

Environmental Concern, Race and Socio-Economic Status in Post-Apartheid South Africa, 1996-2006

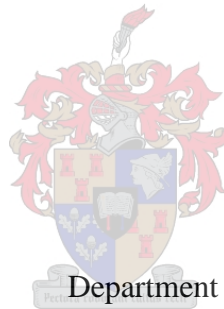
by

Sean Edward Beckett

*Thesis presented in partial fulfilment of the requirements for the
degree of Master of Arts in the faculty Arts and Social Sciences*

at

Stellenbosch University



Department of Sociology and Social Anthropology

Faculty of Arts and Social Sciences

Supervisor: Dr H.E. Prozesky

Co-supervisor: Mr J.H. Vorster

December 2013

Declaration

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Date: 8 November 2013

Abstract

This thesis examines longitudinally the nature of environmental concern in post-apartheid South Africa. During the years of colonialism and apartheid, environmental policy making and implementation was characterised by environmental racism that focused on ecocentric notions of nature conservation and protection, to the exclusion of black, coloured and Asian South Africans. The post-apartheid government has attempted to rectify the exclusion of black people from environmental rights, by enshrining in the Bill of Rights the right to an environment that is not harmful to South Africans' health or well-being. In light of the Bill of Rights unique political and practical implementation in South Africa, and on the basis of a comprehensive review of the empirical and theoretical literature on environmental concern, two hypotheses were formulated for testing in this thesis. The first, which is informed by an environmentalism of the poor or "empty-belly environmentalism" theory, proposes that South Africans have become more environmentally concerned since the end of apartheid. The second hypothesis is informed by the post-materialist thesis, and examines whether controlling for socio-economic status eliminates difference in environmental concern amongst the various race groups. The research design applied in this thesis is a longitudinal analysis of secondary data, in particular World Values Survey data. The results of this analysis led to a rejection of the first hypotheses, and a partial rejection of the second hypothesis. Additionally, the results reveal that since 1996 environmental concern has become less influenced by race and class. The thesis also contributes methodologically to future research on environmental concern, by raising concerns about the operationalisation and conceptualisation of environmental concern in the World Values Survey.

Opsomming

Hierdie tesis ondersoek die aard van omgewingsbesorgdheid in post-apartheid Suid-Afrika. Gedurende die jare van kolonialisme en apartheid was beleidmaking en -implementering gekenmerk deur omgewingsrassisme wat op ekosentriese opvattinge van natuurbewaring en -beskerming gefokus het. Dit het tot die uitsluiting van swart, bruin en Asiatiese Suid-Afrikaners gelei. Die post-apartheid regering het gepoog om hierdie groot ongelykhede reg te stel, deur die reg tot 'n omgewing wat nie skadelik vir hul gesondheid of welsyn is nie, vas te lê in die Handves van Menseregte. In die lig van hierdie omgewingsbeleidspunte se unieke politieke en praktiese implementering in Suid-Afrika, en op grond van 'n omvattende oorsig van die empiriese en teoretiese literatuur oor omgewingsbesorgdheid, is twee hipoteses in hierdie tesis getoets. Die eerste hipotese, waaraan 'n omgewingsbewustheid van die armes of "leë maag omgewingsbewustheid"-teorie gestalte verleen het, voer aan dat Suid-Afrikaners sedert die einde van apartheid meer omgewingsbesorgd geword het. Die tweede hipotese, wat voortvloei uit die post-materialistiese tesis, ondersoek of die verskil tussen die rasgroepe in terme van omgewingsbesorgdheid verdwyn as hulle sosio-ekonomiese status konstant gehou word. Die navorsingsontwerp van hierdie tesis is 'n longitudinale ontleding van sekondêre data. Die resultate van hierdie analise onthul dat omgewingsbesorgdheid sedert 1996 minder volgens ras en klas gestruktureer word; buitendien is die eerste hipotese verwerp en die tweede hipotese gedeeltelik verwerp. Hierdie resultate het kommer oor die operasionalisering en konseptualisering van omgewingsbesorgdheid in die "World Values Survey" gewek.

Acknowledgments

I would like to acknowledge the very important role of Dr H.E. Prozesky and Mr J.H. Vorster in supervising my thesis and thank them for their patience and guidance. I am grateful to Kathryn for her love, support and her reading and editing of many versions of this manuscript. I would also like to thank the following people for their support over the years: my mother and grandmother, Linda, Kevin and Rose. I dedicate this thesis to my Grandfather who passed away in 2003 and without whom I would never have started this journey.

Table of contents

CHAPTER 1: INTRODUCTION	1
1.1 Introduction	1
1.2 Background and rationale	1
1.3 Aims and objectives	4
1.4 Outline of research strategy	5
1.5 Structure of the thesis	5
CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK	6
2.1 Introduction	6
2.2 Conceptualising environmental concern	6
2.2.1 Behaviour in relation to the environment	9
2.2.2 Findings of environmental concern research in South Africa	11
2.3 Environmental concern, race and SES	14
2.3.1 Historical context	14
2.3.2 Green issues in post-apartheid South Africa	16
2.3.3 Brown issues in post-apartheid South Africa	18
2.3.4 Red issues in environmental management	21
2.3.5 Race and environmental concern	22
2.3.6 SES and environmental concern	25
2.3.6.1 Income and environmental concern	26
2.3.6.2 Educational attainment and environmental concern	27
2.3.6.3 Occupational class and environmental concern	29
2.4 Theoretical framework	30
2.4.1 Post-materialist thesis	30
2.4.2 Environmentalism of the poor	32
2.5 Conclusion	33
CHAPTER THREE: METHODOLOGY	35
3.1 Introduction	35
3.2 Research design: Secondary analysis	35
3.3 Time dimension: Longitudinal analysis	38
3.4 The WVS as data source	40
3.4.1 Rationale for using the WVS	40
3.5 Conceptualisation and operationalisation of variables	42
3.5.1 Outcome variable: Environmental concern	42
3.5.2 The measurement of environmental concern	42
3.5.3 The environmental concern index of the WVS	44
3.5.3.1 The 1996 wave	44
3.5.3.2 The 2001 wave	44
3.5.3.3 The 2006 wave	46
3.5.3.4 Limitations of the WTPEP index and constraints on the thesis	46

3.5.4	Environmental concern in a cross-cultural context	49
3.6	Predictor variables: Race and SES	53
3.6.1	Socio-economic status	54
3.6.1.1	Commonly accepted measures of SES in the South African context	55
3.6.1.2	The measurement of socio-economic status in the WVS	57
3.6.1.3	Validation of SES measures	58
3.6.2	Limitations of the measurement of SES	60
3.6.3	Race	61
3.7	Population and sampling	62
3.8	Data analysis methods and techniques	65
3.8.1	Correlation	65
3.8.2	Independent samples t-test	66
3.8.3	Regression analysis	66
3.9	Ethical considerations	67
3.10	Conclusion	67
CHAPTER 4: RESULTS		69
4.1	Introduction	69
4.2	Testing Hypothesis I: Increase in environmental concern since 1996	69
4.2.1	Results of analysis	69
4.2.2	Discussion of results	71
4.3	Testing hypothesis II: Race, SES and environmental concern	72
4.3.1	Wave I: The 1996 study	72
4.3.1.1	The relationship between race and SES	72
4.3.1.2	Sampling	74
4.3.1.3	The relationship between race, SES and environmental concern	76
4.3.2	Wave II: The 2001 study	79
4.3.2.1	The relationship between race and SES	79
4.3.2.2	Sampling	80
4.3.2.3	The relationship between race, SES and environmental concern	81
4.3.3	Wave III: The 2006 study	83
4.3.3.1	The relationship between race and SES	83
4.3.3.2	Sampling	84
4.3.3.3	The relationship between race and environmental concern	85
4.3.4	Discussion of results	87
4.4	Conclusion	88
CHAPTER 5: DISCUSSION		90
5.1	Post-materialist thesis	90
5.2	Environmentalism of the poor	92
5.3	Reflections on the limitations of the WVS	93
5.4	Recommendations	95
5.5	Conclusion	96
REFERENCES		98

List of tables

Table 1: Items in WTPEP index: 1996, 2001 and 2006	39
Table 2: Summary of exploratory factor analysis of the WTPEP index, 1996.....	44
Table 3: Summary of exploratory factor analysis of the WTPEP index, 2001.....	45
Table 4: Summary of exploratory factor analysis of the WTPEP index, 2006.....	46
Table 5: Modification to occupational schema of the WVS to create a social class item	58
Table 6: Correlation matrix for SES indicators for all 3 waves.....	59
Table 7: Summary of exploratory factor analysis of SES indicators for all three waves	59
Table 8: Results on the two indicators that comprised the WTPEP index in 1996	69
Table 9: Results on the three indicators that comprised the WTPEP index in 2001 and 2006	70
Table 10: Descriptive statistics of the WTPEP index, 1996 to 2006.....	71
Table 11: Correlation matrix for relationship between race and SES	74
Table 12: Comparison of 1996 Census data with the weighted sample of the 1996 WVS wave	75
Table 13: Simple regression results for individual predictors on the WTPEP index	77
Table 14: Multiple regression results for predictors on the WTPEP	78
Table 15: Correlation matrix for relationship between race and SES	80
Table 16: Comparison of 2001 Census data with the weighted sample of the 2001 wave of the WVS.....	80
Table 17: Simple regression results for individual predictors on the WTPEP index	82
Table 19: Correlation matrix for relationship between race and SES	84
Table 20: Comparison of South Africa's Population data with the weighted sample of the 2006 wave of the WVS	85
Table 21: Simple-regression results for individual predictors on the WTPEP index	86
Table 22: Multiple regression results for predictors on the WTPEP.....	87

List of figures

Figure 1: Boxplot of the relationship between race and SES in 1996	73
Figure 2: Boxplot of racial groups' WTPEP scores in 1996	76
Figure 3: Boxplot of the relationship between race and SES in 2001	79
Figure 4: Boxplot of racial groups' WTPEP scores in 2001	81
Figure 5: Boxplot of the relationship between race and SES in 2006	83
Figure 6: Boxplot of racial groups' WTPEP scores in 2006	86

CHAPTER 1: INTRODUCTION

1.1 Introduction

Section 24 of South Africa's Bill of Rights outlines the right of each South African to an environment that is not harmful to their health or well-being, as well as the right to ecologically sustainable development (Republic of South Africa, 2009). Unfortunately, for the majority of South Africans this has not been achieved, as illustrated by Thabo Mbeki's 1997 State of the Nation Address during which he equated poverty with an environment of squalor, stench, decaying rot and carelessly abandoned refuse (Gibson, Ismail, Kilian & Matshikiza, 2008:178). After drawing this parallel, former President Mbeki further likened prosperity to tidy streets, wooded lanes and blossoms offsetting the green, singing grass. His is a view that paints a picture of the vast disparities in the experiences of South Africans when they encounter the natural and urban environment. The role of apartheid in manufacturing these disparities is alluded to by McDonald (2002:1) and Rossouw and Wiseman (2004:131) in their identification of the history of South African environmental policy as cruel and perverse. During the years of the apartheid regime many black South Africans were forcibly removed from their ancestral lands, to make way for nature conservation, and relocated to townships that lacked adequate food, shelter and clean water. At the same time the government spent billions of Rands on preserving wildlife and protecting wildflowers for the enjoyment of white people. The repercussions of such policy making and institutional action continue to reverberate through South African society's understanding and experience of the natural environment that surrounds them. If South Africa is to develop a sustainable future for all, this division needs to be addressed. The effect of this environmental racism, particularly the manner in which it may have impacted upon South Africans' concern for the environment, is the central theme of this thesis.

1.2 Background and rationale

This section will provide a brief discussion of the historical context of environmental management in South Africa, which will be elaborated upon in more detail in Chapter 2. Thereafter, the motivation behind this project is discussed. And lastly, the significance of a study of environmental concern on South Africa is examined.

Beinart and Coates (1995:72) and Khan (2002:17) argue that the establishment of conservation policies in South Africa mirrored those of the United States of America (USA),

as in both countries it was members of the well-educated, affluent upper and middle classes who established whites-only wildlife protection and landscape preservation organisations. Consequently, both the USA and South Africa's early conservation movements protected nature solely for the purposes of the privileged, such as recreational hunting and tourism (Beinart & Coates, 1995). These practices may be labelled as environmental racism.

Environmental racism is a notion that emerged in the 1960s American civil rights movement, in black churches and among grassroots activists who shared the perception that racism was at the heart of social policy, housing and urban environmental management (Ruiters, 2002:114). This is similar to the South African context to the colonial and apartheid era, when South Africa, the dominant environmental ideology was characterised by a wildlife-centred, preservationist approach which principally appealed to wealthy, educated, white South Africans (Khan, 2002:15). Through the adoption of such an ideology, the conservation movement tended to alienate the majority of black South Africans from what was widely perceived as an elitist concern, nonessential to their daily struggle for survival (Khan, 1990b, as cited in Khan, 2002:15 & Cock, 1991:14). This alienation of blacks from the environmental movement was compounded by the collective effect of racially discriminatory laws and punitive conservation regulations which led to increased hostility among black South Africans towards what was the mainstream conservation movement's definition of conservation issues (Khan, 1990a, as cited in Khan, 2002:16). The norms of environmental concern at the time continued, in part, to be drawn along racial lines throughout late apartheid and the early years of post-apartheid South Africa. Therefore the concept of environmental racism that was formulated in America in the 1960s may be useful to understand the way South Africans' experience of the environment has been mediated by race from the past to the present.

Environmental racism was implemented during the colonial period and was firmly institutionalised in the apartheid era; as such, it provides a backdrop to understanding environmental concern in post-apartheid South Africa. Additionally, the inequality of service delivery and the concurrent privatisation of services have maintained many environmentally related socio-economic inequalities in post-apartheid South Africa (see McDonald, 2002; McDonald, 2009:xv). Thus, one would expect environmental concern in South Africa to still be influenced by race and socio-economic status (SES). As Anderson, Wentzel, Romani and Phillips (2010:26) have shown, SES has a strong positive relationship to awareness of environmental-protection activities.

Therefore, one may hypothesise that there is an interaction between race, SES and environmental concern. The post-materialist thesis argues that people whose lives are characterised by a struggle for material resources will view nature in an instrumentalist way. This means they may think of nature as a resource to be utilised and will not be concerned much about environmental protection (Struwig, 2010:198). On the other hand, individuals whose basic material needs have been met are more likely to display post-materialist values and express concern about environmental degradation. Therefore if the SES of individuals is kept constant there should be no difference in the concern of the different race groups towards the environment.

The antithesis to this argument is the environmental deprivation theory and the environmentalism of the poor theory (Nixon, 2011 & Martinez-Alier, 2002). Environmental deprivation theory posits that the more someone is exposed to environmental degradation, the greater their concern for the environment will be, as environmental degradation may impact their survival strategies. This theory is supported by the proliferation of grassroots environmental organisations in South Africa among poor and rural people. Whittaker, Segura and Bowler (2003), disagreed with the environmental deprivation theory and instead put forward the relative deprivation theory when they claim that people living in polluted and degraded areas get used to the situation and that an outcry is more likely to come from people living in cleaner areas who become exposed to the so-called “dirty” side. The environmentalism of the poor argument is fairly similar to the environmental deprivation theory and focuses on the environmental justice movement and its effects on environmental concern in a Third World context (this is discussed in more detail in Chapter 2). The purpose of this thesis is to determine the role of the post-materialist thesis and the environmentalism of the poor theory in enhancing our understanding of environmental concern in South Africa.

The value of this study is that it can provide policy makers in South Africa with an overview of the nature of national environmental concern. This research focuses on South Africans’ willingness to make economic sacrifices to serve environmental interests. For example, the South African government believes that a low-carbon economy can be achieved through carbon-pricing mechanisms (Republic of South Africa, 2011:189). Low-carbon citizenship, which is an aim of carbon-pricing mechanisms, suggests “that people change their attitudes and behaviours in relation to normative goals that exist around activities such as energy consumption and, hence contribute to low carbon emissions” (Owens & Drifill, 2008, as cited in Scott, 2011:153). One example of this is South Africa’s introduction of a carbon tax on vehicles (Scott, 2011:156). This study may assist those who have to implement

such policies to better understand which groups in South Africa may be more or less accepting of a low-carbon citizenship lifestyle, for example.

1.3 Aims and objectives

There has been a fair amount of research on environmental concern in South Africa (see Picard, 2003; Turpie, 2003; Zellie, 2003; Anderson, Romani, Phillips, Wentzel & Tlabela, 2007; Hunter, Strife & Twine, 2010; BBC World Service Trust, 2010; Anderson *et al.*, 2010; Struwig, 2010; Anderson, Romani, Wentzel & Philips, 2013;). It is noteworthy that not all of these studies make use of the term “environmental concern”. Some of them use the term “environmental awareness” (Anderson *et al.*, 2007; BBC World Service Trust, 2010), while some prefer the term “environmental perceptions” (Hunter, *et al.*, 2010 & Picard, 2003) and others use “environmental consciousness” (Anderson *et al.*, 2010). These terminological differences highlight the vast array of conceptualisations of environmental concern and will be dealt with in more detail in Chapter 3. In contrast to the aforementioned studies, this study provides a longitudinal analysis of environmental concern in South Africa and as such, the first of its kind in the country. Adopting such a methodology allows one to determine whether environmental concern has become less or more racialised and/or class-based over time.

The first aim of this study is to investigate whether South Africans are becoming less or more environmentally concerned, hence the first hypothesis states that South Africans have become more environmentally concerned since the end of apartheid. The second aim of this study is to establish whether there are any differences in environmental concern in South Africa, according to race and SES. Therefore the second hypothesis states that: When controlling for class there is no difference in environmental concern amongst the various race groups.

The final aim of this research is to provide a critical reflection on methodological challenges involved in and limitations associated with conducting a secondary, longitudinal analysis of World Values Survey (WVS) data on environmental concern in a developing country context with a relatively unique history of environmental governance. This critique, especially of the way in which environmental concern has been measured, leads to recommendations on how environmental concern could be more appropriately measured in the future. Furthermore, I will reflect on the manner in which environmental concern has been operationalised in the WVS and whether it truly is transferable across different cultures. This critique also examines the shortcomings of using a multipurpose cross-national survey and problematic issues relating to sampling and measurement. The intention of this

methodological aspect of the thesis is to assist future research on environmental concern, as well as future researchers that plan to use the WVS to answer their research questions.

1.4 Outline of research strategy

I will go about achieving the aims of this study by employing a quantitative research strategy and secondary analysis of data as research design. The hypotheses will be tested by analysing three consecutive waves of the WVS: 1996, 2001 and 2006. The WVS is a repeated survey, i.e., in each wave a different sample of respondents is requested to respond to the same, or at least similar, items (Firebaugh, 2010:795). It is used to study changing values and their impact upon social and political life. At the time of writing this thesis, five waves of the WVS had already been executed, from 1981 to 2007 (WVS, 2008). However, only those items dealing with environmental concern in the 1996, 2001 and 2006 waves, will be analysed. The rationale is that, due to the many changes over time in items measuring environmental concern in the WVS, only these waves are comparable.

No longitudinal study focussing specifically on environmental concern in South Africa has yet been undertaken, therefore this study is filling a gap in the environmental-concern literature, while concurrently executing an analysis of environmental concern that only longitudinal data would allow. Longitudinal data allow for the understanding of social change; additionally, repeated surveys are useful for understanding aggregate change over time, whereas a panel survey would focus on individual change over time (Firebaugh, 2010:795). Because the WVS is a repeated survey, it remains representative of the changing demographics of the South African population, thereby providing insight into South Africans' attitudes toward environmental concern over time.

1.5 Structure of the thesis

The thesis will be structured in the following manner: the second chapter includes a review of empirical and theoretical literature relevant to the thesis; the third chapter consists of a discussion of the methodology employed in this study; the fourth chapter presents the results of this study; and the last chapter provides a discussion of the results in relation to the theoretical literature as well as the results of previous research.

CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

In the last two decades, the concept of environmental concern has increasingly become a subject of inquiry and debate in sociology and similar disciplines¹. This attention has led many scholars to question what exactly environmental concern, pro-environmental attitudes or environmental values entail. This chapter will review literature pertaining to environmental concern in relation to each of the two variables of interest to this study, i.e. race and SES.

This literature review will illustrate the relevance of this particular study, as it contributes to the existing body of literature that relates to environmental concern in South Africa. Firstly, environmental concern will be discussed in a section that examines the manner in which values, attitudes and environmental concern have been conceptualised, and the findings of research on environmental concern in South Africa. Secondly, race, SES and environmental concern will be examined in a section that will provide the historical context for this study. Thirdly, the theoretical framework this thesis will use, will be examined in a section that will include a discussion of the post-materialist thesis and the environmentalism of the poor theory. In conclusion, a summary of the literature review will be provided.

2.2 Conceptualising environmental concern

Environmental concern consists of various attitudes and behaviours towards the environment (Parker & McDonough, 1999:156). However, to understand environmental concern in this study, it needs to be understood within the context of the WVS. The conceptualisation of values is important in this context. Joubert (1992:47) argues that values are notions ideas, or conceptions in the minds of people and that “values are appreciative, evaluative, or normative notions, ideas or, conceptions”. There is a vast array of definitions and conceptualisations of values, which Joubert (1992:48) believes is indicative of the ordinary, everyday use of the term by journalists, priests, politicians, and writers of fiction. In comparison, social scientists transform values into a theoretical and technical term that may be significantly related to

¹When one runs the term “environmental concern” through the Sciverse Scopus database and requests only social science research, a dramatic increase can be seen from 1985, when only 3 articles were published, to 2011 when 154 articles on environmental concern were published. By no means does this provide a comprehensive view of the environmental concern field. However, these results do reflect quite a dramatic increase in cognizance of the environment within social science research over the last two decades.

human behaviour, beliefs other than values, and to social circumstances. In the face of this multiplicity of interpretation and meaning, there is a need for a definitive conceptualisation of what values entail.

This study takes as its point of departure that concern for the environment is a notion, idea or belief in the mind of people – as conceptualised above. Unfortunately, this study cannot show how these beliefs are formed, as it does not use longitudinal panel data to understand changes in individuals' understanding of environmental concern over time. Instead, this study can determine how these values are changing at an aggregate level, such as among different race groups or according to different socio-economic groups. Dietz, Fietzgerald & Schwom (2005:346) highlight the difference between values and attitudes in the following way:

Values differ from attitudes in that attitudes are positive or negative evaluations of something quite specific. We might value wilderness, and we might oppose a proposal for oil development in a wildlife refuge. The former is more general and would be considered a value; the latter is more specific and considered an attitude.

For this study, environmental values are expressed in attitudes towards paying for environmental protection. The overarching theoretical construct being studied in this thesis is environmental concern.

Environmental concern has been variously defined in the literature, with conceptualisations ranging from the very broad “composite of environmental attitudes and environmental behaviours” (Parker & McDonough, 1999:156), to the very narrow “positive attitudes towards preserving the environment” (Minton & Rose, 1997, as cited in Struwig, 2010:212). In her study of environmental concern in South Africa, Willers (1996:39) conceptualises such concern as “a psychological tendency expressed by evaluating issues related to the degradation of the environment and depletion of natural resources with feelings of worry or distress”. This conceptualisation is very similar to the one used by Kollmuss and Agyeman (2002:240) in their review of theoretical explanations for the gap between environmental knowledge/awareness and pro-environmental behaviour. It is important to note that included within these definitions are behavioural intentions in the form of active personal involvement concerning environmental matters (Willers, 1996:43). The problem with this operationalisation of environmental concern is that often personal involvement with environmental matters is formalised through institutions, and requires access to and investment of personal financial resources. The absence of such material resources renders the majority of South Africans “not concerned” towards environmental matters, by virtue of

the way in which such concern is measured. To establish the context and epistemological foundation of the values being measured in this study, one needs to better understand the WVS and its aims.

In the WVS many of the variables under study are closely correlated and can be depicted in two major dimensions of cross-cultural variations (WVS, 2008:6), i.e. traditional/secular-rational and survival/self-expressional values. The argument is formulated as follows: moving geographically in the world, from north to south, reflects a shift from secular-rational to more traditional values, and moving from west to east reflects a shift from survival values to self-expressional values. It is posited that all industrial societies' worldviews have moved from traditional values to that of secular-rational values, but with the rise of knowledge societies, cultural change moves in a new direction (WVS, 2008:6), in that values change from survival values to self-expressional values. These societies are characterised by an overwhelming shift from focussing on economic and physical security towards laying emphasis upon subjective well-being, self-expression and quality of life. These self-expression values place high priority upon environmental protection (amongst other concerns).

In their study, Callan, Gallois, Noller and Kashima (1991, as cited in Willers, 1996:25) conceptualised values in the following way: "values can be conceptualised as goals people strive for; they are central to a person's system of attitudes and beliefs, and play a deciding role in how attitudes are organised". Eagly and Chaiken (1993, as cited in Willers, 1996:25) treat values as attitudes toward relatively abstract goals that a person strives towards. In addition, a distinction needs to be drawn between socio-cultural values and individual ones. Dietz, Fitzgerald and Schwom (2005:335) argue that the social sciences focus on four value clusters: self-interest, altruism, traditionalism, and openness to change. There has been consistent theoretical and empirical support for the existence of relationships between these values and environmentalism. However, there is a lack of literature concerning the causes of value change and the overall effects of value change on changes in behaviour (Dietz, Fitzgerald & Schwom, 2005:335).

One way in which environmental concern can be operationalised, is to take into account both anthropocentric and ecocentric dimensions of orientations when constructing scales to measure environmental concern, as Carlson and Van Staden (2006) have done. The difference between these two dimensions lies in the motivations for expressing environmental concern. An anthropocentric orientation towards the environment highlights the utilitarian aspects of the environment and considers only human beings as morally relevant. This

orientation focuses on the ability of the environment to satisfy various human needs and wants, and therefore self-interest requires humans to protect and conserve the natural environment. A weak version of anthropocentrism does, however, move away from this instrumentalist view. It considers human consciousness to be the source of all values and is based on the belief that the experience of beauty is something that humans bring into the world (Hargrove, 1992:204).

By contrast, an ecocentric orientation towards the environment focuses on the intrinsic value and the moral relevance of the natural world, of which human beings form only one part (Gagnon Thompson & Barton, 1994:149). During South Africa's apartheid years, environmental management legislation and policies focused exclusively on the ecocentric dimension, ignoring the anthropocentric. As mentioned in Chapter 1, during apartheid the dominant environmental discourse was characterised by a wildlife-centred, preservationist approach, which appealed mainly to the affluent, educated, and therefore predominantly white, minority. This distinction between the different orientations is helpful, as it recognises the fact that concern regarding any "natural environment" may be motivated either anthropocentrically or ecocentrically. This, in turn, leads to the recognition that different kinds of equally valid environmental concerns exist. For example, a New York urbanite who makes a financial contribution to the National Geographic Society exhibits a kind of environmental concern that differs substantially from that exhibited by a grassroots South African activist defending her constitutional right to an unpolluted environment.

Willers and Van Staden (1998, as cited in Carlson & Van Staden, 2006:8) suggest that environmental concern develops from interactions between individual subjective experience, personal factors, structures at the socio-level, and temporal and spatial structures. Van Staden (1983, as cited in Carlson & Van Staden, 2006:10) argues that the expression of environmental concern may therefore be viewed as the result of a dynamic process of interactions between various factors at different levels of experience. Including experience into a measurement of environmental concern allows for a more inclusive notion of who is environmentally concerned. In other words, understanding what experiences a particular person has had in relation to the natural environment fosters an understanding of what type of environmental concern that person would most likely display.

2.2.1 Behaviour in relation to the environment

Behaviour acted out towards the environment has been taken to occur as a result of a person's environmental attitudes (Parker & McDonough, 1999:156). One important study applied a

connectivity to nature variable as a predictor of environmental behaviour and environmental concern (among others) (Dutcher, Finley, Luloff & Buttolph Johnson, 2007:490). These researchers created a connectivity-to-nature scale and found that it was “significantly and positively associated with both environmental concern and environmental behaviour, controlling for a series of standard socio-demographic variables”.

However, Kollmuss and Agyeman (2002:242) state that knowledge and awareness of environmental problems do not necessarily lead to pro-environmental behaviour. Carlson and Van Staden (2006:24) refer to this issue as “attitude-behaviour correspondence” and indicate that reasonable attitude-behaviour consistency cannot always be assumed. Four reasons for the weak correlation between these two variables have been suggested. Firstly, Rajcecki (1982, as cited in Kollmuss & Agyeman, 2002:242) argues that direct experience has a stronger influence on people’s behaviour than indirect experience does. The second reason relates to normative influence: if an environmentally unfriendly lifestyle is encouraged by the dominant culture, the gap between attitude and action will widen. The third reason concerns temporal discrepancy: if attitudes change over time and data are collected first about attitudes and only later on behaviour, inconsistent results would be produced. The final reason refers to the range of attitude-behaviour measurements. Often the measured attitudes are much broader in scope than the behaviour that is being measured. For instance, the attitude “Do you care about the environment?” is often measured with the indicator “Do you recycle?” This leads to problems of measurement validity, as the statement does not truly measure what it purports to measure². Finger (1994, as cited in Scott, 2011:153) also provides a critique of the behavioural model when she states that:

The linear, mechanistic model of behaviour change has been widely critiqued. The relationship between knowledge and action is not readily seen in practice [...] for example claims that the majority of people is highly aware of environmental issues, but may not act on the knowledge. Smith and Pangasopa (2008) point out that rather than using this knowledge to shift behaviour, people take it in and reproduce this received knowledge in their own everyday discourses. This behavioural approach has also been criticised for being too individualistic, suggesting that a collective approach by groups of people, would be a more successful approach to changing behaviour.

Many sociologists have tried to address the value-behaviour gap, according to Redclift and Benton (1994, as cited in Kollmuss & Agyeman, 2002:247):

² According to Bryman (2008:695), measurement validity refers to the degree to which a measure of a concept truly reflects that concept.

One of the most important insights which the social scientist can offer in the environmental debate is that the eminently rational appeals on the part of environmentalists for “us” to change our attitudes or lifestyles, so as to advance a general “human interest” are liable to be ineffective. This is not because [...] “we” are irrational, but because the power to make a significant difference, one way or the other, to global or even local environmental change, is immensely unevenly distributed. This new body of research points out that people’s values are “negotiated, transitory, and sometimes contradictory”.

This highlights the problem with the value-behaviour gap, in particular with the assumption that a display of concern towards the environment will automatically lead to pro-environmental behaviour. The value-behaviour gap relates to one of the limitations of this study: if my results were to show that South Africans display attitudes that can be classified as environmentally concerned, this would not necessarily mean a translation of this concern into pro-environmental behaviour, nor that any policies that deal with the environment will be well received.

2.2.2 Findings of environmental concern research in South Africa

The results of nationally representative surveys conducted in South Africa up to the time of writing, point to the fact that environmental concern is not accorded the same priority as other political and social concerns in South Africa³. For example, an analysis of the 2004 South African General Household Survey data (Anderson *et al.*, 2007:157) shows that only 10 per cent of households in South Africa perceive water pollution as a community problem. The authors also found that having a low SES was important when perceiving water pollution as a problem, and that educational attainment of the household was negatively related to the perception of water pollution as a problem. The way South Africans perceive water pollution seems to be consistent with other countries on the continent (Anderson *et al.*, 2007:160). In this regard, Anderson *et al.* (2007:160) note that:

there does not appear to be a high level of awareness about environmental concerns among South Africans, despite the attention given to environmental concerns in the constitution and by the current government. In this respect, the South African population does not differ significantly from those in other parts of the world. While the perceptions

³ The results of the South African Social Attitudes survey in 2007 show that environmental problems ranked 13 out of a possible 16 places when South Africans were asked to record the three most important challenges facing South Africa today (Seagar, 2009).

concerning the specifics of water pollution appear to have some consistency with that which White and Hunter (2005) found with reference to socio-economic status in Ghana, it is not clear whether similar patterns exist among South Africans when it comes to other environmental issues.

Seagar (2009) also found that South Africans were less concerned about climate change than other developing countries, such as Brazil, Nigeria, India and China. Furthermore, Struwig (2010:201) found that almost half of South Africans agree with the statement that “too much of a fuss is made about the environment and economic imperatives should be focused on instead”. She has shown that after a decade of natural resource management, South Africans still perceive conservation parks as being of limited benefit to them. Struwig (2010:201) also revealed that almost a third of South Africans felt that there are more important things to do in life than to protect the environment. In a later study conducted by Anderson, Wentzel, Romani & Phillips (2010:7), the authors remark that out of four environmental problems (land degradation, air pollution, water pollution and littering) only littering was viewed by more than 20 per cent of South African households as a community problem. This paints a fairly bleak picture for environmental concern in South Africa.

There are, however, contradictory findings, as the aforementioned results differ from those produced by other studies (Holl, Daily & Ehrlich 1995; White & Hunter 2009), in which a much higher proportion of respondents view environmental pollution as an issue. Inglehart (1995:65) found that 71 per cent of South Africans approved of the ecological movement⁴ and Struwig (2010:217) showed that only a third of South Africans agreed with the statement that poorer countries should make less effort than richer countries to protect the environment. The proportion that agreed with this is similar to that found in developed nations such as Switzerland and Ireland⁵. She concludes that South Africans have a heightened sense of responsibility to the environment and would not shy away from responsible environmental practices because of an economic disposition.

A study conducted by the BBC World Service Trust shows that South Africans are aware of the phenomenon of climate change (BBC World Service Trust, 2010:5). This is contradictory to Seagar’s (2009) article where more than a quarter of South Africans

⁴ This refers to organisations that have the well-being of the natural environment as their focus.

⁵ Agreement with this item might point towards South Africans’ view of themselves as a developing nation and therefore being able to shirk these responsibilities. A comparison with countries with similar economic dispositions to South Africa’s would have been more useful.

indicated they had never heard of climate change⁶. Additionally, the BBC study shows that most South Africans do not view climate change as having any special relevance to South Africa or to the rest of the African continent. However, when participants of the study were asked to think about the impact of climate change locally, they linked it to local issues such as the loss of wildlife and increased flooding. South Africans recognise their contributions to climate change, but are reluctant to moderate their lifestyle in order to reduce carbon emissions, particularly as they see very little government or private sector leadership in this regard. This is echoed by Seagar's (2009) results that "48% of respondents felt that government should take responsibility for action to prevent further climate change and 14% felt that large companies also had a role to play". Additionally, South Africans tend to view the destruction of the environment as an inevitable consequence of their country's development (BBC World Service Trust, 2010:5).

The problem with all these contradictory data is that environmental concern has been operationalised differently in each of these studies. Therefore, these findings relate to different types of environmental concern and, more importantly, none of the studies mentioned above report the results of a factor analysis, which would have shed light on the different dimensions of environmental concern that the researchers purport to measure. For instance, South Africans' concern over loss of biodiversity is a different dimension of environmental concern than their willingness to pay for environmental protection.

Nevertheless, research conducted on environmental concern in South Africa indicates that concern towards the environment tends not to take precedence over other social issues, such as HIV, crime, poverty and unemployment in South Africa. Hannigan (2006:76) provides a useful model for understanding why environmental issues have not received as much attention from the South African public as a variety of other social issues have. Four key factors predict how well environmental issues will be taken up by the public: uniqueness, relevance, stature and familiarity. Uniqueness may refer to distinctiveness, or how the public views a problem as separate from other similar issues. Relevance refers to the degree to which a particular environmental problem matters to the ordinary citizen. Stature refers to the public's attitudes towards the specific environmental issues; this may also refer to the symbolic stature of a specific environmental issue. Familiarity refers to how well-known a particular environmental problem is to an audience. Of these four factors it appears that the

⁶ It should be noted that the BBC World Service Trust (2010) study did not use a representative sample of South Africans and was also conducted a couple of years after the data, which Seagar's (2007) article used, was collected.

relevance of environmental issues, in relation to other social issues, seems to apply to South Africans' lack of concern towards environmental issues.

2.3 Environmental concern, race and SES

Underlying this thesis is the postulate that an interaction exists between race, SES and environmental concern. The following section will highlight the historical context of environmental management and environmental policies in pre- and post-apartheid South Africa, as well as previous studies' findings, in order to explain the interaction between race, SES and environmental concern. In this study, race is measured using the racial categories inherited from the apartheid government, which is still used to this day (See Chapter 3 for a more in-depth discussion thereof), and SES is measured using three indicators: income, education and occupational class.

2.3.1 Historical context

This section firstly examines the legacy of the environmental racism implemented by the pre-apartheid and apartheid regime, as well as the effects such a legacy may have had on environmental concern in post-1994 South Africa. Secondly, it provides background information on the current environmental ideology adopted by the post-apartheid government.

Khan (2002:17) traces the roots of environmental racism to the colonial conservation policies implemented in the latter part of the 19th century, by which time, according to Carruthers (2008:203), the establishment of South African national parks and provincial game and nature reserves was well underway. From conception, the development of these protected areas went hand-in-hand with the forcible eviction of African residents and subsequently the exclusion of these former residents from subsistence hunting as they were perceived as environmentally destructive competitors (Carruthers, 1995, as cited in Khan, 2002:18). In line with this, Anderson and Grove (1987, as cited in Khan, 2002:18) suggest that European settlers perceived Africans to be uncivilised, while considering themselves to be the benchmark of progress and civilisation. Such notions formed the basis of the early 19th century's conservation ideology, which was, for all intents and purposes, a reflection of the belief in white cultural superiority that was widely held in the different colonies at that time.

Environmental racism became further entrenched during the South African segregation era (1910-1947), a period in which black South Africans were deliberately excluded from enjoying accommodation in the conservation areas and were seldom tolerated as visitors (Khan, 2002:18). Indeed, black South Africans, cast as poachers, were actively discouraged

from visiting conservation areas, in contrast to the encouraged visitation of white visitors who were framed as conservationists (Carruthers, 1995; as cited in Khan, 2002:19).

During this period, the implementation of the Land Act of 1913 restricted African land ownership to only 7% of the total country (Ramphela, 1991:3). This was increased in 1936 to 13%, as compensation for the loss of voting rights. However, the land given to black people was largely barren and unproductive. During this era environmental racism was, for the first time, embedded in the non-governmental sphere with the establishment, in 1943, of a new dominant soil organisation called the National Veld Trust (NVT) (Kahn, 2002:19). The NVT was openly racist and, with the assistance of the government at that time, all resources and education concerning soil conservation were focused solely on white farmers (Khan, 2002:19). Furthermore, the National Department of Agriculture initiated a land-service movement which was open only to white youth, and the Division of Soil Conservation within the Department of Agriculture aimed all its conservation and education services towards white farmers. From these examples, the development of environmental racism from discriminatory perceptions to legislatively entrenched practice becomes apparent.

The apartheid era (1948-1989) that followed was, according to Khan (2002:20), characterised by the extreme politicisation of environmental conservation and the further institutionalisation of environmental racism. The government's homelands policy confined black South Africans to small rural areas, which led to overpopulation⁷, poverty, a lack of basic services and, inevitably, environmental degradation (Timberlake, 1986; Durning, 1990, as cited in Khan, 2002:20). Furthermore, the negative effects of "Bantu Education" on literacy levels was a major obstacle to the development of an informed public, able and willing to participate in environmental decision-making. Additionally, the Group Areas Act and the Separate Amenities Act meant that black, coloured and Indian population groups were confined to hostile environments, frequently lacking community facilities, cultural amenities, or green, open spaces which could be used for social activities (Khan, 2002:20; Manuel & Glazewski, 1991:196). Furthermore, the Group Areas Act⁸ meant that black people were moved to live in areas far from their places of employment, as part of a deliberate attempt to discourage urbanisation (Ramphela, 1991:5). This led to fragmented cities, severe

⁷ For example, in the Ciskei the population doubled over the 12-year period 1970–1982, because of this policy.

⁸ The Group Areas Act was first passed in 1950, but repeatedly amended thereafter. The restriction of black peoples' movement in South Africa pre-dates formal apartheid. In 1921 an official commission argued that Africans should only be allowed into towns as temporary workers (Ramphela, 1991:5). Therefore this act straddles the colonial and the apartheid era

traffic problems and major transport problems for the urban poor. This, in turn, has led to an urban environmental crisis (Lawson, 1991:47).

Under apartheid black South Africans lacked sufficient political power to stop the erection of sewage plants, polluting industries and landfills close to black residential areas, exacerbating their already wretched living conditions. The Separate Amenities Act meant that natural resources and recreational facilities were unfairly distributed and, according to Khan (2002:22), may have had a detrimental impact on the affected communities' environmental attitudes and perceptions. It may be argued that, because black South Africans lost their environmental decision-making power and were excluded from the use of environmental amenities, a degree of apprehension from black South Africans with regards to issues of conservation and environmental decision making should be expected, particularly as such issues are framed in opposition to other social issues such as poverty.

The following subsections will highlight the change in environmental ideology in South Africa during the post-apartheid years. The discussion will utilise a threefold understanding of environmental issues: firstly, as “green” issues where the focus is on the “preservation, conservation and recovery of the landscape where the human footprint is eliminated or minimized” (Freund, 2001:718); secondly as brown issues, which Freund (2001:718) defines as a focus upon public health, sanitation and the need for recreational spaces; and thirdly, as red issues which concern environmental rights (Cock 2004:30). These three understandings of environmental issues are not mutually exclusive; however, separating them from one another is a useful way in which to understand the complexity of how environmental issues, and concern over those issues, are variously perceived and constructed.

2.3.2 Green issues in post-apartheid South Africa

During its years in power, the apartheid government constructed environmental issues almost exclusively as green issues. It did so by attempting to conserve the environment primarily through the erection of fences and carrying out of patrols around nature conservation areas, and the establishment of breeding and cultivation programmes. Some authors have labelled this type of conservation “fortress conservation” (Büscher & Dietz, 2005:1; Dahlberg & Burlando, 2009:1). De Beer and Marais (2005) and McDonald (2002:1) argue that this led many people, particularly black South Africans, to feel alienated from conservation issues and to regard these issues negatively. Moreover, during apartheid black South Africans viewed the environment as a white, suburban issue of little relevance to the anti-apartheid struggle. The post-apartheid government realised that they do not have the resources to

continue this fortress-type conservation and could not justify, on moral grounds, the continuation of protectionist conservation (Büscher & Dietz, 2005: 3). Hence, the post-apartheid government realised the importance of integrating development programmes with conservation.

Under the post-apartheid government a change in conservation ideology has been experienced, as the transformation of the political sphere fed into a new, more socially responsive, conservation ideology (Khan, 2002:28). According to De Beer and Marais (2005:51), the social, economic, political and environmental changes experienced since 1994 are reflected in a shift in priorities from nature conservation to natural resource management. The latter entails the management of natural resources so as to ensure sustainable use of those resources. De Beer and Marais (2005:51) encapsulate the people-based interventions and complexities of this new conservation ideology by stating that:

This new approach to the environment poses a new challenge: not one of preserving by keeping people out, but one of managing by making people part, making them part of conservation while simultaneously allowing them to share in the benefits of the natural environment.

This new approach led to the ideology of community-based conservation (CBC) that started emerging in South Africa in the 1990s. Büscher and Dietz (2005:1) state that, during this period, conservation of natural resources seemed to have progressed towards local ownership and local management. However, it would appear that the limit of community ownership of natural resources has been reached. This is because many of the communities in Africa have not yet been able to effectively conserve their wildlife and biodiversity (Büscher & Dietz 2005:1). This has led to the “international community” calling for a more imposing style of conservation once again, which is a trend that is promoted and backed by substantial financial means.

Proponents of the reversion to fortress conservation argue, by implication, that development and conservation are inherently incompatible (Büscher & Dietz, 2005:1). Moreover, they attribute the failure of CBC in Africa to its being:

shaped by western notions and values of conservation which emphasise the intrinsic and aesthetic values of wildlife, [...] whereas local communities see conservation more economically as having to serve the maintenance or enhancement of their livelihoods (Büscher and Dietz, 2005:3).

2.3.3 Brown issues in post-apartheid South Africa

Many of South Africa's brown issues may be ascribed to the social engineering process pursued by previous governments for the benefit of the white minority (Ramphela, 1991:3). The post-apartheid government's initiatives to redress inequalities originating from apartheid would therefore have to include not only conservation issues, but also social justice issues, including brown environmental issues. In order to achieve a "safe environment" for everyone – as required by the constitution – the problem of different types of pollution needed to be addressed. More specifically, the unequal exposure to pollution by the different socio-economic groups in South Africa needed to be rectified.

The simplest, but also one of the most important, developments in this regard has been the redefinition of the term 'environment' in South Africa's constitution to include the working and living space of black South Africans. In Section 24 of the Bill of Rights, (RSA, 1996), all South Africans are entitled to an environment that is not harmful to their health. It is clear that environmental pollution will infringe on this right and, as such, the government needs to address brown and green issues concurrently. It has become clear that to deal with environmental degradation, other social issues would need to be addressed simultaneously (McDonald, 2002:2). In response to this recognition, the discourse of environmental justice was adopted and an attempt was made by civil society, academics and the government to incorporate environmental issues into the broader intellectual and institutional framework of human rights and democratic accountability.

Although the government has made minor advancements in service delivery⁹, the majority of the poor people in South Africa still do not have access to adequate housing, and poverty remains widespread. It is partly because of failures in redressing socio-economic inequalities of the past, that environmental degradation still persists in South Africa. Gibson, Ismail, Kilian and Matshikiza (2008:185–189) highlight that land degradation has increased, water availability and quality is under pressure, air quality has worsened, and 34% of South Africa's terrestrial ecosystems are vulnerable or endangered. Furthermore, South Africa's dependence on coal-driven energy means that climate change should be a very real concern for South Africans.

South Africa's macro-economic policies and hostile global financial markets have both directly and indirectly led to much resource-depletion and environmental degradation.

⁹ Between 1994 and 2008, 18 million people have gained access to clean water and the South African government's electricity roll out figures are impressive, according to Hallowes (2011:6)

Furthermore, land degradation has been exacerbated by unemployment, poverty and a lack of land-use regulation (DEA, 2012). Bond (2000:33) argues that there were high hopes of the post-apartheid government and its departments developing tough environmental policy and strong environmental values and strategies. Unfortunately, these hopes have failed to materialise. Additionally, Bond (2012:148) argues that South African capital's reliance on fossil fuels for energy has led to environmental degradation in many areas of South Africa. This can be traced to two activities that have continued since apartheid: the coal-burning power plants of the parastatal Eskom and the coal/gas-to-oil conversions of Sasol. The unsustainable use of natural resources is compounded by cheap electricity being produced for large mining companies and metal firms, while millions of poor people are regularly disconnected or denied access to electricity due to their inability to pay their electricity bills (Bond, 2012:145). For residents of poor neighbourhoods to survive without electricity, they have to burn other natural resources to keep warm and prepare food, causing indoor pollution which, in turn, has created an increase in tuberculosis and other respiratory illnesses. Air quality has also been affected by vehicle emissions, which are rapidly increasing due to a greater number of cars on the roads (DEA, 2012). There has also been an increase in the outbreak of fires in poorer neighbourhoods, due to paraffin stoves. All of this has led to the establishment of social movements concerned with electricity issues, the Soweto Electricity Crisis Committee being the largest and most popular (Bond, 2012:177). This demonstrates how issues of social inequality, environment and health tie in with one another, thereby shaping the environmental concerns of South Africans.

The environmental implications of poor service delivery and failing infrastructure are very serious in South Africa (Hallowes, 2011:7). Some infrastructural problems include a lack of flush toilets¹⁰ and proper sewerage facilities, lack of electricity supply and limited access to clean drinking water. These infrastructural problems cause people to understand water issues and/or environmental degradation as community problems, according to Anderson *et al.* (2010:26). Furthermore, SES appears to have an effect on perceptions of environmental problems. SES is related to behaviours such as the treatment of water for drinking and cooking, and has an effect upon South Africans' willingness to participate in recycling (Anderson *et al.*, 2010:26). The awareness of environmental protection activities (such as South Africa's "Working for Water" and "Working on Fire" job creation programmes) is also strongly associated with SES.

¹⁰ The 2011 Census shows that only 57% of South Africans have flush toilets.

The environmental consequences of infrastructural shortcomings are widespread within South Africa. People living in poverty are forced to use streams to relieve themselves and dump their refuse, which contributes to disease and groundwater contamination. For many low-income households, the inaffordability of electricity or being off the power grid entirely means that they have to resort to cutting down trees and burning coal and kerosene for cooking and heating (McDonald, 2009:xv), all of which are detrimental to the ecosystems in which they live and form part of. McDonald (2002:294) believes that the absence of these services is by far the most serious environmental problem in the country, but he also argues that the privatisation of municipal services has provided temporary resolutions to some of these problems. However, increased privatisation of what were previously municipal responsibilities increases the danger of companies discriminating against poor neighbourhoods, poor households receiving substandard services, a lack of accountability and monitoring of private firms in black residential areas, and the public health and safety risks associated with environmental violations and poor working conditions. Beyond these issues, privatisation does very little to curtail over-consumption in wealthy neighbourhoods and to provide a more equitable share of resources.

Cock (2006:293) argues that privatisation is forcing individuals to seek private remedies to socially produced problems. This process, according to Cock (2006:293), is illustrated by the manner in which access to clean and adequate water is threatened by privatisation and pollution. Cock (2006:293) further argues that the privatisation of state functions or assets leads to the replacement of social objectives with profitability by state-owned agencies, and the opening of historically state-controlled industries to private competition. In terms of access to clean water, this has led to pre-paid water meters being installed in South Africans' homes, thereby depriving the poor of water when they run out of money. Cock (2006:298) also argues that the pollution of clean water in South Africa is due to state failure, as she illustrates with reference to the Steel Valley struggle. In this case the failure of the state to provide municipal water to smallholdings around Vanderbjlpark meant that residents were reliant on groundwater which was contaminated by a steel mill. This steel mill was once a state-owned company, but is now owned by Mittal steel, the largest steel-producing company in the world (Cock, 2006:299).

As such, privatisation itself becomes one of the numerous obstacles to solving brown issues in an equitable fashion in South Africa. This, in turn, hinders the potential for a democratic, equitable and accountable environmental management system in South Africa's poorest urban neighbourhoods (McDonald, 2002:319).

In South Africa, the relation between brown issues and green issues is teased out by Freund (2001:718) when he argues that, in big cities, brown issues relating to public health and sanitation are inevitably more important than green issues concerned with the preservation, conservation or recovery of the landscape. This is especially visible in Durban: “as most councillors represent poor constituents with very basic concerns, the green issues of the past have largely given way to brown issues” (Freund, 2001:718). What is clear from this section is that, of all the environmental issues in post-apartheid South Africa, brown issues have received the most attention. It is clear that policy needs to address both the green and brown environmental spheres in a holistic manner. The next section reviews this process.

2.3.4 Red issues in environmental management

This section will highlight environmental rights, specifically the manner in which policy and environmental governance shape environmental management. Harsant (2004:73) argues that there has been a shift in global environmental governance from industrial development to sustainable development. This shift has occurred in South Africa through a reformist-institutional approach that focuses on the different forms of law, from customary international law on environmental management – contained in the South African constitution – to local government Municipal Structures Act 117 of 1998 (as cited in Harsant, 2004:73). These different laws are meant to facilitate environmental governance from the supranational level to the local level (Harsant, 2004:73). However, “most environmental laws, be it international, regional, national or local, are unenforceable and non-justifiable” (Harsant, 2004:74). The latest manifestation of the reformist-institutional approach is the New Economic Growth Path (NEGP), which is a macro-economic policy framework that was adopted by government after the Green Economy Summit of 2010. This identifies job creation, innovation and the green economy as the three pillars of future growth (Swilling & Annecke, 2012:212).

South African environmental management law and policy is considered some of the best in the world (Scott, Oelofse & Weaver, 2001, as cited in Oelofse, Scott, Oelofse & Houghton, 2009:483) because they embody sound democratic principles (Rossouw & Wiseman, 2004:131). Despite sound policy, the government departments in charge of implementation of these policies find themselves in a situation of institutional ambiguity characterised by an unclear allocation of responsibilities to provincial, national and local government for sustainable development (Rossouw & Wiseman, 2010:131), as well as a lack of capacity to

proceed with the implementation of these policies. This is succinctly stated by Swilling (2010:77):

it is one thing to formulate policy, it is a very different matter when it comes to implementation through inter-institutional coordination, budget reform and regulatory interventions. Like many other policy realms, the South African state's capacity to formulate policies is not matched by its capacity to implement those policies.

This sentiment is echoed by Rossouw and Wiseman (2004:131) who state that implementation, compliance and enforcement are lagging. Along with this lack of capacity, government's tools to develop sustainability are largely inappropriate for the South African context. Up until now, environmental management has been driven – both in South Africa and globally – by ecological modernisation (Oelofse *et al.*, 2009:483). This is an instrumentalist approach which emphasises the physical and natural environment as the chief recipient of environmental impacts; in addition, solutions to environmental problems are conceptualised in a technocentric way and are viewed as the responsibility of scientific experts and managers. Opposing this are approaches that emphasise participatory and more equitable processes of environmental management which strive for protection from inequality and poverty that markets may produce. The latter approach may better suit the post-apartheid government's goal of re-addressing past inequalities; as South Africans may feel alienated by top-down and technocentric policies.

2.3.5 Race and environmental concern

The literature on the relationship between race and environmental concern underlines the assumption that black people do not show as much concern for the environment as white people do (Morrison & Dunlap, 1986; Mohai, 1990). Historically in the United States, very few environmental activists belonged to minority groups, therefore environmentalism was seen to embody upper-middle-class values and interests. According to Mohai (1985:821 “there were some faulty inferences and interpretations made by some widely cited articles on outdoor groups and conservation groups [...] which concluded that ‘conservation-preservation’ is an upper middle class social movement”. Therefore environmental activists and people who display environmental concern were seen as a fairly homogenous group, composed of white upper-middle-class people. Many black political and intellectual leaders adopted a hostile stance towards the environmental movement, as it was perceived as undermining working-class interests (Hershey & Hill, 1977–1978; Ostheimer & Ritt, 1976, as cited in Jones & Carter, 1994:561). This negative outlook on environmental problems

among members of the black population in the United States has definite commonalities with many black South Africans' environmental standpoint.

The reason for this can be linked to the apartheid government's adoption of authoritarian environmental policies. A statement by a rural community worker in the 1990s articulates the effects of these policies on black people under apartheid: "if conservation means losing water rights, losing grazing and arable land and being dumped in a resettlement area [...] this can only promote a vigorous anti-conservation ideology among rural communities" (Khan, 1990, as cited in Ramphela, 1991:6). Hence apartheid nature conservation benefitted white people only (Struwig, 2010:199; McDonald, 2002; Cock & Fig, 2002), and was characterised by strict environmental policies and the erection and patrolling of fences. This is echoed by Picard (2003:182) who holds that, under apartheid, notions of race, power and privilege helped shape the management and creation of the nation's protected areas, thus relationships between neighbouring communities and protected areas were often characterised by misunderstanding, conflict and distrust (Carruthers, 1989:188; Picard, 2003:182).

This section will investigate the empirical results of South African studies that focus specifically on environmental concern and race. Struwig (2010:213) states that, when her environmental concern index¹¹ was used to measure environmental concern among the different race groups in South Africa, significant differences between races were found. Black respondents were least concerned about the environment, followed by coloured, Indian and white respondents. Furthermore, Struwig (2010:213) argues that South Africa's history of exclusivity in terms of environmental assets, as well as socio-economic differences between the different race groups, should lead one to anticipate that African, Indian and coloured populations will display less concern towards the environment than the white population of South Africa.

Zellie (2003) analysed South African elites' concern towards the environment, using the 2001 South African WVS data, and compared it to that of the general public. He created an index of different types of environmental concern in order to measure the willingness and ability of the general population to contribute financially or materially to environmental improvement (Zellie, 2003:46). This index grouped respondents' attitudes into one of three categories: active concern, inactive concern and neutral concern. Active concern was conceptualised as a willingness and ability to contribute financially and materially to

¹¹ Her environmental concern index was constructed from items in the 2005 SASAS. She conceptualises environmental concern as a composite of environmental attitudes and environmental behaviours (Parker & McDonough 1999, as cited in Struwig 2010:212).

environmental agendas; inactive concern refers to an inability and unwillingness to contribute financially towards environmental agendas; and neutral concern refers to attitudes that are hesitant or uncertain in this regard.

Zellie (2003:53) proceeded to cross-tabulate race with the abovementioned categories of environmental concern. The results revealed coloured respondents have the highest percentage (48%) of those who are actively concerned. These findings and Zellie's interpretation thereof support environmental deprivation theory and also contradict the assumption that environmentalism is imported from First World countries. Zellie (2003:53) postulates that, due to their closer affinity to the western world, as compared to other races in South Africa, white people's attitudes would be rooted in an ideal of environmentalism which has close ties to the developed world. In addition, the higher SES of the whites should have given them more access to the values and opinions of the developed world through the media. This does, indeed, become apparent when one considers the responses of the respondents to a question on whether human beings should master, or co-exist with, nature. The overwhelming majority (84%) of the white population believed "that man should co-exist with nature" (Zellie, 2003:53). While the lowest percentage (42%) of those that believe "man should coexist with nature" was found amongst black respondents Zellie (2003:53).

Zellie (2003:63) states that the relationship between race and income level is also evident in responses to this question, as data reveal that the lower a respondent's income level, the more likely he/she would be to agree that man should master nature. When cross-tabulating race with whether the respondents prefer environmental protection to economic growth and the creation of jobs, the highest percentage (68%) of those who preferred economic growth and the creation of jobs over environmental protection was found among the black respondents (Zellie, 2003:57). It is interesting to note that this finding contrasts with the results of a Ghanaian study conducted by White and Hunter (2009:974), who report that 70% of respondents were in favour of environmental protection, rather than economic growth and the creation of jobs.

Anderson *et al.*'s (2010:7) South African study's results show a difference between black and non-black¹² households in terms of views on littering, land degradation, water pollution and air pollution as community problems. According to their study, black households were three times as likely as non-black households to view water pollution and land degradation as community problems. Additionally, air pollution and littering were twice as likely to be

¹² This refers to white, coloured and Indian/Asian people in this specific study.

viewed as problems by black households as by non-black households. Anderson *et al.* (2010:24) also found a general lack of awareness of environmental initiatives (such as Working for Water) among black households. This contrasted with the observation that black households were much more likely than non-black households to perceive problems related to environmental pollution. However, the authors of this study controlled for SES and found that awareness of environmental programmes is strongly related to SES.

This was also the case in a more recent study of recycling among urban South Africans. Anderson, Romani, Wentzel and Phillips (2013:19) found that differences in the recycling behaviours between urban South Africans simply reflect differences in the SES of households, rather than race (of the head of the household). This suggests that, as material conditions improve in households, the relationship between race of the head of a household and recycling rate, weakens. This shows the interdependence of race and SES when discussing environmental concern in South Africa, and leads us into the discussion of the next predictor variable for this study, i.e. SES.

2.3.6 SES and environmental concern

In this study SES is operationalised in terms of three variables, namely education, income and occupational class. Due to the fact that SES may be conceptualised and operationalised in many ways, this section will focus on the concept SES as a whole as well. However, where possible an attempt to segregate the discussion into these three constructs will be attempted (income, educational attainment & occupational class). It must also be noted that SES and race are very closely associated in South Africa (see Chapter 4).

In 2009, the BBC World Service Trust (2010:16) conducted a study concerning the South African public's understanding of climate change. An interesting finding of their research is that:

While people [in South Africa] are concerned about the changes they have witnessed in their immediate environment, there is a tendency to view climate change as a “green” topic that is the domain of environmentalists and the urban elite.

This statement highlights the relationship between SES and environmental concern in South Africa. Reverting to Zellie's (2003:49) environmental concern index, it reveals that a much larger percentage (58%) of the elite cohort of South Africans than of the general public (40%) is willing to contribute materially to environmental improvement, and that a very low

percentage of the public would invest their own resources in environmental protection (Zellie, 2003:49).

Most studies on environmental concern have been conducted in developed countries, therefore the little research that has been conducted in developing countries is particularly relevant to this study. White and Hunter (2009), who conducted a survey on environmental concern in Ghana, highlight the rise of “environmentalism of the poor”, which focuses on social conflicts and environmental entitlements (Guha & Martinez-Alier, 1997:5; White & Hunter, 2009:963). This type of environmental concern comes to the fore through activism. The authors note that:

[...] residents of developing countries face difficult choices between natural resource preservation and exploitation (and presumed attendant economic development), but what is noteworthy for policy is the way the counterbalance has made its way into the international policy discourse [...] thereby recognizing that poverty-alleviation challenges are intrinsically bound up with natural resource conservation.

This quote reveals the highly complex relationship between SES and environmental concern in a developing setting such as South Africa. Research on the relationship between SES and environmental awareness seems to produce mixed results. Therefore it would be interesting to consider intervening variables that may help to shed light on this intricate relationship.

2.3.6.1 *Income and environmental concern*

South African research on the relationship between income and environmental concern seems to produce results that are unclear and inconsistent, as shown by Zellie’s (2003) study. Zellie (2003:49) examined the relationship between environmental concern and income and found income and environmental concern do co-vary, but he never reported the strength of the relationship. Interestingly, those with the highest income (R10 000 or more per month) exhibited the highest level of inactive concern. Conversely, the lower-income groups (R1 300 or less per month) exhibited a much higher level of active concern. This seems to refute the post-materialist thesis, which argues that the poor are unable to care for the environment, due to other, more pressing needs. Struwig’s (2010:213) findings indicated the opposite of Zellie’s findings. The former’s study, the group that earned the most also scored the highest on her environmental concern index, and those who were categorised as the lowest-income earners scored the lowest on the environmental concern index. In this instance, Struwig’s findings therefore confirm the post-materialist thesis. Zellie (2003:51) attributes his

counterintuitive findings to the intense environmental degradation experienced by the lower-income group. Furthermore, the lower-income group are more reliant on the natural resources offered to them by the environment, hence the sustainable use and restoration of these resources might be viewed as essential for their livelihoods. Zellie's results are also contrary to the findings of a cross-national study conducted by Franzen (2003; as cited in White & Hunter, 2009:5), who found "a positive correlation with support for global environmental protection and national gross domestic product (GDP), suggesting less environmental concern within less wealthy settings"¹³.

Additionally, Zellie (2003:56) analysed the relationship between income and respondents' views on whether environmental or economic issues should be accorded priority in the government's policies. The results reveal that a higher percentage of respondents (45%) among the highest-income group (R10 000 or more a month) than among the lowest-income group (39% among those earning R1300 or less per month) are likely to select environmental protection over economic growth and the creation of jobs. On the issue of whether humans should master or co-exist with nature, a relationship with income was found: while 42 per cent of the lowest-income group believe that man should master nature, 80 per cent of the highest-income group believe that man should co-exist with nature (Zellie, 2003:59). The results of Struwig's (2010:213) study were very similar, as lower-income groups scored lower on her environmental concern index. Moreover, groups with the highest income showed the most concern for the environment.

2.3.6.2 *Educational attainment and environmental concern*

In her South African study on environmental concern, Willers states that (1996:56), "the level of education achieved is one of the most consistent findings in the literature on correlates of environmental concern". This is disputed by Struwig (2010:213), according to whom the findings in this regard are more mixed than those of Willers. In addition, as a variable, level of education should not be equated with knowledge of the environment: research in the USA and in South Africa (Arcury, 1990 and Adler & Ackerman, 1981, as cited in Willers, 1996:57) has revealed fairly low levels of knowledge about environmental issues and environmental degradation, even when level of education is positively related to environmental concern. Also, the increase in environmental concern as educational level increases does not necessarily translate into pro-environmental behaviour (Kollmuss & Agyeman, 2002:248).

¹³It needs to be borne in mind, however, that national-level measures such as GDP are not comparable to individual-level measures such as SES.

However, a consistent positive relationship between level of education and environmental concern has been found in studies conducted in the USA according to Van Liere & Dunlap's (1981) review of environmental concern studies. A study by Buttel and Flinn (1974:57) supported these findings. A South African study conducted by Reynolds (1992, as cited in Willers, 1996:58) found that people with matric or a tertiary qualification displayed a more positive attitude towards the environment than people with less formal schooling. Craffert and Willers (1994:42) showed that significantly more of the higher qualified respondents in their study considered environmental degradation as a priority than those with lower educational qualifications. Contradicting these findings are those produced by two studies conducted in the USA by Mohai and Bryant (1998:495 and Uyeki & Holland, 2000:656) in both cases the relationship between education and environmental concern is negative. This means that as the educational attainment of the respondents rose, their concern for the environment decreased. Conversely, Guth, Green, Kellstedt and Smidt (1995, as cited in Struwig, 2010:214) found a weak correlation between education and environmental concern. Although it is important to note that none of the three studies focus on South Africa, they do present rather conflicting views of the relationship between environmental concern and education. This is recognised by Whitaker, Segura and Bowler (2003:437&445), as cited in Struwig, 2010:214), who posit that "education is an important contributor to the formation of personal opinions, but there appears to be little reason to expect education to work in a systematic and independent way to influence a person's concern for the environment".

Finally, in Struwig's (2010:214) South African analysis a linear, positive association was found between level of education and environmental concern, as people with the lowest level of education were the least environmentally concerned. This was also reported for Ghana by White and Hunter (2009:973), who state that formal education renders people more likely to voice environmental concerns. According to Anderson *et al.* (2007:133), in South Africa, education of the head of the household is not related to concern about water pollution, but it has an important effect on whether households treat drinking water. In a more recent study, education of the head of the household was found to be positively related to recycling (Anderson *et al.*, 2013:10). The argument that the more educated one is the higher your level of concern towards the environment, confirms scholars beliefs who argue in favour of the post-materialist thesis. This undercuts the notion that the poor could care for the environment as much as the wealthy do, as generally, the poor do not attain levels of formal education as high as those of the wealthy.

2.3.6.3 *Occupational class and environmental concern*

Not much attention has been paid to occupational class in South African research on environmental concern. However, many South Africans equate environmentalism with upper-middle-class concerns, as highlighted earlier by the BBC World Service Trust (2010:16) and Cock's (1991:14) study on climate change. In that study, South Africans equated climate change to a "green topic", which is the concern of the urban elite. This brings to the fore the relationship between occupational class and environmental concern. Therefore, it is vital to study this relationship to better understand how SES and environmental concern are related to one another.

Van Liere and Dunlap (1980:183) conducted a meta-analysis on the social bases of environmental concern. They state that environmental concern is positively correlated to occupational prestige¹⁴, as the upper classes have solved their basic material needs and are thus free to focus on the more aesthetic aspects of human existence. This is informed by Maslow's hierarchy of needs theory; hence concern for environmental quality is something that develops only after other basic needs have been met. Related arguments are found in the relative deprivation theory, according to which members of the lower class have experienced only poor physical conditions and are therefore less aware that they live, work and play in more polluted areas than members of the upper class (Morrison, Hornback & Warner, 1972, as cited in Van Liere & Dunlap, 1980:184). Conversely, the members of the upper class have experienced pleasant work, residential and recreational environments, and have a heightened concern of environmental degradation when they do encounter it. Hence, Morrison (1972, as cited in Van Liere & Dunlap, 1980:184) believes it is relative deprivation and not absolute deprivation that leads to environmental concern. This study has been criticised by Buttell and Flinn (1978b, as cited in Van Liere & Dunlap, 1980:184) for relying too much on figures based on environmental organisation membership and therefore not being able to generalise to the mass public. Buttell and Flinn (1978b, as cited in Van Liere & Dunlap, 1980:184) believe that because working-class and lower-class respondents typically reside in highly polluted areas, they are expected to be as much or even more environmentally concerned than the upper classes.

Van Liere and Dunlap (1980:190) reviewed many studies that investigate occupational prestige as a predictor for environmental concern generally the results show a positive, although weak, relationship between these two variables. These authors conclude that the

¹⁴ While these authors use the label "occupational prestige", I prefer occupational class because of the way it is operationalised in the WVS and the way I have coded this variable (see Chapter 3).

evidence for a relationship between occupational prestige and environmental concern is therefore very weak at best. It must be kept in mind that the studies reviewed by Van Liere and Dunlap are all more than 30 years old and were all conducted in the USA. The South African context is vastly different from the American one, and differences between the classes in terms of environmental concern therefore need to be examined in this context.

2.4 Theoretical framework

Due to the inter-disciplinary nature of the field of environmental concern, there is a proliferation of different views on how environmental concern should be understood and explained. According to Kollmuss and Agyeman (2002:239), some of the theoretical contributions include: early US linear progression models; altruism, empathy and pro-social behaviour models; and sociological models. There are also economic models and psychological models that consider behaviour in general. This reveals just how many disciplines have contributed to our understanding of the construct of environmental concern. This part of the literature review highlights the theoretical framework that will be applied in this thesis, and its influence on how I have come to understand environmental concern.

2.4.1 Post-materialist thesis

In cross-national surveys such as the WVS, European Values Survey and the Health of the Planet Survey, the measurement of environmental concern is primarily informed by the Post-materialist thesis. The underlying assumption of this thesis is that highly industrialised, wealthy nations show concern towards the environment (Dunlap & York, 2008:529). This argument is based upon (1) the emergence of environmentalism and “green” political parties in North America and Northern European countries before anywhere else in the world; and (2) the cautious reaction of developing nations to the 1972 United Nations Conference on the Human Environment in Stockholm.

The post-materialist thesis has produced a theoretical understanding of environmental concern as a luxury that is accorded a high position on Maslow’s hierarchy of needs, and as such, only considered once more basic material needs have been fulfilled (Dunlap, 1975, as cited in Dietz, Fitzgerald & Schwom, 2005:360). For example, Inglehart (1995) argues that mass support for environmental concern occurred in countries with publics that hold post-materialist values. This hypothesis has sparked critique from a number of social scientists (e.g. Guha & Martinez-Alier, 1997; Lowe & Rudig, 1986; Brechin & Kempton, 1994) who

argue that the post-materialist thesis emphasises value change rather than “objective environmental deterioration” (Dunlap & York, 2008:531).

The reason for the post-materialist thesis’s emphasis on value change may be found in the social sciences’ tendency towards socio-cultural determinism – an over-compensatory reaction to the environmental determinism propagated by geographers in the 19th century. Therefore, when measuring environmentalism, environmental conditions tend to be conspicuously absent from social sciences analysis. This was highlighted in a study on South Africans’ perceptions of water pollution by Anderson *et al.* (2007:157), who argue that:

living in poor environmental circumstances was generally associated with the perception of an environmental problem, and it was not necessary for the household head to have a high education. These findings counter the view that perception of environmental problems is a post-materialist perspective. Rather, those most likely to be directly affected by water pollution are also most likely to see it as a problem.

Secondly, the post-materialist thesis is very similar to popular “modernisation theories”, which assume that “continued economic development will lead to affluent, socially and politically tolerant industrial futures” (Roberts & Hite, 2002, as cited in Dunlap & York, 2008:531). In addition, many social scientists have empirically identified anomalies in the post-materialist thesis (see Dunlap & York, 2008; Brechin & Kempton, 1994; Dunlap & Mertig, 1997), which suggest that citizen concern for the environment is not dependent on national affluence, nor is it dependent on post-materialist values.

Nevertheless, the post-materialist thesis has become popular in sociology, economics and political science, and strongly informs the way in which environmental concern is measured in cross-national surveys. The way in which items are formulated therefore fall prey to certain pitfalls, by (1) assuming access to financial resources needed to act in what is narrowly defined as an environmentally concerned manner; and (2) employing a western, ecocentric conceptualisation of “environment” and the motivations that drive concern about that environment. Consequently, those who lack such resources and do not ascribe to an ecocentric view, i.e. the poor in Third World countries, tend to be simplistically accorded the status of not being environmentally concerned. Therefore one may argue that an anthropocentric concern about the environment as a resource, rather than as aesthetically pleasing, should be accorded a level of importance at least equal to that of ecocentric concern, when measuring environmental concern among South Africans. I therefore hypothesise that, when controlling for class there is no difference in environmental concern amongst the

various race groups. This hypothesis is informed by the post-materialist thesis, as I expect those South Africans that have had their basic needs met (according to Maslow's hierarchy of needs) will have had a better chance to develop post-materialist values, irrespective of their race.

2.4.2 Environmentalism of the poor

In his book, *Slow violence and environmentalism of the poor*, Nixon (2011:4), posits that “turbo-capitalism” has treated people and our ecosystems as disposable, and this has led to the creation of vulnerability in the ecosystems and people that have been subjected to neo-liberalism. Nixon (2011:4) theorises that, because the neo-liberal era has intensified its assault on resources, it has also intensified resistance, whether through isolated local struggles or across national boundaries in an effort to build cross-national alliances. Nixon (2011:4) proceeds to highlight the way environmentalism in the South, where green or environmentalist discourses were often regarded with scepticism and as neo-colonial (as discussed in section 2.3.2), has shifted significantly in recent years due to the increasing visibility and credibility of environmental justice movements that have resisted antihuman environmentalism and that often sought to resist the green agenda of rich nations and western NGOs. Nixon (2011:4) believes that:

the fate of environmentalism – and more decisively, the character of the biosphere itself – will be shaped significantly in decades to come by the tension between what Ramachandra Guha and Joan Martinez-Alier have called “full-stomach” and “empty-belly” environmentalism.

In an attempt to redistribute natural resources equally among all South Africans, the post-apartheid government and civil society have adopted an environmental justice discourse. According to McDonald (2002:3), “environmental justice can be defined as incorporating environmental issues into the broader intellectual and institutional framework of human rights and democratic accountability”. Furthermore, environmental justice is anthropocentric in its orientation, i.e., it takes people rather than flora and fauna as its focus, while locating them in a complex web of social, economic, political and environmental relationships. Consequently, the environmental justice movement attempts to address injustices in the abovementioned relationships. This relatively recent move towards the reallocation of natural resources and involvement of the poor and previously disenfranchised in environmental decision-making may have had an effect on the majority of South Africans' attitudes towards the environment. Furthermore, Anderson *et al.* (2007:135) hypothesize that because

environmental rights have been enshrined in the Bill of Rights, it may result in a higher level of public awareness of environmental matters. However, they found that despite the attention given to environmental concerns in the constitution, it does not appear as if there is an increase of awareness in the South African public's concern towards the environment. It is therefore important to study possible changes in South Africans' environmental concern over an extended time period that would take into account the potential effects of changes in environmental policy and discourse.

I hypothesise that since 1996 South Africans would have become more environmentally concerned. This hypothesis is informed by Jacklyn Cock's (2006:294) argument that there is a social crisis in South Africa, constituted by a growing gap between the discourse of rights and the reality of unmet needs, especially as these needs relate to environmental issues such as land, water and sanitation. It is the acknowledgement of this crisis that has led to the recent increase in service delivery protests in South Africa.

2.5 Conclusion

This literature review has shown that the field of environmental concern is fairly vast and that quite a few studies have been conducted on environmental concern. Although only a few very similar studies have been conducted in South Africa on this topic (Zellie, 2003; Struwig, 2010; Anderson *et al.*, 2007; Hunter *et al.*, 2010;; Anderson *et al.*, 2010; Anderson *et al.*, 2013), as this review has shown, results have not always been consistent. In addition, many of the findings have been disputed (Struwig, 2010), especially when measures are dissimilar, such as measures of environmental concern on a national level and on an individual level. In this regard, it is important to note the great variety of ways in which environmental concern was measured in the studies reviewed. The literature that was consulted for this review did not provide a homogenous view of what constitutes environmental concern. Care needs to be taken when comparisons are drawn with previous research that is based on different dimensions of environmental concern from the one chosen for this thesis.

Finally, the literature review has elucidated the very complex interplay between race, SES and environmental concern, especially in the diverse South African context. The thinking underlying the hypotheses regarding the relationship between these variables is often directed by the post-materialist thesis, which posits that poor people will not be as concerned about environmental protection as the wealthier ones are, because the poor have other, more basic needs that need to be fulfilled. At first glance this seems to be a valid argument, but it is a

superficial one, which does not take into account the way in which environmental concern has been operationalised in the WVS. Hence, it is crucial to problematise the concept of environmental concern and to highlight possible pitfalls associated with the way in which it has been measured in most cross-national surveys. It is in this regard that this thesis aims to make a methodological contribution in addition to its empirical input.

In addition, the review has shown that, generally, South Africans are not as environmentally concerned as their counterparts in developing countries and do not consider climate change a threat. Instead, as with many environmental issues, it is seen as an urban elite concern. Therefore, one may expect, environmental concern to be influenced by class in South Africa. Since no longitudinal study on environmental concern has been conducted in South Africa, this study hopes to elicit important findings on whether South Africans are becoming more or less concerned about the environment. It also hopes to show which racial groups are more concerned about the environment when controlling for class. A longitudinal study will be able to show which direction South Africans' concern for the environment might take in the future. This longitudinal study can therefore remedy a gap in the literature and improve our understanding of environmental concern in South Africa both in a cross-sectional way and over time.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

To achieve the objectives of this study, I decided to analyse existing data generated by the three most recent waves (1996, 2001 and 2006) of the WVS. The decision to conduct a secondary analysis was taken after considering the size and diversity of the South African population to which I wanted to generalise and the large sample needed to achieve this. A secondary analysis of survey data is known as an unobtrusive research method, according to Neuman (2011:374). Its benefits are that it is relatively inexpensive, allows for comparisons across groups, facilitates replication, and permits examination of issues that have not been considered by the original researchers (Neuman, 2011:375). Furthermore, large-scale surveys can be very expensive and difficult to conduct and, for most researchers, the cost and time required for a major national survey are prohibitive. However, a secondary analysis, especially a longitudinal one, also has shortcomings, which will be discussed in more detail in this chapter.

The WVS is unique because it is the only dataset that allows for a longitudinal analysis of environmental concern in South Africa. In South Africa, the first wave of the WVS was conducted in 1982, with subsequent waves conducted in 1990, 1996, 2001 and 2006. Longitudinal analysis of environmental concern is only possible with data collected during the last three waves, therefore my study will be restricted to those items only.¹⁵ Furthermore, I chose to analyse only those items on the environment that can be formulated into an index in each of the last three waves. Generally an index is preferable to a single item measure as it provides more variation in responses (Babbie, 2010:147). By constructing the index in the following way it also partly replicates previous well known studies in the environmental concern literature (see Dunlap & York, 2008; Inglehart, 1995). This chapter is devoted to understanding why I chose these data and how I went about analysing them.

3.2 Research design: Secondary analysis

According to Phelan (2000, as cited in Prozesky, 2007:121), “any secondary analysis is constrained by parameters that are determined by the research purpose of those who originally collected the data to be analysed”. Hence, using these data requires making

¹⁵ See Table 1 for the items I selected, these are the items that were applied the most consistently in the WVS’s different waves.

significant preliminary decisions in terms of the study population, the variables included, and the conceptualisation and measurement of the variables in my study. These choices can significantly influence the findings (Phelan 2000, as cited in Prozesky, 2007:121). In addition, Bryman (2008:300) states that one of the limitations of a secondary analysis is that the data are often collected for the original researcher's own needs, and therefore data on key variables may be absent. This applies to my study, in the sense that the WVS has a relatively limited focus on environmental concern.

Gremy (1989, as cited in Glover, 1996:29), notes that there are three types of problems with secondary data analysis: technical, institutional and epistemological. In my use of the WVS, the first two problems have been addressed, as will be discussed in a section on technical issues presented later. Technical problems relate to the degree of familiarity the researcher has with the data and the level of documentation available to the researcher. Institutional problems involve the arrangements for secondary analysts to gain access to the data.

It is the epistemological problem that seems to provide the largest hurdle, this problem focuses on the given-nature of the data, i.e. "the fact that the primary data were produced within a particular view of what constituted knowledge and in terms of a specific perspective" (Glover 1996:29). However, Hyman (1972, as cited in Glover 1996:29) disagrees that the epistemological problem is not an issue in the secondary analysis of data. According to him/her, the epistemological problem assists the researcher approaching his/her definition of concepts in a more exhaustive manner, and to think about these concepts in different ways. Approaching the definitions of the original concepts in a different way may lead to a potential slippage between concept and indicator; while this might present a challenge, it forces the researcher to think carefully about theoretical frameworks. For instance, the concept of environmental concern is conceptualised in the WVS in terms of the post-materialist thesis, and therefore its indicators focus on economic relations and not religious or anthropocentric dimensions of environmental concern.

Glover (1996:29) also highlights that secondary analysts use data that has been commissioned by governments (or in this case a research organisation). The effect on the conceptualisation and operationalisation process is noted when she states:

"the questions asked, and the resulting variables, are likely to be related to a specific, historically located, conception of what is politically feasible and acceptable [...] Thus the data represent a consensus around a given cultural and historical context, which the secondary analyst has to take as a given .

Therefore it is clear that the WVS's assumptions and theoretical underpinnings of their organisations are important to my research. Furthermore, Glover (1996:30) argues that a different epistemological perspective may have produced a different effect. Inglehart, who is the leading figure of the WVS organisation, makes the central assumption that value change is informed by modernisation theory (Haller, 2002:140). Haller argues that:

Inglehart's first and central assumption is that value change is primarily a consequence of changing technological and economic-material factors. The chief witness is Karl Marx: modernization theory's most influential proponent, Karl Marx, claimed that economically developed societies show the future to less developed societies [...] Industrialization is seen as the central element of a modernization process that affects most other elements of society. In this spirit Inglehart (1995:67) considers that socio-economic change follows coherent and relatively predictable patterns and that economic development has systematic and to some extent, predictable cultural and political consequences (Inglehart and Baker, 2000:29).

Modernisation theory ties in well to the post-materialist thesis and clearly Inglehart has constructed the questionnaire to measure and thereby theorise on the changes experienced in the participating countries. This highlights the constraint of any analysis using the WVS.

Bourdieu, Chamboredon and Passeron (1991:36) argue that a secondary analysis of material, such as the WVS data, collected for a different problematic, can never fully and adequately answer questions for which, and by which, they were not constructed. This highlights the constraint on using the WVS for an analysis of environmental concern. However, Bourdieu *et al.*'s (1991) argument does not call into question the validity of using second hand material, but rather of recalling the epistemological conditions of the retranslation, which always deals with (well or badly) constructed facts. This effort in interpretation, of which Durkheim's (1897, as cited in Bourdieu *et al.*, 1991:36) well known study on suicide is an early example, provides the best training for epistemological vigilance, since it requires the researcher to render explicit the problematics and principles of object construction, the object in this case being the WVS's data, that are implied in the data and in the new treatment (secondary analysis) applied to it (Bourdieu *et al.*, 1991:36). These authors argue that if these epistemological preliminaries are not considered, there is a great risk of treating identical things differently, and different things identically. Researchers may also compare the incomparable and fail to compare the comparable, if the epistemological preliminaries of secondary analysis are not considered. To avoid this, I have to keep in mind that the operationalisation of environmental concern in the WVS may not be appropriate for a

context outside of Europe and America (see section 3.5.4 for a longer discussion). According to Bourdieu *et al.* (1991:36), even the most “objective data” are constructed from theoretical presuppositions and therefore overlook information which another construction of the facts might have grasped (Bourdieu *et al.*, 1991:36-37). The theoretical presuppositions of the WVS render any deviation from a post-materialist analysis of the data quite challenging. This problem has been addressed somewhat since the 2005 wave, which saw the introduction of questions about local and global environmental problems. However, the introduction of these questions poses another difficulty, which will be discussed next.

3.3 Time dimension: Longitudinal analysis

Another important methodological issue to consider concerns issues related to a longitudinal analysis of WVS data. My study will focus on the environmental items in the WVS, specifically environmental concern among South Africans. Since the first wave of the WVS, a battery of environmental items has been included in the WVS. Although understanding the way people’s values have changed is the core objective of the WVS (WVS, 2008), many changes have been made to items over time, and the environmental items are not exempt. This poses serious problems for longitudinal analysis, especially since the items in the first wave, conducted in 1981, are completely different from those contained in the most recent wave (2006).

In addition, concern has been raised about whether a construct can remain relevant over time (Perry, 2011:156), and this is particularly relevant to environmental concern: what was considered as concern for the environment in the 1980s is definitely not viewed the same way today. Environmental problems do not remain the same over time, as the hole in the ozone layer illustrates well. Our experience of the environment has changed since the 1980s, and will continue to do so. While this problem is common to all longitudinal research, it will not be a major hurdle in this study, as South Africa’s environmental problems have remained fairly similar in the decade it focuses on.

The first (1981) wave of the WVS was conducted by the European Values Study (EVS), and although a few environmental items were included in the root questionnaire¹⁶, they were excluded from the South African questionnaire. The 1990 South African wave contained only one environmental item which was removed from the next (1996) wave, thereby rendering

¹⁶ The root questionnaire is the questionnaire developed by the scientific advisory committee and then passed down to the principal investigators of each country following consultation. Countries are allowed to exclude or include items from the root questionnaire.

longitudinal analysis impossible. Although two new items (1 and 2 in Table 1 below) appear in the root questionnaire for the 1996 wave, they were again excluded from the South African questionnaire. The only item that has been consistently included in each wave, is therefore the one that focuses on a respondent's willingness to agree to an increase in taxes if these were to be used in combating environmental pollution or damage. The 1996 wave seems to be the most problematic in terms of longitudinal analysis, due to the fact those items in that wave that make up the willingness-to-pay-for-environmental protection (WTPEP) index are different from those that constitute the same index in the 2001 and 2006 waves. For the 1996 wave, items 2 and 4 in the table below will constitute the index, while for the 2001 and 2006 waves, items 1, 2 and 3 make up the index. In addition, it needs to be noted that the wording of item 2 changed slightly from environmental damage in 1996 to environmental pollution in 2001.

Table 1: Items in WTPEP index: 1996, 2001 and 2006

Item no	Wording of statement	1996	2001	2006
1	I would give part of my income if I were certain that the money would be used to prevent environmental pollution ¹⁷		X	X
2	I would agree to an increase in taxes if the extra money is used to prevent environmental damage/pollution	X	X	X
3	The government has to reduce environmental pollution, but it should not cost me any money		X	X
4	I would buy things at 20% higher than usual prices if it would help protect the environment	X		

The rationale for the WVS including these items is based on the assumption that those who are environmentally concerned will be more willing to pay for environmental protection than those who are not. Also, a longitudinal analysis should show that societies who have seen a steady growth in GDP are more likely to display post-materialist values, and therefore more people willing to pay for environmental protection.

The implications of changes that have been made over time to the items measuring environmental concern are that a longitudinal analysis of environmental concern can only be conducted from 1996 to 2006, which restricts my South African analysis to the post-apartheid era. Furthermore, any comparison between the 1996 and 2001/2006 cross-sectional analyses

¹⁷ All of the items in Table 1 use a Likert-type scale as the response options for the respondents. The response options were constructed as follows: strongly agree, agree, disagree and strongly disagree. None of these categories were collapsed in this study.

of the WTPEP index is problematic, due to changes in the composition of the index and the wording of the items, as presented in Table 1.

3.4 The WVS as data source

As mentioned earlier, the WVS was conceptualised under the guidance of Inglehart and Abrahamson (MacIntosh 1998:452). These scientists used this survey to develop a post-materialist scale, which indicates “a worldwide trend away from concerns with material well-being toward a postmaterialist value system that emphasises the free expression of ideas, greater democratisation, and the development of more humane societies” (1995, as cited in MacIntosh 1998:452). The objectives of the WVS are summarised as follows:

The WVS is a worldwide network of social scientists studying changing values and their impact on social and political life. The WVS [...] carried out representative national surveys in 97 societies containing almost 90 percent of the world’s population. These surveys show pervasive changes in what people want out of life and what they believe. In order to monitor these changes, the WVS has executed five waves of surveys, from 1981 to 2007 (WVS, 2008).

What can be inferred from this quote is that the WVS provides social scientists with the ability to analyse changes in values and attitudes, among diverse societies, and over the course of three decades. Additionally, it allows for a cross-cultural comparison in terms of a wide array of values. The WVS provides vast opportunities for analysis and also theoretical innovation, as a wide variety of variables are included in each wave. However, it has not escaped critique, as voiced by MacIntosh (1998:452): “it remains to be confirmed that cultural, technological, and language differences can be overcome to permit a rigorous comparison of attitudes across so many countries”.

3.4.1 Rationale for using the WVS

At the start of my research, I examined all nationally representative datasets to determine whether they would provide me with a longitudinal analysis of environmental concern in post-apartheid South Africa. For a variety of reasons that will be outlined below, the WVS fit my needs the best. An alternative dataset that was considered for this thesis is the South African Social Attitudes Survey (SASAS) which has been conducted annually by the Human Sciences Research Council since 2003. However, the SASAS data on environmental attitudes do not provide opportunities for longitudinal analysis; it was conducted in 2005 and 2010. The 2010 data is not available and there is no way of seeing whether it will be similar to the

2005 data, thereby allowing for longitudinal analysis. The data on environmental attitudes are also older than those provided by the most recent wave of the WVS (2006), and have been analysed before by Struwig (2010). Moreover, Struwig (2010:212) was unable to validate the environmental items into an index. She describes the process of constructing her index, from the SASAS 2005 data, in the following way:

In an attempt to understand the underlying environmental concepts that were tested by the questions, a factor analysis was done. This factor analysis did not, however, clearly reveal specific factors, but did reveal which questions were correlated. Using this and eliminating the questions that had a high non-response, the author selected the statements below to form part of the environmental index. These statements are varied and did not try to test one specific principle. Rather, they tested environmental versus economic imperatives, the environment and its relationship to other social issues, human interventions and their effects on the natural environment, and commitment towards environmental protection. While this index is not comprehensive enough to measure all facets and components of environmental concern, it does broadly reflect intent and commitment to the environment.

The results for the factor analysis, which would have elucidated the number of dimensions of environmental concern that are measured in her study, were never reported, and leads one to question the way in which the environmental concern index was constructed in the first place.

Another alternative that was considered is the General Household Survey (GHS). The data generated by the GHS's environmental items range only from 2003 until 2011; additionally, they focus predominantly on whether the respondents have been exposed to certain types of pollution. While the GHS provides data on a larger sample than the WVS, and is more consistent in its inclusion and wording of environmental items, it does not measure environmental concern *per se*. The few items that do focus on concern for the environment¹⁸ have been phrased seemingly without taking into consideration the possibility of a social desirability bias. Also, as with SASAS, an analysis of the environmental items has already been conducted (see Anderson *et al.*, 2007; Anderson *et al.*, 2010).

Although I decided against using their data, I will use the findings from these studies to compare them to the findings of my study, thereby locating my study within the broader South African literature on environmental attitudes. Although WVS data were partially

¹⁸ These focus on the behaviour of the household, for instance: does the household make a concerted effort to save water and electricity? I am of the opinion that it is a fruitless question to ask, as it is socially highly desirable to answer in the affirmative. Additionally, as explained in the literature review, the logical jump from awareness of environmental pollution to pro-environmental action cannot necessarily be made.

utilised by Struwig (2010) and Zellie (2003), both of these analyses leave room for improvement. Neither of these studies validates the indices that were used; discusses sampling issues; uses multivariate analyses to better understand the relationships between their variables; nor uses a longitudinal design. In sum, my motivation for analysing the WVS data is that, at the time of writing, it was the most underutilised data and the items in the WVS fit my research problem the best of all the nationally representative data available.

3.5 Conceptualisation and operationalisation of variables

3.5.1 Outcome variable: Environmental concern

As already noted, the WVS has conceptualised environmental concern very differently across the five waves (1981, 1990, 1996, 2001 and 2006), which hinders longitudinal analysis of the data. The longitudinal analysis of environmental concern is the most important part of this thesis. The most consistent measure of environmental concern in the WVS, which therefore allows for longitudinal analysis, is the WTPEP index. The indicators that make up this index are the only ones that can possibly constitute an environmental concern index in the WVS. Therefore I decided to use the WTPEP index as the only outcome variable for this study. This index was constructed in the same way Dunlap and York (2008:540) did in their study on global environmental concern and the limits of the post-materialist explanation. These researchers found that “willingness to make economic sacrifices for the environment is a distinct dimension of environmental concern among the general publics of a highly diverse set of nations”. This section will provide an overview of how environmental concern has been measured in the three waves, and how I will proceed to measure it in this study.

3.5.2 The measurement of environmental concern

Although the construct of environmental concern has, according to Heberlein (1981, as cited in Dunlap & Jones, 2002:2), been measured in many studies, the literature does not seem to provide a clear understanding of how it should be measured. Moreover, he notes the difficulties involved in measuring environmental attitudes in general, as follows:

The environment as an object is constantly present and has multiple sub-objects which do not, as individual objects, represent the totality. We have attitudes about specific objects in the environment such as pine trees, a particular river, the Rocky Mountains, etc. The environment is an experiential object, but no one experiences “the environment” as a whole, but rather separate distinct aspects of the environment.

It is from this apprehensive position that I will review the index put forward by the WVS's scientific advisory committee to measure environmental concern. First, I will consider some of the theoretical intricacies involved in conceptualising environmental concern; and secondly, I will perform an exploratory factor analysis (EFA) to validate the different indices¹⁹ for each of the 1996, 2001 and 2006 waves of the WVS.

Much of the environmental concern literature disagrees on the conceptualisation and operationalisation of this construct. According to Xiao and Dunlap (2007:471), "the environmental concern literature has been highly fragmented and disorganised". They attribute this state of affairs to the diverse disciplinary backgrounds of the researchers that work on the topic, and the lack of theory and established measures upon which to ground their analysis. Consequently, inconsistent results that cannot be compared have hindered the accumulation of knowledge (e.g., Heberlein, 1981; Gray, 1985; Guber, 2003; Dunlap & Jones, 2002, as cited in Xiao & Dunlap, 2007:471).

This impasse could create serious hurdles for the accumulation of knowledge on the topic on environmental concern. However, authors such as Heberlein (1981) and Dunlap and Jones (2002, as cited in Xiao & Dunlap 2007:473) provide evidence of a gradual increase in the consistency of the public's environmental attitudes and beliefs over time, thereby increasing the meaningfulness of the construct. The seemingly multidimensional character of the construct is due to the "neglect of random and systematic measurement errors in commonly utilised analytic techniques such as Cronbach's alpha and exploratory factor analysis" (Xiao & Dunlap, 2007:473). Consequently, these authors advocate for a more advanced statistical technique referred to as confirmatory factor analysis²⁰. This is not necessary for my study, as Dunlap and York's (2008) study showed that, across many nations, the items that constitute the WTPEP index measure only one factor²¹ or dimension of environmental concern. This means that more advanced statistical techniques are unnecessary, and any attempt to test, through a confirmatory factor analysis, whether the construct environmental concern is unidimensional, is superfluous, as I am analysing only one dimension of environmental

¹⁹ Dunlap and York (2008) performed an EFA on these items as well. However, they also included four other environmental items in their EFA, thereby testing the dimensionality of environmental concern across approximately 50 nations.

²⁰ This is a form of factor analysis in which specific hypotheses about the structure of and relationships between the latent variables that underlie the data, are tested (Brown, 2006:1).

²¹ Constructs such as environmental concern may have many dimensions, which are referred to as factors or latent variables (Field, 2009:629). By reducing a group of interrelated variables to a smaller set of factors, factor analysis achieves parsimony by explaining the maximum amount of common variance in a correlation matrix, by using the smallest amount of explanatory constructs. Therefore the items that make up the WTPEP index form one coherent dimension of environmental concern.

concern. Dunlap and York (2008) conducted an EFA on only the 1996 and 2001 data. I will conduct an EFA on both of these waves and the 2006 wave, so as to show the test-retest reliability of this index and to confirm whether only one dimension of environmental concern is consistently being analysed in this project.

3.5.3 The environmental concern index of the WVS

This section will focus on the WTPEP index and how its longitudinal analysis was approached. This section will also validate the indices for each year, and test their reliability²².

3.5.3.1 *The 1996 wave*

In Dunlap and York's (2008:543) analysis of the 1996 wave²³, they created a "willingness index" from items 2 and 4 in Table 1. I therefore replicated this EFA, and present the results in Table 2 below. Both of these items form part of one dimension, as they did in Dunlap and York's (2008) study²⁴. These indicators explain 82% of the common variance, and this index may be reported as being very reliable due to the high Cronbach's Alpha score produced.

Table 2: Summary of exploratory factor analysis of the WTPEP index, 1996

Indicator number and description	Factor loadings
2. I would agree to an increase in taxes if the extra money is used to prevent environmental damage	.904
4. I would buy things at 20% higher than usual prices if it would help protect the environment	.904
Eigenvalues ²⁵	1.44
% of variance	82
Cronbach's α	.775

3.5.3.2 *The 2001 wave*

In the 2001 wave of the WVS, the WTPEP indicators were changed, thereby causing problems with the longitudinal analysis of these data. Has been indicated Table 1 above, the

²² The reliability of an index refers to whether the measure consistently reflects the concept it is measuring (Field, 2009:673)

²³ It took three years for all the participating nations in the WVS to complete the third wave, therefore many authors refer to it as the 1995-1998 wave. I refer to it as the 1996 wave because the South African survey was completed in 1996.

²⁴ I replicated their analysis as they did not provide the Cronbach's alpha and neither did they provide the full results for their EFA of the South African data.

²⁵ An eigenvalue represents the amount of variation explained by a factor, and an eigenvalue of 1 represents a substantial amount of variation (Field, 2009:641). Therefore it is suggested that one retains all factors that have an eigenvalue of more than 1, whereas Kaiser's criterion reports that this is too strict, and a value of 0.7 is sufficient. This thesis will retain all factors with an eigenvalue above 1.

index will be composed of items 1, 2 and 3. Item 3 is double-barrelled²⁶, and therefore could be problematic in terms of analysing the results. This led to Dunlap and York (2009:546) examining it as a single item, the reason they did this is because it did not form one factor on their willingness index across all the countries they were examining. In contrast, in my study, the only requirement is that item 3 should form part of the same dimension as items 1 and 2.

The results from this study, as presented in Table 3 of the EFA I conducted, show that all 3 items load on one dimension. What is problematic about this index, however, is that the Cronbach's alpha of .129 is very low, which raises concern about the test-retest reliability of the index. The reliability of this index may have been affected negatively by the double-barrelled nature of item 3, as some respondents may have responded to the first part of the item, whereas others may have responded to the second part of the item²⁷. Nevertheless, the inter-item correlation is fairly strong, which again highlights the unidimensionality of the WTPEP index. Items 1 and 2 correlate strongly ($r > .6$, $p < .05$), but in contrast, item 3 correlates with the other two negatively ($r < -.25$, $p < .05$). This is due to the way I reverse-coded this item. Based on the assumption that the respondents are answering the second part of the item (i.e. "reducing environmental pollution should not cost me any money"), when scoring this index I will reverse-code this item and thus the respondents who strongly agree with this item will receive a low score on the WTPEP index.

Table 3: Summary of exploratory factor analysis of the WTPEP index, 2001

Indicator number and description	Factor loadings
1. I would give part of my income if I were certain that the money would be used to prevent environmental pollution	.872
2. I would agree to an increase in taxes if the extra money is used to prevent environmental pollution	.869
3. The government has to reduce environmental pollution, but it should not cost me any money	-.578
Eigenvalues	1.849
% of variance	62
Cronbach's α	.129

²⁶ A double-barrelled item refers to a request for a single response to an item with multiple parts (Babbie 2010:257). Item 3 requests respondents' opinion on whether the government should reduce environmental pollution and whether it should cost them anything. Hence there are two parts to this question.

²⁷ After removing the double-barrelled item, the Cronbach's alpha score, for the index, jumps up to .755.

3.5.3.3 *The 2006 wave*

In the 2001 and 2006 waves, items 1, 2 and 3 were consistently included (see Table 1), which is beneficial for the longitudinal analysis of the data. I performed an EFA on the same three items and the results are presented below in Table 4. The results are very similar to the 2001 wave. All 3 items form part of one dimension and these items account for 62% of the common variance. Once again, the reliability of this index is low, as indicated by the Cronbach's $\alpha = .179$.²⁸ I decided to keep the index the same, in the interests of conducting a longitudinal analysis.

Table 4: Summary of exploratory factor analysis of the WTPEP index, 2006

Indicator number and description	Factor loadings
1. I would give part of my income if I were certain that the money would be used to prevent environmental pollution	.885
2. I would agree to an increase in taxes if the extra money is used to prevent environmental pollution	.879
3. The government has to reduce environmental pollution, but it should not cost me any money	-.570
Eigenvalues	1.881
% of variance	62
Cronbach's α	.179

The inter-item correlation for the 2006 wave was very similar to that which was produced for 2001. This means that the one dimension of environmental concern measured in these two waves is very similar across them, and therefore will allow for longitudinal analysis. As in the 2001 wave, Items 1 and 2 displayed a strong positive correlation ($r = .697$, $p < .05$.) and items 1 and 2 a medium-strength and negative correlation ($r > -.250$, $p < .05$) with item number 3. This also, and again, points to the unidimensionality of the WTPEP index. The Cronbach's alpha of this index may also be partially affected by the reverse coding of item number 3 (see Field, 2010:675). The reliability of item 3 is concerning, but this item was included to highlight the problems of undertaking a secondary analysis of existing data as a research method. In addition, I will conduct the analysis of this index without the double-barrelled item and report any findings that may influence the results of my thesis in anyway.

3.5.3.4 *Limitations of the WTPEP index and constraints on the thesis*

What is considered in this sub-section is whether environmental concern is actually being measured by the indicators in the WTPEP index. Environmental concern is a highly abstract

²⁸ Once I have removed the double-barrelled item the Cronbach's alpha score, for the index, jumps up to .813

construct. Different ways of measuring it can lead to diverse and, more than likely, conflicting results on South Africans' concern towards the environment. For instance, one may claim that the environment surrounding one's community, or even globally, is degraded, but whether one is able to or even willing to contribute financially to the protection of that environment, is a completely different matter.

It would have been preferable to measure different dimensions of environmental concern. However, this is the only multi-indicator index that clearly forms one dimension of environmental concern in the WVS. Although there are problems with the double-barrelled nature of item 3, this indicator still explains quite a lot of common variance with the other two indicators and does clearly measure respondents concern towards the environment. At the moment the WTPEP index is the best measure we have available to us to fulfil this objective. Dunlap and Xiao (2007:490) consider how best to measure environmental concern and state that,

[...] there is a need for a shift in the focus of research on environmental concern. Instead of limiting attention to static statuses depicted as “unidimensional” or “multidimensional”, we suggest that researchers begin by recognizing the multifaceted nature of “environmental concern” [...] and employ operationalizations that do justice to its complexity. We further suggest that they conceptualize the interconnectedness among the various facets as “constraint,” and recognize that the degree of constraint may vary over time and across populations.

Awareness of the constraints of this conceptualisation and recognition of the fact that environmental concern does include many other dimensions, will allow for a better understanding of the results produced by this study. But I would argue that the operationalisation of the construct by the WVS has not done justice to its complexity. However, these indices can provide some insight into South Africans willingness to pay for environmental protection.

In addition, by using (in the absence of viable alternatives) the WTPEP index to measure environmental concern, as I will do here for South Africa and other authors have done in the past elsewhere (see Inglehart, 1995; Dunlap & York, 2008), reduces this highly complex construct to an economic rationality: if you are willing to pay, you are environmentally concerned, and if you cannot pay or are unwilling to pay, you are not environmentally concerned.

Besides this overarching conceptual problem, there are other, more technical, problems with the WTPEP index that need to be highlighted. In particular, the item that asks

respondents whether they believe the government should reduce environmental pollution and it should cost them nothing, is not only double-barrelled, as mentioned before, but the first part of the sentence is a sentiment that pro-environmental respondents would agree with, while the second part of the item is one pro-environmental people would disagree with (Dunlap & York 2008:539). Another concerning item, which forms part of the 1996 wave, asks respondents whether they would be willing to pay 20% extra for products if doing so would protect the environment; this assumes that such products are readily available and affordable to consumers in South Africa, a developing nation. Therefore, if a respondent cannot afford these products or does not have access to them, he/she will attain a low score on the WTPEP index.

Further operationalisation-related problems emerge as a result of the vague wording of some of the items – a response to the need for the wording of the items in the WVS, as a cross-national survey, to be applicable to multiple countries. However, this leads to ambiguous items that may be interpreted differently by respondents, which may, in turn, lead to poor test-retest reliability. Neumayer (2002:334) also described the broad and unfocused nature of the WVS's environmental concern items as the reason he was unable to conduct validity checks. According to Bulte, Gerking, List and De Zeeuw (2005, as cited in Togler & García-Valiñas, 2007:539), preferences in terms of protecting the environment depend upon the level of specificity of information within a questionnaire. For example, one item states: "I would agree to an increase in taxes if the extra money were used to prevent environmental damage", but the percentage increase in taxes and type of environmental damage to be prevented, are left open to interpretation. Togler and García-Valiñas (2007:539) highlight some of the problems with this item when they state:

The consequences of taxation are not mentioned either. No information is provided to what extent income tax, value added tax or other taxes are supposed to increase. Thus, it is not clear who will have the highest tax burden. On the other hand, unspecified payment schemes will increase the variance, but may influence the willingness to contribute. An unspecified statement still helps to measure preferences and values and to reduce strategic behavior via influencing the quantity or quality of environmental goods – people might intentionally indicate false willingness to contribute values in order to match their own preferences. When neither specific goods nor quantitative values are used, the attributes of the environmental goods in questions do not have to be thoroughly explained to be sure that respondents understand and respond with the appropriate willingness to accept an increase in taxes.

A related point, but one that only emerged after the results of this study had been interpreted, is that two of the items that form part of the WTPEP index imply that the government should play a role in the decreasing of environmental pollution, and may therefore inadvertently measure confidence in the government's ability to curb environmental problems. This issue, and the results of an additional simple regression analysis that was performed to investigate it further, will be discussed in more detail in section 4.3.4 of Chapter 4.

Another conceptual issue relates to the labelling of respondents as unwilling to sacrifice economically for environmental protection when they are unable to afford to pay for environmental protection. Inglehart (1995:60) does this by arguing that those countries that receive low scores on his index demonstrate an "unwillingness to sacrifice for environmental protection". Hence, the distinction between unwilling and unable is not sufficiently clear in the index.

3.5.4 Environmental concern in a cross-cultural context

Environmental concern is not understood the same way everywhere in the world, and the environment has different connotations in different contexts. The WVS's conception of environmental concern has been formulated in and for a First World context, as discussed by Dunlap and York (2008:440) when they state:

These behaviours are largely representative of what Guha and Martinez-Alier (1997) term the "full-stomach" environmentalism of wealthy nations and largely inapplicable to the "empty-belly" environmentalism of poorer nations, and strongly biased in favor of residents of the affluent, largely Northern-hemisphere countries. People living in poverty stricken third world nations reuse and recycle and conserve water out of necessity, and it is difficult to imagine how they would respond to these items. Even the two politically oriented items are worded with "Northern environmentalism" in mind, as third world environmentalists are less likely to protest in writing or to make *financial* contributions to environmental groups than are their rich-nation counterparts.

Yaprak (2003:177) argues that one of the most important concerns of cross-national surveys relates to the operationalisation and transferability of the concepts they attempt to measure. He writes that these concepts tend to be defined and operationalised in a western context and then applied in other settings, whilst the conceptual domain and applicability of these concepts may not be completely transferable from the "North" to the "South". This is seen in the WTPEP index's indicators: the assumption underlying these is that people in countries such as South Africa have access to or can afford to pay for environmentally friendly

products. This may be the case in western countries, but in South Africa and other developing countries not everyone is able to gain access to these services or products.

One way of overcoming this problem of measures that do not “travel well”, such as environmental concern, is suggested by Yaprak (2003:177), according to whom researchers should:

[...] pay greater attention to identifying, and working with, culture-specific constructs and learn to assess, much more deeply, the cultural embeddedness and situational dependency of constructs. This will involve not only determining how best to construe a concept in different cultural settings and a more rigorous examination of the equivalency of our constructs, but also desensitizing the dominance of our governing culture or research philosophy through decentering procedures to guard against forced-framing of research questions in cultures where they might be inappropriate or irrelevant. It may also involve the use of, and greater reliance on, unstructured approaches for further probing the cultural embeddedness of our concepts and constructs. Examining our constructs and the interrelationships among them in a broader range of cultural settings is likely to improve our understanding of the nature and extent of influence of these constructs on behavior, their universality or cultural embeddedness, and how these might vary in different contexts.

His argument may be applied to the manner in which environmental concern was operationalised in the WVS, as it exhibits a lack of sensitivity to what environmental concern means in the developing world. The WVS has forcibly framed environmental concern in a way that is largely inappropriate and irrelevant to the South African context. In this context, differences in levels of environmental concern among South Africans lie in the meaning of the environment in different South Africans lives. On the one hand, there are South Africans who rely upon the environment to sustain themselves, but are probably relatively uninformed about global warming or climate change²⁹. Therefore, the future of the environment is tied intricately into their lives and their futures. But because they do not know or have not heard of global warming, or do not use products to mitigate global warming, they may be presumed to be unconcerned about the environment. Therefore, this concept is framed in a First World context, yet it is applied to a Third World context such as South Africa. Differences in the way nature and the environment are understood not only exist between the African and

²⁹ Seager (2009) has shown that roughly a third of South Africans have never heard about climate change or global warming.

European context, but also between eastern and western contexts, as illustrated by Murota (1985:105):

The Japanese people considered themselves so intimately integrated with nature that they could not identify it objectively as a separate entity. To the Japanese, nature is an all-pervasive force that is manifested in the shape of a tree, waves, or other natural objects. Nature is at once a blessing and a friend to the Japanese people [...] people in Western cultures, on the other hand, view nature as an object and, often as an entity set in opposition to humankind (Minamoto, 1974). Western cultures have attempted to satisfy the needs and desires by conquering nature with the help of technology.

The above quote highlights the tensions and problems with operationalising environmental concern in a cross-national context, such as the WVS. The challenge of operationalising environmental concern is expanded upon by Dunlap and Jones (2002:2), when they state that the meaning of “the environment” is ambiguous, since some people equate this term with nature or wilderness, while others equate it with their immediate surroundings. Some people equate the environment with specific settings, such as the countryside (Barry, 1999, as cited in Dunlap & Jones, 2002:2). Environments therefore connote different things for different people and cultures. Hence, the connotations western people in Europe, where the WVS was conceptualised, attach to the environment might be very different from those that most Africans associate with the environment. The remainder of this subsection considers what these differences might be and how they could influence the measurement of environmental concern.

While this seems to be the experience of many South Africans, due to apartheid (see Chapter 2). It must be noted that stories, religions, moral systems and language are intimately connected to place and thereby the natural environment. Therefore non-western people all over the world embrace the interdependence between nature and human culture. Nature will always appear to humans through its cultural meaning (Huey-Li, 2003, as cited in Nordstrom 2008:133). People have been enculturated into different ways of thinking about the environment. Hence, to produce a culturally sensitive measurement of “the environment” is a highly challenging task.

Another issue to consider is the Likert-type scale³⁰ used by the WVS as response options for the environmental concern items. Many authors have investigated the effects of Likert-type scales on cross-national or cross-cultural research results (see Harzing, 2006:243; Kieruj

³⁰ All the items that constitute the WTPEP index make use of a Likert-type scale, i.e., respondents are asked to agree, strongly agree, disagree or strongly disagree with each statement.

& Moores, 2013:193; Tobi & Kampen, 2011:553). Indices or scales relying on Likert-type items, such as in the WVS and by implication this study, presuppose that responses to an item are based on the substantive meaning respondents attach to the items to which they respond (Harzing, 2006:243). However, people's responses are influenced by their response style (Tobi & Kampen, 2011:553). In light of this, the scores respondents receive on these scales may simply reflect the manner in which people respond to surveys. For example (and with particular relevance to this study), in the USA Hispanics and African Americans show a greater preference for extreme responses, particularly towards the positive end of the response scale, when compared to European Americans (Clarke III, 2000, as cited in Harzing, 2006:244). These biases should be kept in mind when analysing these data and interpreting the results.

Another problem in these data is that respondents were not given a "Don't know" option when responding to the WTPEP index items. Alwin (2007:17) argues that often survey researchers discourage respondents from saying "Don't know" and thereby prompt an answer from the respondents. When respondents say they don't know this tends to be a function of a lack of information rather than ambivalence or indifference (Converse, 1976, as cited in Alwin, 2007:17). Following this, if respondents feel pressured to provide a response they will most likely produce an error. In the South African context – where unemployment and poverty are rife – providing respondents with the option of "Don't know" when prompted on their willingness to pay for something they might not be able to afford seems a fairly reasonable response. Therefore it appears that the response scale the WVS offers could be more applicable to a Third World context.

Smith (2010:735) believes that cross-cultural/cross-national surveys are complex mechanisms with many components and that both random and non-random error can originate from each component³¹. Additionally, these components interact with one another in very complex ways. Hence, it is imperative for cross-national/cross-cultural surveys to apply the total survey error approach to each survey³². Smith (2010:734) is of the opinion that

³¹ The different components of a survey, according to Smith (2010:734) are comprised of the following: overall study design which includes target population; sampling (e.g., sample frame, coverage, and respondent selection procedure); response rate and non-response bias; interviewer recruitment, training, supervision and validation; instrument development (pretesting, wording, response scales, order context, item scaling); translation; data capture and processing (e.g., data entry, coding, transference, and back-ups); documentation and archiving; and analysis. All of these parts have the potential for some form of error and therefore combine to form total survey error.

³² Total survey error is the "the difference between [a statistic's] actual [true] value for the full target population and the value estimated from the survey" (Lessler, 1984, as cited in Smith, 2010:734). This approach means

cross-cultural or cross-national surveys are subject to more sources of error, as differences in language, culture and structure across target populations mean that identical surveys cannot be administered and that the error structure of each survey is likely to vary. In addition, different survey organisations employ their own protocols, interviewers and sampling techniques. To decrease error in cross-national/cross-cultural research, functional equivalence across surveys is needed. This is pertinent to my study, as I have longitudinally analysed three waves, thus the total survey error across these three waves is multiplied threefold, and these errors interact with one another in very complicated ways. Moreover, a lack of metadata for the 1996 and 2001 waves (see section 3.7 for a more in-depth discussion) renders the variation unknown, preventing one from taking steps to compensate for this error. This is one of the primary limitations of conducting a secondary analysis. The secondary analyst will never know how efficiently trained the fieldworkers were, how well the coding and entering of data had been executed and, in the present case, how the sampling was conducted for 1996 and there were no response rates reported for 1996, 2001 and 2006. Additionally, the margin of error for the three waves is not reported. Therefore, it is impossible to control for the total survey error in the WVS.

3.6 Predictor variables: Race and SES

Van Liere and Dunlap (1981) review hypotheses that contribute to or explain variation in environmental concern. One of these they refer to as the “social class” hypothesis. This hypothesis states that education, income and occupational prestige are positively associated with environmental concern. This explanation of variation in environmental concern is very similar to the post-materialist thesis (see Chapter 2). In the South African context, race and class exhibit a strong relationship: as stated by Seekings and Natrass (2006:35), race served to shape the class structure in apartheid and helped to allocate positions within it to the various races. Furthermore, these class categories and their relationship to race have remained fairly similar in post-apartheid South Africa. The two predictors that I will use in this study to understand variation in environmental concern in South Africa, are race and SES. This section will outline how the WVS has operationalised these two variables and the limitations thereof in a South African context.

recognising these different sources of error and then attempting to achieve functional equivalence and a reduction of these different sources of error.

3.6.1 Socio-economic status

As constructs, SES and social class are often analysed in an atheoretical way. SES derives its origins from Weber and his notion of status. Weber (as cited in Gerth & Mills, 2009:186) states that “class distinctions are linked in the most varied ways with status distinctions”. Furthermore, status honour is above all else a specific “style of life”. It is this “style of life” that can provide some insight into the social bases of environmental concern in South Africa, and whether this concern is a distinctly middle-class and upper-class phenomenon. Marks (1999:2) highlights theoretical differences between Weberian and Marxist perspectives on the operationalisation of social class and SES:

Weber emphasised the labour market, by focusing on the market value of skills and other attributes that individuals brought to the labour market. Three attributes are important to Weberian approaches: the ownership of wealth producing materials and enterprises; skills (including credentials and qualifications); and social prestige [...] in contrast, Marxist approaches emphasise the ownership and non-ownership of the means of production in defining employers and workers. Marxist and neo-Marxist measures of social class are always categorical, distinguishing at least three class groups: large employers; the self-employed; and workers.

Marks (1999:4) states that the most influential Weberian class schema was created by Goldthorpe and Erikson (1992, as cited in Marks, 1999:4). This schema is commonly used in cross-national research that focuses on social stratification, occupational mobility and educational attainment. It groups classes into managers and professionals (the service class); routine white-collar workers; the self-employed and small-business owners; and three divisions of manual workers, based on levels of skill and supervision (Goldthorpe & Erikson, 1992, as cited in Marks, 1999:4). Marxist approaches tend to distinguish the working class from the self-employed and employers. The problem, though, in a Marxist measure of class, is how to define the working class. Therefore, according to Marks (1999:4), the proposed size of the working class varies widely among studies.

This study will apply a multiple measure of SES; more specifically, by following a Weberian approach to measuring this construct. The indicators are income, education and occupational class. However, occupational class will be coded to suit the South African context. I will not follow a Marxist approach, because the WVS’s occupational-prestige item has been coded in a way that renders a Marxist analysis impossible.

3.6.1.1 *Commonly accepted measures of SES in the South African context*

In a study on inter-generational occupational mobility amongst black people in Khayelitsha and Mitchells Plain, Ziervogel and Crankshaw (2009:243) categorised the occupational structure of their study population as follows: managers and professionals; clerical, sales and service workers; skilled and semiskilled manual workers; and lastly, unskilled manual workers. While this categorisation is of interest to my study, it only focuses on the employed, and is therefore not representative of the whole South African population.

In their comprehensive study on race, class and inequality in South Africa, Seekings and Nattrass (2006:247) classify individuals' occupations into five classes, which will be used to operationalise occupational class in my study:

- the upper class which consists of managers and professionals;
- the semi-professional class which consists of teachers and nurses;
- the intermediate class which consists of routine white-collar, skilled, and supervisory workers;
- the core working class which contains semiskilled and unskilled workers (except farm and domestic workers); and
- the marginal working class which contains farm and domestic workers.

This classification is based upon Goldthorpe's (1997; as cited in Seekings and Nattrass, 2006:247) schema, and it combines occupations that have similar economic power, due to broadly similar employment relationships in terms of economic security, career prospects, and autonomy (Seekings & Nattrass, 2006:247). The upper and semi-professional classes correspond theoretically to Goldthorpe's (1997) first two classes (the service class of managers and professionals, and routine white-collar workers), in which the employment relationship is one of service, characterised by the prospect of incremental advancement, as well as employment security and a high degree of autonomy. Semi-professional occupations differ from professional occupations in that the former is characterised by less autonomy, limited prospects of upward occupational mobility, and the qualification required is of a lower level. Seekings and Nattrass's (2006:247) core and marginal working class corresponds to Goldthorpe's (1997) classes VIIa and VIIb³³, for which employment is provided on a labour contract, and labour is provided under close supervision and within a highly regulated

³³Goldthorpe and Erikson's well-known class schema has class categories that are different from the class schema used by Seekings and Nattrass (2006). I provide only the roman numerals for Goldthorpe and Erikson's class schema as a reference for readers to compare to the original class schema, should they wish to do so.

payment system. The intermediate class proposed by Seekings and Natrass (2006:247) encompasses Goldthorpe's (1997) classes III and V. This class combines elements of the service relationship and the labour contract. Seekings and Natrass's (2006:247) schema differs in two important ways from the one provided by Goldthorpe (1997). The first difference is that the former includes manual workers in the intermediate class, as its originators argue that:

in the South African context, skilled manual workers often enjoy a degree of economic power comparable to that of supervisory and routine non manual employees, largely because of the high capital intensity of South African industry. Second, we suggest that there is a key distinction between the core and marginal working classes based on the nature of the labour contract. In the South African context, as in Brazil and many other southern societies, a large number of workers sell their labour for wages without any formal contract: their conditions of work are quite distinctive and they are especially vulnerable to employers. These clearly include many farm and domestic workers and arguably growing numbers of other workers as well (Seekings & Natrass, 2006:251).

Seekings and Natrass (2006:251) proceeded to classify households in terms of individual respondents' classifications, by considering other sources of income, such as property and business, and also the occupations of all the individuals who reside in the household. The authors were able to do this because they had data at their disposal on the exact amount of income generated by each household. This is not possible with the WVS, due to none of the questionnaires including items on all the respondents in the respondent's household, and a household cannot be classified on the basis of one respondent's demographics. The WVS does, however, require respondents to fill in their household's monthly income, and it collects data on the head of the household's occupational class³⁴.

While Seekings and Natrass's (2006) class schema has only five occupational categories, my study will have six occupational class categories. This study will include the unemployed, as one can be unemployed and still have an opinion on the environment. The unemployed pose serious problems for class analysis, as the thesis of class theory is defined in terms of exploitation of labour, while the unemployed are oppressed, but not exploited (Seekings & Natrass, 2006:274). I will, however, argue that including the underclass³⁵, i.e. those that have

³⁴ Unfortunately there are problems with these income data and the head-of-the-household data that will be discussed in Chapter 5.

³⁵ While Seekings and Natrass (2006:299) demonstrate that this term carries highly negative connotations, they argue that in South Africa very good empirical and theoretical reasons exist for using this term. It highlights a section of the population that has suffered acute disadvantage. "This label is an appropriate recognition of the

never been employed³⁶ will add significant value to my analysis of environmental concern. It is specifically this group that can be expected, on the basis of the post-materialist thesis, to display very little, if any concern for the environment.

3.6.1.2 *The measurement of socio-economic status in the WVS*

Although multiple measures of SES are preferred, because they tend to capture “aspects of socio-economic background not captured by a single measure” (Graetz, 1995, as cited by Marks, 1999:6), much of the published research that involves an operationalisation of SES as part of an analysis of WVS data, does so with only one indicator (see, for example, Stroope, 2012; Hamamura, 2012; Zellie, 2003). This item asks a respondent to situate his/her household’s gross income in a specific earning bracket. Unfortunately, the measurement of respondent’s household income varied greatly across the three waves, with the change from 2001 to 2006 being especially drastic, from measuring total Rands per month to a scale with 10 arbitrary levels (10 represents the highest income and 1 the lowest income) on which respondents were asked to situate their household. This has a negative effect on the test-retest reliability of this measure, especially when it is across three different surveys, hence I did not utilise household-income data for 2006. According to Casale and Desmond (2007:61), almost 60% of South Africans’ main source of income is comprised of salaries and wages, followed by pensions and grants (14%), and remittances (14%). Therefore, asking respondents about these different sources of income could have provided a more consistent and complete means of measuring monthly household income.

However, in an analysis of the Indian sample of the WVS data, Babones (2010:133) uses three indicators of SES. The first two are household income and education, the latter of which is operationalised by asking a respondent to report the highest level of education he/she has completed. Response options range from no formal education to university degree completed. The third and final indicator Babones (2010:134) uses to measure SES is occupational class. This item is operationalised into 13 categories (see Table 5 below). Babones (2009) employs one of the most sophisticated measures of SES I have encountered in the literature that reports on analyses of WVS data.

I will adopt the same variables as Babones (2010) for my analysis of SES. The only change I have made is to adopt Seekings and Nattrass’s (2006) occupational class schema,

systematic disadvantage that distinguishes this class from the bulk of the working population” (Seekings & Nattrass, 2006:299).

³⁶ The WVS stipulates that respondents can only be classified as such if they have never had a job.

instead of the one proposed by the WVS and used by Babones (2010), because it is better suited to the South African context. The WVS's occupational class schema lumps together teachers, accountants and lawyers into one category; which will therefore not be completely similar to the semi-professional class of Seekings and Nattrass (2006). However, it is important that teachers are not classified as upper class, therefore I decided to include the professional worker (lawyer, accountant and teacher) category under the semi-professional class. The original schema and the way it has been modified are presented in Table 5:

Table 5: Modification to occupational schema of the WVS to create a social class item

WVS occupational schema (head of household)	Modified occupational class schema
Employer/manager of establishment with 10 or more employees	Upper class
Farmer: has own farm	
Employer/manager of establishment with less than 10 employees	
Professional worker – lawyer, accountant, teacher, etc.	Semi-professional class
Supervisory – office worker: supervises others	Intermediate class
Foreman and supervisor	
Skilled manual worker	
Non-manual – office worker: non-supervisory	Core working class
Semiskilled manual worker	
Unskilled manual worker	
Member of armed forces, security personnel	
Agricultural worker	Marginal working class
Never had a job	Underclass

3.6.1.3 Validation of SES measures

I will not combine Babones's abovementioned indicators of SES (household income, education and occupational class) into an index, but will keep them separate to allow me to examine how much variance in environmental concern each indicator individually explains. As shown in Table 6, all three of these items correlate fairly well across all three waves³⁷. In all three waves, the weakest correlation is found between educational level and occupational class. This is somewhat concerning, as one would expect level of education to play a strong role in determining the occupational class of an individual. However, the educational level referred to here is the respondent's, whereas the occupational class variable refers to the head

³⁷ For the 2006 wave the correlation between education and occupational class is the only correlation to report on, due to the discarding of the household income data for that wave.

of the household. This is not an ideal measure for SES, and may be the cause of the lower than expected correlation between these indicators.

Table 6: Correlation matrix for SES indicators for all 3 waves.

Indicators	Income	Occupational class	Education level
1996			
Income	1	n=2439	n=2796
Occupational class	.468***	1	n=2751
Education level	.507***	.209***	1
2001			
Income	1	n=2276	n=2130
Occupational class	.213***	1	n=2670
Education level	.410***	.135***	1
2006			
Occupational class	n/a	1	n=2670
Education level	n/a	.135***	1

*p<.05 **p <.01 ***p<.001

Due to these difference in the operationalisation of the SES indicators, I decided to conduct an EFA with oblique rotation³⁸ on these items, thereby determining whether these SES indicators, drawn together, measure a single concept, or more than one concept. The EFA revealed that in 1996, 2001 and 2006 the items consistently loaded on one dimension. On all three waves only one eigenvalue was extracted. Table 7 below shows that all the indicators used measure the SES of individuals. I did not present the reliability score of the Cronbach's alpha, as these items will not be compiled into an index or a scale. I prefer to view the effects of these indicators separately on the outcome variable. This allows for a more nuanced understanding of the relationship between class and environmental concern

Table 7: Summary of exploratory factor analysis of SES indicators for all three waves

Indicator reference	Factor loadings		
	1996	2001	2006
Total household income per month	.736	.707	n/a
Head of the household's occupational class	.344	.582	.707
Respondent's educational level attained	.600	.526	.707
Eigenvalues	1.680	1.814	1.414
% of variance	55.988	60.481	70.684

³⁸ Oblique rotation is a method of rotation in factor analysis that allows underlying factors to be correlated (Field, 2009:790).

3.6.2 Limitations of the measurement of SES

In terms of the predictor variables, some operationalisation-related problems exist. For example, an item requests respondents to report their total household income, but data on the number of dependents that reside in the house are never collected. The problem is that one wealthy person living on their own might earn the same amount of money as a household with many dependents³⁹. Furthermore, as mentioned above, the income variable was measured differently from one wave to another, with the most drastic change occurring in the 2006 wave, when respondents were asked to rate their household's income on a scale. Not only does the change render comparison over time almost impossible⁴⁰, but the interpretation of this scale is subjective and therefore households with the same income may rate their income on different points of the scale. These changes have a negative effect on the reliability of this study and in turn affect the quality of survey data. Alwin (2007:298) argues that the

effects of unreliability on statistical inferences involves its attenuation of bivariate statistical associations and regression coefficients [...] the unreliability of predictor variables bias regression coefficients downward, making it more difficult to reject the null hypothesis.

There are also deficiencies in the way education level was measured: the item collected data on the respondent's educational attainment, but he/she is not necessarily the head of the household, whose level of education was not asked. This means that the potential influence of having a household head with a high level of education cannot be determined, hence the effects of education on willingness to pay for environmental protection cannot be fully understood with the available data. Jolliffe (2002:289) states that, generally, studies have collected data on the average level of education in the household, the maximum level of school attainment, minimum level of school attainment, or the head of the household's level of education. When trying to estimate the SES of the household, Jolliffe (2002:305) argues that the maximum level of educational attainment should be used. The educational attainment of the head of the household may be a much better indicator of SES of the household than the individual respondents' measure used by the WVS.

³⁹ Instead, Togler and García-Valiñas (2007:540) use an employment satisfaction variable to counteract the large number of missing data on the income variable. However, I did not use this in my study due to the high level of unemployment in South Africa.

⁴⁰ Although one could address this by changing all the income items into a scale out of 10, this would lead to poor construct reliability

3.6.3 Race

The racial categories used in the WVS include: black, white, coloured and Asian. Seekings and Natrass (2006: ix) explain these labels in more detail: African/black refers to people classified by the apartheid state as “native”, “Bantu” or “black”. White refers to people first classified as European and later as white by the apartheid government. Asian refers to people who came to South Africa, forcibly or by choice, from the Indian subcontinent and who in the past were classified as “Asiatic” by the apartheid government. Finally, coloured refers mainly to people in the Western Cape; this label was accorded to those who did not fit into any of the aforementioned categories. Additionally, this label was assigned to those who were descendants of the indigenous Khoi and San people who inhabited the Western Cape before the arrival of either white or African people; other coloured people are the descendants of “Malay” slaves, bought from Indonesia and elsewhere by Dutch colonists, or descendants of relationships between white and African people (Seekings & Natrass, 2006:ix).

According to Bulmer (2010:109), the justification for requesting respondents to classify themselves into one of these four racial groups is often framed in a policy context and in terms of existing social inequalities, especially in South Africa. According to Maré (2001:77), the post-apartheid South African government focuses upon the categories used in the Census and by government agencies conducting the Census, or any other form of bureaucratic administration that is reliant on these categories. Nobles (2000:11, as cited in Maré, 2001:87) argues that,

[c]ounting by race is hardly a transparent process because of the very conceptual ambiguities that surround race itself, and the political stakes attached to it [...]. On these views of race as neither fixed nor objective, taken together, race is at once an empty category and a powerful instrument. Yet theoretical formulations that stress the radical plasticity of race, mostly correctly, risk obscuring its concrete manifestations and the institutional sites of its construction and maintenance [...] race is not something that language simply describes, it is something that is created through language and institutional practice.

Nobles (2000:183-184) writes further that racial ideas and political imperatives become infused in the census-taking process, causing confusion and ambivalence among those who are counted, due to the tension between statistical objectivity and the grounding of statistics in political life. Moreover, the Census confirms and legitimises, and therefore also serves to create, racial categories.

Maré (2001:80) agrees and critiques the way social scientists have uncritically accepted the four South African race categories in their own research and writing. He asks the question: “How do we address a rejection of the actual ‘existence’ of races as well as the overwhelming existence of the social construct in having shaped – and still shaping – the life chances of citizens?” These issues need to be taken cognisance of when conceptualising race in a South African study, and the implications of such a conceptualisation need to be considered. I considered collapsing the black, coloured and Asian categories into “non-white”, in response to the way in which one of my hypotheses has been formulated, but eventually decided to retain the Census categories, due to severe differences in the experiences of the environment among the black, coloured and Asian groups during apartheid (see Chapter 2 for a discussion on these differences). Having more racial categories than simply white and non-white allows one to better understand, through analysis, whether there is variation in environmental concern among the different race categories, after controlling for SES, over time, and also assists one in developing a more nuanced understanding of the relationship between race, SES and environmental concern. Moreover, I will present a more detailed and elaborate analysis of race and environmental concern than Struwig (2010) or Zellie (2003) have done. This will be achieved by using statistical techniques such as regression analysis, thereby allowing for a more detailed examination of the relationship between race and environmental concern, rather than only reporting the distributions of each racial group.

3.7 Population and sampling

This section will discuss the target population of the three samples as well as the sampling techniques employed by Markinor. Markinor is a survey-based market research company which has implemented all the WVS’s waves in South Africa. After completion of a survey, all technical information must be presented in a document to the WVS head office, so as to make it freely available on the WVS’s website. The metadata provided by Markinor and the WVS are hard to trace and not very detailed, which poses another challenge for this secondary analysis of the data. I will commence this section with a discussion of the 1996 wave, then move on to the 2001 wave, and finally consider the 2006 wave.

Very little information has been archived on the sampling procedure followed for the 1996 wave. However, what could be ascertained is that the black portion of the sample was fairly representative in terms of location of residence, with 600 sampling units living in the major urban centres and 500 in rural areas, spread across all nine of the country’s provinces

(Steenekamp, 2011:76). The total sample size was 2 899 respondents (Steenekamp, 2011:77). Also, the data have been weighted, but there is no technical report that identifies the variables according to which the data were weighted.

The first time a WVS sample approximated a nationally representative sample in terms of race, was in 2001. All respondents had to be older than 16 years of age. The sample was stratified by gender, area and race, and was representative of urban as well as rural populations: according to Steenekamp (2011:76), 60% of the sample resided in metropolitan centres and 40% in towns, villages and rural areas. Markinor defined each area – metropolitan, city, large town, small town and village – in terms of community size. However, the exact size differences among the areas are not stipulated clearly in the technical report (Harris & Kotze, 2001). Within each area, sampling points were selected, although the procedure was different for urban and rural areas. While sampling in urban areas was conducted as randomly as possible⁴¹ to ensure representivity of the urban population in a province, in rural areas (which consisted of a much larger amount of sampling points), small towns were selected, and then interviews were conducted within a 20km radius of the boundaries of each selected town.

The 2001 sample was representative of urban as well as rural populations, with 60% drawn from the metropolitan centres and the rest from towns, villages and rural areas (Steenekamp, 2011:77). The technical report for the 2001 WVS states that six interviews were to be conducted at each sampling point, and the final number of sampling points was 500, which produced a total sampling size of 3000. The sampling unit fieldworkers received from Markinor, was street names (Harris & Kotze, 2001:31). Once a fieldworker arrived at a street, every third dwelling was selected on the same side of the road. The respondent was selected randomly from the household members, using a selection grid provided by Markinor. Substitution of a household was allowed after three unsuccessful calls. Additionally, 20% of interviews were back-checked⁴². The weighting of the sample was based on the All Media and Products Survey, the ultimate source of these figures is the South African general population Census conducted in 1996.

For the 2006 wave of the South African WVS, the probability sampling method of stratified random sampling was used again to draw a representative sample of the resident South African population aged 16 years and above (WVS, 2006). The sample was stratified

⁴¹ The fieldworkers were instructed to select households as randomly as possible, which means it may not have been a random selection of urban areas.

⁴² Back-checked refers to when the fieldwork manager contacts a completed interviewee to make sure the interview was conducted.

according to region, race and community size. Sixty percent of the sample resided in urban areas (defined as large cities with populations exceeding 250 000 inhabitants), while the remaining forty percent resided in non-metropolitan areas (including cities, large towns, small towns, villages and rural areas). The realised sample for the 2006 wave consisted of 2988 respondents. Weighting of the sample was conducted according to community size, province, race, gender and age. Kotzé and Steenekamp (2009:13) discuss the weighting of the 2006 sample that was used to render the sample more representative. According to these authors, “the 2006 sample was weighted to the full population and within a statistical margin of error of less than 2% at 95% confidence level” (Kotzé & Steenekamp, 2009:13).

As in the 2001 wave, the urban areas and the rural areas were again sampled differently. In the urban areas the ultimate sampling unit was selected by following six steps. The first step was the random selection of suburbs. It was decided by Markinor that six to eight interviews were to be conducted per randomly selected enumerator area. The second step was the random selection of streets in each suburb⁴³. The third step involved the selection of the starting point in the street. Interviewers were given a random number with the instruction to select the lowest street number ending with the random number. Therefore, if the fieldworker was given a random number of 9, then the house with the lowest street number ending with 9 was selected. After the first interview in the third step every 4th dwelling⁴⁴ was selected. After this, the left-hand rule applied, i.e. after completing an interview, a fieldworker keeps to the left of the road and selects the next house on that same side of the street. The fifth step – was used only when applicable – is the selection of the household and household member. If only one household resided in a dwelling, then that household was selected. If there was more than one male/female at a dwelling, they were listed on a Kish⁴⁵ grid and randomly selected (WVS, 2006).

In the rural areas, all dwellings in an enumerator area were counted, and then the number of interviews that needed to be conducted in that area was divided by the number of dwellings. Markinor ensured a 50% split on sex, i.e. an equal number of females and males were interviewed, by alternating the interviewing of males and females: if a female was

⁴³ If there was no street, then interviewers had to locate themselves on maps using other streets or landmarks. If there were no maps of a suburb, interviewers were given a random alphabet letter and number. The letter would represent the first letter of a street's name and the number would be the street number of the house that should be approached for the first interview.

⁴⁴ A dwelling was defined as a stand, physical address, a structure or group of structures where one or more households are living (WVS, 2006).

⁴⁵ The Kish grid is a method for selecting members within a household to be interviewed. It uses a pre-assigned table of random numbers to find the person to be interviewed.

interviewed at one dwelling, then a male was interviewed at the following dwelling. When a fieldworker arrived at a selected dwelling and s/he had to interview a male, all males above 16 years of age in the/a residing household were listed on the questionnaire, and one male was randomly selected by using a Kish grid. The same process was followed for females. If the selected respondent was not present, two additional visits were made. If the interview could still not be conducted, the selection procedure was repeated for that dwelling to select a respondent for a substitution interview. All substitution interviews were recorded, which allowed for back-checks and for response rates to be calculated. Additional quality-control measures included fully training the fieldworkers, as well as spot-checking.

This section on sampling has shown that generalisation of the results from the 1996 and 2001 waves' samples to the South African population needs to be interpreted with caution. There is very little evidence that the 1996 wave is representative of the South African population, and it has proven difficult to find additional information on the sampling procedures followed. The 2001 wave's sample comes a lot closer to being representative of the adult South African population, but the selection of sampling points was not done randomly, which raises external-validity concerns. The 2001 sample has been weighted; however, the technical report does not state the degree of sampling error that could be expected. The 2006 wave involved the most rigorous sampling procedure of the three waves, and is weighted to the full South African population, with a statistical margin of error of less than 2% at the 95% confidence level (Steenekamp, 2011:77).

3.8 Data analysis methods and techniques

The analysis of these data was conducted using the IBM Statistical Package for the Social Sciences, versions 19 and 20. This section outlines the statistical techniques and tests that were employed, namely correlation and regression analysis.

3.8.1 Correlation

The correlation coefficient investigates the strength of the relationship between two variables. This thesis makes use of the Pearson product-moment correlation coefficient, which provides a standardised measure of the strength between two interval level variables. The statistic can take any value from -1 (as one variable changes the other one changes in the opposite direction) through to 0 (as one variable changes the other one does not change at all, to +1 (as one variable changes the other variable changes in the same direction by the same amount)

(Field, 2009:791). The strength of the relationship between race and SES will be analysed using the Pearson product-moment correlation coefficient.

3.8.2 Independent samples t-test

An independent samples t-test is used in order to compare the mean scores on a continuous variable for two different groups of participants (Pallant, 2011:239). In this study I want to compare the mean scores of South Africans on the WTPEP index in 2001 and 2006. The t-test will indicate whether there is a statistically significant difference in the mean scores (Pallant, 2011:240). If the differences are statistically significant, an effect size (eta squared) will be calculated. Effect size statistics provide an indication of the magnitude of the differences between the two groups.

3.8.3 Regression analysis

According to Field (2009:198), in regression:

[w]e fit a model to our data and use it to predict values of the dependent variable from one or more independent variables. Regression analysis is a way of predicting an outcome variable from one predictor variable (simple regression) or several predictor variables (multiple regression). This tool is incredibly useful because it allows us to go a step beyond the data we collected.

This statistical technique was used to create a better understanding of how the racial groups differ, when controlling for SES, in terms of environmental concern. It does this by firstly assuming a linear relationship between the outcome variable (environmental concern) and the predictor variables (race and SES). It then calculates the straight line that best fits and explains the outcome variable. This line is then evaluated in terms of the percentage of variance it explains in the outcome variable (Field, 2009:198).

I transformed the racial groups into separate dummy variables, as the level of measurement of the variables is categorical, but needs to be of a ratio or interval level to perform regression analysis. The largest group (in terms of number of cases) is used as the reference group, in this case black respondents, which are compared against the three other racial groups. Hence black people are coded as 0 and the other racial groups as 1 in each of the three dummy variables. I used simple regression to better understand the individual effects of each predictor on the outcome variable and then multiple regression to evaluate the fit of my model on these data. By creating a model through regression analysis, I hope to “go

beyond” a comparison of the differences of the racial groups’ means by accounting for differences in their scores after controlling for SES.

In addition, the results of this regression analysis, and a critical examination of the wording of questions that form part of the WTPEP index, led me to conduct another simple regression analysis to determine the effect of political-party preference on the WTPEP in the 2006 wave’s data. The reason for doing so, and the results of this analysis, are not directly related to the original aims and objectives of the study, but are important for future secondary analysts of WVS data to consider. They are therefore referred to in the discussion of the results (see section 4.3.4 in Chapter 4).

3.9 Ethical considerations

This secondary data analysis is unobtrusive in nature, as no respondents needed to be interviewed or observed. Therefore, ethical considerations bear no direct relevance to my study. Rather, they were the responsibility of the WVS and Markinor, the survey-based market research company that executed all the waves of the WVS in South Africa. The dataset was downloaded for free from the WVS website. The only information that is required of the person downloading the file is their name, telephone number, email address, project title, institutional affiliation and intended use of the WVS data. If one downloads the form on which this information is provided, one is required to accept the terms and conditions of the use of WVS data, which are:

that a) [the data] are used for non-profit purposes; b) correct citations [for this study] are provided and sent to the World Values Survey associations for each publication of results based in part or entirely on these data files. This citation will be made freely available; and c) the data files themselves are not redistributed.

The citations of those articles and of my final thesis will be sent to the WVS organisation.

3.10 Conclusion

This chapter has illustrated the pertinence of using the WVS to analyse environmental concern in South Africa. The complexity involved in the conceptualisation and operationalisation of environmental concern in the WVS was noted as problematic and a lack of recognition from the WVS in terms of the complexity of this construct. However, approaching critically the analysis of environmental concern as measured by the WVS, as was done in this chapter, will hopefully assist researchers in creating improved indices of

environmental concern that are sensitive and relevant to the South African context. To collect data from a representative sample of the South African population would have been too time-consuming and cost-intensive for a Master's thesis. Considering the dearth of research on environmental concern in South Africa and the very large datasets (in terms of both the number of constructs measured, size of the samples drawn and the fact that these data allow for longitudinal analysis) provided free of charge by the WVS, the opportunity to analyse the WVS data on environmental concern should be taken advantage of, regardless of limitations inherent in the data.

CHAPTER 4: RESULTS

4.1 Introduction

This chapter presents the results of an analysis of environmental concern utilising three waves of the WVS. The results concerning the two hypotheses of this study will be discussed separately. The first hypothesis is that South Africans have become more environmentally concerned since 1996. The second hypothesis states that after controlling for SES there will be no difference in environmental concern amongst the various race groups. The latter hypothesis will be tested by examining race and SES together, because race and SES are strongly related to one another in the South African context. For both of these hypotheses I use a longitudinal design to allow for some comparison of results over time. The analysis techniques that will be employed include: univariate analysis, simple regression and multiple regression.

4.2 Testing Hypothesis I: Increase in environmental concern since 1996

This section will present univariate statistics on the different items that comprise the WTPEP index. This is followed by a comparison of these results for each wave, so as to understand whether any change has occurred over time.

4.2.1 Results of analysis

In 1996 the majority (60% or more) of respondents indicated they were unwilling to pay more for environmentally friendly products, or more taxes, if such measures would lead to a decrease in environmental damage:

Table 8: Results on the two indicators that comprised the WTPEP index in 1996

WTPEP items	Strongly agree (%)	Agree (%)	Disagree (%)	Strongly disagree (%)	Total
I would buy things at 20% higher than usual prices, if it would help protect the environment	8	24	41	27	100 (n=2561)
I would agree to an increase in taxes, if the extra money were used to prevent environmental damage	13	27	34	26	100 (n=2575)

As indicated in Table 9 below, in 2001 the percentage of respondents agreeing with an increase in taxes aimed at preventing environmental damage, remained fairly similar to the 1996 percentage.

Table 9: Results on the three indicators that comprised the WTPEP index in 2001 and 2006

WTPEP items by year	Strongly agree (%)	Agree (%)	Disagree (%)	Strongly disagree (%)	Total
2001					
I would give part of my income if I were certain the money were used to prevent environmental pollution	14	41	29	16	100 (n=2679)
I would agree to an increase in taxes if the extra money were used to prevent environmental pollution	13	32	38	17	100 (n=2727)
The government should reduce environmental pollution, but it should not cost me anything	38	38	19	5	100 (n=2812)
2006					
I would give part of my income if I were certain the money were used to prevent environmental pollution	15	38	29	18	100 (n=2670)
I would agree to an increase in taxes if the extra money were used to prevent environmental pollution	11	33	35	20	100 (n=2660)
The government should reduce environmental pollution, but it should not cost me anything	31	47	18	4	100 (n=2747)

However, in 2001 the percentage of respondents averse to such taxes was 5% lower than in the 1996 wave. In general, in 2001 South Africans were far more moderate in their attitudes in this regard than they were in 1996. A higher percentage of South Africans chose to agree or disagree than those who choose to strongly agree or strongly disagree. The results for 2006, also presented in Table 10, are very similar to those for 2001. This suggests that South Africans did not change their opinions significantly over this period.

Yet, the biggest change in attitudes occurs on the indicator asking respondents whether the government should reduce environmental pollution, but it should not cost them anything. From 2001 to 2006 there was a 7% decrease in the percentage of South Africans who strongly agreed with this sentiment, and a concomitant 9% increase in the percentage who

agreed with this statement. Thus, after 2001, South Africans felt less strongly about the matter, or they were less convinced of its merits.

The results of an analysis of the index as a whole are presented in Table 10 below⁴⁶. In 1996 the mean was approximately four out of a possible score of eight and the median was exactly four. The 75th percentile indicates that three-quarters of respondents scored six or less out of a possible eight on the WTPEP index in 1996. Thus South Africans are equally divided on whether they are willing or unwilling to contribute economically towards the environment. The 2001 and 2006 data produced almost exactly the same medians and means. This shows that South Africans' attitudes towards sacrificing economically for the environment did not change from 1996 to 2006.

Table 10: Descriptive statistics of the WTPEP index, 1996 to 2006

Wave		1996	2001	2006
N	Valid	2494	2535	2498
	Missing	441	465	490
Mean		4.40	6.88	6.81
Std deviation		1.70	2.10	2.12
Std. error of mean		.03	.04	.04
Median		4.00	7.00	7.00
Minimum		1.00	3.00	3.00
Maximum		8.00	12.00	12.00
Percentiles	25	3.00	5.00	5.00
	75	6.00	9.00	8.00

Note: Potential minimum and maximum scores, on the WTPEP index, in 1996 were 1 and 8, compared to 2001 and 2006 it was 3 and 12.

An independent samples t-test was run on the 2001 and 2006 sample means of the WTPEP index scores, in order to test whether the means, differ in a statistically significant way. The results from the t-test show that this was not the case [$t(5031) = 1.232, p = .218$, two-tailed], and therefore there is no need to test the magnitude of the differences between the mean scores and we may assume that the two means do not differ in a statistically significant way.

4.2.2 Discussion of results

The results presented here show that from 2001 to 2006 South Africans did not become more willing to pay for environmental protection. Therefore I am obliged to reject this hypothesis. It seems that South Africans have remained very stable in their willingness to pay for

⁴⁶ The 1996 wave's results are highlighted, so as to indicate that these results should not be compared to 2001 and 2006.

environmental protection. However, it is interesting that a higher percentage of South Africans are willing to contribute some of their income than pay additional taxes to prevent environmental pollution (see Table 9 above). This may be attributed to South Africans, although willing to pay for environmental protection, not wanting to pay more taxes. Showing a distrust in the ability of the government to use these funds properly.

4.3 Testing hypothesis II: Race, SES and environmental concern

The analysis presented in this section will be divided according to each wave. At the end, the results will be discussed together and comparisons among the waves will be drawn. The sample profile for each wave will be discussed and compared to the 1996 Census data, 2001 Census data and 2007 Community survey, respectively. The South African Census and Community Survey provides researchers with the demographic composition of the South African population in terms of, among others, race, occupational type and status, and educational level attained. I will compare data on the race and SES variables of the WVS's sample with the Census data to ascertain whether the WVS's sample is representative of the broader South African population. However, household income was measured differently from the Census across all three waves and therefore comparability is very difficult. An investigation into the relationship between race and SES in these data is necessary in order to understand the regression analysis better, to estimate the external validity of the sample, to check for multicollinearity and to help with interpreting environmental concern in a South African context.

4.3.1 Wave I: The 1996 study

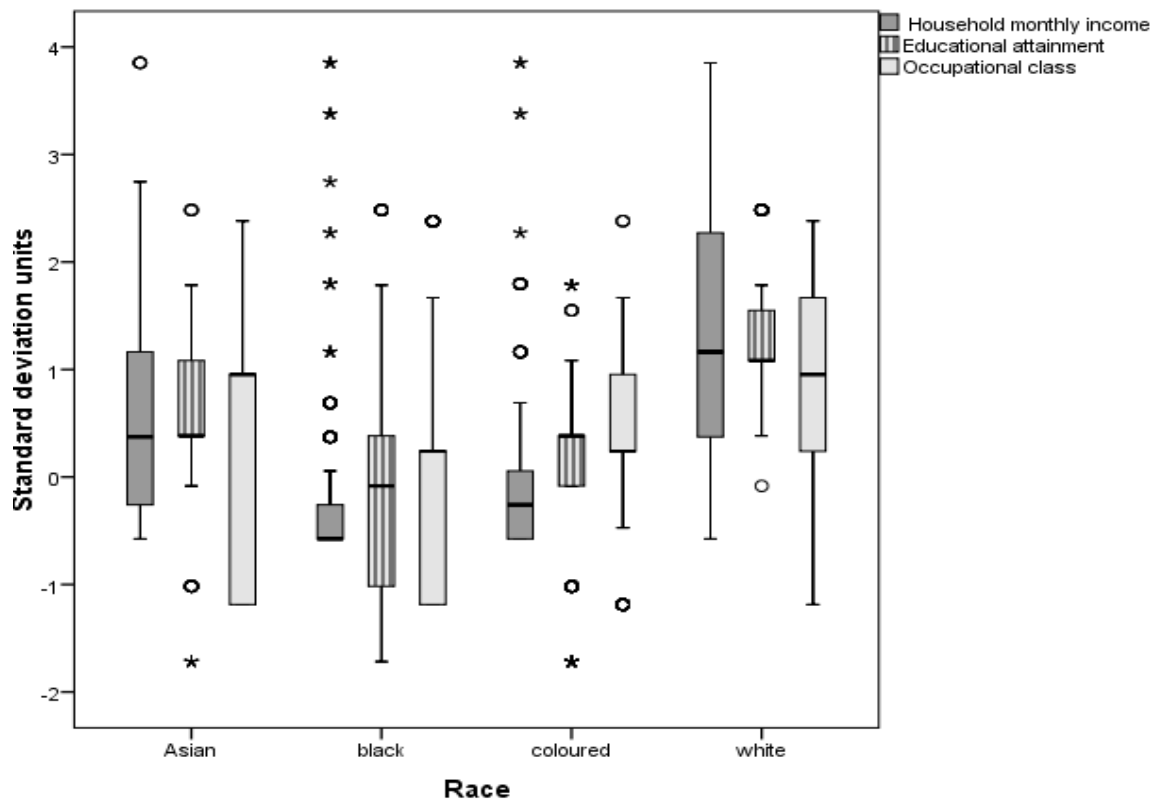
4.3.1.1 *The relationship between race and SES*

The relationship between race and SES in South Africa is discussed by Seekings and Natrass (2006:35), when they state that, in apartheid South Africa, "race served to shape the class structure and to allocate positions within it". Furthermore, the formal deracialisation of public policy in post-apartheid South Africa did not reduce the actual disadvantages experienced by the poor, nor the advantages of the rich [especially not in 1996, as apartheid had only officially ended two years earlier]. This means that race should be associated with occupational class, monthly household income and highest level of education attained. When performing regression analysis, one needs to be able to separate the independent effects of

predictor variables on the outcome variable. If variables are closely related, as race and SES are in the South African context, meeting this requirement becomes challenging.

Figure 1⁴⁷ is a boxplot of household monthly income, educational attainment and occupational class for each racial group. All of these variables are measured in different units (Rand, years and class categories). Therefore I changed the measurement of the variables to z-scores⁴⁸ to make each variable more comparable and to offer a sense of the distribution of these data. What is clear from the box plot is that the median educational attainment, median household monthly income and median occupational class of white respondents is higher than all the other racial groups and is generally higher than South Africa's mean for each SES indicator. Furthermore, black respondents and coloured respondents seem to earn the least household income and have the lowest educational attainment. This is in line with what Seekings and Natrass (2006) describe above.

Figure 1: Boxplot of the relationship between race and SES in 1996



⁴⁷ The box-whisker plot divides the distribution of data into four quartiles. The dark line in the middle of the box represents the 50th percentile or median. The first quartile ranges from the beginning of the whisker to the bottom edge of the boxplot; the area between the beginning of the box and the dark horizontal line represents the second quartile; from the horizontal line to the top of the box is the third quartile; the top of the box is the 75th percentile. From the edge of the box to the top of the whisker is the fourth quartile.

⁴⁸ A z-score is the value of an observation expressed in standard deviation units, by converting a distribution of observations into z-scores a new distribution is created that has a mean of zero and a standard deviation of 1. Therefore zero on the y-axis reflects the mean of educational attainment, occupational class and household monthly income. Each number reflects a standard deviation above or below the mean.

The results for the correlation of race and SES show that white respondents⁴⁹ have a statistically significant and positive relationship with education ($r = .378$; $p < .000$), household income ($r = .680$; $p < .000$) and occupational class ($r = .412$; $p < .000$). This may be interpreted as the higher the probability of the respondents being white the far more likely it is they will earn more, have a higher educational attainment and work in higher occupational class categories. There are no correlations above 0.7 therefore multicollinearity will not be a problem when interpreting the regression analysis (see Table 11 below).

Table 11: Correlation matrix for relationship between race and SES

Correlation matrix	Asian vs Black	Coloured vs Black	White vs Black	Education	Household income	Occupational class
Asian vs Black	1	n=1034	n=1034	n=1034	n=1034	n=1034
Coloured vs Black	-.052*	1	n=1034	n=1034	n=1034	n=1034
White vs Black	-.065*	-.101**	1	n=1034	n=1034	n=1034
Education	.088**	-.012	.378***	1	n=1034	n=1034
Household income	.153***	.037	.680***	.450***	1	n=1034
Occupational class	.168***	.024	.412***	.321***	.553***	1

* $p < .05$ ** $p < .01$ *** $p < .001$

4.3.1.2 Sampling

This section will describe the 1996 WVS's sample in terms of race and SES to ascertain its representivity of the South African population in terms of these variables. In terms of SES, only two of the three indicators will be examined namely, highest educational level attained and occupational class. Although I conceptualised occupational class (see Section 3.6.1.2) differently from the way Statistics South Africa did for the 1996 Census, a comparison of the occupational categories used by Statistics South Africa with those used in the WVS is possible in terms of three different classes, i.e. unemployed, core working class and upper class.

⁴⁹ The correlation matrix makes use of dummy variables as well (see Chapter 3 for more on dummy variables).

Although the 1996 sample was weighted, it is still useful to conduct this comparison, due to the lack of documenting how the sample was weighted⁵⁰. The reason I used the Census is because it is the best indicator of the demographics of South Africa's population that we, as social scientists, have available⁵¹.

The black respondents sample was not representative of black people in South Africa. After weighting, 73% of the 1996 sample was black and 16% white. The 1996 Census estimated that Africans constituted 77% of the population, followed by whites (11%), coloureds (9%) and Asians (3%) (Statistics South Africa, 1996). As can be noted from Table 12 below, whites and blacks are most poorly represented in the WVS data when compared to the Census data. Blacks are under-represented by 4% and whites over-represented by 5%.

Table 12: Comparison of 1996 Census data with the weighted sample of the 1996 WVS wave

Variables		Census (%)	WVS (%)
Race	Asian	3	3
	Black	77	73
	Coloured	9	8
	White	11	16
Occupational class	Unemployed	34	27
	Core working class	40	29
	Upper class	5	3
Education	No schooling	19	11
	Completed some secondary schooling	34	36

In terms of SES, Table 12 shows that the unemployed are underrepresented in the WVS data when compared to the Census. The disparities that can be observed are probably due to the fact that the 1996 Census used a definition of unemployment⁵² that differs from the one the WVS used⁵³. The unemployment figure in the 1996 October Household Survey was recorded as 17%, according to the strict definition, while 34% of the economically active population

⁵⁰ When the weight is applied to these data (1996) the figures approximate those figures of the Census; when these data are unweighted, the sample over represents white respondents in the sample. Therefore it is still important to compare the sample distribution with the Census data.

⁵¹ However, according to Statistics South Africa, the undercount for the 1996 Census is 10%, which is quite high (Statistics South Africa, 2011).

⁵² The unemployed are defined as "those people within the economically active population who (a) did not work in the seven days prior to Census night, (b) wanted to work and were available to start work within a week of Census night, and (c) had taken active steps to look for work or to start some form of self-employment in the four weeks prior to Census night" (Statistics South Africa, 1998:3).

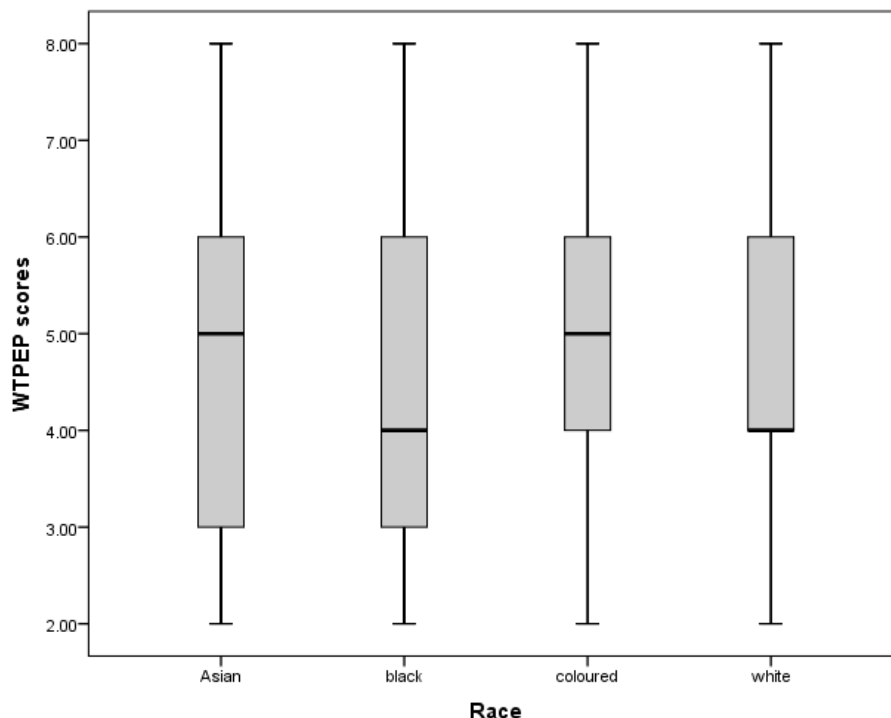
⁵³ The WVS only asks if the head of the household is currently employed; it stipulates no time frame or what is meant by being employed.

was recorded as being unemployed when using the expanded definition⁵⁴ (Horschowitz 1996:14; Statistics South Africa, 1996). I would argue that the WVS uses the expanded definition, therefore the unemployed are underrepresented in its data. Additionally, the upper class are also marginally underrepresented in the WVS. The vast disparity between the core-working-class percentages may be attributed to the differing definitions. However, it still raises concerns over the representivity of the 1996 WVS sample; therefore generalisation to the South African population should be done with caution.

4.3.1.3 *The relationship between race, SES and environmental concern*

The lowest possible score on the WTPEP index is 1 out of 8 and the highest possible score is 8 out of 8. Figure 2 shows that Asian and coloureds share the highest median WTPEP index score of five, while whites and blacks share the lowest median score of four. The median relates to the 50th percentile, therefore half of the black respondents and white respondents scored four or less on the WTPEP index. Moreover, 25% of white respondents attained a median score of four out of a possible score of eight, hence the second quartile appears to be missing on the boxplot.

Figure 2: Boxplot of racial groups' WTPEP scores in 1996



⁵⁴ The expanded definition focuses on the desire to work, irrespective of whether or not the person has taken active steps to find work.

To better understand the differences in these scores, one needs to use regression analysis to establish how race has impacted on South Africans' willingness to pay for environmental protection. As described in the literature review, environmental concern is still class-based, therefore it is important to regress SES and race against environmental concern. This will first be done for SES and race separately and then together in the multiple regression part of this thesis. A simple regression analysis (see Table 13 below) shows that black South Africans, who are the reference group, which I used in the dummy variables, scored the lowest; which is why the unstandardised-coefficients column (B) has positive values. Additionally, the black racial group's score is significantly different from that of the coloured respondents and white respondents, as coloured respondents scored the highest on the WTPEP index in 1996, followed by white, Asian and then black respondents.

The SES variables explain the most variance, and also have the largest effect sizes⁵⁵ on the WTPEP index in 1996. This means that, of all the factors considered, household income and not race is the most important factor when determining whether South Africans will be willing to make economic sacrifices for the environment.

Table 13: Simple regression results for individual predictors on the WTPEP index

Predictor variables	B	SE B	β	R^2 (%)
Race				1.4
Black vs. Asian	.233	.209	.022	
Black vs. coloured	.659	.120	.110***	
Black vs. white	.349	.091	.077***	
Education	.048	.008	.121***	1.4
Household income	7.22	.000	.139***	1.9
Class	.203	.008	.133***	1.7

*p <.05 **p <.01 ***p <.001

It would be useful to determine whether there are still differences among the different race groups, after controlling for SES, on South Africans' willingness to pay for environmental protection. The multiple regression analysis shows that race and SES accounts for approximately four percent of the variance in South Africans' willingness to pay for environmental concern. Moreover, level of education and household income has a small

⁵⁵ Often tests of statistical significance are influenced by sample size, and it is therefore important to consider the effect size together with the significance test. An effect size is a standardised measure of the magnitude of an observed effect. It ranges from 0, which means no effect, to 1, which represents a perfect effect. Cohen (1988, as cited in Field, 2009:56) proposes that effect sizes beneath .10 are small, .30 is a medium effect, and .50 is a large effect. This allows us to compare the association between variables, regardless of the size of the sample.

⁵⁵ When the weight is applied to these data (1996) the figures approximate those figures of the Census; when these data are unweighted, the sample over represents white respondents in the sample. Therefore it is still important to compare the sample distribution with the Census data.

positive effect on the South Africans' scores on the WTPEP index. This means that as SES increases, so does the respondent's willingness to pay for environmental protection after controlling for race. Race and occupational class account for the most variance, in South Africans' willingness to pay for environmental protection. Importantly, after controlling for education, the differences in white respondents and black respondents' scores are no longer significantly different from black respondents' scores. This means that when white and black respondents' educational levels are the same, their scores on the WTPEP index are very similar. It is clear from the multiple regression that coloured respondents' scores are statistically significantly different from black respondents' scores, after controlling for SES. Furthermore, coloured respondents scored the highest on the WTPEP index after controlling for SES (see Table 14 below⁵⁶).

Table 14: Multiple regression results for predictors on the WTPEP

Predictor variables	Model 1	Model 2	Model 3	Model 4
Black vs. Asian	.105	.011	-.122	-.230
Black vs. coloured	.746***	.728*	.673**	.652**
Black vs. white	.567**	.390*	.135	.066
Education		.037*	.030	.025
Household income			4.46	5.77
Class				.233***
Constant	4.239	3.973	3.966	3.330
R ²	.017	.022	.023	.036

*p <.05 **p <.01 ***p <.001

In 1996, SES and not race was the best predictor of environmental concern as measured by the WTPEP index. However, some racial differences remain after controlling for SES. Coloured respondents are more willing than any other race group to pay for environmental protection. Additionally, after controlling for education, the difference between black and white respondents is no longer statistically significant. Therefore environmental concern is class-based as the three SES indicators explained more variance than race and the differences in the racial groups' scores were not explained away by SES.

⁵⁶ In this analysis I entered several predictor variables into the regression analysis at the same time, thereby creating a multiple regression model to understand environmental concern. I did this by using the forced entry method (see Field, 2009:227). This is in contrast to the simple regression analysis where each predictor was regressed against the outcome variable on its own. Therefore each variable above is a model to understand the data. These models can be interpreted as follows (model 1 is race; model 2 is race and education; model 3 is race, education and household income; model 4 is race, education, household income and occupational class).

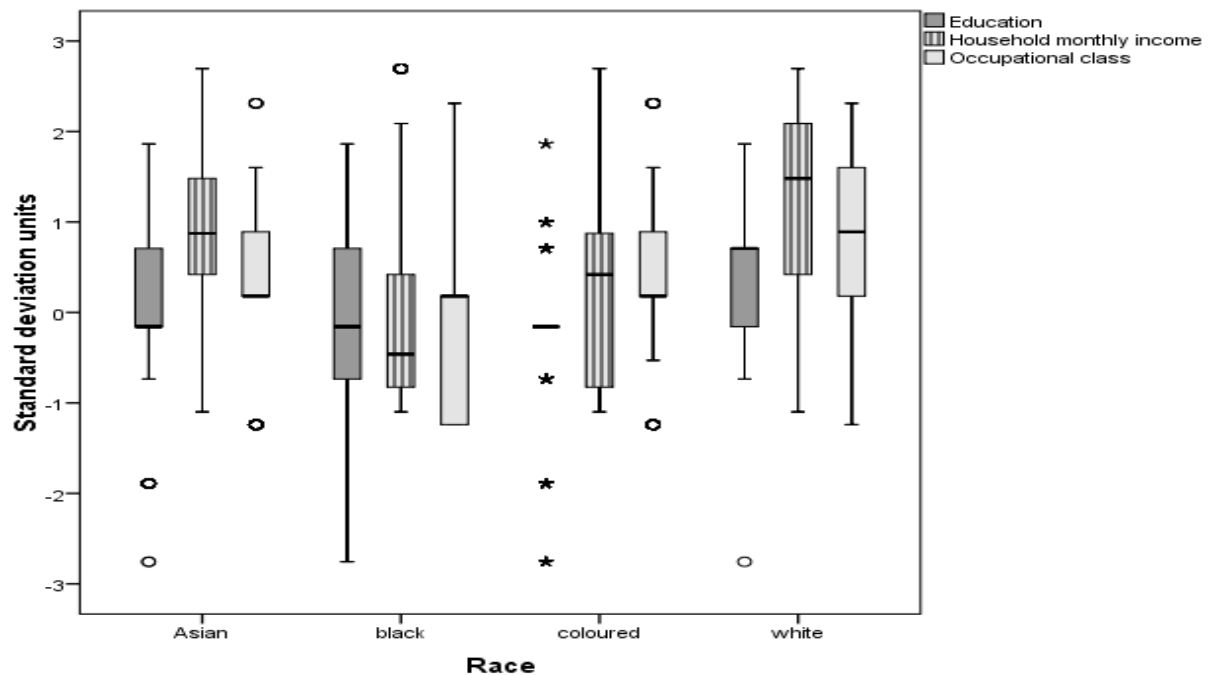
4.3.2 Wave II: The 2001 study

This section will present the results of the second wave of the WVS. It will replicate the analysis that was used above, so as to allow for some comparison of results over time.

4.3.2.1 The relationship between race and SES

In 2001 the results were similar to the 1996 ones, in that black and coloured respondents' household income was the lowest (Figure 3). Furthermore, the educational attainment of black respondents seems to be the lowest out of all the racial groups. Once again white respondents have the highest median in terms of monthly household income, occupational class and educational attainment. The distribution of these data highlights the expected relationship between SES and race in South Africa as discussed by Seekings and Natrass (2006).

Figure 3: Boxplot of the relationship between race and SES in 2001



The correlations for race and SES show that multicollinearity will not be a problem when analysing the regression analysis for the 2001 data. Furthermore, there is a positive and statistically significant relationship between the white dummy variable and education ($r = .071$; $p < .05$) and household income ($r = .201$; $p < .000$) and occupational class ($r = .137$; $p < .000$). This shows that if you are white there is a greater possibility that you are going to have a higher educational attainment, reside in a household with a fairly high monthly income and the household head in your house will be in a higher occupational class category

(see Table 15). This is in line with what was observed in Figure 3 and therefore confirms that the sample has good external validity.

Table 15: Correlation matrix for relationship between race and SES

Correlation matrix	Asian vs Black	Coloured vs Black	White vs Black	Education	Household income	Occupational class
Asian vs Black	1	n=1079	n=1079	n=1079	n=1079	n=1079
Coloured vs Black	-.063*	1	n=1079	n=1079	n=1079	n=1079
White vs Black	-.025	-.063*	1	n=1079	n=1079	n=1079
Education	-.028	-.077**	.071*	1	n=1079	n=1079
Household income	.199***	.033	.201***	.308***	1	n=1079
Occupational class	.107***	.075**	.137***	.164***	.464***	1

*p < .05 **p < .01 ***p < .001

4.3.2.2 Sampling

The 2001 sample was closer than the 1996 sample to being nationally representative of all racial groups. The total sample size in 2001 was 3 000 (Steenekamp, 2011:77-78). However, when compared to the Census 2001 data⁵⁷, black respondents are underrepresented by approximately 7% and white respondents overrepresented by 4% (Table 16). Furthermore, the WVS has underrepresented the percentage of respondents that have received no schooling and completed some primary schooling.

Table 16: Comparison of 2001 Census data with the weighted sample of the 2001 wave of the WVS

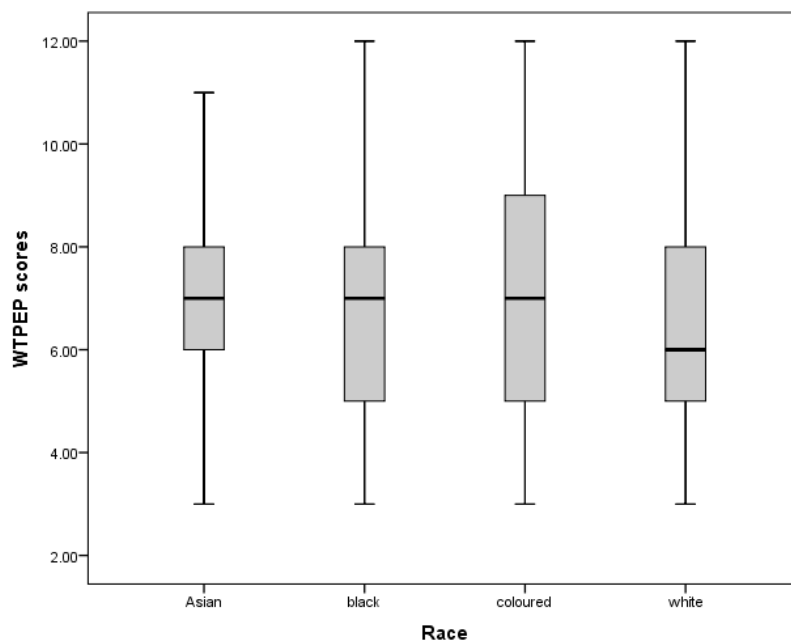
Predictor variables		Census (%)	WVS (%)
Race	Asian	3	4
	Black	79	72
	Coloured	9	11
	White	10	14
Occupational class	Unemployed	24	25
	Core working class	34	29
	Upper class	5	4
Education	No schooling	18	4
	Completed some secondary schooling	56	40

⁵⁷ In 2001, the Census undercount was estimated to be 17%. There was an underestimate on children under the age of 5, an underestimate on children between 10 and 19, an underestimate on men relative to women and finally an underestimate on the white population (Statistics South Africa, 2001)

4.3.2.3 *The relationship between race, SES and environmental concern*

The Asian, black and coloured respondents' medians on the 2001 WTPEP index are exactly the same, i.e. a score of seven out of a possible score of 12 (see Figure 4 below). Importantly, white respondents scored the lowest median: six out of a possible score of 12. This means that in 2001 white South Africans were probably not as willing to pay for environmental protection as the other racial groups. White South Africans also exhibit the most variation in the top 25% of their scores, as shown by the very long top whisker of the boxplot for that race group.

Figure 4: Boxplot of racial groups' WTPEP scores in 2001



To better understand these differences in the racial groups' scores, and to determine which racial group scored the highest on the WTPEP index, a simple regression analysis was conducted, using black respondents as the reference group. As can be seen from the unstandardised coefficient scores, the positive number ascribed to coloured respondents shows that coloured respondents scored the highest mean, followed by Black respondents, then white respondents and finally Asian respondents, who scored the lowest on the WTPEP index (see Table 17 below). Furthermore, the difference between black respondents' mean score and that of the other racial groups is statistically significant. These results also show that education on its own has the largest effect size ($\beta = .078$; $p < .001$). This means that level of education has the largest effect on South Africans' WTPEP index scores, although

the effect size is relatively small. However, race accounts for the most variance in the WTPEP index scores, therefore race is the strongest predictor in this instance.

Table 17: Simple regression results for individual predictors on the WTPEP index

Predictor variables	B	SE B	β	R^2 (%)
Race				1.1
Black vs. Asian	-.578	.212	-.054**	
Black vs. coloured	.430	.134	.065**	
Black vs. white	-.371	.117	-.064**	
Education	.049	.012	.078***	.6
Household income	3.97	.000	.032	0
Class	.157	.056	.074*	.5

*p <.05 **p <.01 ***p <.001

The combined effect of these predictors may be seen in the multiple regression presented below (see Table 18). This analysis may show us whether the differences in the races pertain even after controlling for the SES of individuals. It becomes apparent that educational attainment, occupational class and income provide statistically significant results ($p < .01$). Of all the predictors, education explains the most variance in environmental concern. Moreover, in the third model, education recorded the strongest effect, after controlling for race and household income ($\beta = .156$, $p < .01$). After controlling for SES, Asian, white and black respondents have very similar scores and only black and coloured respondents' scores are significantly different from one another. Hence, after controlling for educational attainment, household income and occupational class; it appears that the coloured respondents are the most willing to sacrifice for environmental protection.

Table 18: Multiple regression results for predictors on the WTPEP

Predictor variables	Model 1	Model 2	Model 3	Model 4
Black vs. Asian	-.513	-.559	-.319	-.353
Black vs. coloured	.567**	.627**	.671**	.629**
Black vs. white	-.203	-.326	-.102	-.172
Education		.094***	.112***	.110***
Household income			.000*	.000***
Class				.250**
Constant	6.711	5.823	5.875	5.179
R^2	.007	.023	.028	.035

*p <.05 **p <.01 ***p <.001

In 2001 education is the best predictor of South Africans' willingness to pay for environmental protection after race has been held constant. The multiple regression has shown that there are differences among the races groups after controlling for SES.

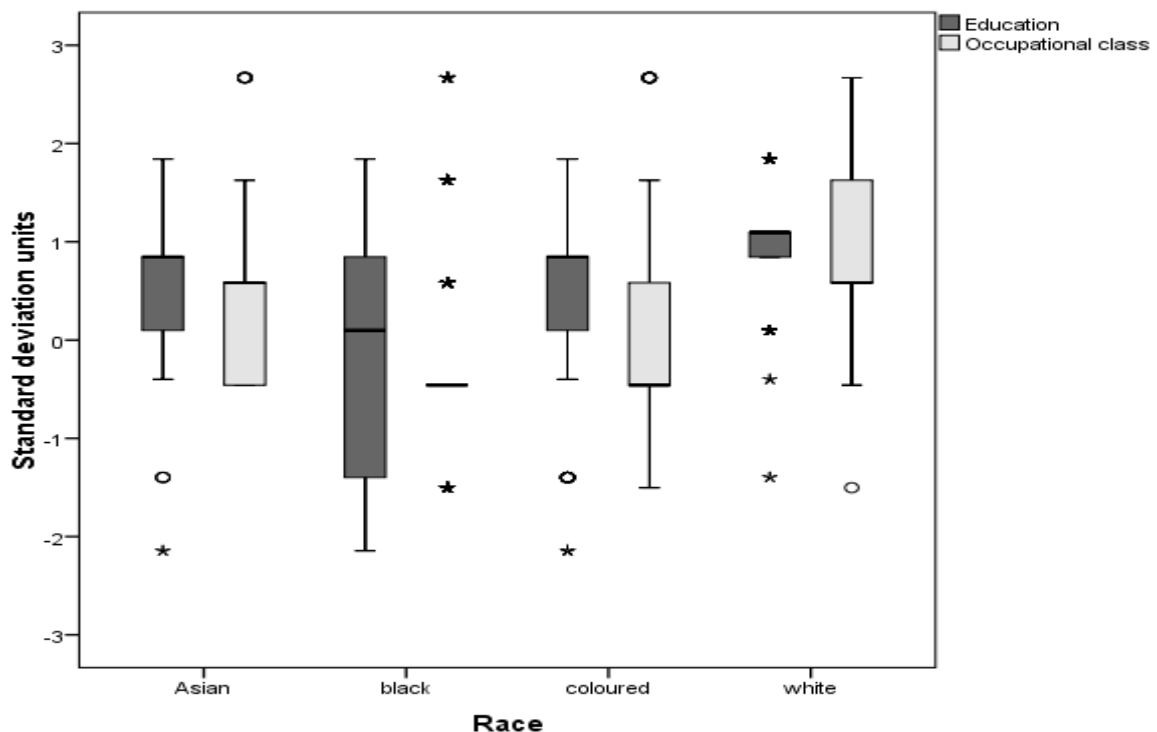
4.3.3 Wave III: The 2006 study

The same analysis will be repeated as for the above two to allow for comparison of results over time. But first the relevant methodological issues will be discussed.

4.3.3.1 The relationship between race and SES

In 2006 the measurement of monthly household income changed to the respondent's subjective interpretation of their household's income. I would rather not use this measure, as it lacks comparability to the previous two waves and external validity (see Section 3.6.1.2 for a more in-depth discussion). Figure 5 shows that once again white people have the highest median for educational attainment. The distribution of black respondents' occupational class is crowded around the South African mean of this variable; therefore it shows only one line instead of the full boxplot.

Figure 5: Boxplot of the relationship between race and SES in 2006



The correlation matrix shows that coloured respondents have a positive and statistically significant relationship ($r = .115$; $p < .000$) with occupational class; the same may be said for white respondents and occupational class ($r = .374$; $p < .000$). These results show that race and SES are indeed correlated; however, multicollinearity will not be a problem when interpreting the regression analysis (Table 19).

Table 18: Correlation matrix for relationship between race and SES

Correlation matrix	Asian vs Black	Coloured vs Black	White vs Black	Education	Occupational class
Asian vs Black	1	n=1214	n=1214	n=1214	n=1214
Coloured vs Black	-.033	1	n=1214	n=1214	n=1214
White vs Black	-.036	-.063*	1	n=1214	n=1214
Education	.017	.039	.197***	1	n=1214
Occupational class	.061*	.115***	.374***	.351*	1

* $p < .05$ ** $p < .01$ *** $p < .001$

4.3.3.2 *Sampling*

Although the 2006 sample is considered representative of the adult population of South Africa at that time (see Section 3.7), I decided to compare the 2006 WVS data to the 2007 Community Survey (see Statistics South Africa, 2008) to test its external validity. This was done to make sure the SES indicators are representative of the target population as they are generally not weighted. The 2007 Community Survey was conducted to fill the 10-year gap between the 2001 and 2011 Censuses. Some of the results of my indicators could not be compared with the Community Survey. In that case I substituted it with 2001 Census and 2007 Labour Force Survey (LFS) data (see Table 20).

Table 19: Comparison of South Africa's Population data with the weighted sample of the 2006 wave of the WVS

Predictor variables		Community Survey (%)	WVS (%)
Race	Asian	3	2
	Black	79	80
	Coloured	9	7
	White	10	11
Occupational class	Unemployed*	21	37
	Core working class**	34	25
	Upper class**	5	2
Education	No schooling	10	9
	Completed some secondary schooling	40	40

*Source: Labour Force Survey 2007

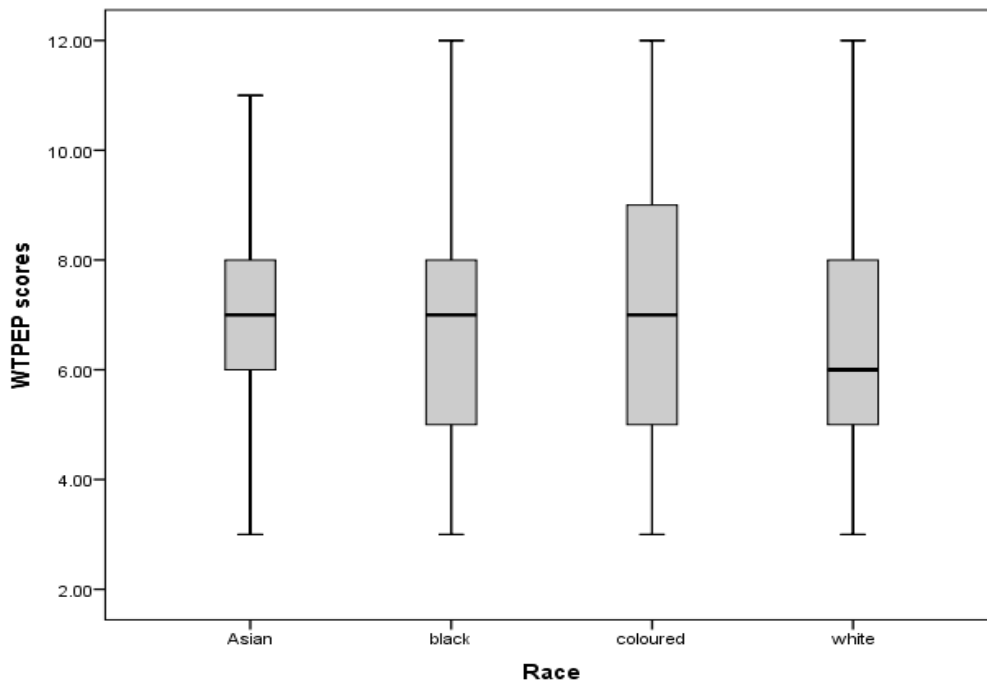
**Source: Census 2001

The 2006 WVS sample reports a 37% unemployment rate, which is much higher than the rate reported by Statistics South Africa's LFS (Statistics South Africa, 2009). The disparities that can be observed are probably due to the fact that the 2007 LFS used a definition of unemployment that differs from the one the WVS used. Highest level of education attained is the next SES indicator in terms of which distributions can be compared. In this regard, the distribution in the WVS sample is almost exactly the same as that in the Community Survey of 2007. The core working class is larger in the 2001 Census data than in the 2006 WVS's sample, and a higher percentage of those that have completed secondary schooling have been recorded in the Census data than in the WVS's sample. I would argue, after reviewing the WVS's sample and considering that it is weighted (as discussed above), that the 2006 sample has the highest external validity of all the WVS samples discussed.

4.3.3.3 *The relationship between race and environmental concern*

The boxplot below presents South Africans' WTPEP scores, according to race. This figure shows that all racial groups scored a median of seven out of a possible score of 12; except for white respondents who scored a median of six out of a possible score of 12. The boxplot for Asian respondents shows that their distribution of scores is normally distributed. When compared to the other racial groups, it appears that whites did not score the highest on the WTPEP index (Figure 6).

Figure 6: Boxplot of racial groups' WTPEP scores in 2006



The simple regression shows that coloured respondents score the highest mean followed by black respondents, then Asian respondents and finally, white respondents (see Table 21). Only white respondents' mean scores differ statistically significantly from the black respondents' mean scores. Additionally, education and class account for no extra variance in the outcome variable.

Table 20: Simple-regression results for individual predictors on the WTPEP index

Predictor variables	B	SE B	β	R^2 (%)
Race				.3
Black vs. Asian	-.152	.292	-.010	
Black vs. coloured	.168	.164	.021	
Black vs. white	-.384	.133	-.058**	
Education	.001	.011	.001	0
Class	.003	.048	.002	0

*p < .05 **p < .01 ***p < .001

The combined effect of the predictors accounts for less than 1% of the variance in South Africans' willingness to make economic sacrifices for environmental protection (see Table 22). In the 2006 wave, race accounts for the most variance in the outcome variable, but it is a very small percentage of the variance. Education explains no further variance in South Africans' WTPEP scores, and occupational class decreases the amount of variance the model explains, thereby showing that SES does not have an effect on how South Africans scored on the WTPEP index.

Table 21: Multiple regression results for predictors on the WTPEP

Predictors	Model 1	Model 2	Model 3
Black vs. Asian	-.233	-.240	-.253
Black vs. coloured	.447	.438	.424
Black vs. white	-.354	-.385	-.418
Education		.010	.009
Class			.020
Constant	6.843	6.757	6.716
R ²	.002	.002	.001

*p <.05 **p <.01 ***p <.001

4.3.4 Discussion of results

The above section presented the results of an analysis of the WTPEP index, so as to test the hypothesis that after controlling for SES there will be no difference in environmental concern amongst the various race groups. To confirm this hypothesis after controlling for SES there should be no difference in the respondents scores on the WTPEP index and would have to do consistently so across all three waves. The results show that in 1996 and 2001 all the racial groups' scores were not the same after controlling for SES. In the 2006 wave, this changes and none of the racial groups' scores are statistically significantly different – after controlling for SES. Therefore, I have to reject the hypothesis in 1996 and 2001 and confirm the hypothesis for 2006.

In 1996, South Africans' willingness to sacrifice economically for the environment was influenced by SES. It must be stated that my expectation, based upon the literature review, was that this willingness would be far more class-based than the results for the 1996 wave show. Nevertheless, in 1996, if a South African's SES was high (i.e., your household earned more, you had achieved a higher level of educational, and your head of your household was located in the higher occupational ranks) he/she was more likely to be willing to pay for environmental protection than if his/her SES was low.

In the 2001 data, South Africans' WTPEP scores seem to become less racialised and class based as, together, the predictors explain less variance in the outcome variable. Interestingly, education plays an important role in 2001, as the strongest effect size was reported for educational attainment in the simple regression. Furthermore, a positive slope is reported in the multiple regression for educational attainment of South Africans. This confirms that the higher the respondent's educational attainment, the more likely he/she will be willing to pay for environmental protection. However, all the effect sizes are considered small, therefore the effect of SES on these data is not strong. The removal of the double-barrelled item from the index shows very little difference from these results. This means that the removal of the

double-barrelled item has no effect on whether I reject or accept my research hypothesis for the 2001 data.

Interestingly, in 2006 South Africans' WTPEP index scores were not structured according to race or SES. In this wave, the model I constructed for these data has no effect on South Africans' willingness to pay for environmental protection. Moreover, as race and SES explain less variance in the WTPEP index over the course of the three waves (as inferred from the decline in explained variance for each of these predictors in each multiple regression model), it becomes clear that environmental concern is not as racialised and class-based as it was in 1996. Furthermore, the removal of the double-barrelled item from my analysis, in no way influences whether I will reject or accept my hypothesis as the results are almost exactly the same as when this item is included in my analysis. The results for 2006 are very interesting, because all the racial groups scored very similar results, and therefore another factor (or factors) is determining the way these respondents' attitudes towards the environment are changing, as can be seen in the decline in variance explained by the three consecutive multiple regression models.

I would argue that it might be a lack of confidence in the government's ability to curb environmental problems that has led to my regression model not explaining any variance in the 2006 data. The reason for this is that two of the questions that form part of this index imply that the government should play a role in the decreasing of environmental pollution. While this is not particularly relevant to my hypothesis, I conducted a simple regression on the effect of voting for the African National Congress (ANC) on South Africans' WTPEP. It showed that those who voted for the ANC were also more willing to sacrifice economically for environmental protection. This predictor accounted for much more variance than race or SES, and also had a medium-sized effect, therefore confirming my suspicion that in 2006 South Africans' WTPEP was influenced by the political attitudes of the respondents: those who have faith in the ANC would also have faith that the party could curb environmental degradation. Additionally, Pierce (1997:30) argues that environmental concern is also influenced by the political culture of the country.

4.4 Conclusion

This chapter has shown that neither race nor SES are good predictors of environmental concern as measured by South Africans willingness to pay towards environmental protection. There is also no increase in their willingness to pay as expressed in the 2001 to 2006 waves.

This chapter has shown that changes in the operationalisation of environmental concern over the three waves of the WVS hinder longitudinal analysis. However, based on these findings, one cannot conclude that there was no change in environmental concern, but only no change in environmental concern as reflected by the narrow conceptualisation and operationalisation of environmental concern in the WVS. The next chapter will entail a discussion of these results and the conclusion of this thesis.

CHAPTER 5: DISCUSSION

This chapter will discuss the complex interplay between environmental concern, race and SES among the South African public, by revisiting the post-materialist and the “environmentalism of the poor” theories in relation to the findings presented in Chapter 4. The results will also be compared to other, similar studies, so as to locate them within the South African literature, and a brief summary on the limitations of this study will be provided.

5.1 Post-materialist thesis

The post-materialist thesis argues that people whose lives are characterised by a dearth of material resources will view nature in an instrumentalist way. This means they may view nature as a resource to be utilised, and therefore will not be too concerned about environmental protection (Inglehart, 1995). On the other hand, individuals whose basic material needs have been met are more likely to display post-materialist values and express concern towards environmental degradation. To confirm the post-materialist thesis, the SES predictors should have consistently had a positive effect on the WTPEP index, and after controlling for SES there should be no difference in willingness to pay for environmental protection among the various race groups.

However, this was not always the case. In 1996 and 2001 there were differences in the race groups after controlling for SES. In both waves the differences between coloured and black respondents willingness to pay for environmental protection was statistically significant. In 2006 there were no differences among the various racial groups. Moreover, it seems as if race and SES play no role in determining South Africans willingness to pay for environmental protection in the 2006 wave.

Other researchers that have applied the post-materialist thesis to understand environmental concern have shown that it does not account for all their findings. For instance, Anderson *et al.*'s (2007:157) results indicate that concern for water pollution is not a post-materialist problem. Rather, those most likely to be affected by environmental problems are more likely to view them as problems, a scenario that is in line with the environmental deprivation theory

In a similar study, focusing on South Africans' concern for the environment, Struwig's (2010:213) environmental concern index indicates that groups with the highest level of income and educational attainment showed the most concern towards the environment. However, based on their study, Hunter *et al.* (2010:537) state that SES did not have a clear

relationship with environmental concern. This is once again in contrast to a later study, on recycling, by Anderson *et al.* (2013:19) that suggests as material conditions improve in households, racial difference in rates of recycling will decrease. I have argued that the contradictory nature of results such as these may result from the different conceptualisations of environmental concern that have been used by researchers in South Africa (see Anderson *et al.*, 2007; Hunter *et al.*, 2010; Struwig, 2010).

My analysis of South Africans' willingness to pay for environmental protection produced a few findings that tend to support the post-materialist thesis. In 1996 and 2001, the level of education attained by South Africans has had the most consistent effect on, and generally positive relationship with, their willingness to pay for environmental protection. This means that the post-materialist thesis is confirmed in this instance, albeit not convincingly. Because the overall effect of race and SES on environmental concern in these data is fairly small.

Furthermore, in 2001 South Africans' SES had a weak effect (and a weaker effect than in 1996) on willingness to pay for environmental protection. However, there was still a weak positive effect of education and occupational class on the WTPEP scores of South Africans. In 2006 none of the results support the central argument of the post-materialist thesis, i.e. that environmental concern is a post-materialist value.

The post-materialist thesis also states that people who are exposed to environmental pollution and whose livelihoods rely on the natural resources that surround them will be environmentally concerned (see Dunlap & York, 2008:536). This is an understanding of environmental concern which is fairly similar to that provided by the environmental deprivation theory. Though there are some problems with this formulation⁵⁸; it is hard to test this longitudinally in South Africa, because the indicators focusing on the material nature of environmental problems (water pollution, land degradation, sanitation, air pollution and littering) were only introduced in the 2006 wave of the WVS. The absence of these data does not allow for the testing of the relative deprivation theory. Longitudinally, in 2001 and 2006, race and SES generally had a smaller effect on South Africans' concern for the environment, when compared to 1996. This may indicate that environmental concern has become less influenced by race, and that SES is playing a less definitive role in South Africans' willingness to pay for environmental protection.

⁵⁸ Dunlap and York (2008:536) argue that the way Inglehart revised the theory has made it unfalsifiable, because environmental concern in the 'North' is attributed to Post-Materialism and environmental concern in the 'South' is attributed to the exposure of environmental problems/degradation.

5.2 Environmentalism of the poor

It may be argued that the democratic, post-1994 South African government has helped many South Africans meet their material needs. Thus one would expect South Africans' willingness to pay for environmental protection to increase as Gross Domestic Product (GDP) of the country increases, as predicted by the post-materialist thesis. According to Du Plessis and Smit (2006:2), South Africa showed an average of only 0.3% growth rate in GDP from 1985 to 1994. However this increased drastically to a 3% average increase in GDP growth from 1995 to 2006. Although there was also a concurrent increase in inequality (Hoogeveen & Ozler, 2004:1), which may have stymied the development of post-materialist values, this inequality may have bred an "empty-belly" type of environmentalism (Guha & Martinez-Allier, 1997, as cited in Dunlap & York, 2008:440). Nixon (2011:4) proposes that, because of the neo-liberal assault on natural resources, there has been an intensification of resistance against corporations and organisations fuelling environmental degradation, whether through isolated local struggles, or across national boundaries.

An environmentalism of the poor theory was used by Dunlap and York (2008:550) to understand the findings of their study, which investigated the relationship between the environmental items in the WVS and the GDPs of the various participating countries in the WVS. Dunlap and York (2008:550) found three negative correlations, two insignificant correlations and three positive correlations between environmental concern and GDP. Although they provide some support to the environmentalism of the poor theory, their results are inconclusive. In order to test this theory in the South African context, I hypothesised that South Africans would have become more environmentally concerned since the end of apartheid, due to the growing gap between the discourse of rights and the reality of unmet needs (Cock, 2006:294).

Environmental problems are often embedded in social problems. As such, Hunter, Strife and Twine (2010:538) expect individual and societal environmental perceptions to be diverse, interrelated, and closely tied to social concerns. Therefore, South Africans may be environmentally concerned due to the interaction between environmental concern and social problems, as highlighted by Martinez-Alier (2002:179):

the Environmental Justice Network Forum, who have substantial township and rural organization membership and mobilize South Africans on a range of urban, environmental health, and pollution-related problems, and also land and water management problems[...] had not been considered by the 'wilderness' NGOs. In their

view, good environmental management involves protecting people as well as plants and animals

This was confirmed in a study on air pollution, water pollution and littering, conducted by Anderson *et al.* (2010:25), which shows that these environmental problems were viewed as problems if households, regardless of race, resided in informal housing. Therefore, one would expect South Africans on a lower SES level to exhibit a higher level of environmental concern and willingness to pay for environmental protection than those on higher SES levels and SES. However, no negative associations between SES and environmental concern were found in my study.

This study has shown that South Africans have not become more environmentally concerned. Instead, their willingness to contribute towards environmental protection has remained stable from 2001 to 2006. Therefore the hypothesis that South Africans would have become more environmentally concerned was rejected.

This study neither fully supports the environmentalism of the poor argument, nor does it support the post-materialism thesis. Rather the data showed that those who voted for the ANC were also more willing to sacrifice economically for environmental protection. This predictor accounted for much more variance than race or SES, and also had a medium-sized effect, therefore confirming my suspicion that in 2006 South Africans' WTPEP was influenced by the political attitudes of the respondents: those who have faith in the ANC would also have faith that the party could curb environmental degradation. Moreover, South Africans' belief in the ruling government's ability to make sufficient use of their taxes to reduce environmental pollution or damage influences environmental concern in post-apartheid South Africa (see the results for the item number three in 2001 and 2006). These insights also highlight the poor operationalisation and conceptualisation of the underlying dimensions of environmental concern in the WVS. This limitation, as well as a few others, will be dealt with in the following section.

5.3 Reflections on the limitations of the WVS

This section will highlight the shortcomings of this thesis (for a more in-depth discussion see Chapter 3), and how the shortcomings of this thesis may be relevant to other studies using secondary data analysis as a research design. A longitudinal analysis of WVS data is an important contribution to understanding of the changes in the level of environmental concern among the South African public as a whole. An additional contribution this thesis hopes to

make is to provide an understanding of the limitations of conducting a secondary analysis of WVS data and, more specifically, limitations that should be considered when using cross-national surveys as a data source.

In the context of this study, the main limitation of the WVS as a data source is that measuring environmental concern is not its main priority. Environmental concern only forms part of a broader set of values that the WVS purports to measure. Therefore, the conceptualisation and operationalisation of the outcome variable of this study is rather superficial. The implication of this is that internal validity as well as theory testing are hard to achieve. This can be seen in the inconsistent results that this study has produced. Moreover, by insinuating that the WTPEP index measures environmental concern in South Africa, as I have done here and other authors have done in the past (see Inglehart, 1995; Dunlap & York, 2008), reduces this highly complex construct to an economic rationality, i.e., if you are willing to pay for environmental protection, you are environmentally concerned. If you cannot pay or are unwilling to pay, it means you do not care for the environment. Besides this overarching conceptual problem, there are other more technical problems, such as the double-barrelled nature of one of the items in the WTPEP index.

Another limitation associated with using the WVS, as I have done in this study, relates to the fact that it has been designed as a cross-national study. The WVS's conception of environmental concern has been formulated in and for a First World context, as Dunlap and York (2008:440) explain:

These behaviours are largely representative of what Guha and Martinez-Alier (1997) term the “full-stomach” environmentalism of wealthy nations and largely inapplicable to the “empty-belly” environmentalism of poorer nations, and strongly biased in favour of residents of the affluent, largely Northern-hemisphere countries. People living in poverty stricken third world nations reuse and recycle and conserve water out of necessity, and it is difficult to imagine how they would respond to these items. Even the two politically oriented items are worded with “Northern environmentalism” in mind, as third world environmentalists are less likely to protest in writing or to make *financial* contributions to environmental groups than are their rich-nation counterparts

This is evident in the assumption underlying the WTPEP index's indicators that people in developing contexts, such as South Africa, have access to relatively affordable environmentally friendly products. This may be the case in western countries, but in South Africa and other developing countries, not everyone has access to these types of services and products, are able to pay more taxes or give part of their income.

Due to these diverse operationalisations of environmental concern and the different ways in which environmental concern has been operationalised in the WVS, the General Household Survey, the South African Social Attitudes Survey, and the scale produced by Carlson and van Staden (2006), it was not possible to validate the findings of this study against those of other studies conducted in the same context. This constraint needs to be overcome for research on environmental concern in South Africa to produce findings that exhibit measurement and criterion-related validity⁵⁹.

5.4 Recommendations

This section focuses on recommendations for future research on environmental concern in South Africa. One of the foremost aims of such research should be the creation of a comprehensive scale aimed at measuring different dimensions of environmental concern in South Africa. This scale should be explicit in terms of the number of dimensions of environmental concern that it purports to measure. For the measurement of environmental concern to be less Eurocentric than it currently is, it would be useful to consider Carlson and Van Staden's (2006) distinction between ecocentric and anthropocentric dimensions of environmental concern. The double-barrelled item in the 2001 and 2006 WTPEP index should be reformulated. In addition, all the items need to be consistently tested over many years to provide coherent longitudinal data.

From this discussion it becomes apparent that what is needed is a clearer understanding of what the WVS intends to measure longitudinally, the length of the time intervals between the waves should be as similar as possible, and more sensitivity needs to be shown toward the context, and the meaning in those contexts, in which the constructs are being measured. I would also argue that data on environmental concern are of such importance to policy makers (see Anderson *et al.*, 2010:1), that studies of environmental concern should be conducted in their own right, and not merely be included as a module in a multipurpose survey such as the WVS. A panel study on how individuals' concern for the environment changes over the life course may also provide very useful results for policymakers.

Concurrently, there is a need for more qualitative research to be conducted on environmental concern in South Africa. This would provide a better conceptualisation and operationalisation of the construct for the local, South African context. Furthermore,

⁵⁹ Criterion-related validity refers to the degree to which a measure relates to some external criterion (Babbie, 2010:154). In this instance I am unable to determine the validity of the WVS results based on other studies' findings as external criteria. According to Bryman (2008:695), measurement validity refers to the degree to which a measure of a concept truly reflects that concept.

quantitative research on environmental concern in South Africa may benefit from a sequential mixed methods approach (Creswell, 2009:14), according to which qualitative interviews may be conducted for exploratory purposes, followed by a survey in order for the researcher to generalise results to a larger population.

5.5 Conclusion

The research presented in this thesis has shown that South Africans did not become more environmentally concerned between 1996 and 2006, as measured by a willingness to pay for environmental protection. It also shows that after controlling for SES the differences between racial groups does not disappear, except in 2006 where the differences do disappear. Neither the post-materialist thesis nor the environmentalism of the poor theory are of much help to interpret the findings of this thesis. The most consistent finding is that race and SES account for less variance in environmental concern in the 2006 wave of the WVS, than in the 1996 or 2001 waves. This may indicate that South Africans' willingness to pay for environmental protection has become less influenced by race and SES than in 1996, directly after the demise of apartheid.

After considering these findings that the influence of race and SES on environmental concern has decreased, the notion that "the poor" do not care for the environment, has been dispelled. This may be seen in the study's results that black, and at times coloured respondents, were more willing to pay for environmental protection than their white counterparts even though they had less financial means to do so.

The conceptualisation of environmental concern has been extensively discussed and critiqued in this thesis. The validity of the findings may be questioned due to what is arguably a limited attempt by the WVS to conceptualise and operationalise a highly complex construct in a manner that would allow valid cross-national and cross-cultural analyses. Furthermore, the WVS has hampered any longitudinal analysis of environmental concern through a lack of consistency in the application of environmental concern indicators. This problem seems prone to persist for some time: a perusal of the 2013 questionnaire for the WVS shows that even more items on environmental concern have been removed and changed. It appears as if the WTPEP index has been removed completely. Other methodological problems with the South African WVSs include a lack of sampling information for 1996 and 2001, and a general neglect to rule out as much error as possible in 2006, by not back-translating questionnaires and not recording response rates (WVS, 2006). Furthermore, the way in which

socio-demographic data were collected, and households' monthly income measured, is inconsistent over time. The implications of these methodological issues need to be taken into consideration when examining the results of this study.

One of the contributions this study aimed to make was to deduce, from an analysis of willingness to pay for environmental protection in general, which population and SES groups in South Africa may or may not be accepting of a low-carbon lifestyle; and in doing so, assist policy makers in understanding whether SES might be a barrier to the successful implementation of policies that require South Africans to adopt such a lifestyle. After analysing the data and reviewing other researcher's results, it is clear that South Africans are not as willing to contribute to paying for environmental protection as their counterparts in developing countries are (see Struwig, 2010 & Chapter 2).

Interestingly, it appears that SES does not have a significant impact on South Africans' willingness to contribute to environmental protection. What might have an impact is the population's confidence in the ruling party's ability to successfully utilise its tax revenue to implement such environmental protection strategies. This sentiment is echoed by Freund (2001:717), who states that "a failure of governance underlines most environmental problems". Thus, for South Africans to become more accepting of the notion of paying for environmental protection, it is imperative that policy makers ensure that the public is highly confident in government's ability to successfully implement policy. It is a shift in the thinking of the public and in the strategies of the policy makers that would inevitably lead to positive changes in the environments in which South Africans live. This hypothesis is, however, as yet untested, and could be investigated in future research

In conclusion, this secondary, longitudinal analysis of WVS data may lead one to reject the first hypothesis and partly reject the second hypothesis, that South Africans have become more environmentally concerned since the right to a clean environment has been enshrined in their Bill of Rights and that when controlling for SES there will be no differences in environmental concern among the various racial groups. This study does, however, also show that environmental concern in South Africa is becoming less influenced by race and SES. In order to provide further evidence of such a change, future studies on environmental concern need to be more rigorous methodologically, and more consistent. At the moment environmental concern research in South Africa is fragmented and lacks comparability. Only when this has been rectified, would we gain a better understanding of the nature of environmental concern in South Africa.

REFERENCES

- Alwin, D. 2007. *Margins of error: A study of reliability in survey measurement*. New Jersey: Wiley & Sons.
- Anderson, B., Romani, J., Phillips, H., Wentzel, M. & Tlabela, K. 2007. Exploring environmental perceptions, behaviours and awareness: Water and water pollution in South Africa. *Population Environment*, 28(3):133–161.
- Anderson, B., Wentzel, M., Romani, J. & Phillips, H. 2010. *Exploring environmental consciousness in South Africa*. Report 10–709, Population Studies Centre, Institute for Social Research, University of Michigan [Online]. Available: <http://www.psc.isr.umich.edu/pubs/pdf/rr10-709.pdf> [2013, June 12].
- Anderson, B., Romani, J., Wentzel, M. & Phillips, H. 2013. *Recycling behaviour among urban South Africans: The role of race and social status* [Online]. Available: <http://paa2013.princeton.edu/papers/130399> [2013, June 12].
- Babbie, E. 2010. *The practice of social research (12th edition)*. Belmont: Wadsworth.
- Babones, S. 2010. Income, education and class gradients in health in global perspective. *Health Sociology Review*, 19(1):130–143.
- BBC World Service Trust. 2010. *Africa talks climate: Public understanding of climate change* [Online]. Available: <http://africatalksclimate.com/sites/default/files/01-Executive%20Summary.pdf> [2011, September 21].
- Beinart, W. & Coates, P. 1995. *Environment and history: The taming of nature in the USA and South Africa*. Oxon: Routledge.
- Bond, P. 2000. Economic growth, ecological modernisation or environmental justice? Conflicting discourses in post-apartheid South Africa. *Capitalism Nature Socialism*, 11(1):33–61.
- Bond, P. 2012. *Politics of climate justice: Paralysis above, movement below*. Scottsville: University of Kwazulu-Natal Press.
- Bourdieu, P., Chamboredon, J. & Passeron, J. 1991. *The craft of sociology: Epistemological preliminaries*. New York: Walter de Gruyter.
- Brechin, S. & Kempton, R. 1994. Global environmentalism: A challenge to the postmaterialism thesis? *Social Science Quarterly*, 75(2):245–269.
- Brown, T. 2006. *Confirmatory factor analysis for applied research*. New York: The Guildford Press.

- Bryman, A. 2008. *Social research methods* (3rd ed.). Oxford: Oxford University Press.
- Bulmer, M. 2010. Measuring race and ethnicity, in Bulmer, M., Gibbs, M. & Hyman, L. (eds.). *Social measurement through social surveys: An applied approach*. Farnham: Ashgate. 109–127.
- Büscher, B. & Dietz, T. 2005. Conjunctions of governance: The state and the conservation-development nexus in Southern Africa. *Journal of Transdisciplinary Environmental Studies*, 4(2):1–15.
- Buttel, F. & Flinn, W. 1974. The structure of support for the environmental movement, 1968–1970. *Rural Sociology*, 39:56–69.
- Carlson, D. & Van Staden, F. 2006. Environmental concern in South Africa: The development of a measurement scale. *New Voices in Psychology*, 2(1):3–30.
- Carruthers, J. 2008. Conservation and wildlife management in South African national parks 1930s–1960s. *Journal of the History of Biology*, 41(2):203–236.
- Casale, D. & Desmond, C. 2007. The economic well-being of the family: Households' access to resources in post-apartheid South Africa, 1996–2003, in Amaoteng, A. & Heaton, T. (eds.). *Families and households in post-apartheid South Africa*. Cape Town: HSRC press. 61–88.
- Cock, J. 1991. Going green at the grassroots: The environment as a political issue, in Cock, J. & Koch, E. (eds.). *Going green: People, politics and the environment in South Africa*. Cape Town: Oxford University Press. 1–18.
- Cock, J. 2004. Connecting the red, brown and green: The environmental justice movement in South Africa. A case study for the UKZN project entitled: Globalisation, marginalisation and new social movements in post-apartheid South Africa, a joint project between the Centre for Civil Society and the School of Development Studies, University of KwaZulu-Natal. [Online]. Available: <http://ccs.ukzn.ac.za/files/Cock%20Connecting%20the%20red,%20brown%20and%20green%20The%20environmental%20justice%20movement%20in%20South%20Africa.pdf> [2013, June 25].
- Cock, J. 2006. Public sociology and the social crisis. *South African Review of Sociology*, 37(2):293–307.
- Cock, J. & Fig, D. 2002. From colonial to community-based conservation: Environmental justice and the transformation of national parks (1994–1998), in McDonald, A. (ed.). *Environmental justice in South Africa*. Cape Town: University of Cape Town Press. 160–192.

- Craffert, L. & Willers, V. 1994. Public perceptions of environmental issues. *Information Update*, 4(1):41–47.
- Creswell, J. 2006. *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Los Angeles: Sage.
- Dahlberg, A. & Burlando, C. 2009. Addressing trade-offs: Experiences from conservation and development initiatives in the Mkhuzi wetlands, South Africa. *Ecology and Society*, 14(2). [Online], Available: <http://www.ecologyandsociety.org/vol14/iss2/art37/> [2012, January 26].
- De Beer, F. & Marais, M. 2005. Rural communities, the natural environment and development: Some challenges, some successes. *Community Development Journal*, 40(1):50–61.
- Department of Environmental Affairs. 2012. Chapter 5: Air quality, in *Draft 2012 South Africa environment outlook* [Online]. Available: http://soer.deat.gov.za/State_of_the_Environment.html [2012, August 31].
- Dietz, T., Fitzgerald, A. & Schwom, R. 2005. Environmental values. *Annual Review of Environmental Resources*, 30:335–372.
- Du Plessis, S & Smit, B. 2006. Economic growth in South Africa since 1994. Stellenbosch Economic Working Papers 1.
- Dunlap, R. & Jones E. 2002. Environmental concern: Conceptual and measurement issues [Online]. Available: http://www.credreference.com/entry/gwenvsoc/environmental_concern_conceptual_and_measurement_issues [2012, March 20].
- Dunlap, R. & Mertig, A. 1997. Global environmental concern: An anomaly for postmaterialism. *Social Science Quarterly*, 78(1):24–29.
- Dunlap, R. & York, R. 2008. The globalization of environmental concern and the limits of the post-materialism values explanation: Evidence from four multinational surveys. *The Sociological Quarterly*, 49(3):529–563.
- Dutcher, D., Finley, J., Luloff, L. & Buttolph Johnson, J. 2007. Connectivity with nature as a measure of environmental values. *Environment and Behavior*, 39(4):474–493.
- Field, A. 2009. *Discovering statistics using SPSS* (3rd ed.). London: Sage.
- Firebaugh, G. 2010. Analysing data from repeated surveys, in Marsden, P. & Wright, J. (eds.). *Handbook of survey research*. Bingley: Emerald Group. 795–813.

- Freund, B. 2001. Brown and green in Durban: The evolution of environmental policy in a post-apartheid city. *International Journal of Urban and Regional Research*, 25(4):717–739.
- Gagnon Thompson, S. & Barton, M. 1994. Ecocentric and anthropocentric attitudes towards the environment. *Journal of Environmental Psychology*, 14(2):149–157.
- Gerth, H. & Mills, C.W. 2009. *From Max Weber: Essays in sociology*. Routledge: Oxon.
- Gibson, D., Ismail, A., Kilian, D. & Matshikiza, M. 2009. The state of our environment: Safeguarding the foundation for development, in Kagwanja, P. & Kondlo, K. (eds.). *State of the nation: South Africa 2008*. Pretoria: HSRC Press. 178–200.
- Glover, J. 1996. Epistemological and methodological considerations in secondary analysis, in Hantrais, L. & Mangen, S. (eds.). *Cross-national research methods in the social sciences*. London: Pinter. 28–38.
- Goldthorpe, J. 1997. The Goldthorpe class schema: Some observations on conceptual and operational issues in relation to the ESRC review of government social classification, in Rose, D. & O'Reilly, K. (eds.). *Constructing classes towards a new social classification for the UK*. Swindon: Economic and Social Research Council and Office for National Statistics. 40–48.
- Guha, R. & Martinez-Alier, J. 1997. *Varieties of environmentalism: Essays north and south*. London: Earthscan
- Guth, J., Green, J., Kellstedt, L. & Smidt, C. 1995. Faith and the environment: Religious beliefs and attitudes on environmental policy. *American Journal of Political Science*, 39(2):364–382.
- Haller, M. 2002. Theory and method in the comparative study of values: Critique and alternative to Inglehart. *European Sociological Review*, 18(2): 139–158.
- Hallowes, D. 2011. Introduction, in *Toxic futures: South Africa in the crisis of energy, environment and capital*. Scottsville: University of KwaZulu-Natal Press. 1–18.
- Hannigan, J. 2006. *Environmental sociology* (2nd ed.). New York: Routledge.
- Hargrove, E. 1992. Weak anthropocentric intrinsic value. *Monist*, 75(2):183–208.
- Harris, M. & Kotze, H. 2001. *World Values Survey technical report* [Online]. Available: <http://www.wvsevsdb.com/wvs/WVSTechnical.jsp> [2012, October 19].
- Harsant, A. 2004. Environmental governance in the new South Africa: A decade of greening? *Journal for Contemporary History*, 29(3):69–85.
- Harzing, A. 2006. Response styles in cross-national survey research: A 26-country study. *International Journal of Cross Cultural Management*, 6(2):243–266.

- Hoogeveen, J. & Ozler, B. 2004. Not separate, not equal: Poverty and inequality in post-apartheid South Africa. William Davidson Institute Working Paper Number 739.
- Horschowitz, R. 1996. Living in South Africa: Selected findings of the 1996 October Household Survey [Online]. Available: <http://www.statssa.gov.za/Publications/statsdownload.asp?PPN=LivingInSA> [2012, October 19].
- Hunter, L., Strife, S. & Twine, W. 2010. Environmental perceptions of rural South African residents: The complex nature of environmental concern. *Society & Natural Resources*, 23(6):525–541.
- Inglehart, R. 1995. Public support for environmental protection: Objective problems and subjective values in 43 societies. *Political Science and Politics*, 28(1):57–72.
- Jolliffe, D. 2002. Whose education matters in the determination of household income? Evidence from a developing country. *Economic Development and Cultural Change*, 50(2):287–312.
- Jones, R. & Carter, L. 1994. Concern for the environment among black Americans: An assessment of common assumptions. *Social Science Quarterly*, 75(3):560–579.
- Joubert, D. 1992. *Reflections on social values*. Pretoria: HSRC publishers.
- Khan, F. 2002. The roots of environmental racism and the rise of environmental justice in the 1990s, in McDonald, D. (ed.). *Environmental justice in South Africa*. Cape Town: University of Cape Town Press. 15–49.
- Kieruj, N. & Moors, G. 2013. Response style behavior: Question format dependent or personal style? *Quality & Quantity*, 47(1):193–211.
- Kollmuss, A. & Agyeman, J. 2002. Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behaviour? *Environmental Education Research*, 8(3):239–260.
- Kotzé, H. & Steenekamp, C. 2009. *Values and democracy in South Africa: Comparing elite and public values*. Occasional paper. Johannesburg: Konrad Adenauer Stiftung.
- Lawson, L. 1991. The ghetto and the greenbelt: The environmental crisis in the urban areas, in Cock, J. & Koch, E. (eds.). *Going green: People, politics and the environment in South Africa*. Cape Town: Oxford University Press. 46–63.
- Macintosh, R. 1998. Global attitude measurement: An assessment of the World Values Survey postmaterialism scale. *American Sociological Review*, 63(3):452–464.

- Manuel, F. & Glazewski, J. 1991. The oceans: Our common heritage, in Cock, J. & Koch, E. (eds.). *Going green: People, politics and the environment in South Africa*. Cape Town: Oxford University Press. 193–207.
- Maré, G. 2001. Race counts in contemporary South Africa: “An illusion of ordinariness”. *Transformations*, 47:75–93.
- Marks, G. 1999. The measurement of socio-economic status and social class in the Longitudinal Surveys of Australian Youth project. Technical Paper No 14. [Online]. Available: http://research.acer.edu.au/lsay_technical/28 [2011, November 28].
- Martinez-Alier, J. 2002. *The environmentalism of the poor*. Cheltenham: Edward Elgar Publishing.
- McDonald, D. 2002. Introduction: What is environmental justice?, in McDonald, D. (ed.). *Environmental justice in South Africa*. Cape Town: University of Cape Town Press. 1–12.
- McDonald, D. 2002. Up against the (crumbling) wall: The privatisation of urban services and environmental justice, in McDonald, D. (ed.). *Environmental justice in South Africa*. Cape Town: University of Cape Town Press. 292–325.
- McDonald, D. 2009. Introduction, in McDonald, D. (ed.). *Electric capitalism: Recolonising Africa on the power grid*. Cape Town: HSRC Press. xv–xxii.
- Mohai, P. 1985. Public concern and elite involvement in environmental-conservation issues. *Social Science Quarterly*, 66(4):820–838.
- Mohai, P. 1990. Black environmentalism. *Social Science Quarterly*, 71(4):744–765.
- Mohai, P. & Bryant, B. 1998. Is there a “race” effect on concern for environmental quality? *Public Opinion Quarterly*, 62(4):475–505.
- Murota, Y. 1985. Culture and the environment in Japan. *Environmental management*, 9(2):105–112.
- Neuman, W. 2011 *Social research methods: Qualitative and quantitative approaches* (7th ed.). Boston: Pearson.
- Neumayer, E. 2002. Do we trust the data? On the validity and reliability of cross-national environmental surveys. *Social Science Quarterly*, 83(1):332–340.
- Nixon, R. 2011. *Slow violence and the environmentalism of the poor*. Cambridge: Harvard University Press.
- Nobles, M. 2000. *Shades of citizenship: Race and census in modern politics*. Stanford: Stanford University Press

- Nordstrom, H. 2008. Environmental education and multicultural education: Too close to be separate? *International Research in Geographical and Environmental Education*, 17(2):131–145.
- Oelofse, C., Scott, D., Oelofse, G. & Houghton, J. 2009. Shifts within ecological modernization in South Africa: Deliberation, innovation and institutional opportunities, in Mol, A., Sonnenfeld, D. & Spaargen, G. (eds.). *The ecological modernisation reader: Environmental reform in theory and practice*. Oxon: Routledge. 482–497.
- Pallant, J. 2011. *SPSS survival manual* (4th edition). Columbus: McGraw-Hill.
- Parker, J. & McDonough, M. 1999. Environmentalism of African Americans: An analysis of the subculture and barriers theories. *Environment and Behaviour*, 31(2):155–177.
- Perry, P. 2011. Large cross-national surveys: The 6th wave of the World Values Survey and the 2011 New Zealand Study of Values Survey. *New Zealand Sociology*, 26(2):152–157.
- Picard, C.H. 2003. Post-apartheid perceptions of the Greater St Lucia Wetland Park, South Africa. *Environmental Conservation*, 30(2):182–191.
- Pierce, J. 1997. The hidden layer of political culture: A comment on “Postmaterialist values and the environment: A critique and reappraisal”. *Social Science Quarterly*, 78 (1):30–35.
- Prozesky, H.E. 2007. Gender differences in the publication productivity of South African scientists. Unpublished doctoral dissertation. Stellenbosch: Stellenbosch University.
- Ramphela, M. 1991. New day rising, in Ramphela, M. & McDowell, C. (eds.). *Restoring the land: Environment and change in post-apartheid South Africa*. London: Panos. 1–12.
- Redclift, M. & Benton, T. 1994. Introduction, in Redclift, M. & Benton, T. (eds.). *Social theory and the global environment*. London: Routledge. 1–28
- Republic of South Africa. 1996. Constitution of the Republic of South Africa (Act 108 of 1996) [Online]. Available: <http://www.info.gov.za/documents/constitution/1996/96cons2.htm#24> [2013, May 23].
- Republic of South Africa. National Planning Commission. 2011. *National development plan: Vision for 2030* [Online]. Available: <http://www.info.gov.za/view/DownloadFileAction?id=154431> [2012, November 23].
- Rossouw, N. & Wiseman, K. 2004. Learning from the implementation of environmental public policy instruments after the first ten years of democracy in South Africa. *Impact Assessment and Project Appraisal*, 22(2):131–140.

- Ruiters, G. 2002. Race, place, and environmental rights, in McDonald, D. (ed.). *Environmental justice in South Africa*. Cape Town: University of Cape Town Press. 112–126.
- Scott, D. 2011. Achieving low carbon citizenship, in Sutherland, C., Scott, D., Robbins, G. & Sim, V. (eds.). *Towards a low carbon city: Focus on Durban*. Pretoria: Academy of Science of South Africa. 152–161.
- Seagar, J. 2009. *Responding appropriately to climate change may cost a lot...failing to do so may cost the earth* [Online]. Available:http://www.hsrc.ac.za/research/output/outputDocuments/6081_Seager_Respondingappropriatelytoclimatechange.pdf [2012, October 24].
- Seekings, J. & Nattrass, N. 2006. *Class, race, and inequality in South Africa*. Scottsville: University of KwaZulu-Natal Press.
- Smith, T. 2010. Surveying across nation and cultures, in Marsden, P. & Wright, J. (eds.). *Handbook of survey research*. Bingley: Emerald. 733–764.
- Statistics South Africa. 1996. *People of South Africa population Census, 1996* [Online]. Available: <http://www.statssa.gov.za/Census01/Census96/HTML/default.htm> [2013, July 15].
- Statistics South Africa. 1998. *Census definitions* [Online]. Available:<http://www.statssa.gov.za/Census01/Census96/html/metadata/Docs/Dfntns.html> [2012, November 5].
- Statistics South Africa. 2008. *Community Survey 2007 basic results: Municipalities*[Online]. Available: <http://www.statssa.gov.za/publications/P03011/P030112007.pdf> [2013, May 27].
- Statistics South Africa. 2009. *Labour Force Survey: Historical revision September series 2000 to 2007* [Online]. Available: <http://www.statssa.gov.za/Publications/P0210/P0210September2000,2001,2002,2003,2004,2005,2006,2007.pdf> [2013, June 18].
- Statistics South Africa. 2001. *Census in Brief* [Online]. Available: www.statssa.gov.za/Census01/html/CInbrief/CIB2001 [2012, August 8].
- Statistics South Africa. 2011. *Census 2011: What is an undercount?* [Online]. Available: http://www.statssa.gov.za/news_archive/Census2011_Undercount.asp [2012, November 20].

- Statistics South Africa. 2011. *Census in brief* [Online]. Available:
http://www.statssa.gov.za/Census2011/Products/Census_2011_Census_in_brief.pdf
[2012, November 12].
- Steenekamp, C.L. 2011. Bridging the divide: The development, dimensions and determinants of social capital in post-apartheid South Africa. Unpublished doctoral dissertation. Stellenbosch: Stellenbosch University.
- Struwig, J. 2010. South Africans' attitudes towards the environment, in Roberts, B., wa Kivilu, M. & Davids, Y.D. (eds.). *South African social attitudes: Reflections on the age of hope*. Cape Town: HSRC press. 198–219.
- Swilling, M. & Annecke, E., in association with Peter, C. & Wakeford, J. 2012. Transcending resource- and energy-intensive growth: Lessons from South Africa, in Swilling, M. & Annecke, E. *Just Transitions: Explorations of sustainability in an unfair world*. 211–245.
- Tobi, H. & Kampen, J. 2011. Survey error in an international context: An empirical assessment of cross-cultural differences regarding scale effects. *Quality & Quantity*, 47(1):553–559.
- Togler, B. & García-Valiñas, M. 2007. The determinants of individuals' attitudes towards preventing environmental damage. *Ecological Economics*, 63(3):536–552.
- Turpie, J.K. 2003. The existence value of biodiversity in South Africa: How interest, experience, knowledge, income and perceived level of threat influence local willingness to pay. *Ecological Economics*, 46(2):199–216.
- Uyeki, E. & Holland, L. 2000. Diffusion of pro-environmental attitudes? *American Behavioral Scientist*, 43(4):646–662.
- Van Liere, K. & Dunlap, R. 1980. The social bases of environmental concern: A review of hypotheses, explanations and empirical evidence. *Public Opinion Quarterly*, 44(2):181–197.
- Van Liere, K. & Dunlap, R. 1981. Environmental concern: Does it make a difference how it's measured? *Environment and Behavior*, 13(6):651–676.
- White, M. & Hunter, L. 2009. Public perception of environmental issues in a developing setting: Environmental concern in coastal Ghana. *Social Science Quarterly*, 90(4):960–982.
- Whittaker, M., Segura, G. & Bowler, S. 2005. Racial/ethnic group attitudes towards environmental protection in California: Is “environmentalism” still a white phenomenon? *Political Research Quarterly*, 58(3):435–447.

- Willers, V.A. 1996. Environmental concern in South Africa. Unpublished doctoral dissertation. Pretoria: University of South Africa.
- World Values Survey. 2006. Documentation of the Values Survey [Online]. Available:<http://www.wvsevsvdb.com/wvs/WVSDocumentation.jsp?Idioma=I> [2012, November, 22].
- World Values Survey. 2008. *Values change the world: World Values Survey* [Online]. Available: http://www.worldvaluessurvey.org/wvs/articles/folder_published/article_base_110/files/WVSBrochure5-2008_11.pdf [2012, November 12].
- World Values Survey. s.a. Conditions of use [Online]. Available: <http://www.wvsevsvdb.com/wvs/DownloadDocURLlicense2.jsp> [2012, April 4].
- Xiao, C. & Dunlap, R. 2007. Validating a comprehensive model of environmental concern cross-nationally: A U.S.–Canadian comparison. *Social Science Quarterly*, 88(2):471–493.
- Yaparak, A. 2003. Measurement problems in cross-national consumer research, in Jain, S. (ed.). *Handbook of international marketing*. Cheltenham: Edward Elgar.175–194.
- Zellie, H. 2003. Environmental concern in South Africa: An analysis of elite and public attitudes and their implications for public policy. Unpublished master's thesis. Stellenbosch: Stellenbosch University.