), 295-311.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher, 33*(7), 14-26.

Jurin, R. R., & Fortner, R. W. (2002). Symbolic Beliefs as Barriers to Responsible Environmental Behavior. *Environmental Education Research, 8*(4), 373-394. doi: 10.1080/1350462022000026791

Kaiser, F. G., Hubner, G., & Bogner, F., X. (2005). Contrasting the Theory of Planned Behavior With the Value-Belief-Norm Model in Explaining Conservation Behavior. *Journal of Applied Social Psychology, 35*(10), 2150-2170.

Kennedy, E. H., Beckley, T. M., McFarlane, B. L., & Nadeau, S. (2009). Why We Don't "Walk the Talk": Understanding the Environmental Values/Behaviour Gap in Canada. *Human Ecology Review, 16*(2), 151-160.

Kilbourne, W., & Pickett, G. (2008). How materialism affects environmental beliefs, concern, and environmentally responsible behavior. *Journal of Business Research, 61*(9), 885-893. doi: http://dx.doi.org/10.1016/j.jbusres.2007.09.016

Kim, Y. (2011). Understanding Green Purchase: The Influence of Collectivism, Personal Values and Environmental Attitudes, and the Moderating Effect of Perceived Consumer Effectiveness. *Seoul Journal of Business, 17*(1), 65-92.

Kim, Y., & Choi, S. M. (2005). Antecedents of Green Purchase Behavior: An Examination of Collectivism, Environmental Concern, and PCE. *Advances in Consumer Research, 32*(1), 592-599.

Klockner, C. A. (2013). A comprehensive model of the psychology of environmental behaviour—A meta-analysis. *Global Environmental Change, 23*(5), 1028-1038.

Kothari, C. R. (2004). *Research methodology: Methods and techniques*: New Age International.

Krystallis, A., Vassallo, M., & Chryssohoidis, G. (2012). The usefulness of Schwartz's 'Values Theory' in understanding consumer behaviour towards differentiated products. *Journal of Marketing Management, 28*(11/12), 1438-1463. doi: 10.1080/0267257X.2012.715091

Lalonde, R., & Jackson, E. I. (2002). The New Environmental Paradigm Scale: Has It Outlived Its Usefulness. *The Journal of Environmental Education, 33*(4), 28-36.

Laroche, M., Bergeron, J. & Barbaro-Forleo, G. (2001). Targeting consumers who are willing to pay more for environmentally friendly products. *Journal of Consumer Marketing, 18* (6), 503-520.

Larson, K. L. (2010). An Integrated Theoretical Approach to Understanding the Sociocultural Basis of Multidimensional Environmental Attitudes. *Society & Natural Resources: An International Journal, 23*(9), 898-907.

Lea, E., & Worsley, A. (2008). Australian consumers' food-related environmental beliefs and behaviours. *Appetite, 50*(2), 207-214.

Lee, Y.-k., Kim, S., Kim, M.-s., & Choi, J.-g. (2014). Antecedents and interrelationships of three types of pro-environmental behavior. *Journal of Business Research, 67*(10), 2097-2105. doi: http://dx.doi.org/10.1016/j.jbusres.2014.04.018

Lee, T. H., & Jan, F.-H. (2015). The Effects of Recreation Experience, Environmental Attitude, and Biospheric Value on the Environmentally Responsible Behavior of Nature-Based Tourists. *Environmental management, 56*(1), 193-208.

Li, Y., Muthu, S. S., Hu, J., Pik-Yin, M., Ding, X., Wang, L., & Chen, W. (2010). Eco-Impact of Shopping Bags: Consumer Attitude and Governmental Policies. *Journal of Sustainable Development, 3*(2), p71.

Lindeman, M., & Verkasalo, M. (2005). Measuring Values With the Short Schwartz's Value Survey. *Journal of Personality Assessment, 85*(2), 170-178. doi: 10.1207/s15327752jpa8502_09

Lindenberg, S., & Steg, L. (2007). Normative, Gain and Hedonic Goal Frames Guiding Environmental Behavior. *Journal of Social Issues, 63*(1), 117-137.

López, A. G., & Cuervo-Arango, M. A. (2008). Relationship among values, beliefs, norms and ecological behaviour. *Psicothema, 20*(4), 623-629.

Lorenzen, J. A. (2012). Going Green: The Process of Lifestyle Change. *Sociological Forum, 27*(1), 94-116.

Macorr Research Solutions (2015) Sample Size Calculator, Macorr Research Solutions Online. Available at http://www.macorr.com/sample-size-calculator.htm, 1 paragraph. [Accessed 15 January 2015].

Magnusson, M. K., Arvola, A., Hursti, U.-K. K., Åberg, L., & Sjödén, P.-O. (2003). Choice of organic foods is related to perceived consequences for human health and to environmentally friendly behaviour. *Appetite, 40*(2), 109-117.

Mannetti, L., Pierro, A., & Livi, S. (2004). Recycling: Planned and self-expressive behaviour. *Journal of Environmental Psychology, 24*(2), 227-236.

Maréchal, K. (2010). Not irrational but habitual: The importance of "behavioural lock-in" in energy consumption. *Ecological Economics, 69*(5), 1104-1114.

Martinello, N., & Donelle, L. (2012). Online conversations among Ontario university students: Environmental concerns. *Informatics for Health & Social Care, 37*(3), 177-189. doi: 10.3109/17538157.2012.678448

Mayer, F. S., & Frantz, C. M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology, 24*(4), 503–515.

McCarty, J. A., & Shrum, L. (2001). The influence of individualism, collectivism, and locus of control on environmental beliefs and behavior. *Journal of Public Policy & Marketing, 20*(1), 93-104.

McDonald, S., & Oates, C. J. (2006). Sustainability: Consumer Perceptions and Marketing Strategies. *Business Strategy and the Environment, 15*(3), 157–170.

McDougle, L. M., Greenspan, I., & Handy, F. (2011). Generation green: understanding the motivations and mechanisms influencing young adults' environmental volunteering. *International Journal of Nonprofit and Voluntary Sector Marketing, 16*(4), 325-341.

Milfont, T. L., & Duckitt, J. (2010). The environmental attitudes inventory: A valid and reliable measure to assess the structure of environmental attitudes. *Journal of Environmental Psychology, 30*(1), 80-94.

Mogale City Local Municipality (2015) Water Conservation Campaign, Mogale City Local Municipality. Available at http://www.mogalecity.gov.za/news-archive/2015-news/212-may/812-water-conservation-campaign, 5 paragraphs. [Accessed 10 April 2015].

Monroe, M. C. (2003). Two Avenues for Encouraging Conservation Behaviors. *Research in Human Ecology, 10*(2), 113-125.

Montgomery, C., & Stone, G. (2009). Revisiting consumer environmental responsibility: A five nation cross cultural analysis and comparison of consumer ecological opinions and behaviors. *International Journal of Management and Marketing Research, 2*(1), 35-58.

Mostafa, M. M. (2007a). Gender differences in Egyptian consumers' green purchase behaviour: the effects of environmental knowledge, concern and attitude. *International Journal of Consumer Studies, 31*(3), 220-229. doi: 10.1111/j.1470-6431.2006.00523.x

Mostafa, M. M. (2007b). A hierarchical analysis of the green consciousness of the Egyptian consumer. *Psychology & Marketing, 24*(5), 445-473. doi: 10.1002/mar.20168

Nargundkar, R. (2008). *Marketing Research: Texts and Cases*, 3rd edition. West Patel Nagar, New Delhi, Tata McGraw-Hill.

Newton, J., Newton, F., Salzberger, T., & Ewing, M. (2015). A cross-nationally validated decision-making model of environmental coaction. *International Marketing Review, 32*(3/4), 350-365.

Ngo, A.-T., West, G. E., & Calkins, P. H. (2009). Determinants of environmentally responsible behaviours for greenhouse gas reduction. *International Journal of Consumer Studies, 33*(2), 151-161.

Nkomo, J.C. (2005). Consumer choice in an energy efficient lighting context. *Journal of Energy in Southern Africa, 16*(2), 14-19.

Nordlund, A., & Garvill, J. (2002). Value structures behind proenvironmental behavior. *Environment and Behavior, 34*(6), 740-756.

Ohler, A. M., & Billger, S. M. (2014). Does environmental concern change the tragedy of the commons? Factors affecting energy saving behaviors and electricity usage. *Ecological Economics, 107*(C), 1-12. doi: 10.1016/j.ecolecon.2014.07.031

Ojea, E., & Loureiro, M. L. (2007). Altruistic, egoistic and biospheric values in willingness to pay (WTP) for wildlife. *Ecological Economics, 63*(4), 807-814.

Oliver, H., Volschenk, J., & Smit, E. (2011). Residential consumers in the Cape Peninsula's willingness to pay for premium priced green electricity. *Energy Policy, 39*(2), 544-550.

Olofsson, A., & Öhman, S. (2006). General Beliefs and Environmental Concern: Transatlantic Comparisons. *Environment and Behavior, 38*(6), 768-790. doi: 10.1177/0013916506287388

Onur, A., Sahin, E., & Tekkaya, C. (2012). An investigation on value orientations, attitudes and concern towards the environment: the case of Turkish elementary school students. *Environmental Education Research, 18*(2), 271-297. doi: 10.1080/13504622.2011.614690

Orange, E., & Cohen, A. M. (2010). From eco-friendly to eco-intelligent. *Futurist, 44*(5), 28-42.

Padel, S., & Foster, C. (2005). Exploring the gap between attitudes and behaviour: Understanding why consumers buy or do not buy organic food. *British Food Journal, 107*(8), 606-625.

Pagiaslis, A., & Krontalis, A. K. (2014). Green Consumption Behavior Antecedents: Environmental Concern, Knowledge, and Beliefs. *Psychology & Marketing, 31*(5), 335-348. doi: 10.1002/mar.20698

Paladino, A., & Ng, S. (2013). An examination of the influences on 'green' mobile phone purchases among young business students: an empirical analysis. *Environmental Education Research, 19*(1), 118-145.

Pallant, J. (2010). *SPSS survival manual: A step by step guide to data analysis using SPSS*. Berkshire, England: Open University Press.

Palmer J.A., Suggate, J., Bajd, B., Hart, P.,Ho, R.K.P., Ofwono-Orecho, J.K.W., Peries, M., Robottom, I., Tsaliki, E. & Van Staden, C. (1998). An Overview of Significant Influences and Formative Experiences on the Development of Adults' Environmental Awareness in Nine Countries. *Environmental Education Research, 4*(4), 445-464.

Parliamentary Monitoring Group (2013) Equity Index in South African Universities: Briefing by Deputy Minister of Higher Education and Training and the Transformation Oversight Committee, Parliamentary Monitoring Group. Available at https://pmg.org.za/committee-meeting/16621/, 95 paragraphs. [Accessed 9 November 2015].

Pinto, D. C., Nique, W. M., Añaña, E. d. S., & Herter, M. M. (2011). Green consumer values: how do personal values influence environmentally responsible water consumption? *International Journal of Consumer Studies, 35*(2), 122-131.

Poortinga, W., Steg, L., Vlek, C., & Wiersma, G. (2003). Household preferences for energy-saving measures: A conjoint analysis. *Journal of Economic Psychology*, *24*(1), 49-64.

Price, J. C., Walker, I. A., & Boschetti, F. (2014). Measuring cultural values and beliefs about environment to identify their role in climate change responses. *Journal of Environmental Psychology*, *37*(0), 8-20. doi: http://dx.doi.org/10.1016/j.jenvp.2013.10.001

Rahman, S., Haque, A., & Ahmad, M. I. S. (2011). Choice criteria for mobile telecom operator: empirical investigation among Malaysian customers. *International Management Review, 7*(1), 50-57.

Randolph, B., & Troy, P. (2008). Attitudes to conservation and water consumption. *Environmental Science & Policy*, *11*(5), 441-455. doi: http://dx.doi.org/10.1016/j.envsci.2008.03.003

Raymond, C. M., Brown, G., & Robinson, G. M. (2011). The influence of place attachment, and moral and normative concerns on the conservation of native vegetation: A test of two behavioural models. *Journal of Environmental Psychology, 31*(4), 323-335. doi: http://dx.doi.org/10.1016/j.jenvp.2011.08.006

Reijonen, S. (2011). Environmentally friendly consumer: from determinism to emergence. *International Journal of Consumer Studies, 35*(4), 403-409.

Ritch, E., Brennan, C., & MacLeod, C. (2009). Plastic bag politics: modifying consumer behaviour for sustainable development. *International Journal of Consumer Studies, 33*(2), 168-174.

Roberts, J.A., & Bacon, D.R. (1997). Exploring the Subtle Relationships between Environmental Concern and Ecologically Conscious Consumer Behavior. *Journal of Business Research, 40*(1), 79-89.

Rosario, G.-R. M., Carmen, D.-F. M., & Biagio, S. (2014). Values and corporate social initiative: An approach through Schwartz theory. *International Journal of Business & Society, 15*(1), 19-48.

Rousseau, G., & Venter, D. (2001). A multi-cultural investigation into consumer environmental concern. *SA Journal of Industrial Psychology, 27*(1), p. 1-7.

Royne, M. B., Levy, M., & Martinez, J. (2011). The Public Health Implications of Consumers' Environmental Concern and Their Willingness to Pay for an Eco-Friendly Product. *The Journal of Consumer Affairs, 45*(2), 329–343.

Ryan, A. M., & Spash, C. L. (2012). The Awareness of Consequences Scale: An Exploration, Empirical Analysis, and Reinterpretation. *Journal of Applied Social Psychology, 42*(10), 2505–2540.

Saba, A., & Messina, F. (2003). Attitudes towards organic foods and risk/benefit perception associated with pesticides. *Food quality and preference, 14*(8), 637-645.

Sahin, E. (2013). Predictors of Turkish Elementary Teacher Candidates' Energy Conservation Behaviors: An Approach on Value-Belief-Norm Theory. *International Journal of Environmental & Science Education, 8*(2), 269-283.

Said, A. M., Ahmadun, F. l.-R., Paim, L. H., & Masud, J. (2003). Environmental concerns, knowledge and practices gap among Malaysian teachers. *International Journal of Sustainability in Higher Education, 4*(4), 305-313.

Salvaggio, M., Futrell, R., Batson, C. D., & Brents, B. G. (2013). Water scarcity in the desert metropolis: how environmental values, knowledge and concern affect Las Vegas residents' support for water conservation policy. *Journal of Environmental Planning and Management, 57*(4), 588-611. doi: 10.1080/09640568.2012.756806

Samarasinghe, R. (2012). Is Social Psychological Model Sufficient: Empirical Research Gaps for Understanding Green Consumer Attitudinal Behaviour. *International Journal of Advanced Research in Management and Social Sciences, 1*(4), 28-54.

Save the Rhino (2015) Poaching Crisis in South Africa, Save the Rhino. Available at https://www.savetherhino.org/rhino_info/thorny_issues/poaching_crisis_in_south_africa, 12 paragraphs. [Accessed 10 April 2015].

Schaffrin, A. (2011). No Measure without Concept. A Critical Review on the Conceptualization and Measurement of Environmental Concern. *International Review of Social Research, 1*(3), 11-31.

Scherbaum, C. A., Popovich, P. M., & Finlinson, S. (2008). Exploring Individual-Level Factors Related to Employee Energy-Conservation Behaviors at Work. *Journal of Applied Social Psychology, 38*(3), 818-835.

Schultz, P. W. (2000). Empathizing With Nature: The Effects of Perspective Taking on Concern for Environmental Issues. *Journal of Social Issues, 56*(3), 391-406.

Schultz, P. W. (2001). The structure of environmental concern: Concern for self, other people, and the biosphere. *Journal of Environmental Psychology, 21*(4), 327-339.

Schultz, P. W., Gouveia, V. V., Cameron, L. D., Tankha, G., Schmuck, P., & Franek, M. (2005). Values and their Relationship to Environmental Concern and Conservation Behavior. *Journal of Cross-Cultural Psychology, 36*(4), 457-475.

Schultz, P. W., Shriver, C., Tabanico, J. J., & Khazian, A. M. (2004). Implicit connections with nature. *Journal of Environmental Psychology, 24*(1), 31-42.

Schultz, P. W., & Zelezny, L. (1999). Values as predictors of environmental attitudes: Evidence for consistencyacross 14 countries. *Journal of Environmental Psychology, 19*(3), 255-265.

Schwartz, S. H., & Bilsky, W. (1990). Toward a theory of the universal content and structure of values: Extensions and cross-cultural replications. *Journal of Personality and Social Psychology, 58*(5), 878.

Shrikanth, R., & Raju, D. S. N. (2012). Contemporary green marketing–brief reference to Indian scenario. *International Journal of Social Sciences & Interdisciplinary Research, 1*(1), 26-39.

Simon, D. (2010). The challenges of global environmental change for urban Africa. *In Urban Forum, 21* (3), 235-248.

Slimak, M. W., & Dietz, T. (2006). Personal Values, Beliefs, and Ecological Risk Perception. *Risk Analysis, 26*(6), 1689-1705.

Snelgar, R. S. (2006). Egoistic, altruistic, and biospheric environmental concerns: Measurement and structure. *Journal of Environmental Psychology, 26*(2), 87-99.

Sonnenberg, N. C., Erasmus, A. C., & Donoghue, S. (2011). Significance of environmental sustainability issues in consumers' choice of major household appliances in South Africa. *International Journal of Consumer Studies, 35*(2), 153-163. doi: 10.1111/j.1470-6431.2010.00964.x

Soyez, K. (2012). How national cultural values affect pro-environmental consumer behavior. *International Marketing Review, 29*(6), 623-646. doi: http://dx.doi.org/10.1108/02651331211277973

Stakhovych, S., Bijmolt, T. H. A., & Wedel, M. (2012). Spatial Dependence and Heterogeneity in Bayesian Factor Analysis: A Cross-National Investigation of Schwartz Values. *Multivariate Behavioral Research, 47*(6), 803-839. doi: 10.1080/00273171.2012.731927

Statistics South Africa (2015) Mid-year population estimates 2015, Statistics South Africa. Available at https://www.statssa.gov.za/publications/P0302/P03022015.pdf, p. 1-18. [Accessed 9 November 2015].

Steg, L. (2008). Promoting household energy conservation. *Energy Policy, 36*(12), 4449-4453. doi: http://dx.doi.org/10.1016/j.enpol.2008.09.027

Steg, L., Bolderdijk, J. W., Keizer, K., & Perlaviciute, G. (2014). An Integrated Framework for Encouraging Pro-environmental Behaviour: The role of values, situational factors and goals. *Journal of Environmental Psychology, 38*(0), 104-115. doi: http://dx.doi.org/10.1016/j.jenvp.2014.01.002

Steg, L., De Groot, J. I. M., Dreijerink, L., Abrahamse, W., & Siero, F. (2011). General Antecedents of Personal Norms, Policy Acceptability, and Intentions: The Role of Values, Worldviews, and Environmental Concern. *Society & Natural Resources, 24*(4), 349-367. doi: 10.1080/08941920903214116

Steg, L., Dreijerink, L., & Abrahamse, W. (2005). Factors influencing the acceptability of energy policies: A test of VBN theory *Journal of Environmental Psychology 25*(4), 415-425.

Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology, 29*(3), 309–317.

Stern, P. C. (2000). Toward a Coherent Theory of Environmentally Significant Behavior. *Journal of Social Issues, 56*(3), 407–424.

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A Value-Belief-Norm Theory of Support for Social Movements: The Case of Environmentalism. *Research in Human Ecology, 6*(2), 81-97.

Stigter, C. J., & Ofori, E. (2014). What climate change means for farmers in Africa: A Triptych Review Middle Panel: Introductional Matters and Consequences of Global Warming for African Farmers. *African Journal of Food, Agriculture, Nutrition & Development, 14*(1), 8428-8444.

Sütterlin, B., Brunner, T. A., & Siegrist, M. (2011). Who puts the most energy into energy conservation? A segmentation of energy consumers based on energy-related behavioral characteristics. *Energy Policy, 39*(12), 8137-8152. doi: http://dx.doi.org/10.1016/j.enpol.2011.10.008

Tan, B.-C., Hong, Y.-H., & Lam, W.-H. (2015). The Influence of Environmental Values on Green Purchase Behaviour: Direct, Indirect, or Both? *International Journal of Business and management, 10*(12), 234-248.

Thøgersen, J., & Crompton, T. (2009). Simple and painless? The limitations of spillover in environmental campaigning. *Journal of Consumer Policy, 32*(2), 141-163.

Tsakiridou, E., Boutsouki, C., Zotos, Y., & Mattas, K. (2008). Attitudes and behaviour towards organic products: an exploratory study. *International Journal of Retail & Distribution Management, 36*(2), 158-175.

Turaga, R. M. R., Howarth, R. B., & Borsuk. (2010). Pro-environmental behavior: Rational choice meets moral motivation. *Annals of the New York Academy of Sciences, 1185*(1), 211-224.

Van Riper, C. J., & Kyle, G. T. (2014). Understanding the internal processes of behavioral engagement in a national park: A latent variable path analysis of the value-belief-norm theory. *Journal of Environmental Psychology, 38*, 288-297.

Vermeir, I., & Verbeke, W. (2008). Sustainable food consumption among young adults in Belgium: Theory of planned behaviour and the role of confidence and values. *Ecological Economics, 64*(3), 542-553.

Wang, J., Yam, R. C. M., & Tang, E. P. Y. (2013). Ecologically conscious behaviour of urban Chinese consumers: the implications to public policy in China. *Journal of Environmental Planning and Management, 56*(7), 982-1001.

Wells, V. K., Ponting, C. A., & Peattie, K. (2011). Behaviour and climate change: Consumer perceptions of responsibility. *Journal of Marketing Management, 27*(7-8), 808-833.

Welman, C., Kruger, F. and Mitchell, B. (2005) *Research Methodology*, 3rd edition. Cape Town, South Africa: Oxford Southern Africa.

Whitmarsh, L., & O'Neill, S. (2010). Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours. *Journal of Environmental Psychology, 30*(3), 305-314.

Wray-Lake, L., Flanagan, C. A., & Osgood, D. W. (2010). Examining Trends in Adolescent Environmental Attitudes, Beliefs, and Behaviors Across Three Decades. *Environment and Behavior, 42*(1), 61-85. doi: 10.1177/0013916509335163

Wright, K. B. (2005). Researching Internet-Based Populations: Advantages and Disadvantages of Online Survey Research, Online Questionnaire Authoring Software Packages, and Web Survey Services. *Journal of Computer-Mediated Communication, 10*(3), 00-00. doi: 10.1111/j.1083-6101.2005.tb00259.x

Wynveen, C. J., Connally, W. D., & Kyle, G. T. (2013). Pro-environmental Behavior in Marine Protected Areas: The Cases of the Great Barrier Reef Marine Park and the Florida Keys National Marine Sanctuary. *Journal of Park and Recreation Administration, 31*(2), 28-49.

Xing, X. (2009). Study on the ban on free plastic bags in China. *Journal of Sustainable Development, 2*(1), P156.

Young, W., Hwang, K., McDonald, S., & Oates, C. J. (2010). Sustainable Consumption: Green Consumer Behaviour when Purchasing Products. *Sustainable Development, 18*(1), 20-31.

Zelezny, L. C., Chua, P.-P., & Aldrich, C. (2000). Elaborating on Gender Differences in Environmentalism. *Journal of Social Issues, 56*(3), 443–457.

Zhou, M. (2013). A Multidimensional Analysis of Public Environmental Concern in Canada. *Canadian Review of Sociology, 50*(4), 453-481. doi: 10.1111/cars.12028

Ziaei-Bideh, A., & Namakshenas-Jahromi, M. (2014). Explaining effective factors on consumers willingness to pay more for buying green products based on the Value-Belief-Norm theory. *The Open Access Journal of Resistive Economics (OAJRE)/Green Economics*, *3*(15).

Appendices

1. Frequencies and Means Tables

1.1. Egoistic Values

Egoistic Values	***Importance: Frequencies & Means***																
	1 (No importance)		*2*		*3*		*4*		*5*		*6*		*7 (Supreme importance)*		*Total*		***Mean Value***
	Freq	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	
My Health	7	1.8	2	0.5	4	1.0	18	4.7	42	10.9	56	14.5	257	66.6	386	100	**6.32**
My Future	7	1.8	4	1.0	5	1.3	10	2.6	17	4.4	67	17.4	276	71.5	386	100	**6.45**
My Lifestyle	7	1.8	4	1.0	11	2.8	37	9.6	64	16.6	111	28.8	152	39.4	386	100	**5.82**
My Prosperity	9	2.3	3	0.8	13	3.4	33	8.6	62	16.1	88	22.9	177	46.0	385	99.7	**5.88**
Me	5	1.3	4	1.0	6	1.6	15	3.9	26	6.7	54	14.0	276	71.5	386	100	**6.42**

1.2. Altruistic Values

Altruistic Values	***Importance: Frequencies & Means***																
	1 (No importance)		*2*		*3*		*4*		*5*		*6*		*7 (Supreme importance)*		*Total*		***Mean Value***
	Freq	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	
Children	18	4.7	7	1.8	11	2.8	19	4.9	40	10.4	65	16.8	226	58.5	386	100	**5.99**
Humanity	6	1.6	5	1.3	5	1.3	40	10.4	65	16.8	102	26.4	163	42.2	386	100	**5.88**
People in the Community	4	1.0	9	2.3	15	3.9	44	11.4	69	17.9	105	27.2	140	36.3	386	100	**5.69**
Future Generations	5	1.3	4	1.0	9	2.3	29	7.5	47	12.2	89	23.1	203	52.6	386	100	**6.08**
My Children	13	3.4	3	0.8	5	1.3	8	2.1	28	7.3	54	14.0	275	71.2	386	100	**6.36**

1.3. Biospheric Values

Biospheric Values	***Importance: Frequencies & Means***																
	1 (No importance)		*2*		*3*		*4*		*5*		*6*		*7 (Supreme importance)*		*Total*		***Mean Value***
	Freq	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	
Marine Life	17	4.4	27	7.0	43	11.1	68	17.6	94	24.4	66	17.1	71	18.4	386	100	**4.75**
Plants	6	1.6	4	1.0	21	5.4	57	14.8	79	20.5	89	23.1	130	33.7	386	100	**5.55**
Animals	9	2.3	7	1.8	17	4.4	44	11.4	80	20.7	100	25.9	129	33.4	386	100	**5.58**
Trees	6	1.6	8	2.1	17	4.4	57	14.8	65	16.8	87	22.5	146	37.8	386	100	**5.62**
Birds	18	4.7	15	3.9	34	8.8	62	16.1	84	21.8	83	21.6	89	23.1	385	99.7	**5.04**

1.4. Environmental Behaviour

Environmental Behaviour	***Frequencies & Means***										
	(Never)		*(Sometimes)*		*(Often)*		*(Always)*		*Total*		***Mean Value***
	Freq	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	
Recycling glass, paper etc.	102	26.4	204	52.8	57	14.8	23	6.0	386	100	**2.00**
Reusing empty bottles or containers	14	3.6	86	22.3	153	39.6	133	34.5	386	100	**3.05**
Using own shopping bag instead of plastic bags	65	16.8	152	39.4	91	23.6	78	20.2	386	100	**2.47**
Closing tap while washing dishes or brushing teeth	6	1.6	75	19.4	96	24.9	209	54.1	386	100	**3.32**
Having a shower rather than a bath	25	6.5	76	19.7	58	15.0	227	58.8	386	100	**3.26**
Switching off unnecessary lights at home	9	2.3	93	24.1	110	28.5	174	45.1	386	100	**3.16**
Switching off electrical appliances that are not being used	7	1.8	90	23.3	107	27.7	182	47.2	386	100	**3.20**
Supporting the 'Save the Rhino' campaign	158	40.9	110	28.5	56	14.5	62	16.1	386	100	**2.06**
Purchasing organic products	74	19.2	223	57.8	64	16.6	25	6.5	386	100	**2.10**
Purchasing green products e.g. energy saving light bulbs	45	11.7	159	41.3	108	28.1	73	19.0	385	99.7	**2.54**
Purchasing locally produced products	12	3.1	177	45.9	131	33.9	66	17.1	386	100	**2.65**

1.5. Environmental Beliefs

Environmental Beliefs	***Frequencies & Means***												
	Strongly Disagree		*Disagree*		*Neutral*		*Agree*		*Strongly Agree*		*Total*		***Mean Value***
	Freq	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	
When humans interfere with nature it often produces disastrous consequences	6	1.6	10	2.6	80	20.7	172	44.6	118	30.6	386	100	**4.00**
****The balance of nature is strong enough to cope with the impacts of modern industrial nations**	52	13.5	152	39.4	106	27.5	62	16.1	14	3.6	386	100	**3.43**
Plants and animals have as much right as humans to exist	15	3.9	21	5.4	56	14.5	119	30.8	175	45.3	386	100	**4.08**
****The so-called "ecological crisis" facing humankind has been greatly exaggerated**	42	10.9	131	33.9	141	36.5	60	15.5	12	3.1	386	100	**3.34**
The balance of nature is very delicate and easily upset	3	0.8	17	4.4	105	27.3	179	46.5	81	21.0	385	99.7	**3.83**
****Humans have the right to modify the natural environment to suit their needs**	47	12.2	112	29.0	115	29.8	76	19.7	36	9.3	386	100	**3.15**
If things continue on their present course we will soon experience a major ecological catastrophe	8	2.1	15	3.9	68	17.6	147	38.1	148	38.3	386	100	**4.07**
****Humans were meant to rule over the rest of nature**	81	21.0	84	21.8	88	22.9	74	19.2	58	15.1	385	99.7	**3.15**

Degradation of the environment has negative consequences for humanity	5	1.3	8	2.1	71	18.4	148	38.3	154	39.9	386	100	**4.13**
It is important to be seen to be caring for the environment	7	1.8	16	4.2	70	18.2	150	39.0	142	36.9	385	99.7	**4.05**
****Caring for the environment is a private responsibility**	58	15.0	105	27.2	82	21.2	89	23.1	52	13.5	386	100	**3.07**
****Being active with regards to environmental protection gains you social status**	31	8.0	78	20.2	137	35.5	104	26.9	36	9.3	386	100	**2.91**

**Negatively worded beliefs

2. Informed Consent Form

UNIVERSITY OF KWAZULU-NATAL
School of Management, IT and Governance

Dear Respondent,

M Com Research Project

Researcher: Treneya Reddy (Tel No. 076 751 9424)

Supervisor: Professor Debbie Vigar-Ellis (Tel No. 033 260 5899)

Research Office: Mariette Snyman (Tel No. 031 260 8350)

I, Treneya Camilla Reddy am a Masters student in the School of Management, IT and Governance, at the University of KwaZulu-Natal. You are invited to participate in a research project entitled *Egoistic, Altruistic and Biospheric Concerns and Environmental Behaviour of Young Adults.*

The aim of this study is to: Determine the environmental concerns and environmental behavior of young adults.

Through your participation I hope to understand the relationships that exist between one's environmental concerns and their environmental behavior. The results of this survey is intended to contribute to the field of environmental marketing.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. Every student who participates in this research stands a chance to win a gift voucher. Confidentiality and anonymity of records identifying you as a participant will be maintained by the School of Management, IT and Governance, UKZN.

If you have any questions or concerns about participating in this study, please contact me or my supervisor at the numbers listed above.

It should take you about 2 minutes to complete the questionnaire. I hope you will take the time to complete the questionnaire.

Sincerely

Investigator's signature : Treneya Reddy Date : 10/07/2015

This page is to be retained by participant

UNIVERSITY OF KWAZULU-NATAL
School of Management, IT and Governance

M Com Research Project

Researcher: Treneya Camilla Reddy (Tel No. 076 751 9424)

Supervisor: Professor Debbie Vigar-Ellis (Tel No. 033 260 5899)

Research Office: Mariette Snyman (Tel No. 031 260 8350)

CONSENT

I _____ (full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

_____ _____

Signature of Participant Date

This page is to be returned by researcher

3. Questionnaire

Environmental Concern and Behaviour Questionnaire

1. **Please rate the following items by simply inserting an X in the appropriate box from <u>1 (No Importance) to 7 (Supreme Importance)</u> in response to the question:**

<u>I am concerned about environmental problems because of the consequences for:</u>

	1	2	3	4	5	6	7
My Health							
Marine Life							
Children							
My Future							
Humanity							
Plants							
People in the community							
My Lifestyle							
Animals							
Future Generations							
My Prosperity							
Trees							
Me							
My Children							
Birds							

2. **Please indicate how often you perform the following environmental behaviours (Always, Often, Sometimes or Never) by inserting an X in the appropriate box:**

	Always	Often	Sometimes	Never
Recycle glass, paper etc.				
Reuse empty bottles or containers				
Use your own shopping bag instead of buying plastic shopping bags				
Close the tap while washing dishes or brushing teeth				
Have a shower rather than a bath				
Switch off unnecessary lights at home				
Switch off electrical appliances that are not being used				
Support the 'Save the Rhino' environmental campaign				
Purchase organic products				
Purchase green products e.g. energy saving light bulbs				
Purchase locally produced products				

3. **Please indicate your level of agreement with the following statements by inserting an X into the appropriate box:**

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
When humans interfere with nature it often produces disastrous consequences.					
The balance of nature is strong enough to cope with the impacts of modern industrial nations.					
Plants and animals have as much right as humans to exist.					
The so-called "ecological crisis" facing humankind has been greatly exaggerated.					
The balance of nature is very delicate and easily upset.					
Humans have the right to modify the natural environment to suit their needs.					
If things continue on their present course, we will soon experience a major ecological catastrophe.					
Humans were meant to rule over the rest of nature.					
Degradation of the environment has negative consequences for humanity					
It is important to be seen to be caring for the environment.					
Caring for the environment is a private responsibility					
Being active with regards to environmental protection gains you social status.					

4. **Please complete the following demographic information by inserting an X in the appropriate box:**

Age:	18	19	20	21	22	Other (Please specify)

Race:	Black	White	Indian	Coloured	Other(Please specify)

Gender	Male	Female

Degree being studied (please specify)	

Thank you!

4. Ethical Clearance Letter

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

07 July 2015

Ms Treneya Camilla Reddy (209512601)
School of Management, IT & Governance
Pietermaritzburg

Dear Ms Reddy,

Protocol reference number: HSS/0639/015M
Project title: Egoistic, Altruistic and Biospheric concerns and environmental behaviour of young adults

Full Approval – Expedited Application

In response to your application received on 03 June 2015, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol have been granted **FULL APPROVAL.**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Dr Shenuka Singh (Chair)

/ms

Cc Supervisor: Professor Debbie Vigar-Ellis
Cc Academic Leader Research: Professor Brian McArthur
Cc School Administrator: Ms Debbie Cunynghame

Humanities & Social Sciences Research Ethics Committee
Dr Shenuka Singh (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Telephone: +27 (0) 31 260 3587/8350/4557 **Facsimile:** +27 (0) 31 260 4609 **Email:** ximbap@ukzn.ac.za / snymanm@ukzn.ac.za / mohunp@ukzn.ac.za
Website: www.ukzn.ac.za