



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Faculty of Natural and Agricultural Sciences

**The significance of environmental issues and contextual circumstances during
South African consumers' pre purchase evaluation of major household appliances**

Nadine Cynthia Sonnenberg

PhD Consumer Science (Interior merchandise management)

Supervisor: Prof. A.C. Erasmus

Co-supervisor: Prof. A. Schreuder

July 2014



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Faculty of Natural and Agricultural Sciences

**The significance of environmental issues and contextual circumstances during
South African consumers' pre purchase evaluation of major household appliances**

by

Nadine Cynthia Sonnenberg

**Submitted in fulfilment of the requirements for the degree
PhD Consumer Science (Interior merchandise management)**

In the Faculty of Natural and Agricultural Sciences

University of Pretoria

Pretoria

July 2014

DECLARATION

I, Nadine Sonnenberg, declare that the thesis, which I hereby submit for the degree PhD Consumer Science at the University of Pretoria, has not previously been submitted at this or any other tertiary institution, that this is my own work in design and execution and that all reference material in the thesis has been duly acknowledged.



.....
NADINE SONNENBERG

July 2014

SYNOPSIS

The significance of environmental issues and contextual circumstances during South African consumers' pre purchase evaluation of major household appliances

by

Nadine Cynthia Sonnenberg

Supervisor: Prof A.C. Erasmus
Co-supervisor: Prof A. Schreuder
Department: Consumer Science
Degree: PhD in Consumer Science

Keywords: environmentally significant behaviour, consumer decision-making, major household appliances, green consumption, environmentalism, eco-friendly appliances, South African consumers

The pursuit of sustainability and the preservation of natural resources in consumers' product choice and –consumption is a worldwide concern. This research therefore focused on the relevance and inter relationship of various motivational factors in contributing to consumers' pro-environmental intent to purchase eco-friendly appliances in the local context. Since pro-environmental intent does not inexorably lead to environmentally significant choice behaviour, the study also investigated consumers' prioritization of environmentally related product features in the pre-purchase evaluation and selection of major household appliances. The perspective of those with increased spending power as well as access to a wide variety of products in major urban areas (e.g. Tshwane) was of specific interest. A store intercept method with a non-probability purposive sampling approach was used to recruit respondents in stores while they were in the process of acquiring appliances. A structured questionnaire was administered in face-to-face interviews. A total of 667 questionnaires were collected, of which 648 were used for structural equation modelling and conjoint analyses.

Based on the construct associations specified in a structural equation model, an awareness of environmental consequences related to product choice and consumption emerged as an indirect determinant of pro-environmental intent and represents an important precondition for the formation of

subjective norms and moral attitudes. A strong and statistically significant relationship between subjective norms and moral attitudes underscore the importance of a social group's standards in the formation of an individual's own moral norms and attitudes. In relation to perceived behavioural control, subjective norms may fulfill an informative role when consumers are less confident in their own ability to comprehensively evaluate and select a washing machine with eco-friendly attributes. A combination of moral norms, attitudes and anticipated feelings of guilt significantly contributed to respondents' pro-environmental intent, and even though they seemed somewhat less convinced about how easy it is to choose eco-friendly appliances, their intentions to buy such appliances consistently reflect a pro-environmental inclination.

Using Sawtooth conjoint software, trade-off tasks were compiled to determine the relative importance of environmentally related attributes in relation to other conventional features in consumers' pre-purchase evaluation and selection of washing machines. Aggregate results reveal that consumers across various age, income and educational levels prioritise brand and price, despite the long-term financial and environmental repercussions of product features that impact on the use of natural resources. Based on a cluster analysis, four consumer segments were identified that differ in terms of preference structures. Overall, respondents rely on price and brand associations to guide their decision-making due to their inability and inexperience to objectively assess the environmental attributes of a product, which then ultimately contradicts their observed pro-environmental intent.

From a practical point of view, the findings substantiate the development of tailored intervention strategies to facilitate informed decision-making and deliberation of consequences that extend beyond the initial selection of a particular product option. Strategies that emphasize the financial benefits of environmentally related features that span over the entire life cycle of the appliance might prove influential in promoting pro-environmental choices. From a theoretical perspective, the research expands an existing body of knowledge by establishing insight about consumers' behaviour in a Third-World emerging context. In addition, it provides evidence regarding the application of existing theory and methods to explain the inconsistency between consumers' assumed pro-environmental intent and their actual observed choices in the execution of a more complex, expensive and significant act of acquiring major household appliances.

ACKNOWLEDGEMENTS

As would be the case for many who have embarked on the path toward completing a PhD, there were times and circumstances when all just seemed impossible. I made an oath that if I were to complete this path, I would be the first to admit that it was not by my own doing: “*With man this is impossible, but with God all things are possible.*” (Matthew 19:26)

In addition, I would like to extend my sincerest gratitude and appreciation to:

- Clint and Jade, my most beloved, for their unconditional love, patience and the many sacrifices they made during the time that I spent completing this thesis;
- My mother, for the countless hours spent supporting me and being there for my precious daughter, when I could not;
- My father, who have since passed on into a next life, but left me with an understanding that the topic of my thesis was worth pursuing;
- Professor Erasmus, for guidance and support, but above all, for believing in me;
- Professor Schreuder and Jannie Els, for their statistical guidance and providing me with access to the Sawtooth software;
- The students and staff at the University of Pretoria’s Consumer Science Department, for the words of encouragement when I was willing to forfeit the effort;
- Doctor Mike van der Linde, for being my toughest, yet empathetic critic;
- Reviewers who have assisted me in shaping the scientific quality of this endeavour;
- Makro staff and management, for generously assisting me in the data collection effort;
- Whirlpool, for providing financial assistance to collect the data;
- and last, but not least....
- The many respondents who were willing to offer me time and support in completing the questionnaires and very often an additional kind word of encouragement.

TABLE OF CONTENTS

LIST OF TABLES	VIII
LIST OF FIGURES	IX
LIST OF ACRONYMS	X
LIST OF ADDENDA	XI
CHAPTER 1: GENERAL INTRODUCTION	1
BACKGROUND AND JUSTIFICATION FOR THE STUDY	1
Increased concerns about worldwide environmental degradation	1
Private-sphere environmentalism and environmentally significant behaviour.....	2
Existing models of private-sphere environmentalism and ESB.....	3
Increasing consumption trends in emerging economies	7
Environmental concern and ESB in the South African context	8
Electricity consumption and energy concerns in the South African context	9
RESEARCH PROBLEM AND CONTRIBUTION OF THE STUDY	11
RESEARCH OBJECTIVES	13
RESEARCH DESIGN.....	15
Research approach	15
Sample and sampling design.....	15
Questionnaire development and data collection.....	16
Ethical implications	17
PRESENTATION AND STRUCTURE OF THE THESIS	18
REFERENCE LIST	20
CHAPTER 2: PRO-ENVIRONMENTAL MOTIVATION AND INTENT IN THE SOUTH AFRICAN EMERGING MARKET CONTEXT	31
ABSTRACT.....	31
INTRODUCTION	31
THEORETICAL BACKGROUND.....	33
Theory of Planned Behaviour and the Norm-Activation Model	34
Construct associations in Bamberg and Möser's Meta-Analytic Structural Equation Model.....	35

THE PRESENT STUDY	37
Research goals	38
Sample and procedures.....	38
Measures	39
Results	42
DISCUSSION AND CONCLUSION.....	48
REFERENCES	52
CHAPTER 3: CONSUMERS' PREFERENCES FOR ECO-FRIENDLY APPLIANCES IN AN EMERGING MARKET CONTEXT	57
ABSTRACT.....	57
INTRODUCTION	58
CONSUMER CHOICE DECISIONS IN THE SA WHITE GOODS INDUSTRY	60
CONJOINT ANALYSIS METHODOLOGY	62
Questionnaire development and the CVA design.....	64
Data collection and demographic profile of respondents	66
RESULTS AND DISCUSSION	67
CONCLUSION AND RECOMMENDATIONS FOR FUTURE RESEARCH.....	73
REFERENCES	76
CHAPTER 4: THE DEVELOPMENT OF A THEORETICAL MODEL TO INVESTIGATE FACTORS ASSOCIATED WITH ENVIRONMENTALLY SIGNIFICANT CHOICE BEHAVIOUR IN THE SOUTH AFRICAN MAJOR HOUSEHOLD APPLIANCE MARKET: AN INTEGRATIVE CONCEPTUAL APPROACH	82
OPSOMMING	82
ABSTRACT.....	83
INTRODUCTION	84
THEORETICAL BACKGROUND.....	86
Motivational constructs and pro-environmental intent	87
Situational factors in emerging markets and the relevance of an integrative approach.....	89
Opportunities for ESB in the South African major household appliance industry	91
Emerging consumers' ability to assess eco-friendly features of major household appliances	93
PROPOSED CONCEPTUAL FRAMEWORK.....	96
CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH.....	98
REFERENCE LIST	100

CHAPTER 5: GENERAL CONCLUSION	106
INTRODUCTION	106
SUMMARY OF FINDINGS	107
CONCLUSIONS	109
IMPLICATIONS FOR INDUSTRY AND POLICY FORMULATION	111
THEORETICAL CONTRIBUTION	112
LIMITATIONS AND FUTURE RESEARCH RECOMMENDATIONS	113
REFERENCE LIST	118

LIST OF TABLES

CHAPTER 1

TABLE 1: SUMMARY OF RELEVANT THEORIES	6
TABLE 2: ELECTRICITY INDICATORS IN SOUTH AFRICA (Ziramba, 2008)	10

CHAPTER 2

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE	39
TABLE 2: INCOME CATEGORIES BY TSHWANE REGION	39
TABLE 3: COMPARISON OF GENERAL AWARENESS AND INTERNAL ATTRIBUTION CFA MODELS	43
TABLE 4: CORRELATION, SHARED VARIANCE AND AVE AVERAGE FOR MORAL NORMS, GUILT AND ATTITUDES	43
TABLE 5: COMPARISON OF MORAL NORM, GUILT AND ATTITUDINAL CFA MODELS	44
TABLE 6: STANDARDIZED FACTOR LOADINGS	45
TABLE 7: DESCRIPTIVE STATISTICS AND PAIRWISE CORRELATIONS	46
TABLE 8: DISCRIMINANT VALIDITY OF CONSTRUCTS SPECIFIED IN THE MEASUREMENT MODEL	46
TABLE 9: RESULTS OF THE SEM ANALYSIS	48

CHAPTER 3

TABLE 1: AGGREGATE RESULTS OF THE CONJOINT VALUE ANALYSIS FOR WASHING MACHINES	68
TABLE 2: DEMOGRAPHIC COMPARISON OF THE CLUSTERS	71

LIST OF FIGURES

CHAPTER 1

FIGURE 1: SCHEMATIC ILLUSTRATION OF THE RESEARCH MODEL.....	14
---	----

CHAPTER 2

FIGURE 1: META-ANALYTIC STRUCTURAL EQUATION MODEL (Bamberg & Möser, 2007)	36
FIGURE 2: SCHEMATIC ILLUSTRATION OF THE RESEARCH MODEL.....	44
FIGURE 3: FINAL STRUCTURAL EQUATION MODEL.....	47

CHAPTER 3

FIGURE 1: EXAMPLE OF A PAIR WISE TASK	64
FIGURE 2: RELATIVE IMPORTANCE OF ATTRIBUTES FOR VARIOUS CLUSTERS.....	71

CHAPTER 4

FIGURE 1: META-ANALYTIC STRUCTURAL EQUATION MODEL (Bamberg & Möser, 2007)	88
FIGURE 2: MODEL OF RECYCLING BEHAVIOUR (Ölander & Thøgerson, 1995; Thøgerson, 1994)	91
FIGURE 3: CONCEPTUAL FRAMEWORK FOR THE INVESTIGATION OF ENVIRONMENTALLY SIGNIFICANT CHOICE BEHAVIOUR RELATING TO MAJOR HOUSEHOLD APPLIANCES.....	96

LIST OF ACRONYMS

BRICS:	Brazil, Russia, India, China and South Africa
CFA:	Confirmatory Factor Analyses
CVA:	Conjoint Value Analyses
EFA:	Exploratory Factor Analyses
ESB:	Environmentally significant behaviour
LCA:	Life Cycle Analysis
MOA:	Motivation-Opportunity-Abilities model
PBC:	Perceived behavioural control
TPB:	Theory of Planned Behaviour
UNDP:	United Nations Development Programme
UNEP:	United Nations Environment Programme
US EIA:	United States Energy Information Administration
WWF:	World Wide Fund for Nature

LIST OF ADDENDA

ADDENDUM A: QUESTIONNAIRE.....	122
ADDENDUM B: ETHICS APPROVAL.....	140
ADDENDUM C: EXPLORATORY FACTOR ANALYSES (EFA) OF THE MOTIVATIONAL ITEMS (SECTION G OF THE QUESTIONNAIRE)	141
ADDENDUM D: CONFIRMATORY FACTOR ANALYSES (CFA) MODELS	143
ADDENDUM E: REVIEWERS' COMMENTS: MANUSCRIPT SUBMITTED TO THE <i>INTERNATIONAL JOURNAL OF CONSUMER STUDIES</i>	144
ADDENDUM E: REVIEWERS' COMMENTS: MANUSCRIPT SUBMITTED TO THE <i>JOURNAL OF FAMILY ECOLOGY AND CONSUMER SCIENCES</i>	147

CHAPTER 1: GENERAL INTRODUCTION

BACKGROUND AND JUSTIFICATION FOR THE STUDY

Increased concerns about worldwide environmental degradation

One of the most important worldwide academic and social issues of recent times is the growing evidence of the globe's resource depletion and general environmental deterioration. This was first acknowledged by the Bruntland Commission in 1987, followed by the Rio Earth Summit in 1992 and the subsequent World Summit on Sustainable Development in 2002 (Aguirre, 2002; Burgess 2003). In June 2012, twenty years after the initial Earth Summit, world leaders and representatives of various environmental interest groups again convened for the United Nations' Rio+20 Conference on Sustainable Development to re-affirm international commitment towards the pursuit of social equity, poverty eradication and environmental protection against the backdrop of an increasingly populated planet (United Nations, 2012).

The pressure imposed on the world's resources and ecosystems as a result of population growth is apparent, considering that each person requires some minimum of water, food and shelter to survive as well as energy, all of which are ultimately derived from the planet's natural resources and ecosystems. Yet, as pointed out by the United Nations Environment Programme (UNEP), the United Nations Development Programme (UNDP), the World Bank and the World Resources Institute (2000), increasing pressure on the world's resources and ecosystems can not only be blamed on population growth. Although it does represent one of the most basic environmental pressures, a more significant issue revolves around how much and what people consume. For some time now, global increases in consumption have greatly outpaced the Earth's regenerative capacity. In 2008, reports already indicated a 50% "ecological overshoot", which implies that humanity by now uses the equivalent of 1.5 planets to support their activities (World Wide Fund for Nature (WWF), 2012). In the most recent Living Planet Report (WWF, 2012), particular concern is expressed regarding rising consumption trends in high income groups around the world, as well as within emerging economies, where more stringent efforts are required to promote environmentally responsible consumer choices and sustainable consumption patterns.

Private-sphere environmentalism and environmentally significant behaviour

Within a sustainable consumption framework, recycling, buying organically grown food, opting for products that reduce waste as well as ways to save energy represent typical pro environmental (Milfont, Duckitt & Cameron, 2006; Oreg & Katz-Gerro, 2006), and environmentally responsible practices (Follows & Jobber, 2000; Kaplan, 2000), also described as environmentally friendly (Minton & Rose, 1997) and in some cases, environmentally- or ecologically conscious behaviour (Kim & Choi, 2005). When referring to environmentally significant behaviour (ESB), Stern (2000) discriminates between actions that have impact (i.e. "...changes the availability of materials or energy from the environment or alters the structure and dynamics of ecosystems or the biosphere itself") and actions undertaken with the intention of making a positive change to the environment. Clarifying impact- and intent-oriented interpretations of ESB from the outset is important as most researchers contributing to this body of work agree that environmental intent does not inexorably lead to behaviour that has a positive environmental impact (Follows & Jobber, 2000; Minton & Rose, 1997; Tang, Chen & Luo, 2011; Whitmarsh, 2009; Zabkar & Hosta, 2013).

Apart from shedding light on the impact- and intent-oriented construal of ESB, Stern (2000) also provides a classification of such behaviour. Of particular interest to the body of consumer research that is pertinent within the discipline of Consumer Science, is the category of behaviours termed private-sphere environmentalism, which refers to decisions that involve the acquisition, use and disposal of household products that are environmentally significant (Stern, 2000). Two issues are pertinent in this regard, namely that certain actions may have far greater environmental impact than others (Poortinga, Steg & Vlek, 2004; Stern, 2000; Tanner, Kaiser & Wölfing Kast, 2004), and that various categories of private-sphere behaviours may have different sets of causal variables (Barr, 2007; McKenzie-Mohr, 2000; Poortinga *et al.*, 2004; Stern, 2000; Tanner *et al.*, 2004).

The view that some decisions have more significant impact than others is exemplified by the context in which the purchase and use of major household appliances occur. Infrequent decisions to purchase major appliances have long-term implications due to the expected service life and repetitive use of such durables (Erasmus, Boshoff & Rousseau, 2002; Erasmus, Makgopa & Kachale, 2005). Depending on the type of appliance and context, i.e. frequency of use and the household in question, service life is expected to extend over at least ten years (Erasmus *et al.*, 2002). These so-called "white goods", impact on the environment as a result of their water and energy consumption, raw materials used and pre mature replacement that contribute to waste and pollution (Laitala, Boks & Grimstad

Klepp, 2011; McCollough, 2009). Although the environmental impact of an individual household's behaviour (e.g. opting for an environmentally friendly appliance) may be small, the impact becomes significant when many households independently execute the same pro-environmental behaviour over an extended period of time (Stern, 2000). The challenge however is to convince households to engage in such behaviour so that it ultimately becomes "a way of life".

Several cross-national studies (Franzen & Meyer, 2010; Gelissen, 2007; Gifford, *et al.*, 2009; Givens & Jorgenson, 2011; Kvaløy, Finseraas & Listhaug, 2012), confirm a global increase in environmental concern and that such concern is not limited to more affluent, industrialized nations (Dunlap & Mertig, 1997; Fairbrother, 2012). Yet, literature from the environmental psychology, marketing and consumer behaviour disciplines provide ample evidence that people's environmental awareness / concern is associated, but not highly correlated to ESB (Bhate, 2001; Eckhardt, Belk & Devinney, 2010; Follows & Jobber, 2000; Oom Do Valle, Rebelo, Reis & Menezes, 2005). Over the past decade, governments in many parts of the developed world have faced the paradox that the majority of citizens claim to be concerned about environmental issues, yet remain reluctant to adapt their everyday lives accordingly (Burgess, 2003). This attitude/ intention-behaviour gap has been the topic of much debate in recent years and has initiated substantial research effort to accurately predict the occurrence of ESB in developed countries (Eckhardt, *et al.*, 2010; Follows & Jobber, 2000; Stern, 2000; Vermeir & Verbeke, 2006).

Existing models of private-sphere environmentalism and ESB

Some of the key focus areas in ESB research in the past include the investigation of the influence of socio demographic variables (Zelezny & Schultz, 2000), lifestyle profiles (Papaoikonomou, 2013), motivation and various socio-psychological constructs (e.g. Nordlund & Garvill, 2002; Oreg & Katz-Gerro, 2006). Kinnear, Taylor and Ahmed (1974) concluded four decades ago that demographic characteristics apparently have limited statistical significance in terms of an ecological concern index. To date, with the exception of gender (Iyer & Kashyap, 2007; Zelezny, *et al.*, 2000) research findings pertaining to the influence of demographic variables still remain largely inconclusive (Bodur & Sarigöllü, 2005; Deng, Walker & Swinnerton, 2006; Wagner, 2003). Debates about the impact of income on environmental concern for example date from the 1990s (Fairbrother, 2012) and still prevail in contemporary research (Franzen & Meyer, 2010; Gelissen, 2007; Kvaløy, *et al.*, 2012).

Studies focused on social-psychological constructs such as values, attitudes, and beliefs have apparently been found to be more successful in predicting ESB (Barr, 2007; Corral-Verdugo & Frías-

Armenta, 2006; Mannetti, Pierro & Livi, 2004; Oreg & Katz-Gerro, 2006; Tang *et al.*, 2011). Over time, two behavioural theories have dominated this field of research, namely Ajzen's (1991) Theory of Planned Behaviour as well as Schwartz's (1977) Norm-Activation Theory of Altruism. More recently, scholars have proposed that an amalgamation of these models could provide more accurate predictions of ESB (Oom Do Valle, *et al.*, 2005; Oreg & Katz-Gerro, 2006; Schuler & Cording, 2006; Wall, *et al.*, 2007). In particular, Bamberg and Möser's (2007) meta-analytic structural equation model highlights certain key issues in the configuration of these motivational factors. *Awareness of environmental problems* in conjunction with *internal attribution* is viewed as indirect determinants of pro-environmental action (Oom Do Valle *et al.*, 2005; Wall, Devine-Wright & Mill, 2007). Internal attribution prompts emotional reactions such as *guilt*, which then triggers some sense of moral obligation (i.e. *moral norm*) to compensate for environmentally irresponsible behaviour (Bamberg, Hunecke & Blöbaum, 2007; Bamberg & Möser, 2007). Disparity between an individual's own behaviour and the behavioural standard of a reference group (i.e. *subjective norms*) could also elicit feelings of guilt (Bamberg *et al.*, 2007; Bamberg & Möser, 2007). *Subjective norms* are therefore related to *moral norms*, both indirectly via guilt and directly when the social group's standards are internalized as an individual's own moral norms. Subjective norms are thus seen to fulfill a more indirect role, whereas moral norms emerge as a third independent predictor of *intention* to act in an environmentally significant manner along with *attitude* and *perceived behavioural control* as postulated in the original Theory of Planned Behaviour (Bamberg & Möser, 2007). Yet, as pointed out by Bamberg and Möser (2007), further empirical research is needed to establish whether an awareness of consequences and internal attribution represent two distinct constructs and whether feelings of guilt can be separated from an individual's underlying moral obligation to act in an environmentally responsible manner. Recent empirical research also questions the discriminant validity of moral norms and attitudes and argues that moral norms are already encapsulated in people's attitudes toward pro-environmental behaviour (Kaiser, 2006; Chan & Bishop, 2013).

As current theoretical debates surrounding particular constructs and construct associations continue, approaches that model ESB as a function of internal processes and characteristics such as the fore mentioned have been tested and applied to a variety of private-sphere behaviours including recycling (Mannetti *et al.*, 2004; Meneses & Palacio, 2005; Oom Do Valle, *et al.*, 2005), green consumerism and purchase behaviour (Follows & Jobber, 2000; Tanner, *et al.*, 2004; Vermeir & Verbeke, 2006). Despite the potential of these models to clarify underlying motivational constructs, causal factors may however vary across behaviours and individuals (Barr, 2007; Nordlund & Garvill, 2002; Steg & Vlek, 2009; Stern, 2000). Therefore each type of behaviour and target market should be theorized separately.

Determinants of recycling may for example differ from those that contribute to green purchases and in similar vein, rural populations may vary from those in urban areas in their engagement of pro-environmental action. Ideally the focus of models should go beyond underlying motivational factors to incorporate situational forces and personal capabilities such as knowledge and experience (Tanner *et al.*, 2004; Vermeir, & Verbeke, 2006). A broader scope of factors might even have to be included when discussing decisions for complex and expensive environmentally significant consumer behaviours (Stern, 2000). This approach may be particularly relevant in terms of efforts to predict sustainable consumption practices within emerging contexts where consumer populations are diverse (Bodur & Sarigöllü, 2005; Burgess & Steenkamp, 2006; Essoussi & Merunka, 2007).

In adopting some of the underlying assumptions of Gestalt psychology, Lewin (as early as in 1951) explained that a person exists within a psychological field which comprises a configuration of forces (Fiske & Taylor, 2010). Predicting consumers' behaviour therefore requires an understanding of all the factors that are influential in any given situation, which may include the situation itself as well as personal forces such as motivation and cognition. Neither one of the influencing forces can independently predict a person's actions, but the dynamic equilibrium among them may provide more accurate predictions of people's behaviour (Fiske & Taylor, 2010) e.g. their private-sphere environmentalism. In similar vein, a number of theoretical approaches have attempted to combine internal motivational factors with processes, constraints and incentives external to the individual in an effort to predict ESB (Jackson, 2005). Examples include the social practices model by Spaargaren and Van Vliet (2000), Stern's (2000) attitude-behaviour-context (ABC) model, Triandis' (1994) theory of interpersonal behaviour, Ölander and Thøgersen's (1995) motivation-opportunity-abilities model, the model of consumer action by Bagozzi, Gürhan-Canli & Priester (2002) and Barr's (2007) conceptual framework of environmental behaviour.

Integrative theories, such as Ölander and Thøgersen's (1995) motivation-opportunity-abilities (MOA) model conceptualize motivation as a predisposition to act in an environmentally significant manner. However, the MOA model also underscores two issues, which are of particular significance in emerging contexts, namely to facilitate conditions for individuals to adopt ESB, and enquiry about the ability of consumers in these contexts to act in an environmentally significant manner (Ölander & Thøgersen, 1995; Thøgersen, 1994). As an example, availability, affordability competitiveness and information that facilitate environmentally significant choice behaviour are conditions that are frequently highlighted in consumers' acceptance of eco-friendly product alternatives (Aertsens, Mondelaers, Verbeke, Buysse & Van Huylenbroeck, 2009; Gam, Cao, Farr & Kang, 2010; Ritch &

Schröder, 2012; Van Doorn & Verhoef, 2011; Wagner, 2003). Furthermore, an individual's ability to act on his/ her pro-environmental intent e.g. choosing eco-friendly alternatives requires some understanding of the environmental impact of energy, the type and quantity of materials used for the production, transportation and distribution of the product as well as its subsequent use and eventual disposal (Mont & Bleischwitz, 2007). In an emerging context where a substantial segment of the consumer population has had limited product experience and exposure, ability in the form of objective product knowledge (i.e. what consumers actually know) and subjective knowledge (i.e. consumers' perceptions of how much they know) may be of particular importance in promoting pro-environmental choices (Aertsens *et al.*, 2009). The influence of personal experience is also acknowledged since beliefs may change after initial trial and over time when learning has occurred and the ability to perform the behaviour is mastered (Ölander & Thøgerson, 1995; Thøgerson, 1994).

Table 1 Summary of relevant theories

Theory	Key references	Description and relevance for this study
Theory of Planned Behaviour (TPB)	Ajzen (1991)	As one of the most well-known social-psychological attitude-behaviour models that acknowledge personal utility and self-interest as underpinning motives, several authors have assessed the relevance of Ajzen's model in predicting pro-environmental behaviour in more developed countries. To date the model's explanatory value has not been substantiated in the local context in terms of the environmentally significant choice behaviour of major household appliances.
Norm-Activation Theory of Altruism (NAT)	Schwartz (1977)	Based on the assumption that pro-environmental behaviour has altruistic underpinnings with pro-social motives, this model has also been widely applied to predict pro-environmental behaviour in several countries other than South Africa. Empirical evidence was thus needed to verify its relevance in the local context and in particular with regard to the intent of acquiring major household appliances with long term environmental implications.
Combined TPB and NAT meta-analytic structural equation model	Bamberg & Möser, 2007	Assuming that pro-environmental behaviour involves a combination of self-interest and pro-social motives, this model amalgamates TPB and NAT based on a meta-analysis of 46 independent environmentally-related studies. The model has to date not been verified, applied and/or tested in an emerging market context, which warrants further investigation in the local context and in particular with regard to South African consumers' intent to purchase major household appliances with eco-friendly features.
Motivation-Opportunity-Abilities model (MOA)	Ölander & Thøgerson, 1995; Thøgerson, 1994	This model conceptualizes motivation as a predisposition to act in an environmentally significant manner, but also acknowledges the significance of facilitating conditions for individuals to adopt ESB, and the ability of consumers to act in an environmentally significant manner, which may be particularly relevant in emerging markets such as South Africa and in the context of purchasing major household appliances. Based on the underlying importance and relevance of motivational factors in predicting ESB, the MOA model may provide further insight and impetus for future empirical investigation in the local context.

To date, no evidence could be found of the application of the MOA model or any of the fore mentioned theories to the environmentally significant choice and purchase behaviour of major household appliances. Moreover, most databases and models of private-sphere environmentalism reflect conditions in high income industrialized countries such as the USA and may therefore not unequivocally represent conditions in developing and emerging countries (Bodur & Sarigöllü, 2005; Burgess & Steenkamp, 2006; Chokor, 2004; Givens & Jorgenson, 2011; Tang *et al.*, 2011). It is especially true for countries with unique cultural complexities, high levels of income inequality and other unique contextual circumstances such as China (Tang *et al.*, 2011), India (Chatterjee, 2008), Turkey (Bodur & Sarigöllü, 2005), Malaysia (Haron, Paim & Yahaya, 2005), Tunisia (Essoussi & Merunka, 2007) and South Africa (Sonnenberg, Erasmus & Donoghue, 2011) to name a few.

Increasing consumption trends in emerging economies

Over the past few decades the universal quest for the sustainable consumption of global resources confronted several intricate issues. These include concerns in governments about loss of international economic competitiveness if environmental restrictions are adhered to too rigidly; genuine perplexity among politicians, environmental activists and citizens as to what a sustainable development strategy should entail; extensive disputes amongst scientists over the nature and actual rate of environmental change; issues concerning how environmental gains and losses should be measured, evaluated and incorporated into public policy; and how to provide legitimacy for a project that requires a radical reconsideration of values and a restructuring of public and private institutions (Munton, 1997; Shove, 2010).

Within a Third-World context, the sustainability agenda has to date mostly targeted fundamental social issues such as poverty eradication, equity, human rights and empowerment, which are generally associated with the unsustainable use of natural resources in production and consumption (Chokor, 2004; Rogers & Ryan, 2001; United Nations, 2012). Continued efforts to eradicate poverty in emerging economies in recent years have resulted in a migration of increasing numbers of previously disadvantaged citizens to urban areas where the dissemination of materialistic Western lifestyles is most evident and where they become part of higher income groups that possess buying power similar to that of consumers in high income industrialized countries (Chatterjee, 2008; Donoghue & De Klerk, 2009; Haron *et al.*, 2005). Determined to erase their asset deficit, these consumers are inclined to generously spend on multiple, luxurious versions of goods (Mont & Bleischwitz, 2007) which has implications for the environment and its natural resources.

Based on a comprehensive, yet practical classification which incorporates gross domestic product (GDP) per capita (at purchasing power parity), emerging markets refer to the transitional economies of the former Soviet Union, the Eastern Bloc and Asia and the developing countries of Africa, Asia, the Middle East and Latin America (Burgess & Steenkamp, 2006). These countries have a noteworthy economic growth potential that distinguish them from the least developed countries (Burgess & Steenkamp, 2006; Essoussi & Merunka, 2007; National Statistics Offices of the BRICS Group, 2013). The rapidly expanding economies of BRICS countries (i.e. Brazil, Russia, India, China and South Africa) merit specific focus due to their increased consumption and ecological footprints that are indicative of high income industrialized countries (WWF, 2012). In some BRICS countries (e.g. South Africa) the expenditure and ecological footprint of households reflect those of industrialized nations to larger extent because of the equal split between consumption categories such as food, housing, transportation, goods and services, whereas others (e.g. Indian households) tend to spend more on food (WWF, 2012). Evidently, emerging countries such as South Africa can no longer disregard environmental issues and related concerns that confront more developed economies. Subsequently more sustainable consumption practices should be encouraged (Du Plessis, 2009; Rosenberg, 2006), especially among the middle to higher income consumer segments.

Environmental concern and ESB in the South African context

Most emerging contexts such as South Africa comprise two-tier consumer populations, i.e. a developed segment that is part of the wider international global economy and an underdeveloped sector that signifies a less affluent Third-World market (Burgess & Steenkamp, 2006). Currently the average South African's ecological footprint is 2.59 global hectares, which is slightly lower than the world average of 2.7 global hectares per person (WWF, 2012), but as pointed out by Du Plessis (2009) averages do not account for the gap between rich and poor. South Africa's level of income inequality is among the highest in the world (Pricewaterhouse Coopers (PwC) & Economist Intelligence Unit, 2012) and it is estimated that 10% of South African households consume almost 50% of the available products and services, whereas the poorest segments consume a mere 1% (Rosenberg, 2006). As such, certain aspects that impact on personal and contextual circumstances must be considered in promoting specific types of ESB, despite the apparent weak causal relation between demographic variables and pro-environmental behaviour (Bodur & Sarigöllü, 2005; Deng *et al*, 2006).

In terms of environmental concern, lower income groups are occasionally more concerned about environmental threats, since they often reside closer to environmental problem sites and/or industrial

areas, which are in many cases more directly affected by pollution (Chatterjee, 2008; Rousseau, & Venter 2001). Although the less affluent may be “environmentally rational”, they are also restricted in their ability to act in an environmentally significant manner (Chokor, 2004). Conversely, an increasingly large segment of South African middle class consumers exhibit highly aspirational spending with ample opportunity to deploy their disposable incomes in urban malls that stock premium high-end consumer goods (PwC & Economist Intelligence Unit, 2012). Urban residents tend to experience higher levels of mass media exposure, education and political articulation, which facilitate the diffusion of materialistic Western lifestyles into emerging economies (Chatterjee, 2008). It is thus apparent, that a review of consumption behaviour among the middle to high income consumer segments, especially those who reside in urban areas, would be of primary importance in developing strategies to promote private-sphere environmentalism.

Household technology is of specific interest in consumers’ private-sphere environmentalism because acceptance of sustainable principles and lifestyles is based on an appreciation for the impact of technology and development on local indigenous resources and natural environments (McGregor, 2006). In recent years, the South African major household appliance sector has shown significant growth as a result of the escalating needs of an aspiring middle-class, many of whom are acquiring appliances for the first time to erase a so-called asset deficit (Nieftagodien & Van Der Berg, 2007; PwC & Economist Intelligence Unit, 2012). The 2008 energy crisis, which has had a severe impact on the local economy is a stark reminder that energy resources are not unlimited.

Electricity consumption and energy concerns in the South African context

South Africa is ranked as the leading carbon dioxide emitter in Africa and the 12th largest in the world, primarily because of its dependence on coal for energy supply (Niez, 2010; U.S. Energy Information Administration (US EIA), 2013). South Africa’s energy supply per person exceeds that of many other developing countries and it is estimated that South Africans with access to the grid, consume approximately 50% of Africa’s total electricity, although they only represent 5% of the continent’s population (Winkler, 2006). In a recent economic survey, South Africa is criticized for having among the highest greenhouse gas emissions per unit of GDP in the world and has achieved less decoupling of real GDP and CO₂ emissions than most countries (OECD, 2013). Table 1 summarises the electricity consumption/ GDP ratios since the 1970s, which illustrates rapid increases and suggests that electricity consumption has exceeded economic growth (Ziramba, 2008).

Table 2 Electricity indicators in South Africa (Ziramba, 2008)

Year	Electricity consumption (Gwh)	Electricity consumption / GDP (kWh/ 2000 US\$)	Electricity consumption / pop (kWh/ capita)	World electricity consumption/ pop (kWh per capita)
1971	54,647	0.71	2246.17	1286.746
1975	74,894	0.845	2801.12	1471.020
1980	98,951	1.052	3644.44	1718.182
1985	143,491	1.317	4298.10	1869.365
1990	167,226	1.406	4431.48	2066.552
1995	187,825	1.498	4433.59	2145.521
2000	210,670	1.462	4416.57	2322.260
2005	244,920	1.423	4847.64	2595.742

Sources: International Energy Agency: Energy Statistics of non-OECD countries (various issues)

Intensifying energy demands with insufficient capacity and infrastructure eventually culminated in the 2008 energy crisis, which was characterized by blackouts in key sectors and aftermath of ongoing steep electricity tariff increases (Inglesi & Pouris, 2010; Niez, 2010; US EIA, 2013). The energy crisis can in part be attributed to the South African government's efforts to redress past inequalities and its declaration in 2000 that all South Africans should have access to basic services which include water and electricity (Inglesi & Pouris, 2010; Niez, 2010; US EIA, 2013). By 2009 an electrification rate of 75% was achieved with 88% urban and 55% rural populations connected to the electricity supply grid (Nieftagodien & Van Der Berg, 2007; Niez, 2010). However, 3.4 million households still need to be connected and electrification remains a national priority (Niez, 2010).

Amidst growing awareness and regulatory initiatives to address the imbalance between supply and demand, several challenges surround the suggested measures to ensure continuity of energy provision in the country, specifically in terms of minimizing its environmental impact while ensuring sustained economic growth, and continuing with the provision of electricity to previously disadvantaged communities (Inglesi & Pouris, 2010; Niez, 2010). The demand for major household appliances is expected to increase as South African households' disposable income continue to escalate and more consumer populations have access to electrical supply (Euromonitor International, 2013; PwC & Economist Intelligence Unit, 2012). It is therefore crucial to focus on those decisions that have the most significant impact on a household's energy consumption, which include their purchase and use of major household appliances. To date, informational campaigns have emphasized the role of households, and in particular their use of appliances, in alleviating the pressure imposed on the country's energy supply. Yet, in addition to energy consumption, major household appliances also

have several other environmental implications throughout the lifespan of the product, which require sensitizing consumers toward the impact of their choices. Many of the appliances sold within the South African context are imported and have energy ratings and eco-friendly features that comply with European standards (Euromonitor International, 2013). Whether South African consumers consider these features in their choice of appliances is debatable. Establishing theoretical insight with regard to the factors that may lead to more ecological and sustainable consumer patterns (especially in a product category such as household appliances) would be an important step in paving the way for strategic planning on different levels and isolating problems that might inhibit ESB in the quest for more sustainable lifestyles.

RESEARCH PROBLEM AND CONTRIBUTION OF THE STUDY

There is ample empirical evidence of an incremental increase in the consumption of natural resources worldwide that threatens and causes irreparable damage to ecosystems. In terms of high income industrialized countries, progress has been made in grasping the relevant motivational constructs, demographic variables, and to a lesser extent the cognitive and situational factors that embody the basis of private-sphere environmentalism and precede consumers' environmentally significant intent and behaviour during product choice and -consumption. An amalgamation of models based on behavioural theories have already been tested and applied to various actions to deduce the determinants of ESB in these countries. Empirical evidence however almost exclusively addresses conditions in First-World scenarios and is not necessarily relevant in terms of the contextual and cultural complexities of emerging economies such as South Africa. Empirical evidence further indicates that causal factors may vary greatly across different types of ESB. It is for example proposed that each target group's behaviour should be theorized separately, especially in lure of the intention-behaviour gap that hinders the efforts of several pro-environmental campaigns.

Although household appliances are already considered environmentally significant in terms of their impact on an array of resources commencing at the production processes throughout use up to their disposal, limited evidence exist of efforts to understand and describe consumers' acquisition, use and disposal of these products, i.e. ESB. The lack of theoretical insight to interpret ESB within an emerging context such as South Africa is considered an important deterrent of initiatives to promote products with positive environmental consequences such as environmentally friendly appliances. In this regard, the perspective of those with increased spending power as well as access to a wide variety of products in densely populated urban areas were of specific interest. These consumers'

share in the average ecological footprint may be proportionally higher than those who belong to the less affluent segments who are inevitably also not in a position to change their behaviour that easily.

In accordance with the fore mentioned arguments this research was firstly based on questions surrounding the relevance and inter relationship of motivational factors as specified in Bamberg and Möser's (2007) meta-analytic structural equation model (i.e. awareness of environmental problems, internal attribution, subjective norms, guilt, attitudes, perceived behavioural control and moral norms) in contributing to middle- to high income consumers' pro-environmental intent to purchase major household appliances with eco-friendly features in the South African emerging market context. However, as most researchers agree that pro-environmental intent does not inexorably lead to behaviour that has a positive environmental impact, a second research question was focused on consumers' actual environmentally significant choice behaviour. More specifically, the question asked is whether middle- to high income consumers who can afford to choose from a wider array of products, prioritize and assign importance to environmentally related product features with lasting environmental consequences in their pre-purchase evaluation and selection of major household appliances.

From a practical point of view, the empirical findings obtained from this study are significant in terms of efforts to indicate and explicate the inter relationship of motivational factors to promote private-sphere environmentalism. As a key player in Africa, South Africa is likely to continue facing international pressure to fully address environmental issues in the near future. To this effect political efforts are imperative, but public support would be equally important to halt further environmental deterioration. An understanding of consumers' prioritization of environmentally related product features in relation to other conventional attributes could then also inform the development of appropriate marketing campaigns and intervention strategies to further advance ESB in the South African retail environment. From a theoretical perspective, the research will expand the existing body of knowledge by establishing theoretical insight, which not only underlines a Third-World emerging context, but also provides evidence regarding the application of existing theory and methods to explain consumers' pro-environmental intent and behaviour in the execution of a more complex, expensive and significant act of acquiring major household appliances.

RESEARCH OBJECTIVES

Based on the research problem and theoretical background presented in the preceding introduction, the following objectives that were formulated for this study specifically refer to consumers' pre-purchase evaluation and selection of washing machines as an example of major household appliances that are purchased for their households:

- Objective 1: To investigate the underlying associations between the motivational factors that contribute to consumers' pro-environmental intent to purchase washing machines with eco-friendly features.
- Sub-objective 1.1 Based on current theoretical debates, to validate pertinent constructs that are relevant in terms of further investigations in this study, namely general awareness, internal attribution, guilt, moral norms and attitudes.
- Sub-objective 1.2 Following the outcome of sub-objective 1.1, to test a model that approximates the construct associations specified in Bamberg and Möser's (2007) meta-analytic structural equation model in the context of this study. Construct associations are hypothesized as follows:
- Hypothesis 1 (H1): Consumers' awareness of consequences is positively associated with subjective norms (H1a) and moral attitudes (H1b).
- Hypothesis 2 (H2): Subjective norms are positively associated with perceived behavioural control (H2a) and moral attitudes (H2b).
- Hypothesis 3 (H3): Perceived behavioural control (PBC) is a significant predictor of consumers' intentions to purchase washing machines with eco-friendly features.
- Hypothesis 4 (H4): Moral attitudes are significant predictors of consumers' intentions to purchase washing machines with eco-friendly features.

Figure 1 provides an overview of the hypothesized relationships

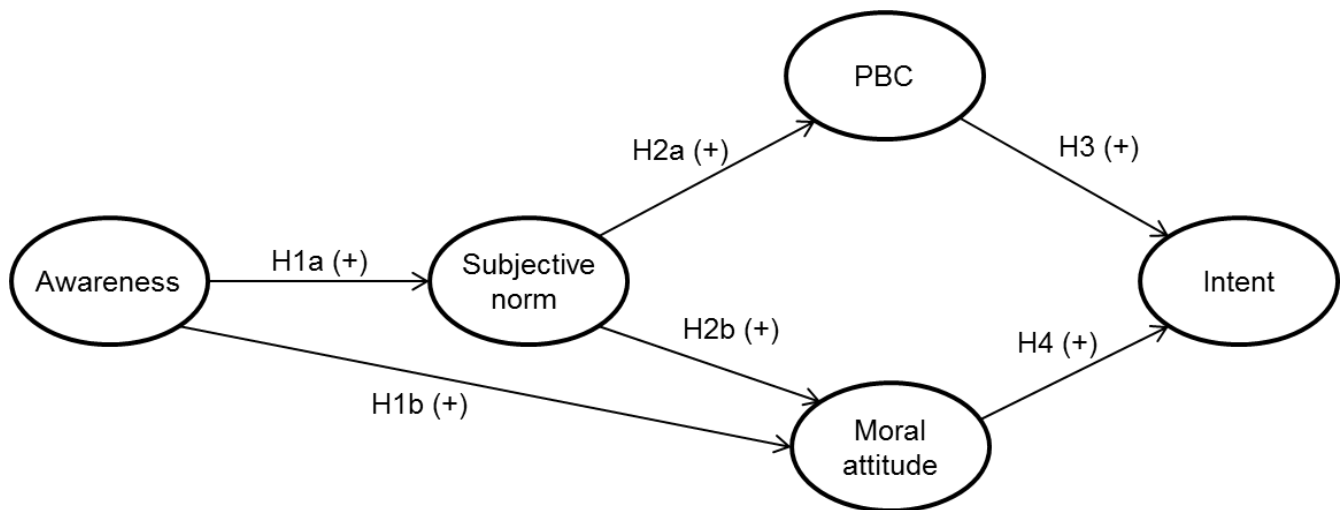


Figure 1: Schematic illustration of the research model indicating hypothesized relationships

Objective 2: To determine and discuss consumers' environmentally significant choice behaviour in terms of their prioritization of product attributes and the importance consumers assign to environmentally related attributes (in relation to other, more conventional features).

Sub-objective 2.1: To determine and discuss the utility values of energy ratings, load capacity and wash cycles in consumers' choice of washing machines;

Sub-objective 2.2: To determine and discuss the utility values of price, brand and brand perceptions in consumers' choice of washing machines;

Sub-objective 2.3: To identify associated clusters of consumers in terms of their prioritization of product features in their pre-purchase evaluation and selection of washing machines and to discuss the implications of their respective choice behaviours.

Based on the results of the fore mentioned objectives the following overarching objective was formulated to expand the theoretical contribution of this study:

Objective 3: To propose an integrative theoretical approach for further investigation of South African consumers' contextual reality in the major household appliance

market, which extends beyond underlying motivational factors and which incorporates situational forces and personal capabilities (e.g. knowledge and experience) that may potentially mediate the relationship between consumers' pro-environmental intent and their environmentally significant choice behaviour.

RESEARCH DESIGN

Research approach

In addressing the objectives of this study, a survey approach was adopted to gain wide and inclusive coverage of the phenomena at a specific point in time (Denscombe, 2007:7; Leedy & Ormrod, 2005:184). The following section provides a brief overview of the sample and sampling design, the questionnaire development and data collection procedures as well as ethical matters which were taken into consideration during the completion of this study.

Sample and sampling design

An important pre-requisite for participation in this study was prior experience in being responsible/ co-responsible for purchasing major household appliances for a household. Furthermore, it was important to obtain the perspectives of middle to higher income consumers since their contribution to the average ecological footprint may be substantially higher than the less affluent. Higher income affords increased spending with at least some opportunity to demonstrate personal preferences when considering choice alternatives. A non-probability purposive sampling approach was therefore used to recruit consumers who were in the process of acquiring major household appliances in retail outlets that offer a wide range of high-end appliances that is specifically targeted at the more affluent consumer segments. A well-known retail chain with stores in each of the major urban sectors of Tshwane agreed to assist in the data collection process by means of a store intercept method. Potential respondents were identified in stores and data was collected in structured face-to-face interviews by the researcher.

The eventual sample (N=667) were mostly female (69%), presumably due to females' leading role when purchasing major household appliances for households. Ages of respondents ranged between 19 and 77 years, with 25% categorised as ≤ 29 years; 45% as 30 to <50 years and 29% as ≥ 50 years. The majority of respondents possessed a higher level of education (63%) and belonged to the White racial group (81%), while 47% of the sample was of the upper middle to higher income- and 53% of

the middle to lower middle income segments. Recent reports confirm a two-tiered divide in the South African appliance market with certain products and retail channels predominantly focused on the higher income groups, whereas others are targeted at the lower income segments (Euromonitor International, 2013). Respondents' residential suburbs were grouped according to five municipal regions (City of Tshwane, 2011), i.e. North West region (n = 46/ 7%); North East region (n = 72/ 11%); Central West region (n = 152/ 23%); Southern region (n = 226/ 34%) and the Eastern region (n = 171/ 25%). A comparison with municipal survey data (City of Tshwane, 2008) indicates that the sample mostly reflects the percentage distribution of households with a monthly household income of \geq ZAR6401 (1USD = 10.5 ZAR) in the various regions.

Questionnaire development and data collection

A structured questionnaire was developed to address the objectives of this study. The questionnaire was pre-tested to eliminate problems before commencement of the main inquiry and to ensure that the chosen procedures were suitable (Strydom, 2005). The final questionnaire (Addendum A) included seven sections:

- **Section A** covered basic socio-demographic information pertaining to gender, age, education, income, population group, area of residence, household size and marital status.
- **Section B** introduced the conjoint tasks with a projective technique and basic descriptions pertaining to the attributes that were included in the conjoint profiles. The conjoint profiles and tasks were developed by means of Sawtooth Conjoint Value Analyses (CVA) software. Chapter 3 provides a more extensive explanation of the conjoint methodology and the development of the conjoint tasks. Section B was divided into four sub-sections, each consisting of ten conjoint tasks. These sub-sections were alternated with sections C, D, E, F and G of the questionnaire to reduce respondent fatigue.
- **Section C** established respondents' prior experience in terms of product- and time related familiarity in purchasing washing machines.
- **Section D** assessed respondents' subjective knowledge regarding the eco-friendly features of washing machines based on subjective knowledge scale items developed by Mukherjee and Hoyer (*in* Bruner, Hensel & James, 2005).
- **Section E** included an LCA-based objective knowledge test which was developed based on the results of a life-cycle assessment on BSH Bosch and Siemens washing machines (Otto, Ruminy & Mrotzek, 2006).
- **Section F** included statements regarding the availability, affordability and competitiveness of washing machines with eco-friendly features as well as the provision of information pertaining to

such features. This section focused on assessing respondents' subjective perception of the conditions/ opportunities that facilitate environmentally significant choice behaviour and involved six point Likert-type *Agreement* scales.

- **Section G** determined motivational constructs relevant to ESB based on scale items used in prior empirical research (Bamberg *et al.*, 2007; Fielding, McDonald & Louis, 2008; Hinds & Sparks, 2008; Manetti *et al.*, 2004; Minton & Rose, 1997; Oom Do Valle, *et al.*, 2005; Steg, Dreijerink & Abrahamse, 2005; Thøgerson, 2006; Wall *et al.*, 2007). Scale items were adapted for this study and pre-tested to refine the question format and wording. All constructs were measured on six point Likert-type *Agreement* scales.

The questionnaires were fairly lengthy, but were administered in face-to-face interviews, which offered the advantage of higher response rates (Mazzocchi, 2008:55). Data collection commenced in August 2012 and was completed by November 2012. A total of 667 questionnaires were collected, of which 648 were used for conjoint analyses and structural equation modelling purposes based on data obtained from sections A, B and G of the questionnaire. *It is thus important to note that the other sections of the questionnaire form part of ongoing research and are excluded from this thesis.*

Ethical implications

Ethical implications are relevant whenever human subjects are the focus of investigation (Leedy & Ormrod, 2005). Following the recommendations of Leedy and Ormrod (2005:101), the following information was included in a cover letter accompanying the questionnaire (Addendum A) that was presented to research participants:

- A concise explanation of the nature of the study.
- A brief description of the procedures involved and the time it would take to complete.
- A declaration that all responses will remain confidential and anonymous.
- The researcher's name, affiliation and contact information for further enquiry about the study

In respecting the participants' right to privacy, no oral or written report or publication of the findings was presented in a manner that may lead to the identification of any particular individual, their responses or behaviour. Furthermore, complete and honest accounts of the research findings is presented with full acknowledgment and recognition of the thoughts, ideas and other intellectual property of external parties (Leedy & Ormrod, 2005:102). In addition to the above, ethical approval (Addendum B) was obtained for this project from the University of Pretoria's internal ethics review committee.

PRESENTATION AND STRUCTURE OF THE THESIS

This thesis is presented in article format. Some of the articles have already been published or accepted for publication at the time of the submission of the integrated thesis (specifically chapters three and four). Manuscripts submitted to, and/or prepared for submission to scholarly journals appear as separate chapters. Each chapter was therefore prepared in the format of the specific journal and is briefly discussed in the subsequent section:

Chapter 2 includes a manuscript entitled “*Pro-environmental motivation and intent in the South African emerging market context*”, which was co-authored by Professors Alet Erasmus and Adré Schreuder based on their contribution as supervisors of this research. The manuscript will be submitted to the Journal of Environmental Psychology. This manuscript is based on the data obtained from section G of the questionnaire and includes testing of a model based on the construct associations proposed in Bamberg and Möser’s (2007) meta-analytic structural equation model. Due to the journal’s prescribed word count limitations, an initial exploratory factor analyses (EFA) of the motivational items, which served as input for the model, is included in Addendum C. A working paper based on the preliminary evidence reported in this manuscript was presented at the Association of Consumer Research “*Making a difference*” Conference, October, 2013, Chicago, IL, North America. The acceptance rate of the working paper track was 62%.

Chapter 3 is a manuscript entitled “*Consumers’ preferences for eco-friendly appliances in an emerging market context*” co-authored by Professors Alet Erasmus and Adré Schreuder based on their contribution as supervisors of this research. The manuscript was submitted in November 2013 and provisionally accepted for publication in February 2014 in the International Journal of Consumer Studies and addresses the results of the conjoint- and cluster analyses that were performed on the conjoint data obtained from Section B in the questionnaire. The empirical evidence presented in this manuscript draws attention to the relative importance of various environmental attributes (i.e. energy efficiency, load capacity and wash cycles) in relation to other product features (i.e. brand, brand perceptions and price) of washing machines. The aggregate results reveal that consumers across various age, income and educational levels prioritise brand and price, despite the long term financial and environmental repercussions of product features that impact on the use of natural resources. In summary the findings underline current literature, which suggests that in order to facilitate pro-environmental product choices “green” product offerings must perform competitively in terms of non-

environmental attributes. Reviewers' comments are included in Addendum D. Amendments have been submitted for finalization of the publication.

Chapter 4 includes a manuscript entitled "*The development of a theoretical model to investigate factors associated with environmentally significant choice behaviour in the South African major household appliance market: an integrative conceptual approach*". The manuscript was co-authored by Professor Alet Erasmus as supervisor of the study and was published in the Journal of Family Ecology and Consumer Sciences, Volume 41, pp. 71-84. Since this manuscript was accepted for publication before the other two manuscripts, the results reported in chapters two and three could not be acknowledged in its compilation. The manuscript does however draw on existing empirical evidence that in part reflect the results and content reported in the other two manuscripts, to offer a theoretically founded argument that models should go beyond underlying motivational factors to incorporate situational forces and personal capabilities such as knowledge and experience to explain ESB. The manuscript is concluded with a multi-dimensional, integrative conceptual framework for future investigations of consumers' ESB in the context of the South African emerging economy. Reviewers' comments as well as the authors' responses are included in Addendum E.

Chapter 5 amalgamates and summarizes the results presented in chapters two and three as they apply to the research problem and objectives detailed in the preceding general introduction. Conclusions are drawn with an acknowledgement of the limitations of the study. The chapter concludes with an evaluation of the methodology and recommendations for future research based on the proposed theoretical model presented in chapter four.

Notification: Certain technical decisions had to be made in terms of the presentation of this thesis.

- A separate reference list is compiled for each chapter due to the format in which this thesis is presented. Reference lists appear at the end of each chapter and only include those references cited in the specific chapter to which it is attached.
- The reference style used in chapters two, three and four coincide with the style used by the respective journals for which manuscripts were prepared.
- The reference style applied in chapters one and five comply with the guidelines prescribed by the University of Pretoria's Department of Consumer Science.
- Numbering of headings and subsections were eliminated for the purposes of the thesis to avoid confusion which might result from the different formats required for each of the journals.
- Although each manuscript included in chapters two, three and four report on different facets of the research, some replication was inevitable due to the overarching theoretical background and justification of the study. A major challenge in presenting this document, was to restrict the length of each chapter (approximately 5000 words) in accordance with the prerequisites for the various journals where the articles were submitted. This required a meticulous scrutiny and revalidation of literature, data, tables and figures to present the findings in a concise yet comprehensive format that would meet the requirements of a PhD thesis.

REFERENCE LIST

Aertsens, J., Mondelaers, K., Verbeke, W., Buysse, J. & Van Huylenbroeck, G. 2009. The influence of subjective and objective knowledge on attitude, motivations and consumption of organic food. *British Food Journal*, 113(11):1353-1378.

Aguirre, B.E. 2002. "Sustainable development" as collective surge. *Social science quarterly*, 83(1):101-118.

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

Bagozzi, R.P, Gürhan-Canli, Z. & Priester, J. 2002. *The social psychology of consumer behaviour*. Buckingham, England: Open University Press.

- Bamberg, S., Hunecke, M. & Blöbaum, A. 2007. Social context, personal norms and the use of public transportation: two field studies. *Journal of Environmental Psychology*, 27:190-203.
- Bamberg, S. & Möser, G. 2007. Twenty years after Hines, Hungerford, and Tomera: a new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of Environmental Psychology*, 27:14-25.
- Barr, S. 2007. Factors influencing environmental attitudes and behaviors: a U.K. case study of household waste management. *Environment and Behavior*, 39(4):435-473.
- Bhate, S. 2001. One world, one environment, one vision: are we close to achieving this? An exploratory study of consumer environmental behaviour across three countries. *Journal of Consumer Behaviour*, 2(2):169-184.
- Bodur, M. & Sarigöllü, E. 2005. Environmental sensitivity in a developing country: consumer classification and implications. *Environment and Behavior*, 37(4):487-510.
- Bruner, G.C., Hensel, P.J. & James, K.E. 2005. *Marketing scales handbook: a compilation of multi-item measures for consumer-behavior and advertising 1998-2001*. Volume IV. Chicago: Thomson.
- Burgess, J. 2003. Sustainable consumption: is it really achievable? *Consumer Policy Review*, 13(3):78-84.
- Burgess, S.M. & Steenkamp, J.E.M. 2006. Marketing renaissance: how research in emerging markets advances marketing science and practice. *International Journal of Research in Marketing*, 23:337-356.
- Chan, L. & Bishop, B. 2013. A moral basis for recycling: extending the theory of planned behaviour. *Journal of Environmental Psychology*, 36:96-102.
- Chatterjee, D.P. 2008. Oriental disadvantage versus occidental exuberance: appraising environmental concern in India: a case study in a local context. *International Sociology*, 23(1):5-33.
- Chokor, B.A. 2004. Perception and response to the challenge of poverty and environmental resource degradation in rural Nigeria: case study from the Niger Delta. *Journal of Environmental Psychology*, 24:305-318.

City of Tshwane. 2008. *City of Tshwane Municipality Household Survey, 2008*. [Online] Available from:

http://www.tshwane.gov.za/AboutTshwane/CityManagement/CityDepartments/City%20Planning,%20Development%20and%20Regional%20Services/Related%20Docs/CoT_HouseholdSurvey2008.pdf
[Accessed: 2013-09-06].

Corral-Verdugo, V. & Frías-Armenta, M. 2006. Personal normative beliefs, antisocial behavior, and residential water conservation. *Environment and Behavior*, 38(3):406-421.

Deng, J., Walker, G.J. & Swinnerton, G. 2006. A comparison of environmental values and attitudes between Chinese in Canada and Anglo-Canadians. *Environment and Behavior*, 38(1):22-47.

Denscombe, M. 2007. *The good research guide for small-scale social research projects*. 3rd ed. Berkshire: McGraw-Hill.

Donoghue, S. & De Klerk, H.M. 2009. The right to be heard and to be understood: a conceptual framework for consumer protection in emerging economies. *International Journal of Consumer Studies*, 33:456-467.

Dunlap, R.E. & Mertig, A.G. 1997. Global environmental concern: an anomaly for post materialism. *Social Science Quarterly*, 78:24-29.

Du Plessis, M. 2009. *The state of the planet: your company's role*. In Trialogue, World Wide Fund for Nature South Africa (WWF-SA) & Indalo Yethu. 2009. *The Environmental Handbook*. Inaugural ed. Cape Town: Trialogue.

Eckhardt, G.M., Belk, R. & Devinney, T.M. 2010. Why don't consumers consume ethically? *Journal of Consumer Behaviour*, 9:426-436.

Erasmus, A.C., Boshoff, E. & Rousseau, G.G. 2002. Elicitation and generation of a script for the acquisition of household appliances within a consumer decision-making context. *Journal of Family Ecology and Consumer Sciences*, 30:46-64.

- Erasmus, A.C., Makgopa, M.M. & Kachale, M.G. 2005. The paradox of progress: inexperienced consumers' choice of major household appliances. *Journal of Family Ecology and Consumer Sciences*, 33:89-101.
- Essoussi, L.H. & Merunka, D. 2007. Consumers' product evaluations in emerging markets: Does country of design, country of manufacture, or brand image matter? *International Marketing Review*, 24(4):409-426.
- Euromonitor International. 2013. Consumer appliances in South Africa. [Online] Available from: <http://www.euromonitor.com/consumer-appliances-in-south-africa/report> [Accessed: 2013-08-07].
- Fairbrother, M. 2012. Rich people, poor people, and environmental concern: evidence across nations and time. *European Sociological Review*, 0(0):1-13.
- Fielding, K.S., McDonald, R. & Louis, W.R. 2008. Theory of planned behaviour, identity and intentions to engage in environmental activism. *Journal of Environmental Psychology*, 28:318-326.
- Fiske, S.T. & Taylor, S.E. 2010. *Social cognition: from brains to culture*. Boston: McGraw Hill.
- Follows, S.B. & Jobber, D. 2000. Environmentally responsible purchase behaviour: a test of a consumer model. *European Journal of Marketing*, 34(5/6):723-746.
- Franzen, A. & Meyer, R. 2010. Environmental attitudes in cross-national perspective: a multilevel analysis of the ISSP 1993 and 2000. *European Sociological Review*, 26(2):219-234.
- Gam, H.J., Cao, H., Farr, C. & Kang, M. 2010. Quest for the eco-apparel market: a study of mothers' willingness to purchase organic cotton clothing for their children. *International Journal of Consumer Studies*, 34:648-656.
- Gelissen, J. 2007. Explaining popular support for environmental protection: a multilevel analysis of 50 nations. *Environment and Behavior*, 39(3):392-415.
- Gifford, R., Scannell, L., Kormos, C., Smolova, L., Biel, S., Boncu, S., Corral, V., Güntherf, H., Hanyu, K., Hine, D., Kaiser, F.G., Korpela, K., Lima, L.M., Mertig, A.G., Mira, R.G., Moser, G., Passafaro, P.,

Pinheiro, J.Q., Saini, S., Sako, T., Sautkina, E., Savina, Y., Schmuck, P., Schultz, W., Sobeck, K., Sundblad, E.L. & Uzzell, D. 2009. Temporal pessimism and spatial optimism in environmental assessments: An 18-nation study. *Journal of Environmental Psychology*, 29:1-12

Givens, J.E. & Jorgenson, A.K. 2011. The effects of affluence, economic development, and environmental degradation on environmental concern: a multilevel analysis. *Organization & Environment*, 24(1):74-91.

Haron, S.A., Paim, L. & Yahaya, N. 2005. Towards sustainable consumption: an examination of environmental knowledge among Malaysians. *International Journal of Consumer Studies*, 29:426-436.

Hinds, J. & Sparks, P. 2008. Engaging with the natural environment: the role of affective connection and identity. *Journal of Environmental Psychology*, 28:109-120.

Ingesi, R. & Pouris, A. 2010. Forecasting electricity demand in South Africa: a critique of Eskom's projections. *South African Journal of Science*, 106(1/2):50-53.

Iyer, E.S. & Kashyap, R.K. 2007. Consumer recycling: role of incentives, information, and social class. *Journal of Consumer Behaviour*, 6:32-47.

Jackson, T. 2005. Motivating sustainable consumption: a review of evidence on consumer behaviour and behavioural change. *Sustainable Development Research Network*. [Online] Available from: http://www.hiveideas.co.uk/attachments/044_motivatingfinal_000.pdf. [Accessed: 2013-04-30].

Kaiser, F.G. 2006. A moral extension of the theory of planned behavior: norms and anticipated feelings of regret in conservationism. *Personality and Individual Differences*, 41:71-81.

Kaplan, S. 2000. Human Nature and Environmentally Responsible Behavior. *Journal of Social Issues*, 56(3):491-508.

Kim, Y. & Choi, S.M. 2005. Antecedents of green purchase behavior: an examination of collectivism, environmental concern, and PCE. *Advances in Consumer Research*, 32:592-599.

Kinney, T.C., Taylor, J.R. & Ahmed, S.A. 1974. Ecologically concerned consumers: who are they? *Journal of Marketing*, 38:20-24.

Kvaløy, B., Finseraas, H. & Listhaug, O. 2012. The publics' concern for global warming: a cross-national study of 47 countries. *Journal of Peace Research*, 49(1):11-22.

Laitala, K., Boks, C. & Grimstad Klepp, I. 2011. Potential for environmental improvements in laundering. *International Journal of Consumer Studies*, 35:254-264.

Leedy, P.D. & Ormrod, J.E. 2005. *Practical research: planning and design*. 8th ed. New Jersey: Pearson Merrill Prentice Hall.

Lewin, K. 1951. *Field theory in social science: selected theoretical papers*. New York: Harper.

Mannetti, L., Pierro, A. & Livi, S. 2004. Recycling: planned and self-expressive behaviour. *Journal of Environmental Psychology*, 24(2):227-236.

Mazzocchi, M. 2008. *Statistics for marketing and consumer research*. Los Angeles: Sage Publications.

McCullough, J. 2009. Factors impacting the demand for repair services of household products: the disappearing repair trades and throwaway society. *International Journal of Consumer Studies*, 33:619-626.

McGregor, S.L.T. 2006. Reconceptualizing risk perception: perceiving majority world citizens at risk from "Northern" consumption. *International Journal of Consumer Studies*, 30(3):235-246.

McKenzie-Mohr, D. 2000. Promoting sustainable behavior: an introduction to community-based social marketing. *Journal of Social Issues*, 56(3):543-554.

Meneses, G.D. & Palacio, A.B. 2005. Recycling behavior: a multidimensional approach. *Environment and Behavior*, 37(6):837-860.

Milfont, T.L., Duckitt, J. & Cameron, L.D. 2006. A cross-cultural study of environmental motive concerns and their implications for pro-environmental behaviour. *Environment and Behavior*, 38(6): 745-767.

Minton, A.P. & Rose, R.L. 1997. The effects of environmental concern on environmentally friendly consumer behavior: An exploratory study. *Journal of Business Research*, 40: 37-48.

Mont, O. & Bleischwitz, R. 2007. Sustainable consumption and resource management in the light of life cycle thinking. *European Environment*, 17:59-76.

Munton, R. 1997. Engaging sustainable development: some observations on progress in the UK. (*In the progress in human geography : Lecture given at the RGS (IBG) Annual Conference held in Glasgow, UK, January 1996. Glasgow. p. 147-163.*

National Statistics Offices of the BRICS group. 2013. BRICS joint statistical publication. 4th ed. [Online] Available from:
http://www.statssa.gov.za/news_archive/Docs/FINAL_BRICS%20PUBLICATION_PRINT_23%20MARCH%202013_Reworked.pdf. [Accessed: 2013-08-11].

Nieftagodien, S. & Van Der Berg, S. 2007. Consumption patterns and the black middle class: the role of assets. *Bureau of Economic Research*, 2:1-10.

Niez, A. 2010. Comparative study on rural electrification policies in emerging economies: keys to successful policies. *International Energy Agency*. [Online] Available from:
<http://www.iea.org/publications/freepublications/publication/name,3880,en.html>. [Accessed: 2013-01-23].

Nordlund, A.M. & Garvill, J. 2002. Value structures behind pro-environmental behavior. *Environment and Behavior*, 34(6):740-756.

OECD. 2013. OECD economic surveys: South Africa 2013. *OECD Publishing*. [Online] Available from:
http://dx.doi.org/10.1787/eco_surveys-zaf-2013-en. [Accessed: 2013-08-11].

- Ölander, F. & Thøgersen, J. 1995. Understanding of consumer behaviour as a prerequisite for environmental protection. *Journal of Consumer Policy*, 18(4):345-385.
- Oom Do Valle, P., Rebelo, E., Reis, E. & Menezes, J. 2005. Combining behavioral theories to predict recycling involvement. *Environment and Behavior*, 37(3):364-369.
- Oreg, S. & Katz-Gerro, T. 2006. Predicting pro environmental behaviour cross-nationally: values, the Theory of Planned Behavior, and Value-Belief-Norm Theory. *Environment and Behavior*, 38(4):462-483.
- Otto, R., Ruminy, A. & Mrotzek, H. 2006. Assessment of the environmental impact of household appliances. *Appliance Magazine.com*, April, 1-5. [Online] Available from: <http://www.appliancemagazine.com/print.php?article+1393&zone=215&first=1> [Accessed: 2011-08-13].
- Papaoikonomou, E. 2013. Sustainable lifestyles in an urban context: towards a holistic understanding of ethical consumer behaviours. Empirical evidence from Catalonia, Spain. *International Journal of Consumer Studies*, 37:181-188.
- Poortinga, W., Steg, L. & Vlek, C. 2004. Values, environmental concern, and environmental behavior: A study into household energy use. *Environment and Behavior*, 36(1):70-93.
- Pricewaterhouse Coopers (PwC) & Economist Intelligence Unit. 2012. South African retail and consumer products outlook 2012-2016. [Online] Available from: <http://www.pwc.co.za/en/publications/retail-and-consumer-outlook.jhtml>. [Accessed: 2013-04-30].
- Ritch, E.L. & Schröder, M.J. 2012. Accessing and affording sustainability: the experience of fashion consumption within young families. *International Journal of Consumer Studies*, 36:203-210.
- Rogers, M. & Ryan, R. 2001. The triple bottom line for sustainable community development. *Local Environment*, 6(3):279-289.
- Rosenberg, E. (2006). Consumerism. In *The Enviropedia. Be the Change You Want to See*. (Ed by D. Parry-Davies), pp.271-273. Be the Change edn. Simonstown: Eco-Logic Publishing CC-CK.

Rousseau, G.G. & Venter, D.J.L. 2001. A multi-cultural investigation into consumer environmental concern. *Journal of Industrial Psychology*, 27(1):1-7.

Schuler, D.A. & Cording, M. 2006. A corporate social performance-corporate financial performance behavioral model for consumers. *Academy of Management Review*, 31(3):540-558.

Schwartz, S.H. 1977. Normative influences on altruism. In L.Berkowitz (Ed.), *Advances in Experimental Social Psychology*. New York: Academic Press.

Shove, E. 2010. Beyond the ABC: climate change policy and theories of social change. *Environment and Planning*, 42:1273-1285.

Sonnenberg, N.C., Erasmus, A.C. & Donoghue, S. 2011. Significance of environmental sustainability issues in consumers' choice of major household appliances in South Africa. *International Journal of Consumer Studies*, 35:153-163.

Spaargaren, G. & Van Vliet, B. 2000. Lifestyles, consumption and the environment: the ecological modernization of domestic consumption. *Environmental Politics*, 9(1):50-76.

Steg, L., Dreijerink, L. & Abrahamse, W. 2005. Factors influencing the acceptability of energy policies: a test of VBN theory. *Journal of Environmental Psychology*, 25:415-425.

Steg, L. & Vlek, C. 2009. Encouraging pro-environmental behaviour: an integrative review and research agenda. *Journal of Environmental Psychology*, 29:309-317.

Stern, P.C. 2000. Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56(3):407-424.

Strydom, H. 2005. The pilot study. In: De Vos, A.S., Strydom, H., Fouché, C.B. & Delpont, C.S.L. (eds.) *Research at grass roots for the social sciences and human service professions*. 3rd ed. Pretoria: Van Schaik.

Tang, Z., Chen, X. & Luo, J. 2011. Determining socio-psychological drivers for rural household recycling behavior in developing countries: a case study from Wugan, Hunan, China. *Environment and Behavior*, 43(6):848-877.

Tanner, C., Kaiser, F.G. & Wölfing Kast, S. 2004. Contextual conditions of ecological consumerism: a food-purchasing survey. *Environment and Behavior*, 36(1):94-111.

Thøgersen, J. 1994. A model of recycling behaviour, with evidence from Danish source separation programmes. *International Journal of Research in Marketing*, 11:145-163.

Thøgersen, J. 2006. Norms for environmentally responsible behaviour: an extended taxonomy. *Journal of Environmental Psychology* 26:247-261.

Triandis, H.C. 1994. *Culture and social behavior*. New York: McGraw Hill.

United States Energy Information Administration (US EIA). 2013. *South Africa: overview*. [Online] Available from: http://www.eia.gov/countries/analysisbriefs/South_africa/south_africa.pdf. [Accessed: 2013-04-30].

United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), World Bank & World Resources Institute. 2000. *World resources 2000-2001: people and ecosystems: the fraying web of life*. Amsterdam: Elsevier.

United Nations. 2012. Rio+20 United Nations' Conference on Sustainable Development. *Agenda item 10: outcome of the conference*. [Online] Available from: <http://www.uncsd2012.org/content/documents/727The%20Future%20We%20Want%2019%20June%201230pm.pdf> [Accessed: 2013-07-13].

Van Doorn, J. & Verhoef, P.C. 2011. Willingness to pay for organic products: differences between virtue and vice foods. *International Journal of Research in Marketing*, 28(3):167-180.

Vermeir, I. & Verbeke, W. 2006. Sustainable food consumption: exploring the consumer "attitude-behavioral intention" gap. *Journal of Agricultural and Environmental Ethics*, 19:169-194.

Wagner, S.A. 2003. *Understanding green consumer behaviour: a qualitative cognitive approach*. London: Routledge.

Wall, R., Devine-Wright, P. & Mill, G.A. 2007. Comparing and combining theories to explain pro-environmental intentions: the case of commuting-mode choice. *Environment and Behavior*, 39(6):731-753.

Whitmarsh, L. 2009. Behavioural responses to climate change: asymmetry of intentions and impacts. *Journal of Environmental Psychology*, 29:13-23.

Winkler, H (ed). 2006. *Energy policies for sustainable development in South Africa: Options for the future*. Energy Research Centre, University of Cape Town. [Online] Available from: <http://www.erc.uct.ac.za/Research/publications/06Winkler-Energy%20policies%20for%20SD.pdf>. [Accessed: 2013-04-30].

World Wide Fund for Nature (WWF). 2012. *The living planet report 2012*. [Online] Available from: http://www.awsassets.panda.org/downloads/1_lpr_2012_online_full_size_single_pages_final_1250516.pdf. [Accessed: 2013-01-23].

Zabkar, V. & Hosta, M. 2013. Willingness to act and environmentally conscious consumer behaviour: can prosocial status perceptions help overcome the gap? *International Journal of Consumer Studies*, 37:257-264.

Zelezny, L.C., Chua, P. & Aldrich, C. 2000. Elaborating on gender differences in environmentalism. *Journal of Social Issues*, 56(3):443-457.

Ziramba, E. 2008. The demand for residential electricity in South Africa. *Energy policy*, 36:3460-3466.

CHAPTER 2: PRO-ENVIRONMENTAL MOTIVATION AND INTENT IN THE SOUTH AFRICAN EMERGING MARKET CONTEXT

Full paper prepared for submission to the *Journal of Environmental Psychology*.
The paper was also peer reviewed and presented as a working paper at the poster session
of the Association of Consumer Research “*Making a difference*” Conference, October,
2013, Chicago, IL, North America

Nadine C. Sonnenberg, Alet C. Erasmus & Adré Schreuder

ABSTRACT

With empirical evidence mostly addressing conditions in First-World scenarios, this study examines the role of motivational constructs as contributors to consumers’ pro-environmental intent in the South African emerging economy. Survey data obtained from 648 respondents using a store intercept method in an urban context was subjected to structural equation modeling. Findings underscore the importance of consumers’ awareness of the environmental consequences of their behaviour as well as subjective norms as indirect determinants of their pro-environmental intent. Subjective norms significantly influence perceived behavioural control as well as a combination of moral norms, guilt and attitudes. These constructs explain on average 73% variance of intent, despite the negative association between perceived behavioural control and intent.

Keywords: pro-environmental intent, motivation, green consumerism, emerging economies, South African consumers

INTRODUCTION

Economic advancement, population growth and increased consumption levels are matters which remain at the core of debates surrounding sustainable consumption in BRIICS countries (Brazil, Russia, India, Indonesia, China and South Africa) (World Wide Fund for Nature (WWF), 2012). These emerging economies are distinguished by their economic growth potential, increasing consumption patterns (Essoussi and Merunka 2007; National Statistics Offices of the BRICS Group, 2013) and an

ecological footprint that emulates that of high income industrialized countries (WWF, 2012). Continued efforts to eradicate poverty and the dissemination of materialistic Western lifestyles are particularly evident in urban areas (Chatterjee, 2008) where more citizens appear to own multiple and sophisticated, advanced versions of products (Mont and Bleischwitz 2007). These trends contribute to environmental degradation which requires intervention to improve matters in the quest for the preservation of natural resources and ecosystems.

An understanding of the internal motivational factors that would encourage consumers' pro-environmental behaviour seems crucial in the development and assessment of environmental intervention programs and marketing campaigns (Bator & Cialdini, 2000; Zelezny & Schultz, 2000; Steg & Vlek, 2009). The reported low correlation between environmental awareness / concern and environmentally significant behaviour (Oom Do Valle, Rebelo, Reis & Menezes, 2005; Eckhardt, Belk & Devinney, 2010) has caused a questioning of the influence of motivational factors on consumers' pro-environmental behaviour (Wagner, 2003; Tanner, Kaiser & Wölfling Kast, 2004). Yet, any policy, program or intervention directed toward solving the environmental crisis necessitates modification of individual private-sphere behaviour, which depends on the individual's initial acceptance of certain key values and beliefs that instill a sense of moral obligation to take appropriate action (Stern 2000). In their pursuit toward a sustainable future, citizens in emerging countries such as South Africa are however confronted with dissimilar challenges and complexities than those who reside in developed countries.

Most emerging contexts comprise two-tier populations, i.e. a developed segment that is part of the wider international global economy as well as an underdeveloped sector that remains wedged in a less affluent Third-World market (Burgess & Steenkamp, 2006). South Africa, as an example, is known to have the third highest level of income inequality in the world (Pricewaterhouse Coopers (PwC) & Economist Intelligence Unit, 2012) and even though the country's ecological footprint is slightly lower than the world average (WWF, 2012), averages do not account for the gap between rich and poor (Du Plessis, 2009). In recent years many previously disadvantaged households have merged into the middle class consumer segments (Donoghue & De Klerk, 2009; PwC & Economist Intelligence Unit, 2012) and are set apart by highly aspirational consumption patterns (PwC & Economist Intelligence Unit, 2012). The poorest segments, on the other hand, consume merely 1% of the available products and services (Rosenberg, 2006) and in terms of environmental concern, they are occasionally more concerned about environmental threats, since they often reside closer to environmental problem sites and/or industrial areas, which are in many cases more directly affected

by pollution (Rousseau, & Venter, 2001). The less affluent are also restricted in their ability to act in a pro-environmental manner merely because their choices are often limited due to circumstances beyond their control (Chokor, 2004).

Apart from socio-economic and demographic disparities, emerging economies are also characterised by cultural diversity with a typical fusion of Western and Eastern cultures (Bodur & Sarigöllü, 2005). A study conducted in China (Tang, Chen & Luo, 2011) for example indicates that subjective norms and moral norms fulfill a more central role in predicting behavioural decisions than personal views/attitudes, which seem more prominent in Western cultures. Empirical evidence further indicates that Western cultures tend to adopt individual decision-making approaches, whereas traditional cultures value collectivistic orientations (Kim & Choi, 2005; Burgess & Steenkamp, 2006; Tang, et al., 2011). Although some cross-national surveys have been instrumental to describe the importance of value orientations across cultures in shaping individuals' pro-environmental behaviour (Milfont, Duckitt, & Cameron, 2006; Oreg & Katz-Gerro, 2006), empirical evidence regarding the role of motivational factors such as norms, internal attribution, guilt and perceived behavioural control in relation to consumers' pro-environmental intentions in emerging contexts remains limited. Evidently, the diversity and complexity of emerging economies present several challenges in embracing the goals of sustainable consumption. This study therefore explored the relevance of conventional theoretical insights that account for the underlying motivational constructs that relate to pro-environmental action in the emerging market context of South Africa.

THEORETICAL BACKGROUND

Motivational constructs such as values, norms, beliefs, attitudes as well as the perceived costs and benefits of action have been used by various scholars in the past to predict various types of pro-environmental behaviour (Corral-Verdugo & Frías-Armenta, 2006; Oreg & Katz-Gerro, 2006) and often form the basis of green marketing campaigns and intervention programs (Stern, 2000; Zelezny & Schultz, 2000). Two behavioural theories that have served as a platform for a number of models, are the Theory of Planned Behaviour (Ajzen, 1991), and Schwartz's (1977) Norm-Activation Theory of Altruism, which have been extensively applied in various fields including environmental psychology, marketing and consumer behaviour disciplines.

Theory of Planned Behaviour and the Norm-Activation Model

Several authors have assessed the relevance of the Ajzen's models in predicting environmentally significant behaviour (Oom Do Valle, et al., 2005; Wall, Devine-Wright & Mill, 2007; Fielding, McDonald & Louis, 2008). Theory of Planned Behaviour (TPB) and its predecessor, the Theory of Reasoned Action, is essentially built on the expectancy-value theories, which is based on the assumption that choices are made with certain expectations surrounding the outcomes and the value of such outcomes for the individual (Ajzen, 1991; Jackson, 2005). TPB and Theory of Reasoned Action however depart from the basic expectancy-value theories by incorporating subjective norms, which relates to the individual's perception of what others who are important to him/her think about the behaviour (Ajzen, 1991; Jackson, 2005). The initial Theory of Reasoned Action thus postulated that the immediate psychological antecedent of an individual's planned deliberative behaviour is intentions to perform/ behave in a specific way, and that these intentions are determined by specific attitudes toward the behaviour as well as social pressure or subjective norms surrounding the behaviour (Ajzen, 1991; Jackson 2005). TPB as a further extension of the Theory of Reasoned Action, includes an additional indicator of intention, namely perceived behavioural control, which relates to a person's perception of factors that may facilitate or inhibit the behaviour (Ajzen, 1991; Jackson, 2005; Wall, et al., 2007).

A major critique against TPB in explaining pro-environmental behaviour is that it does not account for the influence of moral factors (Jackson, 2005). In this regard, Schwartz's (1977) Norm-Activation Model postulates that altruistic behaviour such as pro-environmental behaviour occurs in response to the interrelationship of personal norms, social norms, awareness of consequences, and ascription of responsibility (Oom Do Valle, et al., 2005; Wall, et al., 2007). Personal (moral) norms, which involve feelings of moral obligation (Thøgersen, 2006) are considered the immediate antecedents of altruistic acts (Wall, et al., 2007) and initiate behaviour based on the premise that particular behaviour is "the right thing to do" (Oom Do Valle, et al., 2005). Similar to the subjective norm in the Theory of Planned Behaviour, social norms in Schwartz's model dictate "how we should behave" and is based on the values and beliefs of others (Oom Do Valle, et al., 2005; Thøgersen, 2006). Subsequently, personal- and social norms only become effective once someone becomes aware of the consequences of an act and when personal responsibility is triggered (Stern, 2000; Oom Do Valle, et al., 2005; Wall, et al., 2007). With regard to environmentally significant behaviour, an individual would therefore have to be convinced that particular circumstances or types of behaviour would place others (human and non-human) at risk (awareness of adverse consequences) and that particular types of personal conduct could prevent those consequences (ascription of responsibility to self) (Stern, 2000). By implication,

consumers would feel morally obliged to purchase environmentally friendly products if they are convinced about the environmental impact of those products and moreover, if they believe that their product choices and consumption behaviour may contribute to the preservation of the environment.

In general, the Norm-Activation Model is relevant when pro-environmental behaviour is assumed to have altruistic underpinnings with pro-social motives. The Theory of Planned Behaviour, on the other hand, acknowledges personal utility and self-interest as underpinning motives (Bamberg & Möser, 2007; Wall, et al., 2007). Yet, it may be assumed that pro-environmental behaviour involves a blend of self-interest and pro-social motives, which have led to several attempts to combine these models (Oom Do Valle, et al., 2005; Oreg & Katz-Gerro, 2006; Schuler & Cording, 2006; Wall, et al., 2007). One such amalgamation considered of particular interest for this study is the meta-analytic structural equation model of Bamberg and Möser (2007). Based on an analysis of 46 independent studies that applied the Norm-Activation Model, Theory of Planned Behaviour or similar models to pro-environmental behaviour, this model includes nine variables, *awareness of environmental problems, internal attribution; feelings of guilt, social norms, moral norms, attitude, perceived behavioural control, intention and pro-environmental behaviour*, which have to date not been attended to simultaneously in an emerging context.

Construct associations in Bamberg and Möser's Meta-Analytic Structural Equation Model

Bamberg and Möser's (2007) model provides useful theoretical insight with regard to the configuration of motivational factors that contribute to pro-environmental behaviour. Social/ subjective norms are seen to fulfill a more indirect role, whereas moral norms emerge as a third independent predictor of intention to act in an environmentally significant manner along with attitude and perceived behavioural control. Awareness of environmental problems and internal attribution are viewed as indirect determinants of pro-environmental behaviour. In line with prior empirical evidence (Oom Do Valle, et al., 2005; Wall, et al., 2007) these constructs are important preconditions for the formation of subjective and moral norms and also seem to influence the degree of perceived behavioural control as well as attitude toward pro-environmental behaviour (Bamberg & Möser, 2007).

Feelings of guilt, which are not included in the original Norm-Activation Model or Theory of Planned Behaviour, are also acknowledged as a noteworthy influence in this meta-analytic structural equation model, although the authors contend that the inclusion of this particular construct requires further empirical investigation (Bamberg & Möser, 2007). As an underlying motivational construct, the inclusion of guilt may have several implications. Guilt is activated by internal attribution and refers to a

sentiment of remorse that is provoked when the individual causes, or anticipates causing harm (Bamberg, Hunecke & Blöbaum, 2007; Bamberg & Möser, 2007). In support of the above, recent empirical evidence suggest that the concept of guilt may increase an individual’s propensity to engage in pro-environmental behaviour (Kaiser, 2006; Kaiser, Schultz, Berenguer, Corral-Verdugo & Tankha, 2008). It is argued that guilt triggers some sense of moral obligation (i.e. moral norm) to compensate for harm caused, but is also strongly associated with subjective norms (Hunecke, Blöbaum, Matthies & Höger, 2001; Bamberg, et al., 2007; Bamberg & Möser, 2007). Disparity between an individuals’ own behaviour and the behavioural standard of a social reference group could evoke feelings of guilt (Bamberg, et al., 2007; Bamberg & Möser, 2007). In this regard, subjective norms are related to moral norms, both indirectly via guilt and directly when the social group’s standards are internalized in terms of an individual’s own moral norms. Guilt is furthermore associated with attitudes and perceived behavioural control, since individuals who anticipate stronger feelings of guilt also tend to view the performance of the pro-environmental option as easier and associate more positive personal consequences with choosing a pro-environmental option (Bamberg & Möser, 2007). Figure 1 presents an overview of the construct associations specified in the meta-analytic structural equation model.

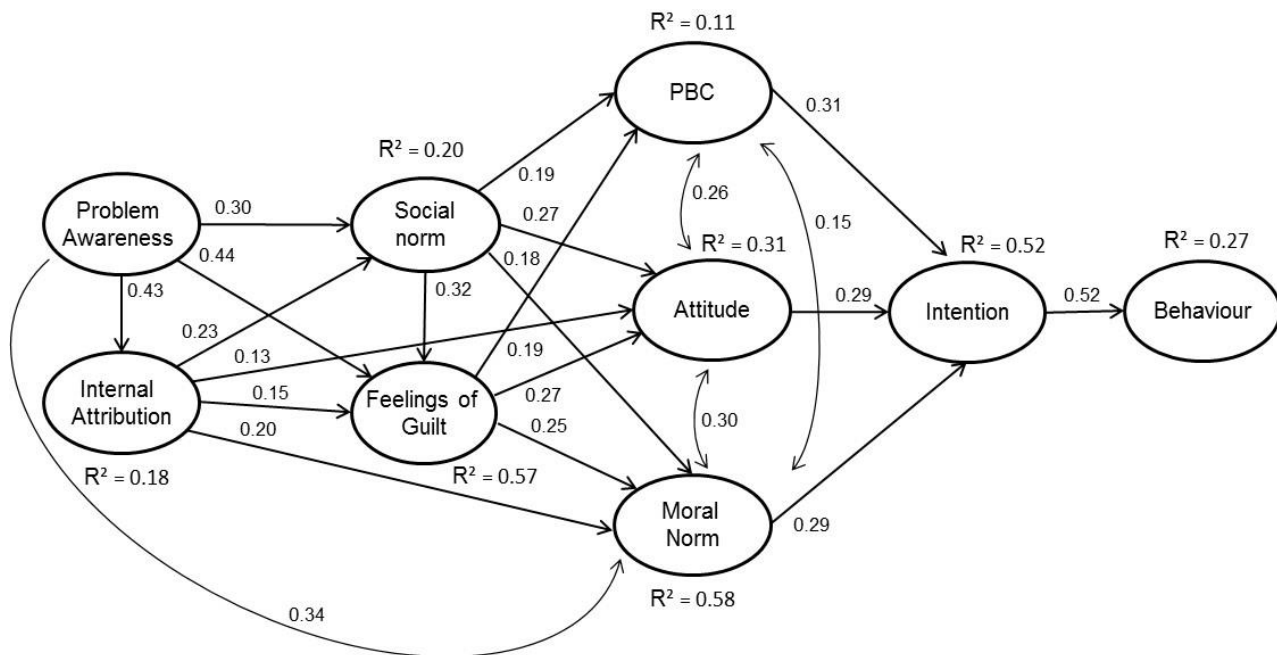


Figure 1. Meta-analytic structural equation model (Bamberg & Möser, 2007)

As indicated by Bamberg and Möser (2007), numerous studies have addressed the role of awareness, attitudes, perceived behavioural control, subjective norms and intentions in contributing to pro-environmental behaviour, yet comparatively few have included guilt and internal attribution as underlying behavioural predictors. More specifically, further empirical research is needed to establish

whether an awareness of consequences and internal attribution represent two distinct constructs and whether feelings of guilt can be separated from an individual's underlying moral obligation to act in an environmentally responsible manner. Recent empirical research also questions the discriminant validity of moral norms and attitudes arguing that moral norms are already encapsulated in people's attitudes toward pro-environmental behaviour (Kaiser, 2006; Chan & Bishop, 2013). While these debates continue, empirical evidence regarding motivational factors mostly addresses conditions in First-World scenarios. Constructs and construct associations that are specified in existing models therefore deserves further examination in emerging market contexts, especially because contextual and cultural differences may add to the intricacy and further complicate such associations.

THE PRESENT STUDY

Based on the fore mentioned arguments this study aimed to establish the relevance of motivational constructs (i.e. an awareness of environmental problems, internal attribution, guilt, moral norms, subjective norms, attitudes and perceived behavioural control) as well as the inter relationship of these constructs in terms of their contribution to an individual's pro-environmental intent to purchase a product, for example electrical appliances with eco-friendly features in the South African emerging market context. While many studies have to date explored the influence of motivational factors related to pro-environmental behaviour such as recycling, energy conservation and buying organically grown foods, comparatively few have investigated pro-environmental behaviour related to the acquisition of durable products that have significant environmental consequences on the short- as well as the long term. The reason for choosing appliances, and more specifically washing machines, as an appropriate product category is twofold. Firstly, a washing machine represents an infrequent purchase decision with significant long-term environmental implications (e.g. detergent, water and energy usage) due to the expected service life and repetitive use of the durable (McCollough, 2009; Laitala, Boks & Grimstad Klepp, 2011). Secondly, millions of South African households have in recent years gained access to electricity through intentional drives to uplift previously disadvantaged communities (Niez, 2010), which have led to increased sales of electrical appliances in the country. Currently, the overextension of the country's existing energy capacity is manifested in perpetual power failures in key urban sectors (Inglesi & Pouris, 2010). This necessitates policies, programs and intervention strategies to endorse energy efficiency and environmental sensitivity in consumers' evaluation, selection and use of appliances. Empirical evidence obtained from this study may therefore contribute to such efforts.

Research goals

Based on current theoretical debates, the initial focus of the present investigation was to validate pertinent constructs that are relevant in terms of further investigations in this study, namely consumers' general awareness of the consequences of their purchase decisions, their subsequent internal attribution, as well as guilt, moral norms and attitudes. Based on the outcomes of the fore mentioned, the study subsequently aimed to test a model that approximates the construct associations specified in Bamberg and Möser's (2007) meta-analytic structural equation model in the context of this study. Actual purchase behaviour was excluded from the model as this study exclusively investigated consumers' pre-purchase behaviour, i.e. their pro-environmental intent notwithstanding the possibility that pro-environmental intent might not necessarily culminate in the actual purchasing of a product with eco-friendly features. Findings would nevertheless provide a useful basis to develop strategies to encourage appropriate action.

Sample and procedures

South Africa's level of income inequality is among the highest in the world (PwC & Economist Intelligence Unit, 2012), which needs to be acknowledged in efforts to promote pro-environmental action. In addressing the objectives of this study, the perspectives of specific consumers were of critical importance, namely the more fortunate with increased spending power and who potentially have a higher share in the average ecological footprint. Typically these consumers have access to a wide variety of products and reside in more densely populated urban areas. Consequently, a non-probability purposive sampling approach was used to recruit consumers who were in the process of acquiring washing machines in prominent retail outlets within selected middle to upper income geographical areas of Tshwane by means of a store intercept method as arranged with the approval of the management of a major retail channel. Tshwane is the administrative capitol of South Africa and a major metropolitan area with multiple appliance retail outlets that offer a wide range of appliances with up-to-date technological innovation that is specifically targeted at more affluent consumer segments. Data was collected in structured face-to-face interviews. Demographic information pertaining to the sample is summarized in Table 1.

Table 1. Demographic characteristics of the sample

Gender	n	%	Age	n	%	Education	n	%	Population	n	%
Male	209	31.3	≥ 29	168	25.4	<Grade 12	49	7.4	White	539	81.1
Female	458	68.7	30-49	299	45.4	Grade 12	193	29.2	Other	126	18.9
			≤ 50	192	29.1	>Grade 12	419	63.4			
Total	667	100	Total	659	100	Total	661	100	Total	665	100

Note: Totals differ due to missing values

Most respondents were female (69%), which may be attributed to females' role in purchasing major household appliances. Respondents were aged between 19 and 77 years, with 25% categorized as ≤29 years; 45% as 30 to <50 years and 29% as ≥50 years. The fact that the majority of respondents were Whites (81%) and possessed a higher level of education (63%) was coincidental as willing respondents were recruited on the spot in stores while evaluating washing machines.

In terms of area of residence, 89 wards were recorded and grouped according to five municipal regions (City of Tshwane, 2008), i.e. North West region (n = 46/ 7%); North East region (n = 72/ 11%); Central West region (n = 152/ 23%); South region (n = 226/ 34%) and the East region (n = 171/ 25%). Compared to the municipal survey data of the City of Tshwane (2008), the sample mostly reflects the percentage distribution of households with a monthly household income of ≥ZAR6401 (1USD = 10.5 ZAR). Respondents' income and area of residence within the greater Tshwane metropolis is summarized in Table 2.

Table 2. Income Categories by Tshwane region

Income category	North West region		North East region		Central West region		Southern region		Eastern region		Total	
	n	%	n	%	n	%	n	%	n	%	N	%
Lower middle <15000 ZAR	37	5.9	32	5.1	68	10.8	65	10.3	66	10.5	268	42.6
Middle income ≥15000–20000ZAR	2	0.3	9	1.4	13	2.1	18	2.9	24	3.8	66	10.5
Upper middle >20000–44999ZAR	4	0.6	19	3.0	31	4.9	73	11.6	43	6.8	170	27.0
High income ≥45000 ZAR	3	0.5	8	1.2	27	4.3	60	9.5	27	4.3	125	19.9

Measures

A structured questionnaire consisting of seven sections was developed. Data from two sections are reported in this paper. The first section comprised of demographic questions pertaining to gender, age, education, household income, population group and area of residence as summarized in Tables 1 and 2. The second section involved measures for motivational constructs, which were based on scale items used in prior empirical research (e.g. Thøgerson 2006; Bamberg et al. 2007; Wall et al.

2007; Hinds and Sparks 2008). Scale items were adapted for this investigation and pre-tested to refine the question format and wording. Motivation constructs were measured on six point Likert-type scales, with response options ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). A neutral middle point was excluded, so that respondents were forced to agree or disagree.

Three items were included to measure an awareness of consequences related to the acquisition and use of washing machines. These items were patterned after measures used in previous studies relating to transport choice (Bamberg et al., 2007; Wall et al., 2007) and were adapted for the purposes of this study as follows: (1) *There is an urgent need for something to be done about the depletion of natural resources as a result of people's use of appliances;* (2) *When using a washing machine, water is consumed which has certain environmental implications;* (3) *High energy consumption of household appliances contribute to environmental problems.* These items' Cronbach α exceeded .78, confirming consistent responses to the items.

Bamberg and co-authors (2007) differentiate between items that relate to a general awareness of consequences and those that measure an awareness of consequences as a result of personal behaviour (i.e. internal attribution). Two items were patterned after measures used in prior research (Wall et al., 2007) and were adapted to address the consequences of personal product choice as follows: (1) *My product choices can have an impact on the environment;* (2) *I can help to solve environmental problems by choosing eco-friendly appliances.* Cronbach α exceeding .79 confirmed internal reliability for the measurement scale.

The influence of subjective norms have been the focus of several studies and the wording of questions usually involve referral to the opinions of friends, neighbours, family, acquaintances or a more collective referral to "people who are important to me" (e.g. Oom Do Valle et al., 2005; Thøgerson, 2006; Bamberg et al., 2007; Wall et al., 2007; Fielding et al., 2008; Hinds & Sparks, 2008). Based on Azjen's (1991) recommendations and the examples of items included in the fore mentioned studies, questions pertaining to the influence of subjective norms were formulated for this study as follows: (1) *Most people who are important to me would approve of my choice of product if it has less harmful implications for the environment;* (2) *Most people who are important to me probably think that I should consider the environmental impact of the products I buy;* (3) *I believe that most of my acquaintances expect that I should choose products that is better for the environment.* This scale's Cronbach α of .80 confirmed consistent responses to the items.

Measures for personal/ moral norms were patterned after items used by Bamberg et al. (2007) and Thøgersen (2006) and included the following: (1) *If the choice is between a conventional and an eco-friendly appliance, I feel that I should buy the eco-friendly option for the sake of the environment*; (2) *I feel morally obliged to buy eco-friendly products, regardless of what others do*. A Cronbach α of .79 confirmed inter-item internal consistency. Moral norms are closely related to feelings of guilt. Bamberg et al (2007) argue that emotional reactions such as guilt should be explored more extensively in conjunction with other motivational constructs. Based on their recommendations and measures used by Kaiser (2006) to tap into anticipated feelings of guilt, the following items were included: (1) *I would feel guilty if I knowingly bought an energy and water intensive washing machine if there are other more eco-friendly machines available*; (2) *I would feel guilty if I knowingly purchased a washing machine from a manufacturer that pollutes the environment*. A Cronbach α exceeding .74 confirmed internal reliability for the measurement scale.

Attitudes toward pro-environmental behaviour have also been extensively measured (e.g. Bamberg et al., 2007; Wall et al., 2007; Fielding et al., 2008). For this study, items used by Hinds and Sparks (2008) served as an example and was adapted as follows: (1) *For me, buying a washing machine that is more eco-friendly is pleasant*; (2) *For me, buying a washing machine that is more eco-friendly is satisfying*; (3) *For me, buying a washing machine that is more eco-friendly is good*. Although attitudes are usually measured by means of a semantic differential scale (Ajzen, 2002; Fielding et al., 2008; Hinds & Sparks, 2008), this study followed the example of Wall et al (2007) by using a Likert-type *Agreement* scale. A Cronbach α exceeding .86 confirmed internal consistency of the scale items.

In addition to subjective norms and attitudes, perceived behavioural control is a construct central to the Theory of Planned Behaviour and has been the topic of much debate. Ajzen (2002) underscored the importance of two dimensions that form the basis of perceived behaviour control, namely self-efficacy (i.e. confidence in one's ability to perform the behaviour) and controllability (i.e. degree to which performance of the behaviour is up to the individual). Based on their meta-analytic review, Armitage and Conner (2001) conclude that self-efficacy should be the preferred measure since it is more clearly defined and accounts for more variance in intention. Following the examples of Wall et al. (2007) and Oom Do Valle et al. (2005), the following items were adapted to serve as a measure of the self-efficacy dimension of perceived behavioural control: (1) *It is easy to compare washing machines in terms of their environmental impact*; (2) *Buying an eco-friendly washing machine is not a difficult task*. The Cronbach α of .66 was somewhat below the acceptable $\geq .70$.

Measures for intention were patterned after items used by Hinds and Sparks (2008) and Bamberg et al. (2007): (1) *In future I would not buy products that have a negative impact on the environment*; (2) *I intend to buy products made by companies known for being environmentally responsible*. The Cronbach α of .87 confirmed internal consistency of responses to the items.

Cronbach values for all the scales except for perceived behavioural control were $>.70$. To assess the uni-dimensionality and discriminant validity of these measures factor analysis was performed, as reported in the following section.

Results

After the data was screened, it was established that 19 cases (2.85%) of the initial 667 responses did not complete the questionnaire in full. They were thus excluded from the data set. The remaining 648 responses (N=648) were retained for confirmatory factor analyses (CFA) and structural equation modelling.

Discriminant validity of internal attribution and a general awareness of consequences

To address the question pertaining to the discriminant validity of internal attribution (i.e. an awareness of consequences related to personal behaviour) and a more general awareness of consequences, a two factor CFA model was specified using maximum likelihood estimation (SPSS Amos, version 22) with raw data as input. In this two factor model all general awareness and internal attribution items were expected to load onto their respective factors. Although the two factor model fit the data well (goodness of fit criteria summarised in Table 3), the CFA results indicated a strong correlation between the two constructs ($r = .96, p < .001$). According to Fornell and Larcker (1981), the discriminant validity of two constructs is substantiated if the average variance extracted (AVE) is higher than the shared variance of the constructs. In this case, the constructs' average AVE (.58) was much lower than their shared variance (.92), which provided confirmation that their discriminant validity could not be established. The CFA model was thus re-specified with all internal attribution and general awareness items loading on to a single factor. Careful consideration of the factor loadings led to the elimination of one internal attribution item. Compared to the two factor model, the resulting single factor model also yielded a good fit to the data (see Table 3) with some improvement in the Adjusted-Goodness-of-Fit Index (AGFI) and the relative/ normed Chi-square.

Table 3. Comparison of general awareness and internal attribution CFA models

	χ^2	<i>df</i>	<i>p</i>	χ^2/df	RMSEA	GFI	AGFI	NFI	CFI
Goodness of fit criterion ^a				≤5	<.07	≥.95	≥.90	≥.95	≥.95
Two factor model	12.418	4	.015	3.10	.057	.99	.97	.99	.99
Combined one factor	6.175	2	.046	3.09	.057	.99	.98	.99	.99

Notes. RMSEA = Root Mean Square Error of Approximation; GFI = Goodness-of-Fit Index; AGFI = Adjusted-Goodness-of-Fit Index; NFI = Normed Fit Index; CFI = Comparative Fit Index. ^aGoodness of fit criterion as recommended by Hooper, Coughlan and Mullen (2008).

The single factor was re-labeled as an “awareness of consequences”, since it may be argued that internal attribution is already captured in a broader awareness of the environmental consequences related to the acquisition and use of appliances such as washing machines.

Discriminant validity of moral norms, guilt and attitudes

To assess the discriminant validity of moral norms, guilt and attitudes, a three factor CFA model was specified in which all moral norm, guilt and attitude items were expected to load onto their respective factors. The CFA results illustrate a strong correlation between attitudes and guilt ($r = .88, p < .001$), between attitudes and moral norms ($r = .92, p < .001$) and between guilt and moral norms ($r = .92, p < .001$). Table 4 summarizes the correlation, shared variance and average AVE for each pair of constructs and based on Fornell and Larcker’s (1981) guidelines, discriminant validity could not be established for the three sets of constructs.

Table 4. Correlation, shared variance and AVE average for moral norms, guilt and attitudes

Constructs	Correlation	Shared variance	AVE average	Discriminant validity
Moral norms vs guilt	.917	.841	.634	Not evidenced
Guilt vs. attitudes	.878	.771	.642	Not evidenced
Attitudes vs. moral norms	.925	.856	.659	Not evidenced

Existing empirical evidence acknowledges the close association between moral norms and anticipated feelings of guilt (Bamberg, et al., 2007; Bamberg & Möser, 2007) and current theoretical debates question the distinctiveness of moral norms and attitudes (Kaiser, 2006; Chan & Bishop, 2013). The strong correlation between these factors in the three factor CFA model also suggests an overlap of guilt, moral norm and attitudinal items in this study. A single factor CFA model was thus proposed in which all guilt, moral norm and attitudinal items were specified to load onto one factor. Careful consideration of the factor loadings led to the elimination of one moral norm item and one guilt item and the CFA was re-run with these items removed. As summarized in Table 5, the resulting single factor CFA model demonstrated a better fit than the initial three factor model.

Table 5. Comparison of moral norm, guilt and attitudinal CFA models

Models	χ^2	df	p	χ^2/df	RMSEA	GFI	AGFI	NFI	CFI
Three factor model	58,66	11	>.001	5.3	.08	.97	.93	.98	.98
Combined one factor	23.58	5	>.001	4.7	.07	.99	.96	.99	.99

Notes. RMSEA = Root Mean Square Error of Approximation; GFI = Goodness-of-Fit Index; AGFI = Adjusted-Goodness-of-Fit Index; NFI = Normed Fit Index; CFI = Comparative Fit Index.

For the purposes of this study, the merged guilt, moral norm and attitudinal factor was re-labeled as “moral attitude” as it synchronizes a sense of moral obligation and anticipated feelings of guilt in addition to specific attitudes that relate to the behaviour in question.

Specification of the research model

Based on the outcome of the first objective of this study (i.e. an assessment of the discriminant validity of moral norms, guilt, attitude, internal attribution and awareness of consequences) a research model was specified that included the retained latent variables. The hypothesized construct associations approximates those specified in Bamberg and Möser’s (2007) meta-analytic structural equation model, with awareness of consequences and subjective norms as indirect predictors of pro-environmental intent. Figure 2 provides an overview of the hypothesized relationships:

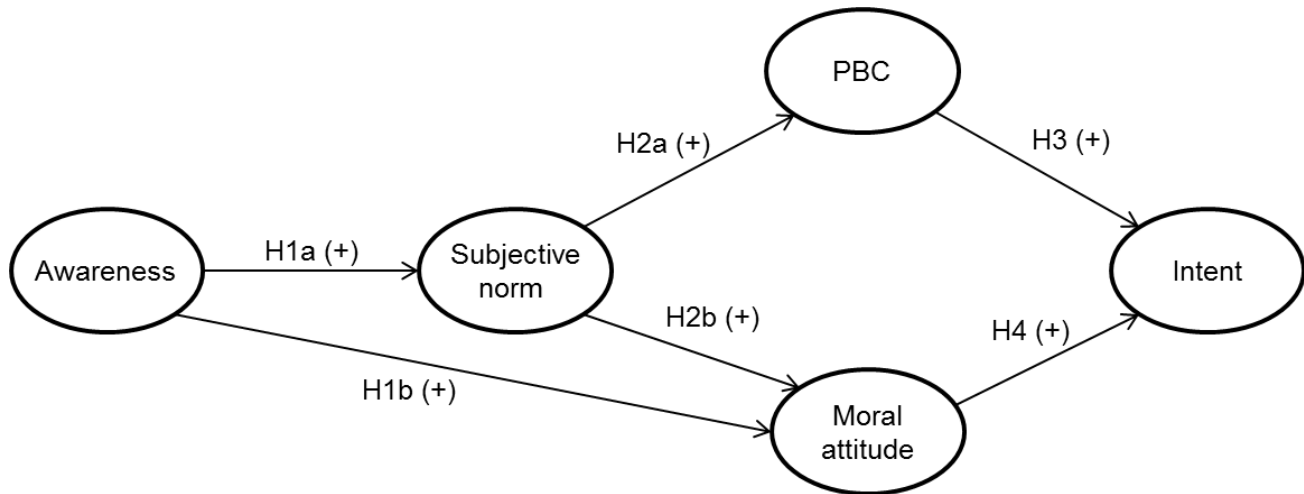


Figure 2. Schematic illustration of the research model

Relating to consumers' purchase decisions when considering new washing machines for their households the following hypotheses were formulated:

Hypothesis 1 (H1): An awareness of consequences is positively associated with subjective norms (H1a) and moral attitudes (H1b).

Hypothesis 2 (H2): Subjective norms are positively associated with perceived behavioural control (H2a) and moral attitudes (H2b).

Hypothesis 3 (H3): Perceived behavioural control (PBC) is a significant predictor of consumers' intentions to purchase washing machines with eco-friendly features.

Hypothesis 4 (H4): Moral attitudes are significant predictors of consumers' intentions to purchase washing machines with eco-friendly features.

Validity of the measurement model

The retained latent variables and items were composed as a measurement model and evaluated by means of CFA. Table 6 summarises the CFA results with all factor loadings above the threshold of .50. No modifications were applied. The model fit the data well with fit indices as follows: $\chi^2 = 277.27$, $df = 94$, $p < 0.001$, $\chi^2/df = 2.95$, GFI = .95, AGFI = .93, RMSEA = .05, NFI = 0.95 and CFI = 0.97.

Table 6. Standardized factor loadings

Latent variable items	Factor loadings
Awareness of consequences 1	.73
Awareness of consequences 2	.77
Awareness of consequences 3	.79
Awareness of consequences 4	.73
Subjective norm 1	.79
Subjective norm 2	.79
Subjective norm 3	.68
Moral attitude 1	.83
Moral attitude 2	.80
Moral attitude 3	.74
Moral attitude 4	.78
Moral attitude 5	.81
Perceived behavioural control 1	.77
Perceived behavioural control 2	.64
Intention 1	.86
Intention 2	.88

Correlations, means, standard deviations and Cronbach's α for the latent variables are summarized in Table 7. Results indicate that means calculated for respondents' awareness of environmental consequences, moral obligation to act in a pro-environmental manner, subjective norms, perceived

behavioural control and pro-environmental intention exceed the theoretical scale mid-point of 3. Evidently, respondents are aware that the use of washing machines has environmental consequences and that product choices can affect the environment. Similarly, respondents agree with statements pertaining to the expectations of important reference persons and their own moral obligations to act in a pro-environmental manner. They seem to be somewhat less convinced regarding the ease of choosing eco-friendly appliances, but their intentions to buy such appliances consistently reflect a pro-environmental inclination.

Table 7. Descriptive statistics and pairwise correlations

Latent variable	M	SD	α	1	2	3	4	5
1. Awareness of consequences	4.90	1.14	.84	-				
2. Subjective norms	4.21	1.31	.80	.63	-			
3. Moral attitudes	4.57	1.22	.89	.78	.76	-		
4. PBC	3.98	1.30	.66	.34	.51	.46	-	
5. Intention	4.60	1.22	.87	.77	.73	.80	.32	-

Notes. Judgments were made on a 6-point scale, PBC = perceived behavioural control, M = Mean; SD = Standard deviation, α = Cronbach's alpha

Correlations between an awareness of consequences, moral attitude, subjective norms and intentions were high, which again brought discriminant validity into question. Table 8 indicates that the discriminant validity of awareness of consequences and moral attitudes as well as moral attitudes and intention is marginal, whereas the average AVE for the other constructs is higher than the shared variance, which substantiates discriminant validity (Fornell & Larcker, 1981).

Table 8. Discriminant validity of constructs specified in the measurement model

Constructs	Correlation	Shared variance	AVE average	Discriminant validity
Awareness vs moral attitude	.780	.608	.600	Marginal
Awareness vs intention	.769	.591	.606	Evidenced
Subjective norm vs moral attitude	.763	.582	.600	Evidenced
Subjective norm vs intention	.729	.531	.606	Evidenced
Moral attitude vs intention	.800	.640	.635	Marginal

Structural equation model and hypotheses testing

Figure 3 denotes the structural model which approximates construct associations specified in Bamberg and Möser's (2007) meta-analytic structural equation model. Based on a maximum-likelihood estimation with raw data as input, the model's overall fit to the data was good ($\chi^2 = 278.31$, $df = 96$, $p < 0.001$, $\chi^2/df = 2.89$, GFI = .95, AGFI = .93, RMSEA = .054, NFI = 0.95 and CFI = 0.97). In this model, perceived behavioural control (PBC) and moral attitudes explained on average 73% of variance of the intention construct. In addition, the variance explained is 41% for subjective norms,

85% for moral attitude and 27% for perceived behavioural control. These percentages are substantially higher than those reported for the corresponding constructs in Bamberg and Möser's (2007) model.

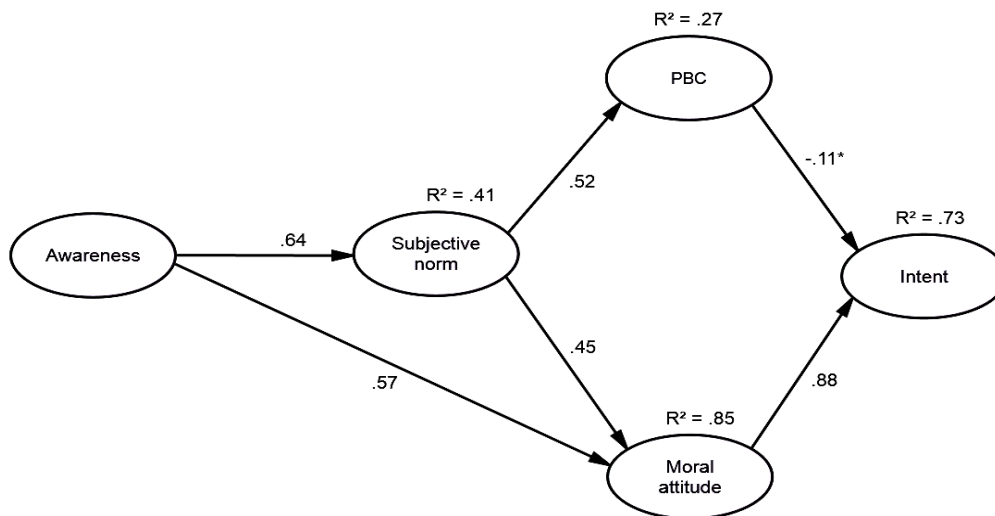


Figure 3. Final structural equation model

As summarized in Table 9, Hypotheses H1a, H1b, H2a, H2b and H4 were all supported by the data. However, Hypotheses 3 was not supported since the relationship between perceived behavioural control and intent was not statistically significant ($p = .052$). In addition, an unexpected negative association between perceived behavioural control and pro-environmental intent ($\beta = -.11, p < 0.01$) may be attributed to the complexity of the behaviour that was investigated in this study. As pointed out by Armitage and Conner (2001), effects of perceived behavioural control may vary as a function of the behaviour studied. To date most of the applications of the Theory of Planned Behaviour in which perceived behavioural control exerted a significant positive effect on pro-environmental intent have focused on habitual behaviours such as recycling, transport choice, household energy conservation or the purchasing of organically grown foods. In comparison, an individual might be less confident in their ability to evaluate and select an eco-friendly washing machine due to inexperience and lack of relevant knowledge as these decisions usually occur on an infrequent basis and are considered complex, high risk and expensive with long term implications.

Table 9. Results of the SEM analysis

Hypotheses		Standardized β (SE)	Supported
H1a	Awareness \rightarrow subjective norm	.643*** (.058)	Yes
H1b	Awareness \rightarrow moral attitude	.568*** (.051)	Yes
H2a	Subjective norm \rightarrow PBC	.524*** (.052)	Yes
H2b	Subjective norm \rightarrow moral attitude	.446*** (.042)	Yes
H3	PBC \rightarrow intent	-.107** (.055)	No
H4	Moral attitude \rightarrow intent	.884*** (.054)	Yes

Notes. *** $p < .001$; ** $p < .01$. PBC = perceived behavioural control

In so far as the other construct associations are concerned, all path coefficients were positive and statistically significant ($p < .001$). Moral attitude is the strongest predictor of intent ($\beta = .884$, $p < .001$), which supports Hypotheses 4. The results also reveal that subjective norms were positively related to perceived behavioural control ($\beta = .524$, $p < .001$), and moral attitudes ($\beta = .446$, $p < .001$), thus confirming Hypotheses H2a and H2b. Furthermore, awareness is positively related to moral attitudes ($\beta = .568$, $p < .001$), with an even stronger relation to subjective norms ($\beta = .643$, $p < .001$). Hypotheses H1a and H1b are therefore also supported. An awareness of consequences had no reported effect on perceived behavioural control in Bamberg and Möser's (2007) model, and also had no statistical significance in this model ($\beta = .02$, $p = .733$).

DISCUSSION AND CONCLUSION

Developing countries have their share of environmental problems such as an increased demand on natural resources, problems with waste management, carbon dioxide emissions and the loss of biodiversity (Mont & Bleischwitz, 2007; WWF, 2012), which require environmental intervention initiatives similar to those in the developed world, e.g. to create environmental awareness through information provision; to stimulate positive attitudes toward environmentally sound alternatives and to create markets for green products (Bodur & Sarigöllü, 2005; Mont & Bleischwitz, 2007). This study examined the relevance of conventional theoretical insights that account for the underlying motivational constructs that amount to pro-environmental intent to acquire a product with lasting environmental implications in the emerging market context of South Africa. Results indicate that constructs and construct associations specified in existing models may differ depending on the type of behaviour under investigation and the specific context in which data is collected.

The initial CFA brought to light that an awareness of the consequences associated with consumers' purchase and use of washing machines in general and those that relate to an individual's own internal ascription of responsibility does not represent distinguishable concepts. In contrast to Western

cultures that demonstrate a proclivity for individual decision-making, emerging market contexts such as South Africa tend to portray collectivistic orientations (Burgess & Steenkamp, 2006). In this regard, it may be argued that the individual's perception of their own contribution and responsibility toward environmental consequences and those that relate to consumer population at large becomes less distinct. In a recent study completed in the same geographic area (Marx-Pienaar, 2014), a knowledge test revealed that 70% of the respondents believed that the average citizen can do very little to reduce climate change. In addition, the scale items used in this study, despite being patterned after existing measures, did not effectively differentiate between items that relate to the consequences of behaviour in general and the individuals' own internal ascription of responsibility for such behaviour. Further scale development may thus benefit future attempts to discriminate between these constructs.

Based on current theoretical debates, this study further sought empirical verification of the discriminant validity of moral norms, guilt and attitudes as separate dimensions related to an individual's motivation to engage in pro-environmental action. In accordance with the findings of Chan and Bishop (2013) as well as Kaiser (2006), the results of this study substantiate the lack of discriminant validity between moral norms and attitudes. As argued by the fore mentioned authors, people's attitudes towards pro-environmental behaviour are often deeply entrenched in moral norms. Moral norms are therefore either a significant precursor of attitudes, or as in this case, represent the same underlying construct. Similarly, guilt elicits a sense of moral obligation to take appropriate action (Bamberg et al., 2007; Bamberg & Möser, 2007) and may therefore be inherent to person's underlying moral norms and attitude toward a particular behaviour. It is however important to recognize that common method variance cannot be precluded as the underlying basis for the observed high correlation among these factors, which emphasizes the need for further empirical evidence to substantiate the uni-dimensionality of the constructs.

Due to the amalgamation of awareness of environmental problems with internal attribution as well as the merge of items related to guilt, moral norms and attitudes, the construct associations that are specified in Bamberg and Möser's (2007) model could only be partially supported. In line with their findings, the conclusion drawn from this study is that an awareness of environmental consequences caused by product choice and consumption is an indirect determinant of pro-environmental intent and represents an important precondition for the formation of subjective norms and moral attitudes. The strong association between subjective norms and moral attitudes underscore the importance of a social group's standards in the formation of an individual's own moral norms and attitudes. Admittedly, collectivism and social group standards are important influences in emerging economies such as

South Africa (Burgess & Steenkamp, 2006). Path coefficients between an awareness of consequences and subjective norms and between subjective norms and perceived behavioural control were substantially higher in this model than those reported in Bamberg and Möser's (2007) model. However, in relation to perceived behavioural control, subjective norms may have an informative rather than purely normative role, since individuals tend to rely on the opinion of others when they have less confidence in their own ability to perform the behaviour in question.

The statistically non-significant and negative association between perceived behavioural control and intent draw the attention to several key issues. Firstly, it is important to acknowledge that the Cronbach alpha for the scale failed to reach the 0.70 threshold, which may compromise statistical conclusion validity. The results may nevertheless imply that respondents were less confident in their own ability to comprehensively evaluate and select a washing machine with eco-friendly attributes due to a lack of requisite knowledge and skills. From a practical point of view, much can therefore be done to implement informational strategies that could enhance consumers' knowledge and understanding of their product choices. Yet, in addressing the nature and measurement of perceived behavioural control, Ajzen (2002) suggested that measures should tap into self-efficacy, i.e. the confidence in one's own ability to perform a behaviour, as well as controllability of factors that are external to the actor such as the perceived situational opportunities for an individual to act in a pro-environmental manner (Tang et al., 2011). In the context of this study, situational opportunities may involve issues such the availability, affordability and competitiveness of eco-friendly alternatives in the South African major household appliance market, as well as the accessibility of information relating to appliances' environmental implications. Since the combined effect of these dimensions may have a more significant effect on pro-environmental intent, it would be imperative for future research endeavors to extend the measurement of perceived behavioural control to include items that both relate to self-efficacy and controllability.

The specific effect of self-efficacy and controllability in the translation of intention into action however also warrants further investigation. Although Armitage and Conner (2001) found that self-efficacy may account for more variance in intention, they emphasize that a combination of self-efficacy and the controllability over factors that extend beyond the individual's intrinsic personal domain may facilitate an individual's eventual enactment of their intent. Furthermore, prior empirical evidence suggests that the more difficult, time-consuming, or expensive a given type of behaviour is, i.e. the higher the risk involved and the less of a necessity or tangibly rewarding it is, the weaker the dependence of the behaviour on motivational variables (Stern 2000; Tanner et al., 2004). Thus, even though individuals

may develop a sense of moral obligation and intent to take pro-environmental action, their ability (i.e. knowledge and skills) and situational /contextual circumstances may mediate the path from intent to eventual behaviour. In this regard, future investigation should focus on a broader scope of causal factors that extend beyond underlying motivational factors to incorporate situational forces and personal capabilities such as knowledge and experience that may mediate the intention-behaviour relationship and culminate in a consumers' prioritization of products' eco-friendly features.

In light of the fore-mentioned arguments, an apparent limitation of the current study relates to its exclusive focus on pro-environmental intent, which excluded a measurement of consumers' actual behaviour. Self-reported measures of behaviour have been widely acknowledged as a problematic issue in social psychological data (Armitage & Conner, 2001) and also more specifically in the environmental domain (Steg & Vlek, 2009). The measurement of actual behaviour is not always feasible, which requires methods that are more adept at predicting pro-environmental choice behaviour. In the consumer behaviour and marketing disciplines, conjoint analysis have been successfully employed to predict consumers' preferences across multi-attribute alternatives (Hair, Black, Babin, Anderson & Tatham, 2006) and have also gained momentum in environmentally related studies to establish consumers' prioritization of eco-friendly features in relation to other more conventional product attributes (Alriksson & Öberg, 2008). These methods may thus benefit future research relating to eco-friendly product choices, since they reveal consumers' preferences in a more indirect, experimental manner, while maintaining a high degree of realism (Hair et al., 2006).

Although this study provides important insight regarding the relevance of motivational constructs in an emerging market context such as South Africa, results should be interpreted cautiously as it is based on a non-probable purposive sample and can therefore not be generalised to the larger South African population. In particular, the influence of various demographic variables can not be accounted for in shaping South African consumers' pro-environmental intent in a representative manner. Despite the reported inconsistency between socio-demographic variables and people's concern about environmental issues in more developed contexts (Diamantopoulos, Schlegelmilch, Sinkovics & Bohlen, 2003), certain demographic characteristics may be worthy of further investigation due to the contextual and cultural complexities of emerging economies. A more representative account of the cultural heterogeneity in the broader South African population may highlight further differentiation with regard to the effect of certain constructs such as subjective and moral norms. Moreover, prior research suggests that collectivistic value orientations, which are prevalent in emerging economies, positively influenced individuals' beliefs about self-efficacy, which in turn increased consumers'

tendency to buy green products (Kim & Choi 2005). Value dimensions could thus represent worthwhile anchoring dimensions for further exploration and to establish how cultural differences in emerging contexts influence consumers' actions. (Oreg & Katz-Gerro, 2006). In this regard, theoretical frameworks such as the Value-Belief-Norm (VBN) Theory (Stern, 2000), deserves to be mentioned, because it includes value dimensions in conjunction with some of the aforementioned motivational constructs.

REFERENCES

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control and the theory of planned behavior. *Journal of Applied Social Psychology*, 32(4), 665-683.
- Alriksson, S., & Öberg, T. (2008). Conjoint analysis for environmental evaluation: a review of methods and applications. *Environmental Science and Pollution Research*, 15(3), 244-257.
- Armitage, C.J., & Conner, M. (2001). Efficacy of the Theory of Planned Behaviour: a meta-analytic review. *British Journal of Social Psychology*, 40, 471-499.
- Bamberg, S., Hunecke, M., & Blöbaum, A. (2007). Social context, personal norms and the use of public Transportation: two field studies. *Journal of Environmental Psychology*, 27, 190-203.
- Bamberg, S., & Möser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: a new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of Environmental Psychology*, 27, 14-25.
- Bator, R.J., & Cialdini, R.B. (2000). The application of persuasion theory to the development of effective proenvironmental public service announcements. *Journal of Social Issues*, 56(3), 527-541.
- Bodur, M., & Sarigöllü, E. (2005). Environmental sensitivity in a developing country: consumer classification and implications, *Environment and Behavior*, 37(4), 487-510.
- Burgess, S.M., & Steenkamp, J.E.M. (2006). Marketing renaissance: How research in emerging markets advances marketing science and practice. *International Journal of Research in Marketing*, 23, 337-356.
- Chan, L., & Bishop, B. (2013). A moral basis for recycling: extending the theory of planned behaviour. *Journal of Environmental Psychology*, 36, 96-102.
- Chatterjee, D.P. (2008). Oriental Disadvantage versus Occidental Exuberance: Appraising Environmental concern in India – A case study in a Local Context. *International Sociology*, 23(1), 5-33.

- Chokor, B.A. (2004). Perception and response to the challenge of poverty and environmental resource degradation in rural Nigeria: case study from the Niger Delta. *Journal of Environmental Psychology*, 24, 305-318.
- City of Tshwane. (2008). *City of Tshwane Municipality Household Survey, 2008*. Retrieved from http://www.tshwane.gov.za/AboutTshwane/CityManagement/CityDepartments/City%20Planning,%20Development%20and%20Regional%20Services/Related%20Docs/CoT_HouseholdSurvey2008.pdf
- Corral-Verdugo, V., & Frías-Armenta, M. (2006). Personal normative beliefs, antisocial behavior, and residential water conservation. *Environment and Behavior*, 38(3), 406-421.
- Diamantopoulos, A., Schlegelmilch, B.B., Sinkovics, R.R., & Bohlen, G.M. (2003). Can socio-demographics still play a role in profiling green consumers? A review of evidence and empirical investigation. *Journal of Business Research*, 56, 465-480.
- Donoghue, S. & De Klerk, H.M. (2009). The right to be heard and to be understood: a conceptual framework for consumer protection in emerging economies. *International Journal of Consumer Studies*, 33, 456-467.
- Du Plessis, M. (2009). *The state of the planet: your company's role*. In Trialogue, World Wide Fund for Nature South Africa (WWF-SA) & Indalo Yethu. 2009. The Environmental Handbook. Inaugural ed. Cape Town: Trialogue.
- Eckhardt, G.M., Belk, R., & Devinney, T.M. (2010). Why don't consumers consume ethically? *Journal of Consumer Behaviour*, 9, 426-436.
- Essoussi, L.H., & Merunka, D. (2007). Consumers' product evaluations in emerging markets: Does country of design, country of manufacture, or brand image matter? *International Marketing Review*, 24(4), 409-426.
- Fielding, K.S., McDonald, R., & Louis, W.R. (2008). Theory of planned behaviour, identity and intentions to engage in environmental activism. *Journal of Environmental Psychology*, 28, 318-326.
- Fornell, C., & Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, February, 39-50.
- Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). *Multivariate data analysis*, 6th Edition. Pearson Education Inc.: New Jersey.
- Hinds, J., & Sparks, P. (2008). Engaging with the natural environment: the role of affective connection and identity. *Journal of Environmental Psychology*, 28, 109-120
- Hooper, D., Coughlan, J., & Mullen, M.R. (2008). Structural equation modelling: guidelines for determining model fit. *The Electronic Journal of Business Research Methods*, 6(1), 53-60. Retrieved from: www.ejbrm.com.

- Hunecke, M., Blöbaum, A., Matthies, E., & Höger, R. (2001). Responsibility and environment: ecological norm orientation and external factors in the domain of travel mode choice behavior. *Environment and Behavior*, 33, 830-852.
- Inglesi, R., & Pouris, A. (2010). Forecasting electricity demand in South Africa: a critique of Eskom's projections. *South African Journal of Science*, 106(1/2), 50-53.
- Jackson, T. (2005). Motivating sustainable consumption: a review of evidence on consumer behaviour and behavioural change. *Sustainable Development Research Network*. Retrieved from http://www.hiveideas.co.uk/attachments/044_motivatingconfinal_000.pdf.
- Kaiser, F.G. (2006). A moral extension of the theory of planned behavior: norms and anticipated feelings of regret in conservationism. *Personality and Individual Differences*, 41, 71-81.
- Kaiser, F.G., Schultz, P.W., Berenguer, J., Corral-Verdugo, V., & Tankha, G. (2008). Extending planned environmentalism: anticipated guilt and embarrassment across cultures. *European Psychologist*, 13(4), 288-297.
- Kim, Y., & Choi, S.M. (2005). Antecedents of Green Purchase Behavior: An examination of Collectivism, Environmental Concern, and PCE. *Advances in Consumer Research*, 32, 592-599.
- Laitala, K., Boks, C., & Grimstad Klepp, I. (2011). Potential for environmental improvements in laundering. *International Journal of Consumer Studies*, 35, 254-264.
- Marx-Pienaar, J.M.M. (2014). *A global perspective on Tshwane households' fresh produce consumption and waste management amidst concerns over climate change*. Unpublished doctoral thesis. Pretoria: University of Pretoria.
- Milfont, T.L., Duckitt, J., & Cameron, L.D. (2006). A cross-cultural study of environmental motive concerns and their implications for pro-environmental behaviour. *Environment and Behavior*, 38(6), 745-767.
- McCullough, J. (2009). Factors impacting the demand for repair services of household products: the disappearing repair trades and throwaway society. *International Journal of Consumer Studies*, 33, 619-626.
- Mont, O., & Bleischwitz, R. (2007). Sustainable Consumption and Resource Management in the Light of Life Cycle Thinking. *European Environment*, 17, 59-76.
- National Statistics Offices of the BRICS group. 2013. BRICS joint statistical publication. 4th ed. Retrieved from http://www.statssa.gov.za/news_archive/Docs/FINAL_BRICS%20PUBLICATION_PRINT_23%20MARCH%202013_Reworked.pdf

- Niez, A. (2010) Comparative study on rural electrification policies in emerging economies: keys to successful policies. International Energy Agency. Retrieved from <http://www.iea.org/publications/freepublications/publication/name,3880,en.html>.
- Oom Do Valle, P., Rebelo, E., Reis, E., & Menezes, J. (2005). Combining behavioral theories to predict recycling involvement. *Environment and Behavior*, 37(3), 364-369.
- Oreg, S., & Katz-Gerro, T. (2006). Predicting pro-environmental behaviour cross-nationally: values, the Theory of Planned Behavior, and Value-Belief-Norm Theory, *Environment and Behavior*, 38(4), 462-483.
- Pricewaterhouse Coopers (PwC) & Economist Intelligence Unit. (2012). South African retail and consumer products outlook 2012-2016. Retrieved from <http://www.pwc.co.za/en/publications/retail-and-consumer-outlook.jhtml>
- Rosenberg, E. (2006). Consumerism. In *The Enviropedia. Be the Change You Want to See*. (Ed by D. Parry-Davies), pp.271-273. Be the Change edn. Simonstown: Eco-Logic Publishing CC-CK.
- Rousseau, G.G., & Venter, D.J.L. (2001). A multi-cultural investigation into consumer environmental concern. *Journal of Industrial Psychology*, 27(1), 1-7.
- Schwartz, S.H. (1977). Normative influences on altruism. In L.Berkowitz (Ed.), *Advances in experimental social psychology* (pp.221-279). New York: Academic Press.
- Schuler, D.A., & Cording, M. (2006). A corporate social performance-corporate financial performance behavioral model for consumers. *Academy of Management Review*, 31(3), 540-558.
- Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: an integrative review and research agenda. *Journal of Environmental Psychology*, 29, 309-317.
- Stern, P.C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56(3), 407-424.
- Tang, Z., Chen, X., & Luo, J. (2011). Determining socio-psychological drivers for rural household recycling behavior in developing countries: a case study from Wugan, Hunan, China. *Environment and Behavior*, 43(6), 848-877.
- Tanner, C., Kaiser, F.G., & Wölfing Kast, S. (2004). Contextual conditions of ecological consumerism: a food-purchasing survey, *Environment and Behavior*, 36(1), 94-111.
- Thøgersen, J. (2006). Norms for environmentally responsible behaviour: An extended taxonomy. *Journal of Environmental Psychology*, 26, 247-261.
- Wagner, S.A. (2003). *Understanding green consumer behaviour: a qualitative cognitive approach*. Routledge: London.

- Wall, R., Devine-Wright, P., & Mill, GA. (2007). Comparing and combining theories to explain proenvironmental intentions: the case of commuting-mode choice. *Environment and Behavior*, 39(6), 731-753.
- World Wide Fund for Nature (WWF). (2012). The living planet report 2012. Retrieved from http://www.awsassets.panda.org/downloads/1_lpr_2012_online_full_size_single_pages_final_1250516.pdf
- Zelezny, L.C., & Schultz, P.W. (2000). Promoting environmentalism. *Journal of Social Issues*, 56(3), 365-371.

CHAPTER 3: CONSUMERS' PREFERENCES FOR ECO-FRIENDLY APPLIANCES IN AN EMERGING MARKET CONTEXT

A paper accepted and in the process of publication in the
International Journal of Consumer Studies

Nadine C. Sonnenberg, Alet C. Erasmus & Adré Schreuder

ABSTRACT

At present, the South African energy supply per person surpasses that of several other developing countries in the world notwithstanding the energy crisis in the country and evidence that South Africa produces among the highest greenhouse gas emissions per unit of GDP in the world. The problem is partly due to an increased demand for major household appliances in recent years, which have resulted in an over extension of existing capacity and perpetual power failures. Increasing consumption patterns in the rapidly expanding economy of South Africa requires intentional efforts to promote more sustainable product choices for example an understanding of the relevance of environmental attributes in consumers' evaluation of product alternatives to ensure lasting environmental implications. Using Sawtooth conjoint software, trade-off tasks were compiled and included in a cross-sectional survey involving 648 households in Tshwane, South Africa to assess the relative importance of various environmental attributes (e.g. energy efficiency) in relation to other product features (e.g. brand and price) of washing machines. Aggregate results reveal that consumers across various age, income and educational levels prioritise brand and price, despite the long-term financial and environmental repercussions of product features that impact on the use of natural resources. Based on a cluster analysis, four consumer segments were identified that differ in terms of preference structures, which offer valuable insight for the development of intervention strategies and marketing campaigns. In summary, the findings underline current literature, namely that in order to facilitate pro-environmental product choices "green" product offerings must also perform competitively in terms of non-environmental attributes. Future studies should focus on a broader scope of factors, including consumers' knowledge and awareness of the environmental impact of their product choices, to better inform marketing campaigns and intervention initiatives.

Keywords: Green products, environmental attributes, conjoint analysis, emerging economies, pro-environmental choices, sustainable consumption, household appliances

INTRODUCTION

Continued poverty eradication efforts within the emerging economy of South Africa, which serves as an example for neighbouring developing African countries, have resulted in a migration of many previously disadvantaged citizens to middle and high-income groups who possess buying power similar to consumers in more developed economies (Nieftagodien and Van der Berg, 2007; Pricewaterhouse Coopers (PwC) and Economist Intelligence Unit, 2012). According to the 2012 Living Planet Report (World Wildlife Fund for Nature (WWF), 2012, p. 50), South Africa's consumption patterns increasingly reflect those of high-income countries, which has important benefits for the local economy, but also requires further consideration of the resulting environmental impact. Although South Africa's ecological footprint of 2.59 global hectares per person is slightly lower than the world average of 2.7 (WWF, 2012), averages do not negate the fact that 10% of South African households consume almost 50% of the available products and services, whereas the poorest segments consume a mere 1% (Rosenberg, 2006, p. 57). Over-consumption by consumer classes inevitably depletes natural resources upon which poorer communities often directly depend (Rogers and Ryan, 2001; Chokor, 2004). Intentional efforts are thus required to promote more sustainable product choices among middle to high-income groups who have the financial means to make alternative product choices, but that would require an understanding of the relevance of environmental attributes in their evaluation of product alternatives.

During the last decade progress was made in more developed economies to ascertain the significance of various aspects that may impact on consumers' pro-environmental product choices and -consumption. These aspects include, amongst other, socio demographic variables (Zelezny *et al.*, 2000; Diamantopoulos *et al.*, 2003), lifestyle profiles (Papaoikonomou, 2013), cognition (Wagner, 2003; Wagner-Tsukamoto and Tadjewski, 2006), motivational constructs such as values, attitudes, and beliefs (Nordlund and Garvill, 2002; Oreg and Katz-Gerro, 2006) as well as situational/ contextual factors (Tanner *et al.*, 2004). However, most research is based on conditions in high income industrialized countries and can therefore not reflect the status quo in emerging countries (Bodur and Sarigöllü, 2005), especially those with unique cultural complexities and contextual circumstances such as South Africa (Rousseau and Venter, 2001). Also, prior research has mostly focused on the factors that precede consumers' pro-environmental product choices, whereas few studies have explored the

actual purchasing context in which consumers are confronted with the reality of assessing various environmental product features in relation to non-environmental attributes, which may be particularly relevant in complex and expensive acts such as purchasing major household appliances.

Some actions may have far greater environmental impact than others (Stern, 2000). As an example, infrequent decisions to purchase major appliances have long-term implications due to the expected service life of at least ten years and the repetitive use of such durables (Erasmus *et al.*, 2005). Viewed from a “cradle-to-grave” perspective, appliances such as washing machines impact on the environment as a result of the initial energy and raw materials used in the production, transportation and the distribution of the appliance, the subsequent water, chemicals and energy consumption of the product throughout its life cycle as well as the eventual disposal of the appliance that contributes to waste and pollution (McCollough, 2009; Laitala *et al.*, 2011; Sonnenberg, *et al.*, 2011; Berkholz *et al.*, 2013). Energy usage, in particular, is a major concern in the South African (SA) context since the country is at present experiencing an energy supply crisis (Niez, 2010; U.S. Energy Information Administration (EIA), 2013), while the situation is not much different in the neighbouring Botswana, Swaziland or Mozambique (Lorenzoni and Pidgeon, 2006). Locally, the energy supply per person surpasses that of several other developing countries (Winkler, 2006) and the country has among the highest greenhouse gas emissions per unit of GDP in the world (OECD, 2013). In recent years millions of households have gained access to electricity through intentional drives to uplift previously disadvantaged communities in SA (Niez, 2010; EIA, 2013). The demand for major household appliances has thus soared in recent years and an overextension of existing capacity is manifested in perpetual power failures in key urban sectors (Inglesi and Pouris, 2010; EIA, 2013). These trends are expected to continue in the near future, which necessitates endorsing energy efficiency and environmental sensitivity in consumers’ evaluation, selection and use of major household appliances.

With numerous SA households joining the ranks of an aspiring middle-class consumer segment, many of whom are acquiring appliances for the first time (Nieftagodien and Van der Berg, 2007; PwC and Economist Intelligence Unit, 2012), this study was focused on gaining an understanding of the relative importance of environmental attributes in relation to other product features such as brand and price in consumers’ preference structures for major household appliances.

CONSUMER CHOICE DECISIONS IN THE SA WHITE GOODS INDUSTRY

Growth in the SA white goods industry has in part stemmed from the SA government's continued service delivery efforts and public housing schemes, which account for over three million homes that were built between 1994 and 2010, transferring an estimated 11 million people from informal settlements into formal housing (PwC and Economist Intelligence Unit, 2012; Department of Human Settlements, 2013). Efforts are ongoing and with an estimated backlog of 2.1 million houses to be completed in the foreseeable future (PwC and Economist Intelligence Unit, 2012) the white goods industry has substantial grounds for future expansion. Currently the industry is dominated by appliances which are imported from Germany, China, the United States, the United Kingdom, Japan and Korea (Finlay and Liechti, 2008) and approximately 25 different brands are sold in the local retail sector (Covary, 2013). LG and Samsung, which are more affordable brands, are considered key role players in this sector (PwC and Economist Intelligence Unit, 2012; Euromonitor International, 2013a) with marketing campaigns that are strongly focused on good value for money, aesthetically pleasing, feature-rich and eco-friendly appliances (Euromonitor International, 2013a).

Consumers' evaluation and selection of major household appliances can comprise of various attributes, which may have a direct or indirect impact on the environment. Washing machines, as an example, may be assessed in terms of wash load capacity, which determines the number of wash loads, water and energy consumption (Sammer and Wüstenhagen, 2006), all of which have significant environmental implications throughout the life span of the product (Otto *et al.*, 2006; Laitala *et al.*, 2011). Over the past few years, appliance manufacturers have endeavored to incorporate life cycle assessment (LCA) into their product design strategies with, amongst other, state-of-the-art sensor technology to achieve optimized consumption of energy and resources (Otto *et al.*, 2006). These initiatives have contributed to an increased availability of energy-efficient, eco-friendly product alternatives in the SA medium-to high-end white goods sector. Furthermore, in an effort to eliminate inefficient appliances on the market, and to empower consumers to make informed choices when purchasing appliances (e.g. dishwashers, washing machines, dryers, ovens, hobs, stoves, refrigerators and freezers), the SA government has recently approved a five-year project with a US\$13-million budget to implement standards and labeling for appliances that are sold locally (Lazenby, 2012; Covary, 2013). Energy labels are well known among European consumers (Sammer and Wüstenhagen, 2006) and the measures suggested for the SA market are modeled after the European Union standards (Covary, 2013).

In addition to availability and the provision of relevant information, affordability is a key issue in consumers' acceptance of eco-friendly alternatives (Aertsens *et al.*, 2009; Gam *et al.*, 2010; Lorenzoni and Pidgeon, 2006; Ritch and Schröder, 2012). Eco-friendly options are generally associated with higher costs that often inhibit pro-environmental decision-making (Wagner, 2003; Van Doorn and Verhoef, 2011). Yet, some evidence suggests that other product features e.g. functionality may supersede price as the primary choice criterion in consumers' evaluation and selection of major appliances (Sonnenberg *et al.*, 2011). Concurrently, whereas some may perceive the higher cost of an eco-friendly alternative as a constraint, others may regard it as an indication of superior quality (Stern, 2000). Price is known to have diverse meanings for individuals with different demographic and socio-psychological profiles, which may be of particular interest in terms of the spending and consumption patterns of an aspiring middle class consumer segment in the SA context (Nieftagodien and Van der Berg, 2007; PwC and Economist Intelligence Unit, 2012).

In summary, opportunities exist within the SA appliance retail sector that would allow consumers to act on their pro-environmental intentions. However, empirical findings about emerging consumers' choice of appliances, especially consumers with increased spending power and access to a wide variety of products in densely populated urban areas remain limited. These consumers' prioritization of eco-friendly product features may be of particular interest in the quest for the preservation of natural resources and ecosystems in the emerging economy of SA. Assessing the long term environmental consequences of purchasing a washing machine with eco-friendly features against more immediate gains (e.g. saving money by acquiring a cheaper conventional alternative) fit the basic assumptions that underlie the process of mental accounting (Thaler, 1985; Erasmus and Mathunjwa, 2011), i.e. consumers might regard immediate advantages more important than the longterm consequences that they might not necessarily feel or experience first hand, when they are confronted with a product purchase. Apart from environmental implications, attributes such as optimized energy- and water consumption also involve financial consequences, which may add further justification in consumers' deliberation of the immediate and future outcomes of their purchase decisions. This study was therefore focused on assessing the relative importance of environmental attributes in relation to other product features such as price and brand in middle- to high-income consumers' evaluation and selection of washing machines, a commodity that almost all households own and use (Nieftagodien and Van der Berg, 2007). The study intentionally excluded low income consumers assuming that even if they were conscious about the relevance of environmental attributes, they would have limited opportunity to choose products other than those that are cheaper and more affordable. Conjoint analysis seemed an appropriate data collection framework for these purposes as it is based on the

premise that any object/ concept is assessed in terms of a bundle of attributes (Hair *et al.*, 2006) e.g. in an actual purchase situation, consumers jointly compare several attributes such as price, brand and performance of the available alternatives in order to select the best possible option (Alriksson and Öberg, 2008).

CONJOINT ANALYSIS METHODOLOGY

Several variants of conjoint analysis have emerged over the past few years, which can be grouped in three main methodologies namely traditional-, adaptive/ hybrid- and choice-based conjoint (Hair *et al.*, 2006). Although these techniques differ in terms of design and data analysis, all of them afford the researcher insight into a respondent's preference structure across multi-attribute alternatives (Farber and Griner, 2000; Hair *et al.*, 2006; Alriksson and Öberg, 2008). The alternatives included in a conjoint study are hypothetical since the researcher specifies the attributes and the levels for each attribute beforehand (Hair *et al.*, 2006; Alriksson and Öberg, 2008). Based on the respondent's choice, rating or ranking of the hypothetical alternatives, the value (i.e. utility and part-worths) assigned to attribute levels (e.g. different prices, features or brands) can be estimated as a measure of an individual's overall preference (Hair *et al.*, 2006). Conjoint analysis is therefore classified as a decompositional method as it decomposes utility from respondents' assessments of predetermined product alternatives (Green *et al.*, 2001; Alriksson and Öberg, 2008; Mazzocchi, 2008) in contrast to compositional multivariate models (e.g. regression and discriminant analyses) that "compose" predictive models based on respondents' autonomous rating of the importance of product attributes (Hair *et al.*, 2006; Alriksson and Öberg, 2008).

Although it has been argued that decompositional techniques are more adept in predicting choice behaviour (Alriksson and Öberg, 2008), it has not been exempt from critique. Since conjoint analysis relies on hypothetical situations/ products, the design phase entails several consequences if poorly executed e.g. the attributes and levels included in the conjoint task is based on the researcher's judgment and could potentially not include the respondents' true preferences (Alriksson and Öberg, 2008). Respondent fatigue and information overload are also issues frequently highlighted, since conjoint tasks can be difficult and time consuming (Sawtooth Software Inc., 2002). It is thus essential to carefully consider the amount of attributes that are included in the study (in terms of complexity and length of the questionnaire) and to pretest the question format to ensure that the conjoint task is comprehensible and easy to complete within an acceptable time frame (Sawtooth Software Inc., 2002; Alriksson and Öberg, 2008).

Despite certain drawbacks, conjoint analysis offers several benefits if it is meticulously planned and executed. In the marketing field, conjoint analysis methodologies have been extensively applied to define products with the optimum combination of features for specific customer segments and to explore the potential of products with attribute combinations that are not yet available (Green *et al.*, 2001; Hair *et al.*, 2006; Mazzocchi, 2008). Since the mid-1990s, conjoint analyses have also gained momentum in environmental studies with applications focused on issues such as ecosystem management, environmental evaluation, environmental policy development, public preferences regarding industrial projects, energy, recreation and consumer preferences for environmentally certified products (Faber and Griner, 2000; Alriksson and Öberg, 2008). Eco-friendly product evaluation and green consumer behaviour is recognized as particularly relevant in the future application of conjoint analyses, especially in terms of the development of new products with eco-friendly features (Alriksson and Öberg, 2008).

In recent years, several software packages have been developed to facilitate the application of the various conjoint methodologies (Green *et al.*, 2001; Hair *et al.*, 2006; Alriksson and Öberg, 2008; Mazzocchi, 2008). For the purpose of this study, the Conjoint Value Analyses (CVA) Sawtooth software package was used to conduct a paired-profile conjoint analysis (Sawtooth Software Inc., 2002). This method incorporates the traditional principles of conjoint analysis in the conjoint task and employs an additive model of consumer preference (Hair *et al.*, 2006, p. 464). The method was suited to this study as the number of attributes included in the investigation was less than ten (Hair *et al.*, 2006, p. 475) and a basic model in terms of estimation procedures was considered appropriate (Hair *et al.*, 2006, p. 461). The method also allowed for the transferal of computer generated conjoint tasks/profiles to paper based questionnaires, which was essential for data collection purposes in this study. In general, conjoint analysis represents a useful approach for environmentally related studies, since it reduces socially desired answers by revealing consumer preferences in a more indirect manner (Sammer and Wüstenhagen, 2006) while maintaining a high degree of realism (Hair *et al.*, 2006). Surveys tend to overestimate consumers' willingness to engage in environmentally responsible behaviour because of social response bias (Mohr *et al.*, 2001). Studies often rely on self-reported behaviour, which do not always reflect actual, observed behaviour (Steg and Vlek, 2009). Since the measurement of actual behaviour is at times problematic, valid and reliable measures that are more adept in predicting pro-environmental choice behaviour is needed (Alriksson and Öberg, 2008; Steg and Vlek, 2009).

Questionnaire development and the CVA design

A structured questionnaire was developed and pre-tested for this study. The questionnaire included, amongst other, a section consisting of demographic questions pertaining to gender, age, education level, household size, income, population group and area of residence as well as a section involving carefully designed conjoint tasks. The design phase is critical to the success of any conjoint project (Sawtooth Software Inc., 2002; Alriksson and Öberg, 2008) and therefore the initial step in creating a CVA design is the compilation of an appropriate choice set. The choice set for this study included specific factors/ attributes (e.g. price and washing programmes as presented in Figure 1) and the levels for each factor (e.g. different price levels and different washing programmes) that were considered relevant in consumers' evaluation and selection of automatic washing machines. Due to the complexity of their design, washing machines require more resources for production compared to other appliances such as refrigerators (Otto *et al.*, 2006), but it is also a category in which significant progress has been made to ensure optimum eco-efficiency (Otto *et al.*, 2006; Euromonitor International, 2013b). Decisions pertaining to the inclusion of specific attributes and levels were guided by an extensive review of catalogues, brochures and websites of appliance manufacturers and retailers as well as prior empirical evidence regarding consumers' evaluation and selection of appliances (Sammer and Wüstenhagen, 2006; Erasmus *et al.*, 2011; Sonnenberg *et al.*, 2011).

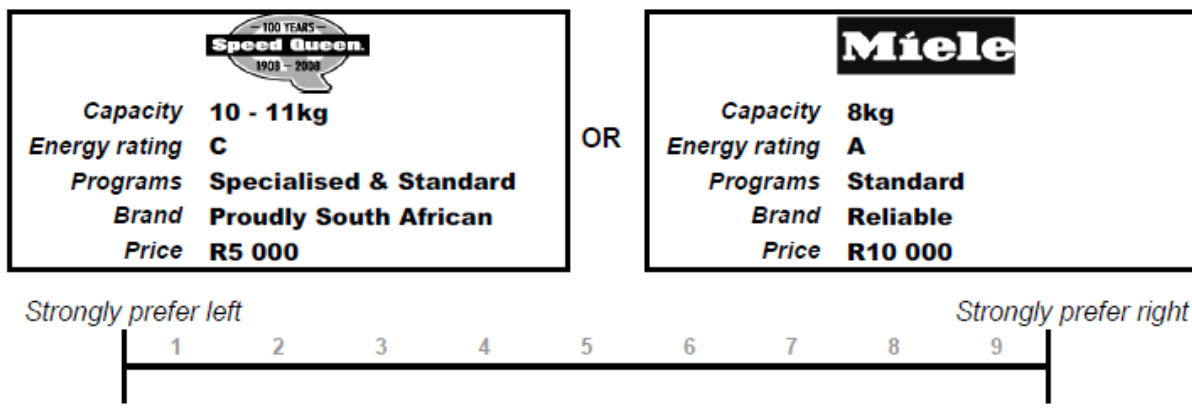


Figure 1. Example of a pair wise task

Environmentally related attributes that were included in the choice set were energy efficiency ratings, wash load capacities and washing programmes/ cycles. To reduce the complexity and length of the questionnaire, a parsimonious approach was adopted in the specification of levels for each factor with careful consideration of the relevance of each level in consumers' assessment of alternatives. As an example, energy efficiency ratings were included rather than actual energy consumption, because consumers tend to interpret A+, A, B or C energy efficiency ratings in a more meaningful manner than

kWh/ wash cycle (Sammer and Wüstenhagen, 2006). Since most washing machines sold within the middle to high-end sector have high energy efficiency ratings, only four levels were specified for this attribute. Similarly, a basic classification and description of washing machine programmes was included in the questionnaire rather than the broad range of available wash cycles that differ substantially in terms of energy- and water consumption. However, to avoid misinterpretation a list of definitions was attached to the conjoint task (Alriksson and Öberg, 2008), which explained what energy efficiency ratings meant and how wash cycles differed in terms of functionality, water- and energy consumption. Wash load capacity levels were specified according to the available range of models in appliance retail outlets. Price, brand and brand perception were also recognized as important selection criteria in consumers' choice of products (Sammer and Wüstenhagen, 2006; Erasmus *et al.*, 2011; Sonnenberg *et al.*, 2011) and levels were specified based on relevant market information.

During the design of the combinations of factors and attribute levels, it inevitably happened that some of the combinations were somewhat extraordinary, for example presenting a brand which is generally quite expensive at a very affordable price and vice versa. This was necessary to determine consumers' price sensitivity and their determination to purchase a specific brand. Having specified the different factors/ attributes and levels, CVA Sawtooth software was employed to create the conjoint tasks. Washing machines were described in terms of all six attributes, with each conjoint task presenting the attributes at different levels. CVA software applies D-efficiency measures (Sawtooth Software Inc., 2002; Kuhfeld and Tobias, 2005) to assess the goodness of a conjoint design in terms of orthogonality (i.e. zero correlation between pairs of attributes) and balance, which is achieved when each level within an attribute is shown an equal number of times (Hair *et al.*, 2006, p. 498; Sawtooth Software Inc., 2002). Based on 10 random versions, each consisting of 40 conjoint tasks, a final set of 40 questions was computed for the study with a D-efficiency of 0.88 which is considered satisfactory. Another useful CVA diagnostic for conjoint questionnaire design is the attribute efficiency coefficients of which the best possible value is 1.00 (Sawtooth Software Inc., 2002). Four attributes (brand, price, washing programmes and brand perception) achieved efficiency coefficients of 0.98, with capacity and energy rating achieving efficiency coefficients of 0.99. A pair wise comparison technique was used to present the conjoint tasks i.e. respondents were asked to compare two profiles at a time indicating their preference for one profile over the other on a nine-point rating scale that allowed them to make their selection on any point on the nine-increment line. The exact points were later measured meticulously. Although pair wise presentation can be fairly difficult for a respondent as it requires a comparison of two sets of information where each set may combine items that are acceptable with

some that are not, it produces finer distinctions between products with different features than single concept presentations (Sawtooth Software Inc., 2002). To reduce respondent fatigue and information overload, conjoint tasks were alternated with other scale items in the questionnaire.

Data collection and demographic profile of respondents

To address the objectives of this study, a cross-sectional survey was conducted in the city of Tshwane, the administrative capitol of SA, which is located in the Gauteng province, the economic hub of the country. Tshwane is a densely populated urban area with numerous shopping centers and retail outlets that offer a wide range, including high-end consumer goods, which best reflects the progress that the country has made in terms of the availability of goods and services in an emerging economy. An important pre-requisite for participation in the study involved experience in the purchasing of major household appliances. This resulted in a non-probability purposive sampling technique, whereby potential participants were identified by means of a store intercept approach, similar to the approach used by Sammer and Wüstenhagen (2006) in their choice-based conjoint study. Permission was obtained from stores that offer a variety of eco-friendly appliances, to approach consumers who were in the process of acquiring washing machines. Respondents who were willing and able to participate in the study were asked to complete a questionnaire on the spot in a structured face-to-face interview.

A total of 648 questionnaires were retrieved for analyses. Most respondents were female (69%), presumably due to females' leading role in acquiring major household appliances as observed in stores. Ages ranged between 19 and 77 years, with 25% categorized as ≤ 29 years; 45% as 30 to <50 years and 29% as ≥ 50 years. Prior empirical evidence confirms that households spend more on appliances in the middle and later stages of the life cycle (Erasmus *et al.*, 2002). The majority of respondents were White (81%) and possessed a higher level of education, i.e. post-secondary school diploma or degree (63%). In formulating the objectives of this study, focus was directed toward middle to high income consumers due to their proportionally higher share in the average ecological footprint. Consequently, 47% of the sample was of the upper middle- to high income- and 53% of the middle to lower middle income segments. In terms of area of residence, 89 geographic wards were recorded and grouped according to five municipal regions (City of Tshwane, 2011), i.e. North West region ($n = 46/ 7\%$); North East region ($n = 72/ 11\%$); Central-Western region ($n = 152/ 23\%$); Southern region ($n = 226/ 34\%$) and the Eastern region ($n = 171/ 25\%$). The study hence aimed to include a proportional sample of the population in accordance with municipal survey data (City of Tshwane, 2008), which

confirms a percentage distribution of households with a monthly household income of \geq ZAR 6401 (1 USD = 10.5 ZAR) in the various regions.

RESULTS AND DISCUSSION

CVA software provides two options for part-worth utility estimation including ordinary least squares (OLS) and monotone regression (Sawtooth Software Inc., 2002). Since the dependent variable was interval scaled, an OLS estimation method was applied (Alriksson and Öberg, 2008; Sawtooth Software Inc., 2002). The results are summarised in Table 1. This estimation includes 25 920 observations based on the responses of 648 individuals, each performing 40 paired comparison choice tasks. For conjoint analysis, the statistical assumptions associated with model estimation is generally limited (Hair *et al.*, 2006, p. 501). The average R^2 , which is a typical goodness-of-fit measure for conjoint analyses models (Baker and Burnham, 2001, p. 394) was 0.90 and the average Kendall's tau was 0.93, indicating a good fit.

Based on the results summarized in Table 1, respondents across various age, population, income and educational levels prioritised price, brand and brand perception, despite the long-term economic and environmental repercussions of product features that impact on the use of natural resources, such as the machine's load capacity, energy efficiency ratings and choice of washing cycles. On an aggregate level, price was the most important attribute in respondents' choice of washing machines. Price levels ranged from 3000 ZAR to 18000 ZAR (1 USD = 10.5 ZAR), with price levels higher than 8000ZAR obtaining negative utility values. Respondents are therefore reluctant to pay more than 8000ZAR for a washing machine, which excludes some of the more sophisticated brands such as Miele that focus strongly on environmentally friendly attributes. Brands and brand perceptions also featured prominently in respondents' preference structures. Brands that obtained the highest utility values namely LG (12.85), Defy (11.83) and Samsung (10.00), coincide with those reported to have the highest market share in the SA home laundry appliances sector (Euromonitor International, 2013b). According to Euromonitor International (2013b), LG electronics dominates this sector with a 27% overall share; Defy Appliances Ltd holds the second largest market share at approximately 23% and Samsung Electronics achieved the third highest market share at 13% in 2012. LG and Samsung, in particular, are supported by marketing campaigns that are strongly focused on "eco-efficiency" (Euromonitor International, 2013b), which may have contributed to the high utility value (14.26) assigned to eco-friendly brand perceptions.

Table 1 Aggregate results of the conjoint value analyses for washing machines

Attribute	Factor importance	Attribute levels	Utility
Price (10.5ZAR = 1USD)	28.5	3000 ZAR	42.44
		4000 ZAR	37.20
		5000 ZAR	24.07
		6000 ZAR	7.71
		7000 ZAR	10.12
		8000 ZAR	1.19
		10000 ZAR	-15.08
		14000 ZAR	-44.75
		18000 ZAR	-62.90
Brand	24.5	Defy	11.83
		Whirlpool	-9.71
		Samsung	10.00
		LG	12.85
		Miele	-21.38
		Bosch	-2.91
		AEG	-2.05
		Siemens	-1.45
		Speed Queen	2.82
Brand perception	14.9	Eco-friendly	14.26
		Reliable	-2.34
		Affordable	1.01
		Innovative	-0.42
		Respected	-7.22
		Prestigious	-7.03
		Proudly SA	1.73
Energy rating	14.5	A+	31.57
		A	12.05
		B	-12.58
		C	-31.04
Washing cycles	10.9	Standard ^a	-5.51
		Standard and eco-friendly ^b	12.85
		Standard and convenience ^c	-6.04
		Standard and hygiene ^d	-5.97
		Standard and specialized ^e	4.66
Load capacity	6.8	7 kg	-11.30
		8 kg	1.79
		10 kg	9.50

Washing programmes were described as follows:

^aStandard programmes include conventional wash cycles for cottons, synthetics, delicate fabrics and woolsens;

^bEco-friendly programmes use up to 50% less energy and/or water without compromising on results;

^cConvenience programmes are less than 30 minute “quick wash” and “reduced ironing” cycles;

^dHygiene programmes use high temperatures and high water levels for high standard of cleanliness;

^eSpecialized programmes are for soft toys, pillow, sport shoes, sportswear and curtains.

Interestingly, the Proudly SA brand perception also obtained a positive utility value (1.74). The Proudly SA campaign was originally launched in 2001 to encourage consumers to purchase locally produced products, predominantly in an effort to stimulate the local economy and to create sustainable job

opportunities (Proudly South African, [s.a.]). Of all the brands listed, Defy was the only brand accredited in accordance with the Proudly SA criteria for membership. However, it is not clear whether the utility value assigned to the Proudly SA brand perception was linked to a sense of national pride or the environmental implications of acquiring a locally manufactured product.

Despite the high utility value of eco-friendly brand perceptions, attributes that have a more immediate environmental impact (i.e. energy ratings, washing programmes/ cycles and load capacity) were less influential in respondents' choice of washing machines. This suggests that respondents do not necessarily realize the overall long-term implications of their product choices and hence rely on price and brand associations to guide their decision-making. Although energy ratings attained an average importance score (14.5%) almost equivalent to that of brand perception (14.9%), the importance of energy ratings may be attributed to escalating electricity prices in SA in recent years rather than concern for the environment. Since 2008, SA consumers have experienced substantial increases in the cost of electricity due to an energy crisis in the country (Inglesi and Pouris, 2010; EIA, 2013). Informed by several energy saving campaigns, SA consumers are now more conscious of energy consumption than ever before and sales of energy efficient A+ rated appliances have grown significantly (Euromonitor International, 2013a). As pointed out by Sammer and Wüstenhagen (2006), consumers may also associate an A+ energy rating with a high-quality product. All of the above, may account for the significant difference between the utility values of A+ (31.57) and C (-31.04) energy ratings.

Washing programmes (which impact on the environment in terms of detergent-, water- and energy usage) and load capacity were the least important criteria in respondents' product choices. Apart from their environmental impact, these features have financial implications that span over the entire life cycle of the appliance, which necessitates informed decision-making and deliberation of consequences that extend beyond the initial selection of a particular product option. Although these attributes achieved a lower ranking in respondents' preference structures, it was encouraging to note that wash cycles with a combination of standard and eco-friendly features were most preferred (utility value of 12.85). In terms of load capacity, respondents preferred the largest capacity with a significant difference in the utility values of 10 kg capacities and 7 kg capacities, which may be attributed to the fact that 60% (n=390) of the respondents belonged to households consisting of three or more members, and that a larger capacity allows for fewer wash loads per week.

Although aggregate results provide useful background regarding the average importance of various attributes across the sample, promoting environmentally significant behaviour often requires identification of target segments of individuals in order to develop tailored intervention strategies (Steg and Vlek, 2009). Cluster analysis, which are algorithms that group observations into homogeneous categories according to similarity rules are often used for segmentation purposes (Mazzocchi, 2008, p. 263) and was considered appropriate for this study. As a first step, the Euclidean distance measure, which simply refers to geometric distance in multi-dimensional space (Mazzocchi, 2008, p. 265; StatSoft Inc, 2013) was computed from the raw conjoint data and entered into a proximity matrix. The Euclidean distances were squared to progressively add more weight on observations that are further apart (StatSoft Inc, 2013). During the initial exploratory phase, a hierarchical (joining/ tree) algorithm was applied whereby it is assumed that each of the (N = 648) observations represents a separate cluster, with each consecutive step involving the amalgamation of clusters until all observations are joined together in a single cluster (Mazzocchi, 2008, p. 269; StatSoft Inc, 2013). Ward's amalgamation rule was applied, which reduces the sum of squares of clusters that are formed at each step (StatSoft Inc, 2013). Close scrutiny of the resulting dendrogram revealed four clusters, which was then used as the *a priori* *k* number of clusters in a non-hierarchical *k* –means clustering approach. Although three, five and six cluster solutions were also considered, the *k*-means method produced a four cluster solution with less variability within clusters and more variability between clusters. The Root Mean Square Standard Deviation (RMSSTD) which measures the homogeneity of the clusters were as follows: .07 (first cluster); .06 (second cluster); .05 (third cluster) and .07 (fourth cluster). Lower RMSSTD values are indicative of homogeneity of the clusters.

Based on respondents' prioritization of particular attributes in their choice of washing machines, the four clusters were labeled as brand buyers (n = 114), price punters (n = 178), energy investors (n = 104) and the indecisive shoppers (n = 252). Figure 2 illustrates the average importance of brands, prices, load capacities, energy ratings, wash cycles and brand perceptions for each of the clusters.

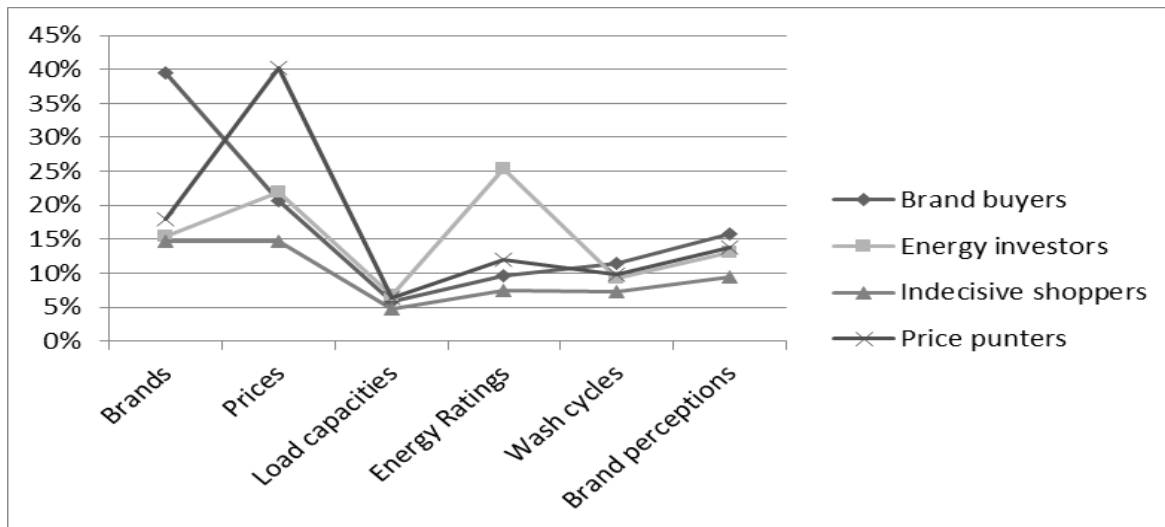


Figure 2. Relative importance of attributes for various clusters

Table 2. Demographic comparison of the clusters

	Brand buyers N = 114/ 18%		Price punters N =178/ 27%		Energy investors N = 104/ 16%		Indecisive shoppers N = 252/ 39%	
	<i>n</i>	%	<i>N</i>	%	<i>n</i>	%	<i>n</i>	%
Gender								
Male	25	21.9	66	37.1	31	29.8	83	32.9
Female	89	78.1	112	62.9	73	70.2	169	67.1
Missing	0	0.0	0	0.0	0	0.0	0	0.0
Age								
19 – 29 years	31	27.2	40	22.5	23	22.1	72	28.6
>29 - 49 years	50	43.9	85	47.8	45	43.3	110	43.7
>49 years	31	27.2	51	28.7	34	32.7	69	27.4
Missing	2	1.8	2	1.1	2	1.9	1	0.4
Education								
≤ Grade 12	42	36.8	60	33.7	36	34.6	97	38.5
Gr 12+degree/diploma	72	63.2	117	65.7	67	64.4	152	60.3
Missing	0	0.0	1	0.6	1	1.0	3	1.2
Income								
<15000 ZAR	53	46.5	63	35.4	32	30.8	108	42.9
≥15000–19999 ZAR	10	8.8	20	11.2	9	8.7	25	9.9
≥20000–44999 ZAR	27	23.7	52	29.2	31	29.8	58	23.0
≥45000 ZAR	18	15.8	37	20.8	23	22.1	44	17.5
Missing	6	5.3	6	3.4	9	8.7	17	6.7
Population group								
White	78	68.4	157	88.2	94	90.4	202	80.2
Black and other	36	31.6	20	11.2	10	9.6	50	19.8
Missing	0	0.0	1	0.6	0	0.0	0	0.0
Household size								
1 member	12	10.5	18	10.1	9	8.7	27	10.7
2 members	28	24.6	52	29.2	34	32.7	74	29.4
3-4 members	49	43.0	79	44.4	44	42.3	107	42.5
>4 members	23	20.2	29	16.3	17	16.3	42	16.7
Missing	0	0.0	0	0.0	0	0.0	2	0.8

A comparison of the four clusters (Figure 2) indicates that the brand of a product is the most important among the brand buyers (39%) and that they thereafter prioritized price (21%) more so than factors associated with environmentally related attributes such as energy rating, wash cycles and load capacities. Based on the demographic information summarized in Table 2, the brand buyer segment had a higher female to male ratio and a large representation (47%/ n=53) of lower income (<15000ZAR) groups. The majority were middle-aged, i.e. thirty to 49 years (44%/ n=50) and belonged to households with three or more members (43%/ n=49). Compared to the other clusters, this group also had a higher representation of Black, Coloured and Asian respondents (32%/ n=36).

For the price punters, price was significantly more important (40%) than any of the other attributes including brand (18%), brand perception (14%), energy ratings (12%), wash cycles (10%) and load capacity (6%). This group was the second largest cluster (n=178), accounting for 27% of the respondents, with comparatively more males (37%/ n=66) than the other clusters. Most price punters belonged to the thirty to 49 age group (48%/ n=85) and had a higher level of education (66%/ n=117). The middle and upper middle income levels (≥ 15000 -44999ZAR) were also well represented in this cluster and most price punters belonged to large households consisting of three or more members.

From an environmental perspective, the energy investors were of particular interest due to their prioritization of energy ratings (25%). However, price was almost equally important (22%), which suggest that cost implications are of primary importance in the energy investors' decision-making. This cluster only accounted for 16% of the sample and could be described as older (30-49 years: 43%/ n=45 and ≥ 50 years: 33%/ n=34), with the majority belonging to the upper middle to high income brackets (≥ 20000 ZAR). They were predominantly White (90%/ n=94), with higher levels of education (64%/ n=67) and their households mostly consisted of two to four members.

The fourth cluster, i.e. the "indecisive shoppers", was the largest of the four groups (n=252/ 39%) and seemed less confident in their prioritization of product attributes as none of the attributes seemed particularly important (<20% importance rating). Brand and price were judged equally important (15%), with the importance scores of other attributes ranging between 5% to 10%. Compared to the demographic profile of the other clusters, this group consisted of younger consumers (≤ 29 years: 27%/ n=72; 30-49 years: 44%/ n=110) of which 43% (n=108) were in the lower income bracket (<15000ZAR), possessing a basic secondary school qualification.

Researchers have argued that experience, knowledge and information contribute to consumers' confidence in their decision-making abilities (Aertsens *et al.*, 2009). Informational strategies that are focused on increasing environmental knowledge/ awareness with emphasis directed toward pro-environmental alternatives (Steg and Vlek, 2009) may therefore benefit a cluster such as the indecisive shoppers. However, when pro-environmental options are expensive, structural strategies that are aimed at changing contextual factors such as the availability, cost and benefits of greener alternatives may be more effective than information campaigns (Steg and Vlek, 2009; Stern, 2000). As an example, pricing policies or incentive schemes for adopting energy-efficient, eco-friendly alternatives may appeal to a cluster such as the price punters. In particular, strategies that emphasize the benefits and long term cost implications of investing in energy efficient technology may further promote pro-environmental choice behaviour among a group such as the energy investors. On the other hand, marketing campaigns that build on eco-friendly brand appeal may be more successful among the brand buyer cluster. SA is characterized by an increasingly large segment of middle-class consumers with aspirational spending on high-end status goods (PwC and Economist Intelligence Unit, 2012; Nieftagodien and Van der Berg, 2007). Since household technology including major household appliances, is a product category that is visually consumed and therefore perceived as an indicator of progress (Erasmus *et al.*, 2011), appliance retail and industry may benefit from brand building and image enhancement surrounding innovative green technology. Taken as a whole, a combination of strategies, both informational and contextual seems most appropriate, since expensive acts such as the purchasing of major household appliances, may be influenced by multiple factors that inhibit or promote environmentally significant choice behaviour (Steg and Vlek, 2009; Stern, 2000).

CONCLUSION AND RECOMMENDATIONS FOR FUTURE RESEARCH

Due to globalization and the influx of leading multi-national appliance manufacturers, the availability and quality of products with eco-friendly features has substantially increased in the SA high-end appliance retail sector over the past few years. Although multi-national firms have improved their environmental impact due to increased pressure from environmentally conscious consumers in developed markets, there is very limited coercion from the SA consumer populations in this regard as decision-making is still exclusively driven by price sensitivity (PwC and Economist Intelligence Unit, 2012). Marketers can therefore not solely rely on consumers' willingness to compromise on non-environmental product attributes for the sake of the environment (Gam *et al.*, 2010). In line with the above, the aggregate results of this study indicate that most consumers highly regard price in their preference structures, despite the relevance of product features with positive environmental

consequences and that may even represent long term financial benefits. In this regard, Kahneman's (2011) critique of the key role of rationality in the prevailing utility theory is justified. Alternative models may offer more insight and are thus worthy of further investigation e.g. Kahneman and Tversky's (1973) Prospect Theory, which acknowledges the irrational and insular outcomes of consumers' assessments as well as Thaler's (1985) mental accounting, whereby consumers discount future implications to benefit from the immediate gains of their choices (Erasmus and Mathunjwa, 2011).

Even though individuals may develop a sense of moral obligation and intent to take pro-environmental action, behaviour is strongly influenced by the actual purchasing context, which must be considered in efforts to promote pro-environmental product choices (Stern, 2000). In reality, eco-friendly options are assessed in terms of all features that apply to conventional alternatives. Moreover, as illustrated in the results of the cluster analysis procedure, different consumer groups may have different priorities in their evaluation and selection of particular products, which implies that marketing campaigns and intervention strategies are best tailored to the preference structures and profiles of specific target segments (Steg and Vlek, 2009).

Although information campaigns are needed to increase consumers' awareness and knowledge of the benefits of environmentally significant choice behaviour, structural intervention strategies that reduce the appeal of environmentally harmful options may be more effective (Steg & Vlek 2009). As an example, precipitous increases in the cost of electricity since the 2008 energy crisis has forced many SA households to become more energy conscious (PwC and Economist Intelligence Unit, 2012) and sales of energy efficient A+ rated appliances have soared (Euromonitor International, 2013a), which indicate some awareness of how energy efficient products can reduce energy consumption. In this regard, the budget allocated by the SA government toward the implementation of energy efficiency standards and labeling for appliances is justified. Results of this study indicate that respondents were confident in their differentiation between A+ and C energy efficiency ratings. As concluded by Sammer and Wüstenhagen (2006) further delineation between A++ and A+ levels (as suggested in the European market) may not be equally "meaningful and effective in reducing "information cost" for consumers.

In terms of policy, prior empirical evidence suggests that households prefer policies that promote the acceptance of new energy-efficient technology above strategies aimed at reducing current equipment usage (Poortinga *et al.*, 2003; Steg and Vlek, 2009). Life-cycle assessments in fact demonstrate that economical and ecological benefits are to be gained by replacing appliances older than ten years

(Otto *et al.*, 2006). Thaler and Sunstein (2003) suggest that government and private institutions could “nudge” consumers toward behaviour with positive consequences by means of “choice architecture” i.e. individuals’ choices are influenced without restricting alternatives or amending financial incentives. As an example, the “Japanese Top Runner” approach which was implemented in 1998, endorsed the elimination of low efficiency appliances from the market by advancing the development of new energy efficient alternatives through standards that was based on the most efficient “Top Runner” product on the market (Kimura, 2010). Consumers are thus not restricted in their choice of alternatives, but the inefficient options are simply eliminated from their choice set. In similar vein, the EcoDesign directive is recognized as an important policy tool in the European Union, which obligates manufacturers to develop appliances with improved energy efficiency and reduced environmental impact throughout the product’s lifespan (De Almeida *et al.*, 2011). However, in South Africa the affordability of replacing older appliances may represent a significant constraint for lower income households and even though such barriers are surmounted, an energy-efficient, eco-friendly appliance still requires effective utilization to realize the long-term economic and financial benefits of green technology. Policy, regulation and strategies to encourage environmentally significant choice behaviour, therefore require careful consideration of the high levels of income inequality and heterogeneity of consumer populations in the SA context.

The empirical findings of this study contribute to theoretical insight that underline environmentally significant choice behaviour in an emerging market context with regard to a product category that has lasting environmental implications and where increased effort is needed to convince consumers of their potential to limit exploitation of the world’s natural resources. This may be particularly difficult as consumers may not experience the benefits of pro-environmental behaviour immediately. It may also be difficult because developing countries are partially excused for lavish behaviour by international organisations due to their developmental status. The results of this study are based on a non-probable purposive sample and can therefore not be generalised. To better inform marketing campaigns and intervention initiatives, future studies should focus on a more representative sample including a broader scope of factors e.g. underlying motivational and situational factors, as well as considering personal capabilities such as knowledge and experience. These factors may highlight further differentiation between various segments of consumers and their evaluation of product alternatives. In addition to segmenting various groups of potential customers, choice simulators can be applied to the conjoint results that enables the researcher to simulate competitive scenarios and estimate the share of preferences that particular attribute combinations are likely to capture (Hair *et al.*, 2006).

Future research may also benefit from assessing the relevance of various conjoint methodologies (e.g. adaptive/ hybrid- and choice-based conjoint) in predicting pro-environmental choice behaviour and extending the application of these methods to other product categories. Causal factors may vary greatly across different target markets and types of pro-environmental behaviour (Stern, 2000; Nordlund and Garvill, 2002). A wide array of relevant phenomena thus offers fertile ground for the further exploration and application of various conjoint methodologies.

REFERENCES

- Aertsens, J., Mondelaers, K., Verbeke, W., Buysse, J. & Van Huylenbroeck, G. (2009) The influence of subjective and objective knowledge on attitude, motivations and consumption of organic food. *British Food Journal*, **113**(11), 1353-1378.
- Alriksson, S. & Öberg, T. (2008) Conjoint analysis for environmental evaluation: a review of methods and applications. *Environmental Science and Pollution Research*, **15**(3), 244-257.
- Baker, G.A. & Burnham, T.A. (2001) Consumer response to genetically modified foods: market segment analysis and implications for producers and policy makers. *Journal of Agricultural and Resource Economics*, **26**(2), 387-403.
- Berkholz, P., Kobersky, V. & Stamminger, R. (2013) Comparative analysis of global consumer behaviour in the context of different manual dishwashing methods. *International Journal of Consumer Studies*, **37**, 46-58.
- Bodur, M. & Sarigöllü, E. (2005) Environmental sensitivity in a developing country: consumer classification and implications, *Environment and Behavior*, **37**(4), 487-510.
- Chokor, B.A. (2004) Perception and response to the challenge of poverty and environmental resource degradation in rural Nigeria: case study from the Niger Delta. *Journal of Environmental Psychology*, **24**, 305-318.
- City of Tshwane. (2008) *City of Tshwane Municipality Household Survey, 2008*. [WWW document].
URL
http://www.tshwane.gov.za/AboutTshwane/CityManagement/CityDepartments/City%20Planning,%20Development%20and%20Regional%20Services/Related%20Docs/CoT_HouseholdSurvey2008.pdf (accessed on September 6th, 2013).
- Covary, T. (2013) South African appliance labeling programme: the pros and cons. *25 Degrees in Africa*, April/May **8**(2), 1-4.

- De Almeida, A., Fonseca, P., Schlomann, B. & Feilberg, N. (2011) Characterization of the household electricity consumption in the EU, potential energy savings and specific policy recommendations. *Energy and Buildings*, **43**, 1884-1894.
- Department of Human Settlements. (2013) Housing budget increases to R28.1 billion. *Media Statements, May 2013*. [WWW document]. URL <http://www.dhs.gov.za/content.php?pagename=Media-Statements-May-2013> (accessed on September 6th, 2013).
- Diamantopoulos, A., Schlegelmilch, B.B., Sinkovics, R.R. & Bohlen, G.M. (2003) Can socio-demographics still play a role in profiling green consumers? A review of the evidence and an empirical investigation. *Journal of Business Research*, **56**, 465-480.
- Erasmus, A.C., Boshoff, E. & Rousseau, G.G. (2002) Elicitation and generation of a script for the acquisition of household appliances within a consumer decision-making context, *Journal of Family Ecology and Consumer Sciences*, **30**, 46-64.
- Erasmus, A.C., Donoghue, S. & Sonnenberg, N.C. (2011) The pertinence of status factors in consumers' consideration of major household appliances. *Journal of Family Ecology and Consumer Sciences*, **39**, 47-55.
- Erasmus, A.C. & Mathunjwa, G.Q. (2011) Idiosyncratic use of credit facilities by consumers in an emerging economy. *International Journal of Consumer Studies*, **35**, 359-371.
- Erasmus, A.C., Makgopa, M.M. & Kachale, M.G. (2005) The paradox of progress: inexperienced consumers' choice of major household appliances, *Journal of Family Ecology and Consumer Sciences*, **33**, 89-101.
- Euromonitor International. (2013a) Consumer appliances in South Africa. [WWW document]. URL: <http://www.euromonitor.com/consumer-appliances-in-south-africa/report>. (accessed on August 7th, 2013).
- Euromonitor International. (2013b) Home laundry appliances in South Africa. [WWW document]. URL: <http://www.euromonitor.com/home-laundry-appliances-in-south-africa/report>. (accessed on August 7th, 2013).
- Farber, S. & Griner, B. (2000) Using conjoint analysis to value ecosystem change. *Environmental Science & Technology*, **34**(8), 1407-1412.
- Finlay, A. & Liechti, D. (2008) e-Waste assessment South Africa. E-Waste Association of South Africa (eWASA). [WWW document]. URL http://ewasteguide.info/files/Finlay_2008_eWASA.pdf. (accessed on April 30th, 2013).

- Gam, H.J., Cao, H., Farr, C. & Kang, M. (2010) Quest for the eco-apparel market: a study of mothers' willingness to purchase organic cotton clothing for their children. *International Journal of Consumer Studies*, **34**, 648-656.
- Green, P.E., Krieger, A.M. & Wind, Y. (2001) Thirty years of conjoint analysis: reflections and prospects. *Interfaces*, **31**(3), S56-S73.
- Hair, J., Black, W., Babin, B., Anderson, R. & Tatham, R. (2006) *Multivariate data analysis*, 6th Edition. Pearson Education Inc., New Jersey.
- Inglesi, R. & Pouris, A. (2010) Forecasting electricity demand in South Africa: a critique of Eskom's projections. *South African Journal of Science*, **106**(1/2), 50-53.
- Kahneman, D. (2011) *Thinking, fast and slow*. Farrar, Straus & Giroux, New York.
- Kahneman, D. & Tversky, A. (1979) Prospect theory: an analysis of decision under risk. *Econometrica*, **47**(2), 263-292.
- Kimura, O. (2010) *Japanese Top Runner approach for energy efficiency standards*. Central Research Institute of Electric Power Industry. [WWW document]. URL: <http://criepi.denken.or.jp/jp/serc/discussion/index.html>. (accessed on January, 31st, 2014).
- Kuhfeld, W.F. & Tobias, R.D. (2005) Large factorial designs for product engineering and marketing research applications. *Technometrics*, **47**(2), 132-141.
- Laitala, K., Boks, C. & Grimstad Klepp, I. (2011) Potential for environmental improvements in laundering. *International Journal of Consumer Studies*, **35**, 254-264.
- Lazenby, H. (2012) SABS introduces energy efficiency labelling standard for appliances. *Engineering News Online* 15 March. [WWW document]. URL: <http://www.engineeringnews.co.za/article/sabs-introduces-energy-efficiency-labelling-standard-for-appliances-2012-03-15>. (accessed on May 13th, 2013).
- Lorenzoni, I. & Pidgeon, N.F. (2006) Public views on climate change: European and USA perspectives. *Climate Change*, **77**(1-2), 73-95.
- McCullough, J. (2009) Factors impacting the demand for repair services of household products: the disappearing repair trades and throwaway society. *International Journal of Consumer Studies*, **33**, 619-626.
- Mazzocchi, M. 2008. *Statistics for marketing and consumer research*. Sage Publications, Los Angeles.
- Mohr, L.A., Webb, D.J. & Harris, K.E. (2001) Do consumers expect companies to be socially responsible? The impact of corporate social responsibility on buying behaviour, *The Journal of Consumer Affairs*, **35**(1), 45-72.
- Nieftagodien, S. & Van der Berg, S. (2007) Consumption patterns and the black middle class: the role of assets. *Bureau of Economic Research*, **2**, 1-10.

- Niez, A. (2010) Comparative study on rural electrification policies in emerging economies: keys to successful policies. International Energy Agency. [WWW document]. URL: <http://www.iea.org/publications/freepublications/publication/name,3880,en.html>. (accessed on January 23rd, 2013).
- Nordlund, A.M. & Garvill, J. (2002) Value structures behind proenvironmental behaviour, *Environment and Behavior*, **34**(6), 740-756.
- OECD. 2013. OECD economic surveys: South Africa 2013. OECD Publishing. [WWW document]. URL http://dx.doi.org/10.1787/eco_surveys-zaf-2013-en. (accessed on August 11th, 2013).
- Oreg, S. & Katz-Gerro, T. (2006) Predicting pro-environmental behaviour cross-nationally: values, the Theory of Planned Behavior, and Value-Belief-Norm Theory, *Environment and Behavior*, **38**(4), 462-483.
- Otto, R., Ruminy, A. & Mrotzek, H. (2006) Assessment of the environmental impact of household appliances. *Appliance Magazine.com*, April, 1-5. [WWW document]. URL <http://www.appliancemagazine.com/print.php?article+1393&zone=215&first=1> (accessed on August, 13th, 2011).
- Papaoikonomou, E. (2013) Sustainable lifestyles in an urban context: towards a holistic understanding of ethical consumer behaviours. Empirical evidence from Catalonia, Spain. *International Journal of Consumer Studies*, **37**, 181-188.
- Pricewaterhouse Coopers (PwC) & Economist Intelligence Unit. (2012) South African retail and consumer products outlook 2012-2016. [WWW document]. URL <http://www.pwc.co.za/en/publications/retail-and-consumer-outlook.jhtml> (accessed on April 30th, 2013).
- Poortinga, W., Steg, L., Vlek, C. & Wiersma, G. (2003) Household preferences for energy-saving measures: A conjoint analysis. *Journal of Economic Psychology*, **24**, 49-64.
- Proudly South African. [s.a.] *About us*. [WWW document]. URL http://www.proudlysa.co.za/consumer_site (accessed on September 5th, 2013).
- Ritch, E.L. & Schröder, M.J. (2012) Accessing and affording sustainability: the experience of fashion consumption within young families. *International Journal of Consumer Studies*, **36**, 203-210.
- Rogers, M. & Ryan, R. (2001) The triple bottom line for sustainable community development. *Local Environment*, **6**(3), 279-289.
- Rosenberg, E. (2006) Consumerism. In: *The Enviropedia, be the change you want to see*. (ed. by D. Parry-Davies), p. 57. Eco-Logic Publishing CC-CK, Simonstown, South Africa.
- Rousseau, G.G. & Venter, D.J.L. (2001) A multi-cultural investigation into consumer environmental concern, *Journal of Industrial Psychology*, **27**(1), 1-7.

- Sammer, K. & Wüstenhagen, R. (2006) The influence of eco-labelling on consumer behaviour: results of a discrete choice analysis for washing machines. *Business Strategy and the Environment*, **15**, 185-199.
- Sawtooth Software Inc. (2002) Conjoint Value Analysis (CVA) Version 3.0 Technical paper series. [WWW document]. URL <http://www.sawtoothsoftware.com/download/techpap/cva3tech.pdf> (accessed on August 26th, 2013).
- Sonnenberg, N.C., Erasmus, A.C. & Donoghue, S. (2011) Significance of environmental sustainability issues in consumers' choice of major household appliances in South Africa, *International Journal of Consumer Studies*, **35**, 153-163.
- StatSoft Inc. (2013) *How to group objects into similar categories*. Electronic Statistics Textbook. StatSoft, Tulsa, OK. [WWW document]. URL <http://www.statsoft.com/textbook/cluster-analysis/?button=1> (accessed on July 29th, 2013).
- Steg, L. & Vlek, C. (2009) Encouraging pro-environmental behaviour: an integrative review and research agenda. *Journal of Environmental Psychology*, **29**, 309-317.
- Stern, P.C. (2000) Toward a coherent theory of environmentally significant behaviour, *Journal of Social Issues*, **56**(3), 407-424.
- Tanner, C., Kaiser, F.G. & Wölfling Kast, S. (2004) Contextual conditions of ecological consumerism: a food-purchasing survey, *Environment and Behavior*, **36**(1), 94-111.
- Thaler, R. (1985) Mental accounting and consumer choice. *Marketing Science*, **4**(3), 199-214.
- U.S. Energy Information Administration. (2013) *South Africa: energy and environmental issues*. [WWW document] URL <http://www.eia.gov/countries/cap.cfm?fips=s> (accessed on March 25th, 2013).
- Thaler, R.H. & Sunstein, C.R. (2008) *Nudge: Improving decisions about health, wealth, and happiness*. New Haven: Yale University Press.
- Van Doorn, J. & Verhoef, P.C. (2011) Willingness to pay for organic products: differences between virtue and vice foods. *International Journal of Research in Marketing*, **28**, 167-180.
- Wagner, S.A. (2003) *Understanding green consumer behaviour: a qualitative cognitive approach*. Routledge, London.
- Wagner-Tsukamoto, S. & Tadajewski, M. (2006) Cognitive anthropology and the problem-solving behaviour of green consumers. *Journal of Consumer Behaviour*, **5**, 235-244.
- Winkler, H. (ed). (2006) *Energy policies for sustainable development in South Africa: Options for the future*. Energy Research Centre, University of Cape Town. [WWW document]. URL <http://www.erc.uct.ac.za/Research/publications/06Winkler-Energy%20policies%20for%20SD.pdf>. (accessed on April 30th, 2013).

- World Wildlife Fund for Nature (WWF). (2012) *Living planet report 2012: biodiversity, biocapacity and better choices*. [WWW document] URL http://wwf.panda.org/about_our_earth/all_publications/living_planet_report/2012_lpr/ (accessed on January 31st, 2013).
- Zelezny, L.C., Chua, P. & Aldrich, C. (2000) Elaborating on gender differences in environmentalism, *Journal of Social Issues*, **56**(3), 443-457.

CHAPTER 4: THE DEVELOPMENT OF A THEORETICAL MODEL TO INVESTIGATE FACTORS ASSOCIATED WITH ENVIRONMENTALLY SIGNIFICANT CHOICE BEHAVIOUR IN THE SOUTH AFRICAN MAJOR HOUSEHOLD APPLIANCE MARKET: AN INTEGRATIVE CONCEPTUAL APPROACH

A paper published in the
Journal of Family Ecology and Consumer Sciences, 2013, Volume 41, pp.71-84

Nadine C. Sonnenberg & Alet C. Erasmus

OPSOMMING

Literatuur dui onteenseglik daarop dat huishoudlike toerusting 'n belangrike impak het op die volhoubaarheid van natuurlike hulpbronne. Binne die Suid-Afrikaanse konteks, waar water en elektrisiteit skaars is, is hierdie onderwerp veral van belang. Die aankoop en langtermyn-gebruik van huishoudelike toestelle het veral implikasies ten opsigte van die energiesektor, wat tans onder toenemende druk is om aan die groeiende verbruikersvraag in die land te voldoen. Met stygende huishoudelike inkomstes, veral van voorheen benadeelde Suid-Afrikaners, kan 'n toenemende aantal huishoudings nou vir die eerste keer groot huishoudelike toestelle bekostig. Daarbenewens het die Suid-Afrikaanse regering in 2000 aangekondig dat alle Suid-Afrikaners geregtig is op toegang tot basiese dienste, insluitend elektrisiteit, wat die aankoop van elektriese toestelle nou vir baie meer huishoudings moontlik maak. Maatreëls wat verbruikers kan aanspoor om energiebesparende en omgewingsvriendelike produkeienskappe tydens verbruikers se besluitnemingsprosesse te prioritiseer het dus groot waarde, en soortgelyke navorsing is reeds in ontwikkelde lande gedoen. Die impak van demografiese veranderlikes, lewenstyl en interne motivering, wat verskeie sosiaal-sielkundige aspekte insluit, is gevolglik reeds breedvoerig in bestaande literatuur aangespreek. Verskeie teoretiese benaderings is ook reeds toegepas, veral in terme van individue se interne motivering om omgewingsvriendelike gedrag te openbaar. Empiriese bevindinge wat 'n oorsprong binne die konteks van ontwikkelde lande het kan egter nie sondermeer na die Suid-Afrikaanse verbruikersmark veralgemeen word nie, veral nie as die land se unieke, diverse populasiesamestelling in ag geneem word nie. Verbruikers se vermoëns, byvoorbeeld hulle kennis, vorige ervaring en vermoë om omgewingsvriendelike produkeienskappe te identifiseer en te beoordeel, asook eksterne faktore binne

die Suid-Afrikaanse konteks, mag verbruikersbesluitneming noemenswaardig beïnvloed, veral wanneer duur, hoë-risiko produkte, soos elektriese huishoudelike toestelle, aangekoop word.

Gebaseer op 'n kritiese oorsig van bestaande empiriese navorsing en teoretiese benaderings wat binne die Westerse konteks in ontwikkelde lande gedoen is, het hierdie manuskrip ten doel om 'n geïntegreerde, multi-dimensionele konseptuele raamwerk saam te stel, wat gepas sou wees vir toekomstige ondersoeke na faktore wat kan bydra om omgewingsvriendelike besluitneming en aankoopgedrag in die Suid-Afrikaanse (en moontlik ander ontwikkelende lande se) kleinhandelsektor aan te moedig wanneer verbruikers elektriese huishoudelike toestelle aankoop.

ABSTRACT

The South African major household appliance sector has shown significant growth in recent years as more previously disadvantaged consumers gain spending power and access to electricity supply. The 2008 energy crisis, which had a significant impact on the local economy was, however, a stark reminder that energy resources are not unlimited. Informational campaigns have since underscored the role of households, and in particular their use of appliances, in alleviating the pressure imposed on the country's energy supply. However, in addition to energy consumption, major household appliances have several other environmental implications throughout the lifespan of the product, which require sensitizing consumers toward the impact of their choices. Many of the appliances sold within the South African context are imported and have energy ratings and eco-friendly features that comply with European standards. Whether South African consumers consider these features in their choice of appliances is, however, debatable. To date, empirical evidence remains limited and there is an urgent need to gain a better understanding of factors that may lead to more environmentally significant choice behaviour in emerging markets. Abroad, progress has been made in developing theoretical approaches and specifying the determinants of pro-environmental consumer behaviour, which may benefit research in the local context. Yet, it is also necessary to acknowledge that South Africa, similar to other emerging markets, has diverse consumer populations, which necessitates an integrative multi-dimensional approach that addresses underlying motivational constructs, situational forces and cognitive capabilities of consumers, to explicate the complexities of pro-environmental action in an emerging market context. Based on a review and critical assessment of existing theoretical insights and models, this paper proposes an integrative conceptual approach for investigation of the South African consumers' contextual reality, including both the facilitating opportunities and constraints that

may inhibit or promote environmentally significant choice behaviour in the major household appliance market.

Keywords: sustainability, environmentally significant consumer behaviour, green behaviour, major household appliances, white goods, emerging market, South Africa

INTRODUCTION

South Africa's rapidly expanding economy and increased consumer spending have secured its position in the BRICS (Brazil, Russia, India, China and South Africa) alliance, which constitutes the fastest growing emerging markets in the world (National Statistics Offices of the BRICS Group, 2013). BRICS' status represents important social and economic benefits for South Africa, but it also requires recognition of the profound environmental impact of ongoing economic growth (World Wide Fund for Nature (WWF), 2012). The energy sector in particular is a major concern: South Africa's energy supply is largely dependent on coal, which has led to its ranking as the leading carbon dioxide emitter in Africa and the twelfth largest in the world (Niez, 2010; U.S. Energy Information Administration (US EIA), 2013). Escalating energy demands, which overextended the existing infrastructure and capacity, eventually culminated in the 2008 energy crisis (Inglesi & Pouris, 2010; Niez, 2010). Blackouts in key sectors and steep electricity tariff increases brought the reality of energy shortages in the country right to the doorstep of South African households (US EIA, 2013). Amidst growing awareness and regulatory initiatives to address the imbalance between supply and demand, several challenges accompany the suggested measures to ensure continuity of energy provision in the country, specifically in terms of minimizing its environmental impact while ensuring sustained economic growth, and continuing with the provision of electricity to previously disadvantaged communities (Inglesi & Pouris, 2010; Niez, 2010).

Since the South African government's declaration in 2000 that all South Africans should have access to basic services, which include water and electricity, an electrification rate of 75% was achieved by 2009, with 88% urban and 55% rural populations connected to the grid (Niez, 2010; Nieftagodien & Van der Berg, 2007). However, 3.4 million households still need to be connected and electrification remains a national priority to redress past inequalities (Niez, 2010). In terms of energy supply per person, South Africa's rating exceeds that of many other developing countries. It is estimated that South Africans with access to the grid consume approximately 50% of Africa's total electricity supply,

although they only represent 5% of the continent's population (Winkler, 2006). In a recent economic survey, South Africa is criticized for having among the highest greenhouse gas emissions per unit of GDP in the world, and has achieved less decoupling of real GDP and CO₂ emissions than most countries (OECD, 2013). In terms of residential electricity demand, it is therefore crucial to focus on those decisions that have the most significant impact on a household's energy consumption, which include households' purchase and use of major household appliances.

Due to the fact that major household appliances are durable commodities with an expected service life of at least ten years, such purchases are made infrequently. Appliances chosen therefore have long-term implications that are not easy (or cheap) to fix once a household discovers that it does not function or perform as expected (e.g. excessive electricity or water consumption) (Erasmus *et al.*, 2005). Household appliances have several environmental implications apart from electricity and water consumption, for example, the impact of raw materials used on the environment and premature replacement that contribute to waste and pollution (Laitala *et al.*, 2011; McCollough, 2009). In addition, households' actual use of appliances is considered the most energy-demanding phase of the product's life cycle (Berkholz *et al.*, 2013). Consumer research regarding the acquisition of major household appliances in the South African context seems appropriate, given the 16% growth estimate that is forecasted for the country's appliance industry between 2012 and 2016, as a result of the escalating needs of an aspiring middle-class, many of whom are acquiring appliances for the first time to erase a so-called asset deficit (Nieftagodien & Van der Berg, 2007; PricewaterhouseCoopers (PwC) & Economist Intelligence Unit, 2012).

A household's decision to purchase an appliance with a low energy rating and other eco-friendly features reflects environmentally significant behaviour (henceforth referred to as ESB) because, as pointed out by Stern (2000), it represents an action that has a clearly defined impact on either the availability of natural resources or the composition and dynamics of natural systems. Over the past decade, research has focused on various antecedents of ESB, including demographic variables, lifestyle profiles, individual factors such as motivation, as well as various socio-psychological constructs (Oreg & Katz-Gerro, 2006; Iyer & Kashyap, 2007; Wagner, 2003:19-23). Apart from the apparent significant influence of gender (Iyer & Kashyap, 2007; Zelezny, 2000), findings pertaining to the influence of other demographic variables remain inconclusive (Bodur & Sarigöllü, 2005; Wagner, 2003:23). Internal motivational factors and various social-psychological constructs such as values, attitudes and beliefs, seem to be more influential in predicting ESB (Oreg & Katz-Gerro, 2006). Over time, scholars have applied an amalgamation of models, such as Ajzen's (1991) Theory of Planned

Behaviour and Schwartz's (1977:221-279) Norm-Activation Theory of Altruism, in their investigation of a variety of behaviours including recycling (Oom do Valle *et al.*, 2005), green consumerism and consumers' purchase behaviour (Follows & Jobber, 2000; Tanner *et al.*, 2004; Vermeir & Verbeke, 2006).

Notwithstanding the relevance of underlying motivational constructs, most researchers contributing to this body of work have concluded that environmental intent does not inexorably lead to actual behaviour (Whitmarsh, 2009; Zabkar & Hosta, 2013), and that various other causal factors warrant further consideration (Barr, 2007; Stern, 2000). In particular, investigations of complex and expensive purchases, such as major household appliances, may require assessment of a broader scope of factors (Stern, 2000; Jackson, 2005). Most of the existing theoretical frameworks and empirical evidence neglect contextual determinants that shape consumers' choices (Foxall, 1999; Stern, 2000; Wagner, 2003:65), particularly in emerging economies such as South Africa, where consumer populations are complex and culturally diverse (Bodur & Sarigöllü, 2005; Burgess & Steenkamp, 2006; Essoussi & Merunka, 2007). With the above in mind, this paper draws on existing empirical evidence to propose that models attempting to explain ESB should go beyond underlying motivational factors, to incorporate situational forces and personal capabilities, such as knowledge and experience (Tanner *et al.*, 2004; Vermeir, & Verbeke, 2006). This paper presents a theoretically founded argument that is concluded with a multi-dimensional, integrative conceptual framework for much needed future investigations of consumers' ESB in the context of an emerging economy such as South Africa.

THEORETICAL BACKGROUND

In a report compiled for the Sustainable Development Research Network, Jackson (2005) identifies two approaches towards an understanding of ESB. The first set of approaches models behaviour as a function of *internal* processes and characteristics (e.g. attitudes, personal norms and values), whereas the second set of approaches views behaviour as a function of processes, constraints and incentives *external* to the individual. Some frameworks have also attempted to integrate these internal and external perspectives. One of the earliest examples of a more integrative approach is Lewin's (1951:238) person-situation-field theory, which postulates that behaviour in any given situation is influenced by a number of factors, which may include the situation itself, the individual's internal motivation, as well as cognition and the person's ability to perform the behaviour in question (Fiske & Taylor, 2010:5).

Therefore, in adopting a more integrative approach, this discussion awards particular attention to three broad categories of causal variables that may impact on an emerging consumer's ESB in the major household appliance sector: (1) internal motivational constructs that culminate in terms of pro-environmental intent; (2) situational factors that may impact on such behaviour, as well as (3) knowledge, experience and the ability to assess the energy saving- and eco-friendly features of major household appliances.

Motivational constructs and pro-environmental intent

Intervention programs, policies and green marketing campaigns often rely on internal motivational constructs to instill a sense of moral obligation among individuals to take appropriate action (Stern 2000; Zelezny & Schultz, 2000). Several studies have assessed the relevance of Ajzen's (1991) Theory of Planned Behaviour and Schwartz's (1977:221-279) Norm-Activation Theory of Altruism to explain one's underlying motivation for pro-environmental behaviour (Oom do Valle *et al.*, 2005; Tang *et al.*, 2011; Wall *et al.*, 2007). The Theory of Planned Behaviour postulates that the immediate antecedent of an individual's planned and deliberate behaviour is intentions to perform the behaviour. These intentions are determined by attitudes toward the behaviour, social pressure or subjective norms surrounding the behaviour and the perceived control of factors that may facilitate or inhibit the behaviour (Ajzen, 1991; Wall *et al.*, 2007). The Theory of Planned Behaviour is classified as an expectancy value theory, which assumes that choices are based on expected outcomes (Jackson, 2005). The Theory of Planned Behaviour therefore acknowledges personal utility and self-interest as underpinning motives for ESB (Bamberg & Möser, 2007; Wall *et al.*, 2007). Norm-Activation Theory, on the other hand, postulates that altruistic behaviour, such as ESB, is guided by moral considerations and pro-social motives (Jackson, 2005) and occurs in response to the interrelationship of personal norms, awareness of consequences, and ascription of responsibility (Oom do Valle *et al.*, 2005; Wall *et al.*, 2007). Based on the argument that ESB encompasses a combination of self-interest and pro-social motives, researchers have since amalgamated these models (Oom do Valle *et al.*, 2005; Oreg & Katz-Gerro, 2006; Schuler & Cording, 2006; Wall *et al.*, 2007).

Combining the Theory of Planned Behaviour and Norm-Activation Theory to explore the underlying motivational constructs contributing to pro-environmental behaviour in an emerging context seems particularly relevant, since emerging consumer populations are often characterized by a mosaic of Western and more traditional cultures (Bodur & Sarigöllü, 2005). While Western cultures tend to assign a more central role toward individual decision-making, traditional cultures demonstrate a more

collectivistic orientation (Burgess & Steenkamp, 2006; Kim & Choi, 2005). This may impact on the significance of constructs such as personal (moral) and social norms, as well as construct associations that are specified in existing conceptual frameworks.

Bamberg and Möser's (2007) meta-analytic structural equation model, which is based on an analysis of 46 independent studies applying the Norm-Activation model, Theory of Planned Behaviour or similar models, highlights certain key issues in the configuration of motivational factors as illustrated in Figure 1.

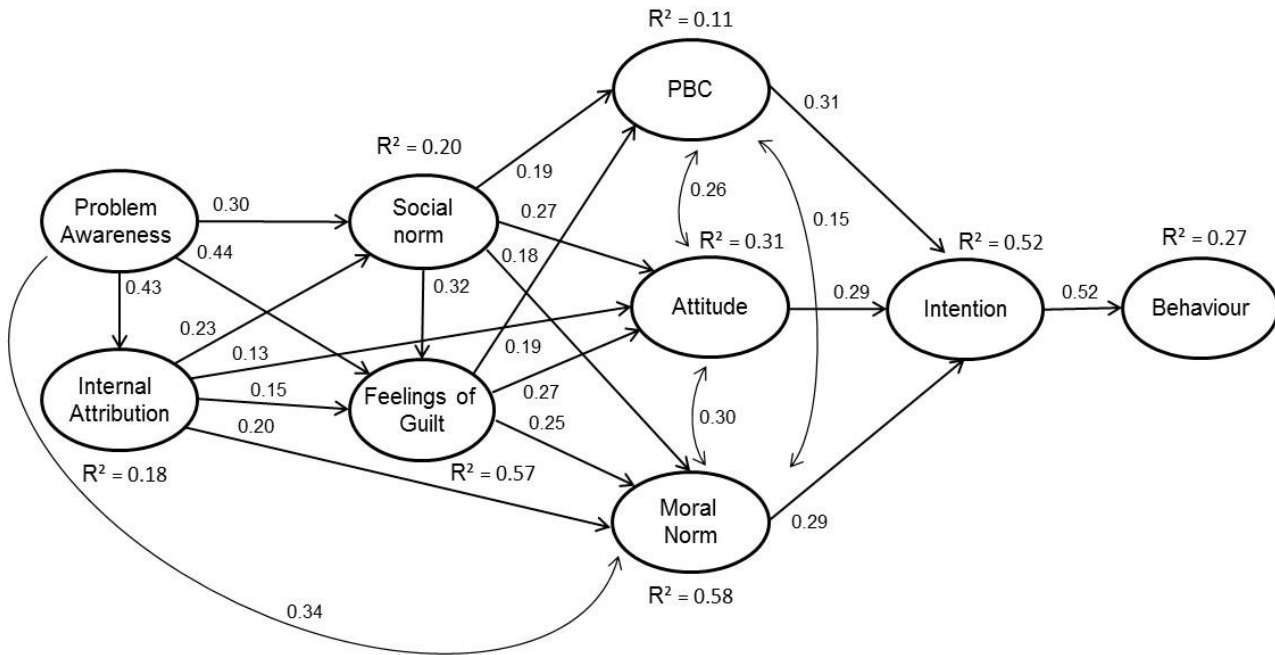


FIGURE 1: META-ANALYTIC STRUCTURAL EQUATION MODEL (Bamberg & Möser, 2007)

Awareness of environmental problems, in conjunction with internal attribution, contributes to the formation of moral norms as postulated in the original Norm-Activation model (Oom do Valle *et al.*, 2005; Wall *et al.*, 2007). Although feelings of guilt are not included in the original Norm-Activation model or Theory of Planned Behaviour, it is acknowledged in Bamberg and Möser's (2007) model. The model proposes that internal attribution triggers emotional reactions such as guilt, which then elicits some sense of moral obligation (i.e. moral norm) to compensate for environmentally irresponsible behaviour (Bamberg *et al.*, 2007; Bamberg & Möser, 2007; Hunecke *et al.*, 2001). Disparity between an individual's own behaviour and the behavioural standard of a reference group (i.e. subjective norms) could also cause feelings of guilt (Bamberg *et al.*, 2007; Bamberg & Möser, 2007). Subjective norms are therefore related to moral norms, both indirectly via guilt and directly

when the social group's standards are internalized as an individual's own moral norms. Subjective norms subsequently fulfill an indirect role, whereas moral norms emerge as a third, independent predictor of intention to act in an environmentally significant manner, along with attitude and perceived behavioural control, in accordance with the original Theory of Planned Behaviour (Bamberg & Möser, 2007).

To date all nine variables included in Bamberg and Möser's (2007) meta-analytic structural equation model (i.e. *awareness of environmental problems, internal attribution, feelings of guilt, social norms, moral norms, attitude, perceived behavioural control, intention and ESB*) have not been attended to simultaneously in an emerging context. Their relevance when promoting environmentally significant choice behaviour in the major household appliance product context is therefore not certain. Research is needed to determine the relevance and impact of these constructs in emerging contexts. One study, for example, concluded that collectivistic orientations in emerging economies positively influence individuals' beliefs about self-efficacy, which in turn increase consumers' tendency to purchase green products (Kim & Choi, 2005). To the contrary, other studies argue that the more difficult, time-consuming, or expensive a given type of behaviour is, i.e. the higher the risk involved and the less of a necessity or tangibly rewarding it is, the weaker the dependence of the behaviour on motivational variables (Stern, 1999; Stern, 2000; Tanner *et al.*, 2004). Thus, even though individuals may have developed a sense of moral obligation and intent to purchase appliances with energy saving and other eco-friendly features, their eventual evaluation and product choice may be influenced strongly by situational factors that are beyond the intrinsic personal domain (Barr, 2007; Steg & Vlek, 2009; Stern, 2000).

Situational factors in emerging markets and the relevance of an integrative approach

Low correlation consistency between consumers' actual observed choices and assumed motivational determinants (Jackson, 2005; Follows & Jobber, 2000), challenges much of the conventional thinking and singular approaches to theory that have dominated contemporary consumer behaviour research (Foxall, 1999; Wagner-Tsukamoto & Tadajewski, 2006). In an emerging economy such as South Africa, empirical verification of consumers' environmental thinking and decision-making may be deterred when local context and experience of consumption are overlooked. Multiple situational factors related to social, economic and political circumstances may influence a consumer's decision to engage in ESB (Haron *et al.*, 2005; Stern, 2000). For example, financial incentives, available technology and growing regulation concerning the environmental impact of manufacturing may

persuade consumers to purchase green products. In addition, the influence of situational factors is often determined by certain personal capabilities such as literacy and experience, which in turn are associated with demographic characteristics such as income and age (Barr, 2007; Stern, 2000). These factors may mediate the relationship between motivation and behaviour (Steg & Vlek, 2009; Thøgersen, 1994). Another key element, distinguished in ESB literature, is that consumers' pro-environmental intent is frequently moderated by habits embedded in contextual conditions (Jackson, 2005; Steg & Vlek, 2009; Stern, 2000).

The complexity of situational determinants and contextual conditions in which consumers' ESB is negotiated cannot be ignored (Jackson, 2005). While extant consumer behaviour research has been labeled as "de-contextualized", with an over-emphasis on internal attitudinal factors (Foxall, 1999; Wagner, 2003:66-67), Jackson (2005) highlights the inexorable controversy between simplicity and complexity in establishing theoretical frameworks for consumer behaviour. Although multifaceted models seem to offer more extensive conceptual insight than simpler models, they are often "poorly structured for empirical quantification" (Jackson, 2005, p.23). Some scholars have nevertheless endeavored to combine internal (motivational) and external (situational) perspectives to establish integrative theories of ESB (Jackson, 2005), including the social practices model by Spaargaren and Van Vliet (2000), Stern's (2000) attitude-behaviour-context (ABC) model, Triandis' (1994:208) model of social behaviour, the model of consumer action by Bagozzi, Gürhan-Canli and Priester (2002:97), and contemporary approaches such as Barr's (2007) conceptual framework of environmental behaviour.

Two issues resonate particular interest for emerging contexts, namely to facilitate conditions for individuals to adopt ESB, and enquiry about the ability of consumers in these contexts to act in an environmentally significant manner. The Motivation-Opportunity-Abilities model, proposed by Ölander and Thøgersen (1995), addresses both, in addition to motivational factors based on the assumptions of the Theory of Reasoned Action. As postulated in other integrative theories (Stern, 2000; Triandis, 1994:208), motivation is viewed as a predisposition to act in an environmentally significant manner (Ölander & Thøgersen, 1995; Thøgersen, 1994). The Motivation-Opportunity-Abilities model further postulates that motivation is subject to a consumer's ability to behave in a specific way, as well as the facilitating opportunities that would allow the individual to act on his/her intention, as illustrated in Figure 2.

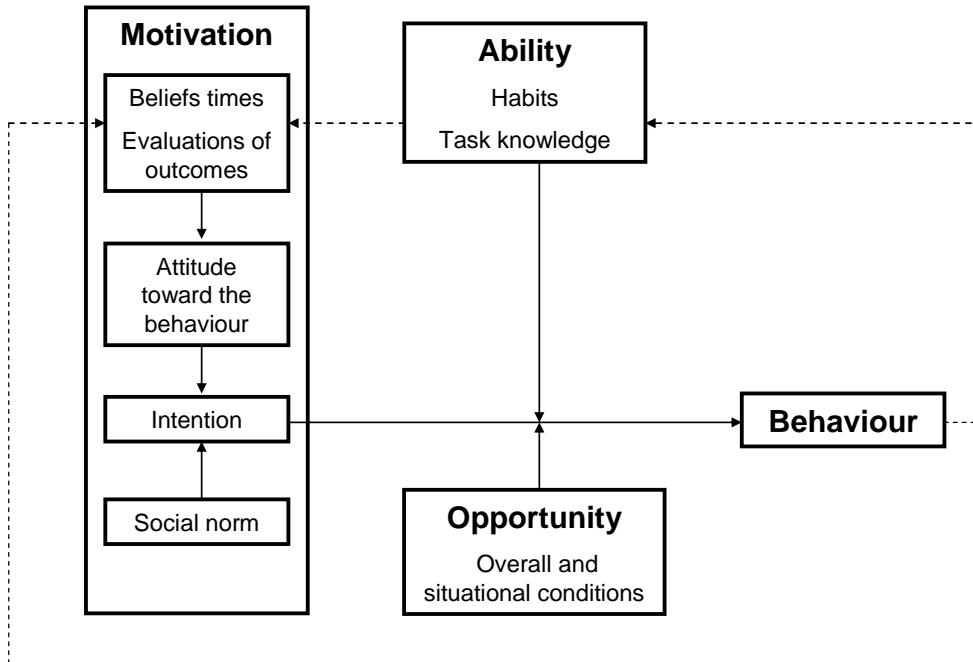


FIGURE 2: MODEL OF RECYCLING BEHAVIOUR (Ölander & Thøgerson, 1995; Thøgerson, 1994)

Personal ability and opportunity therefore moderate the relationship between intention and behaviour. The influence of experience is also recognized in this model since beliefs may change after initial trial and over time, when learning has occurred and the ability to perform the behaviour is mastered (Ölander & Thøgerson, 1995; Thøgerson, 1994). The following sections draw specific attention to the relevance of facilitating opportunities and consumers' ability to engage in environmentally significant choice behaviour in the South African appliances retail sector.

Opportunities for ESB in the South African major household appliance industry

Globally, the pursuit of sustainability and conservation of the environment has become an explicit concern of various stakeholders in the production and supply of major household appliances, including brand leaders in the South African context, such as LG and Samsung (PwC & Economist Intelligence Unit, 2012). Over the past decade, these multi-national firms have undertaken considerable effort to incorporate life cycle assessment (LCA) into their product design strategies, i.e. to replace hazardous substances; to enhance energy efficiency; to improve recyclability and to reduce the use of resources (Mont & Bleischwitz, 2007). Currently, most of the appliances sold in the South African retail sector

are imported from Germany, China, the United States, the United Kingdom, Japan and Korea (Finlay & Liechti, 2008), and an estimated 25 different brands are represented in the local major household appliance market (Covary, 2013). Globalization and increased competitiveness have thus contributed to a proliferation of alternatives in the medium- to high-end sector of the market, boasting the latest technological innovations and eco-friendly features.

Coupled with increased availability of energy efficient and eco-friendly alternatives, the South African government has recently approved a five-year project with a US\$13-million budget to implement standards and labeling for appliances sold locally (Covary, 2013). These measures are modeled after the European Union standards for energy labeling, but have been adapted to comply with conditions in the South African emerging market environment (Covary, 2013). The aim of the project is to eliminate inefficient appliances on the market, and to empower consumers to make informed choices when purchasing appliances such as dishwashers, washing machines, dryers, ovens, hobs, stoves, refrigerators and freezers (Covary, 2013; Lazenby, 2012). In addition, several appliance retail outlets in key urban areas offer additional opportunities for ESB through the provision of information by sales personnel and other immediate sources of information, such as the prominence and availability of the product itself, packaging and promotional brochures (Sonnenberg *et al.*, 2011). Consumers' preferences are at times highly contingent on context and information presentation factors (Pichert & Katsikopoulos, 2008), which have formed the basis of several environmental intervention campaigns such as those described above. Unfortunately informational efforts have had varied success in promoting ESB and have shown limited effect when challenged by external impediments such as economic constraints (McKenzie-Mohr, 2000; Stern, 1999).

Affordability is frequently referred to in discussions about consumers' acceptance of eco-friendly alternatives (Aertsens *et al.*, 2009; Gam *et al.*, 2010; Ritch & Schröder, 2012) because eco-friendly alternatives are perceived to be expensive, which discourages pro-environmental choices (Wagner, 2003:186; Van Doorn & Verhoef, 2011). On the other hand, price has diverse connotations for individuals with different demographic and socio-psychological profiles (Thøgersen, 1994; Stern, 2000): for some, the higher cost of a so-called green product will be a constraint, while others may regard it as an indication of superior quality (Stern 1999). These connotations are particularly relevant in terms of the spending and consumption patterns of aspiring middle class consumers in South Africa (Nieftagodien & Van der Berg, 2007; PwC & Economist Intelligence Unit, 2012). Exploratory evidence regarding consumers' evaluation and selection of major appliances in the South African retail sector indicates that price is not the primary concern and that the functionality of appliances fulfills a more

important role in consumers' purchase decisions (Sonnenberg *et al.*, 2011). Green products should therefore be assessed in terms of all features applicable to conventional alternatives, e.g. brand, functionality and price, and as a result marketers cannot solely rely on consumers' willingness to compromise on non-environmental criteria for the sake of the environment (Gam *et al.*, 2010).

In summary, availability, information provision, affordability and competitiveness of major household appliances are important considerations in assessing the opportunities that would allow consumers to act on their pro-environmental intentions in the South African appliance retail sector. Opportunities have been conceptualized as both a subjective and an objective phenomenon in consumer behaviour literature (Jackson, 2005; Ölander & Thøgerson 1995; Thøgerson, 1994). Subjective views of opportunities closely relate to Azjen's (1991) Theory of Planned Behaviour concept of perceived behaviour control (Jackson, 2005; Thøgerson, 1994). In developing the Motivation-Opportunity-Abilities framework, Ölander and Thøgerson (1995) preferred to conceive opportunities from an objective point of view, i.e. a non-biased, accurate reflection of the situation, as opposed to the consumer's subjective assessment and perception thereof. However, they admit that individuals may perceive the same conditions differently and hence interpret opportunities subjectively and frame their decisions accordingly (Ölander & Thøgerson 1995; Thøgerson, 1994). In this regard, the subjective conceptualization of situational opportunities is important, as consumers may, for example, perceive the availability of eco-friendly, energy saving appliances as low, although many alternatives are available on the market. In addition to the opportunities concept, the Motivation-Opportunity-Abilities model also emphasizes the importance of consumers' ability to engage in ESB, which implies their capability of assessing the environmental impact of their product choices.

Emerging consumers' ability to assess eco-friendly features of major household appliances

Exploratory evidence in the South African context indicates that consumers are often unaware of the environmental consequences of their product choices in the major household appliance category, and are unaware of information that could assist them in their evaluation and realization of purchase decisions that would secure more positive environmental implications (Sonnenberg *et al.*, 2011). These findings confirm the importance of the concept "ability" in the Motivation-Opportunity-Abilities framework, which is operationalized in terms of two dimensions, namely, task knowledge and habit (Ölander & Thøgerson 1995; Thøgerson, 1994).

Task knowledge relates to a person's knowledge about how to reach a goal or to behave (Ölander & Thøgersen 1995; Thøgersen, 1994). From an environmental perspective, a consumer should ideally be able to evaluate a product based on a "cradle-to-grave" life cycle analysis (LCA). In terms of major household appliances, LCA may comprise an understanding of the energy, the type and quantity of materials used for the production, transportation and distribution of an appliance, as well as its subsequent usage in terms of energy, water and chemical consumption, and the eventual disposal of the product (Mont & Bleischwitz, 2007). In an emerging context such as South Africa, where a substantial segment of the consumer population has had limited product experience and exposure to the array of products in the white goods market, the practical implementation of LCA may be somewhat unrealistic. Even beyond the borders of emerging contexts, more experienced consumers in industrially developed countries find it difficult to assess products in terms of the cradle to the grave principle, since it is complex, time-consuming and impractical to perform in the retail setting for every product purchased (Mont & Bleischwitz, 2007; Wagner-Tsukamoto & Tadajewski, 2006). For these reasons Wagner (2003:188-190) suggests that ESB entails a more selective practical application of LCA in the real life context, depending on the amount and type of information available and consumers' prior knowledge.

In the past, various measures have been used to operationalize conceptually distinct dimensions of knowledge. Alba and Hutchinson (1987) propose that consumer knowledge can be operationalized in terms of two different but related dimensions, namely, familiarity and expertise. While familiarity encompasses the amount of product-related experiences that the consumer has accumulated over time, expertise indicates someone's ability to perform product-related tasks. Alba and Hutchinson (1987) further hypothesize that product familiarity increases expertise (i.e. ability and task performance). Amongst others, cognitive effort is reduced through repetition, to the point where it becomes habit, e.g. repeat purchases in which information search and processing is nearly automatically and effortlessly performed (Steg & Vlek, 2009; Wagner, 2003:175-178). These assumptions closely relate to the ability dimension in Ölander and Thøgersen's (1995) Motivation-Opportunity-Abilities model, focusing on the interpretation of recycling behaviour that relies to a large extent on habit formation and task knowledge.

Changes in favour of ESB often require the termination of established habits or routines (Jackson, 2005; Steg & Vlek, 2009; Stern, 2000) and the development of task knowledge, which is particularly relevant in terms of the actual long-term use of major household appliances. However, because major household appliances are expensive, are purchased infrequently, and have long-term functional and

performance consequences, habitual processes will not really be relevant during this type of purchase decision, which requires more analytic consumer information processing. A consumer's ability to process analytically depends on his/her underlying motivation (Alba & Hutchinson, 1987; Aertsens *et al.*, 2009). A highly motivated environmentally concerned individual is hence more likely to gather information about eco-friendly features of an appliance. Time pressure, information complexity and other contextual constraints may, however, inhibit analytic processing, which is particularly relevant when a consumer is not really familiar with a product (Alba & Hutchinson, 1987). In this regard, product class knowledge is an important aspect to consider, since it facilitates a consumer's ability to assess the environmentally-related attributes of a product and to search for relevant information (Aertsens *et al.*, 2009; Bruck, 1985).

Brucks' (1985) categorization of product class knowledge in terms of subjective knowledge, objective knowledge and prior experience has been extensively applied in various studies (e.g. Aertsens *et al.*, 2009; Berger *et al.*, 1994; Moorman *et al.*, 2004; Raju *et al.*, 1995). Objective knowledge represents a measure of what consumers actually know, i.e. the amount, type or organization of stored memory (Aertsens *et al.*, 2009; Brucks, 1985; Moorman *et al.*, 2004; Raju *et al.*, 1995). Subjective knowledge, on the other hand, refers to consumers' perceptions of how much they know and represents their degree of confidence in their own knowledge (Aertsens *et al.*, 2009; Brucks, 1985; Moorman *et al.*, 2004; Raju *et al.*, 1995). Although different, both types of knowledge would be relevant in consumers' search for information to facilitate the decision-making process, and their evaluation and choice of major household appliances. Low levels of subjective knowledge may for example influence consumers' reliance on extrinsic attributes (e.g. price) and dealer opinions (Aertsens *et al.*, 2009; Brucks, 1985). Conversely, objective knowledge facilitates consideration of more product attributes, with increased emphasis on intrinsic performance-related features and the search for more applicable information (Aertsens *et al.*, 2009; Brucks, 1985; Raju *et al.*, 1995).

Consumers' ability is also influenced by their product-related experience. The Motivation-Opportunity-Abilities model assumes that experience increases a consumer's ability (Ölander & Thøgerson 1995; Thøgerson, 1994). In particular, the amount of purchasing or usage experience of a product will improve product class knowledge (Brucks, 1985; Raju *et al.*, 1995). Through familiarity, the consumer's ability to differentiate between products is enhanced as a result of increased cognitive structure. Furthermore, the consumer's ability to remember, elaborate and analyze information in terms of relevance and significance in evaluating and selecting a particular product is also augmented (Alba & Hutchinson, 1987; Wagner, 2003:51).

In summary, the theoretical background presented in this paper indicates that a broader integrative approach is needed to establish a comprehensive understanding of specific ESB's as well as factors that would be influential to instigate change. Motivational factors are seen to have a significant influence, but a person's ability and other situational influences may ultimately determine whether an individual's intent is shaped into ESB. In this regard, the importance of amalgamating empirical findings to advance new conceptual and theoretical frameworks that would endorse pro-environmental action is evident (Zelezny & Schultz, 2000; Stern, 2000).

PROPOSED CONCEPTUAL FRAMEWORK

As stated by Jackson (2005), "A good conceptual model requires a balance between parsimony and explanatory completeness." In an effort to achieve this balance, the conceptual framework depicted in Figure 3 is an adaptation of existing models based on existing literature, and is meant to direct investigations of environmentally significant choice behaviour of consumers in an emerging market, such as the South African major household appliance retail sector. The proposed model incorporates a combination of motivational constructs derived from Bamberg and Möser's (2007) meta-analytic structural equation model, as well as the construct associations proposed in Ölander and Thøgersen's (1995) Motivation-Opportunity-Abilities model.

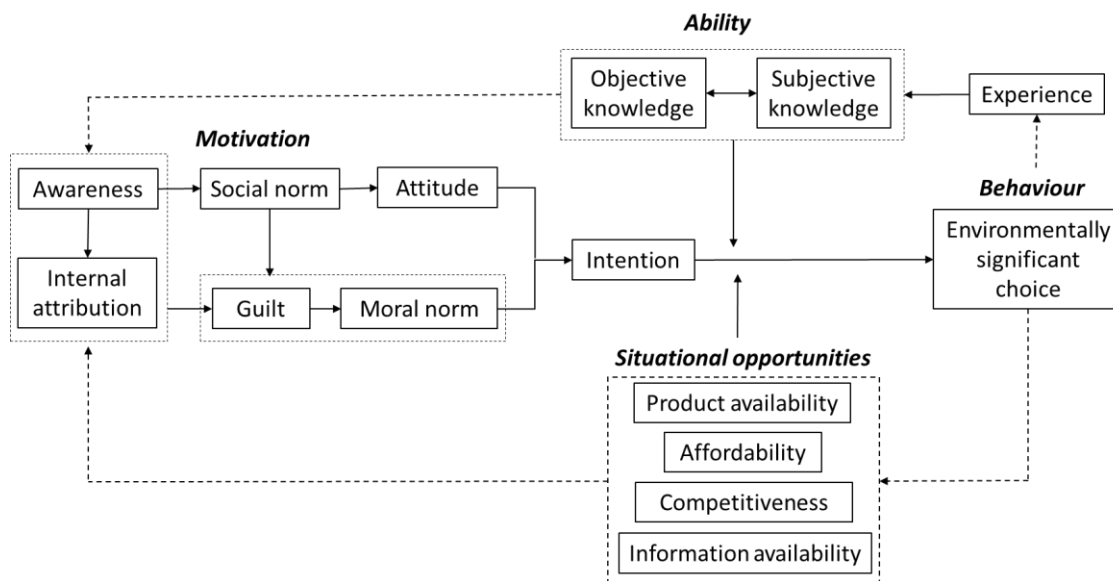


FIGURE 3: CONCEPTUAL FRAMEWORK FOR THE INVESTIGATION OF ENVIRONMENTALLY SIGNIFICANT CHOICE BEHAVIOUR RELATING TO MAJOR HOUSEHOLD APPLIANCES

In line with theoretical insights of Stern (2000), the proposed conceptual framework proposes that motivational factors create a predisposition for consumers to act in an environmentally significant manner. As suggested by Ölander and Thøgerson (1995), motivational factors are encapsulated by consumers' intentions. Although Ölander and Thøgerson's (1995) inclusion of the motivational component in the original Motivation-Opportunity-Abilities model was based on the Theory of Reasoned Action, they acknowledge other possibilities such as Schwartz's (1977:221-279) Norm-Activation model. Acknowledging these arguments and deducing that ESB inevitably encompasses a combination of self-interest and pro-social motives (Oom do Valle *et al.*, 2005; Oreg & Katz-Gerro, 2006; Schuler & Cording, 2006; Wall *et al.*, 2007), the motivational component of the proposed model incorporates Bamberg and Möser's (2007) meta-analytic structural equation model, with inclusion of all the norm-activation constructs as well as those proposed in Theory of Planned Behaviour, except for perceived behaviour control. Perceived behavioural control refers to an individual's belief regarding the relative difficulty to behave in a specific manner (Ajzen, 1991; Tang *et al.*, 2011). Thøgerson (1994) reasons that opportunities, operationalized rationally from an objective point of view, influence perceptions of how difficult particular behaviours would be and thus forms the basis of perceived behaviour control.

Although Ölander and Thøgerson (1995) prefer the objective measurement of opportunities, they also concur with other theoretical insights (e.g. Foxall, 1999; Wagner, 2003:15), namely, that consumers interpret and derive meaning from "objectively given" conditions in a highly subjective manner and that the subjective perception of opportunities corresponds with Azjen's (1991) concept of perceived behavioural control. Azjen (2002) in fact suggests that measures of perceived behavioural control should be extended to include items that assess self-efficacy (i.e. confidence in one's ability to perform a behaviour) as well as controllability (i.e. people's beliefs that they have control over the behaviour). Azjen (2002) argues that these measures may include internal factors such as knowledge and skills, as well as factors that are external to the actor. Research by Tang *et al.* (2011) and Tonglet *et al.* (2004) implemented these measures and confirmed that self-efficacy is the requisite ability to execute ESB and that controllability involves perceived situational opportunities for an individual to act in a pro-environmental manner. This is congruent with the so-called ability and situational opportunities, depicted in the Motivation-Opportunity-Abilities model, which mediate the intention-behaviour relationship.

Based on the above, the situational opportunities concept in the proposed framework (Figure 1) is regarded as an objective measure of subjective perceptions, specifically incorporating consumers'

views on the availability, affordability and competitiveness of eco-friendly alternatives in the South African major household appliance market, as well as the accessibility of information relating to appliances' environmental implications. In terms of a person's ability to perform ESB, Ölander and Thøgerson (1995) highlight the importance of task knowledge and habits. Since the proposed framework focuses on infrequent decisions relating to the purchase of major household appliances, habit has been excluded from the model, although its importance is acknowledged in terms of other types of ESB. Ability is further adapted to address emerging consumers' objective and subjective knowledge of the product category, which ideally, should include LCA in comprehensively assessing the environmental impact of a product. Although objective product class knowledge may provide more accurate indications of a consumer's ability to evaluate product alternatives, subjective measures of knowledge are also included, due to its influence on consumers' decision-making processes and their search for information (Aertsens *et al.*, 2009; Brucks, 1985). The ensuing behaviour may reflect selective application of LCA and the eventual choice of product, with a prioritization of energy saving and eco-friendly features that have significant short- and long-term implications for the environment.

In conclusion, feedback is inevitable as it reflects the influence of experience after initial trials (i.e. product- and time-related familiarity), which will alter consumers' abilities to perform the behaviour, their subjective perceptions of the situational opportunities surrounding the behaviour and their subsequent motivation to engage in such behaviour (Ölander & Thøgerson, 1995; Thøgerson, 1994). Clearly, further research and empirical verification of the proposed construct associations are required, and recommendations are made in the section to follow.

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

As a rapidly expanding economy with increasing consumption patterns, and an ecological footprint that is symptomatic of high income industrialized countries (WWF, 2012), South Africa is compelled to deal with environmental issues more explicitly and with a sense of urgency in the near future. The demand for major household appliances is expected to increase even further as middle income South African households' disposable income continue to escalate, and more consumer populations gain access to electrical supply as a result of electrification programmes. These trends have serious implications for the environment and its natural resources. Based on the theoretical background presented in this paper, an integrative multi-dimensional approach is advocated for research in the South African market, which not only underlines a Third-world emerging context, but also encapsulates motivational constructs, as well as knowledge and situational determinants, in the

execution of the more complex, expensive and significant act of acquiring major household appliances with positive environmental outcomes. Within the field of Consumer Science that is concerned with the well-being of consumers and that strives to facilitate, educate and inform consumers, the empirical verification of this conceptual framework would be significant in terms of efforts to indicate and explicate the interrelationship of factors that contribute to environmentally significant choice behaviour in the South African major household appliance sector.

Verification of the proposed framework requires careful consideration of the units of analysis and the selection of appropriate research methods that are adapted for the unique challenges of consumer behaviour research in the South African context. Sampling in emerging contexts is often complex and challenging due to the lack of sampling frames (Burgess & Steenkamp, 2006), which poses particular problems when representative data is required. Representative data regarding South African consumers is further complicated by the diverse composition of the population. South Africa's level of income inequality is, for example, among the highest in the world. As stated in a recent consumer report: "The top 10% of the country's earners take away 101 times the earnings of the bottom 10% of the population" (PwC & Economist Intelligence Unit, 2012). Averages do not account for the differences in a population and it is therefore argued that in the quest for the preservation of the country's natural resources and ecosystems, focus must be drawn to those with increased spending power and whose share in the average ecological footprint may be proportionally higher than the less affluent, who are inevitably also not in a position to change their behaviour that easily. The relevance of access to a wide variety of products in densely populated urban areas may also be considered. Several prominent appliance retailers in the South African context have outlets in all the major urban centres, offering a wide range of imported appliances specifically targeted at the middle to higher income consumer segments. By focusing on these stores and using a store intercept approach, valuable insight can be gained from consumers who are in the process of acquiring appliances from product assortments that feature the most up-to-date technological innovation and that offer facilitating opportunities for environmentally significant choice behaviour.

In terms of methods, ESB research within the South African context may benefit from existing data collection and analytical techniques, as well as from validated scales in the environmental and consumer behaviour literature. As an example, several scale items have been developed for internal motivational factors such as the awareness of environmental consequences (Bamberg *et al.*, 2007; Heath & Gifford, 2006), guilt (Bamberg *et al.*, 2007), social norms (Oom do Valle *et al.*, 2005; Wall *et al.*, 2007), moral norms (Thøgersen, 2006), attitudes (Bodur & Sarigöllü, 2005; Wall *et al.*, 2007) and

intention (Heath & Gifford, 2006; Wall *et al.*, 2007). However, such scales would have to be adapted to comply with conditions that prevail in the South African market and the specific behaviour under investigation. Furthermore, response bias is an issue frequently highlighted in the measurement of constructs related to pro-environmental behaviour (Bamberg & Möser, 2007; Mohr *et al.*, 2001). When responding to survey questions, respondents may want to appear thoughtful and concerned. Since the cost of answering questions is lower than the cost of actual behaviour, surveys probably overestimate consumers' willingness to engage in ESB (Mohr *et al.*, 2001). Although this effect may not be eliminated altogether, attention could be directed toward the wording and order of questionnaire items in an effort to minimize response bias.

In terms of assessing consumers' environmentally significant choice behaviour, choice modeling and conjoint analysis may be of particular value. By using these techniques, the analysis of consumer evaluations of different combinations of product attributes is possible (Hair *et al.*, 2006:464; Mazzocchi, 2008:347), with specific focus directed toward their evaluation of environmental attributes relative to other non-environmental criteria. A prioritization of energy saving and eco-friendly features in consumers' evaluation and selection of major household appliances may point to ESB with long-term environmental implications.

REFERENCE LIST

- AERTSENS, J, MONDELAERS, K, VERBEKE, W, BUYSSE, J & VAN HUYLENBROECK, G. 2009. The influence of subjective and objective knowledge on attitude, motivations and consumption of organic food. *British Food Journal* 113(11):1353-1378.
- AJZEN, I, 1991. The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes* 50:179-211.
- AZJEN, I. 2002. Perceived behavioral control, self-efficacy, locus of control, and the Theory of Planned Behavior. *Journal of Applied Social Psychology* 32(4):665-683.
- ALBA, JW & HUTCHINSON, JW. 1987. Dimensions of consumer expertise. *Journal of Consumer Research* 13(4):411-454.
- BAGOZZI, RP, GÜRHAN-CANLI, Z & PRIESTER, J. 2002. *The social psychology of consumer behaviour*. Buckingham. Open University Press.
- BAMBERG, S, HUNECKE, M & BLÖBAUM, A. 2007. Social context, personal norms and the use of public transportation: two field studies. *Journal of Environmental Psychology* 27:190-203.

- BAMBERG, S & MÖSER, G. 2007. Twenty years after Hines, Hungerford and Tomera: a new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of Environmental Psychology* 27:14-25.
- BARR, S. 2007. Factors influencing environmental attitudes and behaviors: a U.K. case study of household waste management. *Environment and Behavior* 39(4):435-473.
- BERGER, IE, RATCHFORD, BT & HAINES, GH. 1994. Subjective product knowledge as a moderator of the relationship between attitudes and purchase intentions for a durable product. *Journal of Economic Psychology* 15:301-314.
- BERKHOLZ, P, KOBERSKY, V & STAMMINGER, R. 2013. Comparative analysis of global consumer behaviour in the context of different manual dishwashing methods. *International Journal of Consumer Studies* 37:46-58.
- BODUR, M & SARIGÖLLÜ, E. 2005. Environmental sensitivity in a developing country: consumer classification and implications. *Environment and Behavior* 37(4):487-510.
- BRUCKS, M. 1985. The effects of product class knowledge on information search behavior. *Journal of Consumer Research* 12(1):1-16.
- BURGESS, SM & STEENKAMP, JEM. 2006. Marketing renaissance: how research in emerging markets advances marketing science and practice. *International Journal of Research in Marketing* 23:337-356.
- COVARY, T. 2013. South African appliance labeling programme: The pros and cons. *25 Degrees in Africa* April/May 8(2):1-4.
- ERASMUS, AC, MAKGOPA, MM & KACHALE, MG. 2005. The paradox of progress: inexperienced consumers' choice of major household appliances. *Journal of Family Ecology and Consumer Sciences* 33:89-101.
- ESSOUSSI, LH & MERUNKA, D. 2007. Consumers' product evaluations in emerging markets: Does country of design, country of manufacture, or brand image matter? *International Marketing Review* 24(4):409-426.
- FINLAY, A & LIECHTI, D. 2008. e-Waste assessment South Africa. *E-Waste Association of South Africa (eWASA)*, November 2008. Available online. URL: http://ewasteguide.info/files/Finlay_2008_eWASA.pdf. Accessed 30 April 2013.
- FISKE, ST & TAYLOR, SE. 2010. *Social cognition: from brains to culture*. Boston: McGraw Hill.
- FOLLOWS, SB & JOBBER, D. 2000. Environmentally responsible purchase behaviour: a test of a consumer model. *European Journal of Marketing* 34(5/6):723-746.
- FOXALL, GR. 1999. Putting consumer behaviour in its place: the Behavioural Perspective Model research programme. *International Journal of Management Reviews* 1(2):133-158.

- GAM, HJ, CAO, H, FARR, C & KANG, M. 2010. Quest for the eco-apparel market: a study of mothers' willingness to purchase organic cotton clothing for their children. *International Journal of Consumer Studies* 34: 648-656.
- HAIR, J, BLACK, W, BABIN, B, ANDERSON, R & TATHAM, R. 2006. *Multivariate data analysis*. 6th ed. Upper Saddle River, New Jersey. Pearson Education.
- HARON, SA, PAIM, L & YAHAYA, N. 2005. Towards sustainable consumption: an examination of environmental knowledge among Malaysians. *International Journal of Consumer Studies* 29:426-436.
- HEATH, Y & GIFFORD, R. 2006. Free-market ideology and environmental degradation: the case of belief in global climate change. *Environment and Behavior* 38(1):48-71.
- HUNECKE, M, BLÖBAUM, A, MATTHIES, E & HÖGER, R. 2001. Responsibility and environment: ecological norm orientation and external factors in the domain of travel mode choice behavior. *Environment and Behavior* 33:830-852.
- INGLESI, R & POURIS, A. 2010. Forecasting electricity demand in South Africa: a critique of Eskom's projections. *South African Journal of Science* 106(1/2):50-53.
- IYER, ES & KASHYAP, RK. 2007. Consumer recycling: role of incentives, information and social class. *Journal of Consumer Behaviour* 6:32-47.
- JACKSON, T. 2005. Motivating sustainable consumption: a review of evidence on consumer behaviour and behavioural change. *Sustainable Development Research Network*. Available online. URL: http://www.hiveideas.co.uk/attachments/044_motivatingfinal_000.pdf. Accessed 30 April 2013.
- KIM, Y & CHOI, SM. 2005. Antecedents of green purchase behavior: an examination of collectivism, environmental concern, and PCE. *Advances in Consumer Research* 32:592-599.
- LAITALA, K, BOKS, C & GRIMSTAD KLEPP, I. 2011. Potential for environmental improvements in laundering. *International Journal of Consumer Studies* 35:254-264.
- LAZENBY, H. 2012. SABS introduces energy efficiency labelling standard for appliances. *Engineering News Online* 15 March:1. Available online. URL: <http://www.engineeringnews.co.za/article/sabs-introduces-energy-efficiency-labelling-standard-for-appliances-2012-03-15>. Accessed 13 May 2013.
- LEWIN, K. 1951. *Field theory in social science: selected theoretical papers*. New York. Harper.
- MAZZOCCHI, M. 2008. *Statistics for marketing and consumer research*. Los Angeles. Sage.
- McCOLLOUGH, J. 2009. Factors impacting the demand for repair services of household products: the disappearing repair trades and throwaway society. *International Journal of Consumer Studies* 33:619-626.
- McKENZIE-MOHR, D. 2000. Promoting sustainable behavior: an introduction to community-based social marketing. *Journal of Social Issues* 56(3):543-554.
- MOHR, LA, WEBB, DJ & HARRIS, KE. 2001. Do consumers expect companies to be socially

- responsible? The impact of corporate social responsibility on buying behavior. *The Journal of Consumer Affairs* 35(1):45-72.
- MONT, O & BLEISCHWITZ, R. 2007. Sustainable consumption and resource management in the light of life cycle thinking. *European Environment* 17:59-76.
- MOORMAN, C, DIEHL, K, BRINBERG, D & KIDWELL, B. 2004. Subjective knowledge, search locations, and consumer choice. *Journal of Consumer Research* 31:673-680.
- NATIONAL STATISTICS OFFICES OF THE BRICS GROUP. 2013. BRICS joint statistical publication. 4th ed. Available online. URL:
http://www.statssa.gov.za/news_archive/Docs/FINAL_BRICS%20PUBLICATION_PRINT_23%20MARCH%202013_Reworked.pdf. Accessed 11 August 2013.
- NIEFTAGODIEN, S & VAN DER BERG, S. 2007. Consumption patterns and the black middle class: the role of assets. *Bureau of Economic Research* 2:1-10.
- NIEZ, A. 2010. Comparative study on rural electrification policies in emerging economies: keys to successful policies. *International Energy Agency*. Available online. URL:
<http://www.iea.org/publications/freepublications/publication/name,3880,en.html>. Accessed 23 January 2013.
- OECD. 2013. OECD economic surveys: South Africa 2013. *OECD Publishing*. Available online. URL:
http://dx.doi.org/10.1787/eco_surveys-zaf-2013-en. Accessed 11 August 2013.
- ÖLANDER, F & THØGERSEN, J. 1995. Understanding of consumer behaviour as a prerequisite for environmental protection. *Journal of Consumer Policy* 18(4): 345-385.
- OOM DO VALLE, P, REBELO, E, REIS, E & MENEZES, J. 2005. Combining behavioral theories to predict recycling involvement. *Environment and Behavior* 37(3):364-369.
- OREG, S & KATZ-GERRO, T. 2006. Predicting proenvironmental behaviour cross-nationally: values, the Theory of Planned Behavior, and Value-Belief-Norm theory. *Environment and Behavior* 38(4):462-483.
- PICHERT, D & KATSIKOPOULOS, KV. 2008. Green defaults: information presentation and pro-environmental behaviour. *Journal of Environmental Psychology* 28:63-73.
- PRICEWATERHOUSE COOPERS (PwC) & ECONOMIST INTELLIGENCE UNIT. 2012. South African retail and consumer products outlook 2012-2016. Available online. URL:
<http://www.pwc.co.za/en/publications/retail-and-consumer-outlook.jhtml>. Accessed 30 April 2013.
- RAJU, PS, LONIAL, SC & MANGOLD, WH. 1995. Differential effects of subjective knowledge, objective knowledge, and usage experience on decision making: an exploratory investigation. *Journal of Consumer Psychology* 4(2):153-180.

- RITCH, EL & SCHRÖDER, MJ. 2012. Accessing and affording sustainability: the experience of fashion consumption within young families. *International Journal of Consumer Studies* 36: 203-210.
- SCHULER, DA & CORDING, M. 2006. A corporate social performance-corporate financial performance behavioral model for consumers. *Academy of Management Review* 31(3):540-558.
- SCHWARTZ, SH. 1977. Normative influences on altruism. In Berkowitz, L. (ed.) *Advances in experimental social psychology*. New York. Academic Press.
- SONNENBERG, NC, ERASMUS, AC & DONOGHUE, S. 2011. Significance of environmental sustainability issues in consumers' choice of major household appliances in South Africa. *International Journal of Consumer Studies* 35:153-163.
- SPAARGAREN, G & VAN VLIET, B. 2000. Lifestyles, consumption and the environment: the ecological modernization of domestic consumption. *Environmental Politics* 9(1):50-76.
- STEG, L & VLEK, C. 2009. Encouraging pro-environmental behaviour: an integrative review and research agenda. *Journal of Environmental Psychology* 29: 309-317.
- STERN, PC. 1999. Information, incentives, and proenvironmental consumer behavior. *Journal of Consumer Policy* 22:461-478.
- STERN, PC. 2000. Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues* 56(3):407-424.
- TANG, Z, CHEN, X & LUO, J. 2011. Determining socio-psychological drivers for rural household recycling behavior in developing countries: a case study from Wugan, Hunan, China. *Environment and Behavior* 43(6): 848-877.
- TANNER, C, KAISER, FG & WÖLFING KAST, S. 2004. Contextual conditions of ecological consumerism: a food-purchasing survey. *Environment and Behavior* 36(1):94-111.
- THØGERSON, J. 1994. A model of recycling behaviour, with evidence from Danish source separation programmes. *International Journal of Research in Marketing* 11:145-163.
- THØGERSON, J. 2006. Norms for environmentally responsible behaviour: an extended taxonomy. *Journal of Environmental Psychology* 26:247-261.
- TONGLET, M, PHILLIPS, PS & READ, AM. 2004. Using the Theory of Planned Behaviour to investigate the determinants of recycling behaviour: a case study from Brixworth, UK. *Resources, Conservation and Recycling* 41:191-214.
- TRIANDIS, HC. 1994. *Culture and social behavior*. New York. McGraw Hill.
- U.S. ENERGY INFORMATION ADMINISTRATION (EIA). 2013. *South Africa: overview*. Available online. URL: http://www.eia.gov/countries/analysisbriefs/South_africa/south_africa.pdf. Accessed 30 April 2013.

- VAN DOORN, J & VERHOEF, PC. 2011. Willingness to pay for organic products: differences between virtue and vice foods. *International Journal of Research in Marketing* 28(3):167-180.
- VERMEIR, I & VERBEKE, W. 2006. Sustainable food consumption: exploring the consumer “attitude-behavioral intention” gap. *Journal of Agricultural and Environmental Ethics* 19:169-194.
- WAGNER, SA. 2003. *Understanding green consumer behaviour: a qualitative cognitive approach*. London. Routledge.
- WAGNER-TSUKAMOTO, S & TADAJEWSKI, M. 2006. Cognitive anthropology and the problem-solving behaviour of green consumers. *Journal of Consumer Behaviour* 5:235-244.
- WALL, R, DEVINE-WRIGHT, P & MILL, GA. 2007. Comparing and combining theories to explain proenvironmental intentions: the case of commuting-mode choice. *Environment and Behavior* 39(6):731-753.
- WHITMARSH, L. 2009. Behavioural responses to climate change: asymmetry of intentions and impacts. *Journal of Environmental Psychology* 29:13-23.
- WINKLER, H (ed). 2006. *Energy policies for sustainable development in South Africa: Options for the future*. Energy Research Centre, University of Cape Town. Available online. URL: <http://www.erc.uct.ac.za/Research/publications/06Winkler-Energy%20policies%20for%20SD.pdf>. Accessed 30 April 2013.
- WORLD WIDE FUND FOR NATURE (WWF). *The living planet report 2012*. Available online. URL: http://www.awsassets.panda.org/downloads/1_lpr_2012_online_full_size_single_pages_final_1250516.pdf. Accessed 23 January 2013.
- ZABKAR, V & HOSTA, M. 2013. Willingness to act and environmentally conscious consumer behaviour: can prosocial status perceptions help overcome the gap? *International Journal of Consumer Studies* 37:257-264.
- ZELEZNY, LC, CHUA, P & ALDRICH, C. 2000. Elaborating on gender differences in environmentalism. *Journal of Social Issues* 56(3):443-457.
- ZELEZNY, LC & SCHULTZ, PW. 2000. Promoting environmentalism. *Journal of Social Issues* 56(3):365-371.

CHAPTER 5: GENERAL CONCLUSION

INTRODUCTION

The pursuit of sustainability and the preservation of the earth's natural resources is global imperative and has been acknowledged as one of the eight millennium developmental goals (United Nations, 2013). Emerging economies such as South Africa have their share of problems related to environmental degradation and is therefore likely to continue facing international pressure to collaborate and fully address environmental issues in the near future. Yet, as pointed out in the introduction to this study, governments in many parts of the developed world are faced with the paradox that the majority of citizens claim to be concerned about environmental issues, yet remain reluctant to adapt their everyday lives accordingly (Burgess, 2003). In this regard, much progress has been made in grasping the relevant factors that embody the basis of private-sphere environmentalism and which precede consumers' environmentally significant intent and behaviour during product choice and -consumption. However, empirical evidence has to date mostly addressed conditions in developed countries that are not necessarily relevant in terms of the contextual and cultural complexities of emerging economies such as South Africa. In addressing the lack of theoretical insight to interpret environmentally significant behaviour in the local context, this research was focused on establishing the inter relationship of motivational factors such as an awareness of environmental problems, social norms, attitudes, perceived behavioural control and moral norms in contributing to middle- to high income consumers' pro-environmental intent to purchase major household appliances with eco-friendly features. Since pro-environmental intent does not inexorably lead to environmentally significant choice behaviour, this research also addressed the question whether these consumers prioritize environmentally related product features with lasting environmental consequences in their pre-purchase evaluation and selection of major household appliances for their households.

This chapter provides an overview and summary of the results of the research as they apply to the research problem and objectives that were explicated in the introductory chapter of the thesis. It also further expands on the conclusions and recommendations for future research that were presented in each of the manuscripts prepared for publication that constitute chapters two, three and four. Specific sections are devoted to the practical implications of the results for industry and policy formulation as well as the theoretical contribution of the study. A final summary of the limitations of this study is

presented based on a concluding evaluation of the methodology, which then also underscores specific recommendations for future research.

SUMMARY OF FINDINGS

Based on current theoretical debates, the initial focus of the investigation was to determine whether various constructs such as an awareness of environmental consequences, internal attribution, guilt, moral norm and attitudes represent distinct dimensions that could be linked to an individual's pro-environmental intent to purchase appliances with eco-friendly features in the South African emerging market context. More specifically, the first sub-objective was to validate pertinent constructs that are relevant in terms of this study, namely general awareness, internal attribution, guilt, moral norms and attitudes. The initial confirmatory factor analysis indicated that concepts relating to an awareness of the consequences associated with consumers' purchase and use of washing machines in general, and concepts that relate to an individual's own internal ascription of responsibility are not distinguishable. Furthermore, in accordance with the findings of Chan and Bishop (2013) as well as Kaiser (2006), the results of this study substantiate the lack of discriminant validity in terms of definitions pertaining to moral norms and attitudes. A definition of guilt poses similar challenges as guilt elicits a sense of moral obligation to take appropriate action implying that it may therefore be inherent to person's underlying moral norms and attitude towards a particular behaviour.

Based on the outcome of the fore mentioned, a second sub-objective of this study was to test a model that approximates the construct associations specified in Bamberg and Möser's (2007) meta-analytic structural equation model. Due to the amalgamation of awareness of environmental problems with internal attribution as well as the merge of items related to guilt, moral norms and attitudes, the construct associations that are specified in Bamberg and Möser's (2007) model could only be partially supported. An awareness of environmental consequences inferred from product choice and consumption emerged as an indirect determinant of pro-environmental intent and represents an important precondition for the formation of subjective norms and moral attitudes. A strong and statistically significant relationship between subjective norms and moral attitudes underscore the importance of a social group's standards in the formation of an individual's own moral norms and attitudes. Overall, the path coefficients between an awareness of consequences and subjective norms and between subjective norms and perceived behavioural control were substantially higher in this model than those reported in Bamberg and Möser's (2007) model, which may be attributed to a more collectivistic approach and social group standards, which inevitably include cultural nuances in

emerging economies such as South Africa. In relation to perceived behavioural control, findings revealed that subjective norms may have a more informative role, since individuals tend to rely on the opinion of others when they have less confidence in their own ability to perform the behaviour. In contrast to the positive and statistically significant association between moral attitudes and intention, the relation between perceived behavioural control and intent was not statistically significant and negative, which may be due to the complexity of the intended behaviour. Despite the negative association between perceived behavioural control and intent, the constructs specified in this model explained on average 73% of the variance of the intention construct, which notably exceeds the figure in Bamberg and Möser's (2007) model. Inspired by Bamberg and Möser's (2007) meta-analytic structural equation model that is based on an analysis of studies that applied the Norm-Activation Model, Theory of Planned Behaviour or similar models to pro-environmental behaviour in developed countries, this study hence confirmed a model that depicts the construct associations relevant to the context of an emerging economy.

The second objective of this study was to determine the relative importance of environmentally related attributes in relation to other product features in consumers' pre-purchase evaluation and selection of washing machines for their households. In particular, the focus was on the utility values of energy ratings, load capacity and wash cycles as well as price, brand and brand perceptions in consumers' choice of washing machines. On an aggregate level, price was the most important attribute in respondents' choice of washing machines, with price levels higher than 8000ZAR obtaining negative utility values. Brands and brand perceptions also featured prominently in respondents' preference structures with eco-friendly brand perceptions obtaining high utility values. Brands that obtained high utility values such as LG and Samsung, coincide with those reported to have the highest market share in the South African home laundry appliances sector and are supported by marketing campaigns that are strongly focused on "eco-efficiency" (Euromonitor International, 2013). However, attributes with more obvious environmental consequences seemed less influential in respondents' choice of washing machines. Energy ratings seem to feature to some extent with a significant difference between the utility values of A+ and C ratings, which may be attributed to escalating electricity prices that have drawn much attention to households' electricity consumption in recent years. Load capacity and washing programmes/ cycles that impact on the environment in terms of detergent, water- and energy usage were the least important criteria in respondents' choice of product. Findings therefore suggest that much needs to be done to make consumers more aware and more sensitive about their product choices and consumption practices, specifically in terms of how the impact of their purchase and consumption choices on the environment and the sustainability of global resources.

Although aggregate results provide useful background regarding the importance of various attributes across the sample, a further sub-objective of the study was to identify and describe clusters of consumers in terms of their prioritization of product features, reasoning that it may be of particular value in the development of tailored intervention and marketing strategies. Four clusters of consumers were identified, namely brand buyers, price punters, energy investors and indecisive shoppers. Brand and brand perceptions were most important among the brand buyers, although consumers belonging to this cluster also prioritized price to some extent. Environmentally related attributes were of minor importance to this cluster. For the price punters, price was significantly more important than any of the other attributes including brand, brand perception, energy ratings, wash cycles and load capacity. From an environmental perspective, the energy investors are of particular interest due to their prioritization of energy ratings. These consumers however regard price almost equally important, which suggests that cost implications are of primary importance in the energy investors' decision-making. The fourth cluster can also be labeled as the "indecisive shoppers". They formed the largest cluster and seemed less confident in their prioritization of product attributes. The extent of their indecisiveness is accentuated by evidence that none of the attributes specified in the investigation achieved importance scores higher than 15% in their decision-making and they considered brand and price equally important. Particularly concerning in terms of consumers' decision-making practices, is that this group is the largest.

CONCLUSIONS

As can be gathered from the results of this study, constructs and construct associations specified in existing models may differ depending on the type of behaviour under investigation and the specific context in which data is collected. In the context of this investigation, respondents seem aware that the use of washing machines has environmental consequences and that product choices can affect the environment. Individuals' perceptions of their own contribution towards environmental degradation and the contribution of the consumer population at large, were however less distinct, which could be explained by the prevailing collectivistic orientations in emerging markets such as South Africa. Yet, in accordance with empirical evidence obtained in more developed contexts, an awareness of consequences contributes to the formation of specific subjective norms and moral attitudes: findings showed that respondents took cognizance of the expectations of important reference persons and own moral obligations when deliberating pro-environmental behaviour. Subjective norms in particular may fulfill an informative role when consumers are less confident in their own ability to

comprehensively evaluate and select a washing machine with eco-friendly attributes which may be technologically complex and which poses a high risk potential due to long-term implications. A combination of moral norms, attitudes and anticipated feelings of guilt significantly contributed to respondents' pro-environmental intent, and even though they seemed somewhat less convinced regarding the ease of choosing eco-friendly appliances, their intentions to buy such appliances consistently reflected a pro-environmental inclination.

However, as emphasized from the outset, pro-environmental intent does not inexorably lead to environmentally significant choice behaviour. Current literature substantiates the argument that the more difficult, time-consuming, or expensive a given type of behaviour is, i.e. the higher the risk involved and the less of a necessity or tangibly rewarding it is, the weaker the dependence of the behaviour on motivational variables (Stern, 2000; Tanner, Kaiser & Wölfling Kast, 2004). Through conjoint analysis it was concluded that respondents across various age, population and educational levels prioritise price, brand and brand perception, despite the long term economic and environmental repercussions of product features that impact on the use of natural resources, such as the machine's capacity, energy efficiency ratings and washing programmes. Respondents therefore apparently do not fully realize the overall long-term implications of their product choices and rely on price and brand associations to guide their decision-making, which contradicts their observed environmental concern and pro-environmental intent. The prevailing intention-behaviour gap, which has been the topic of much debate in the environmental psychology, marketing and consumer behaviour disciplines, therefore also seems relevant in the context of this study. This gap may be exacerbated due to respondents' inability and inexperience to objectively assess the environmental attributes of products such as major household appliances. Inexperience and a lack of relevant knowledge may further explain the high utility values assigned to eco-friendly brand perceptions, since consumers may depend on such perceptions to infer environmental qualities associated with their choice of product rather than objectively assessing the relevant attributes.

An overall prioritization of price over other product attributes that included functional performance-, and environmental related criteria, confirms sentiments in a recent consumer report, in which it is stated that even though multi-national firms have improved their environmental impact due to increased pressure from environmentally conscious consumers in more developed markets, there is very limited coercion from the South African consumer populations in this regard with most decision-making exclusively based on price sensitivity (Pricewaterhouse Coopers (PwC) & Economist Intelligence Unit, 2012). Factors that extend beyond the individual's intrinsic personal domain such the

availability, affordability and competitiveness of eco-friendly alternatives in the South African major household appliance market, as well as the accessibility of information relating to appliances' environmental implications will thus highly likely remain key issues in facilitating consumers eventual enactment of their pro-environmental intent. Tailored intervention strategies are therefore needed to facilitate informed decision-making and a deliberation of consequences that extend beyond the initial selection of a particular product with pertinent features. In view of the importance of price and cost implications to consumers in a South African context, strategies that emphasize the financial benefits of environmentally related features that span over the entire life cycle of the appliance might be more successful to promote pro-environmental product choices. These aspects are further highlighted in the following section.

IMPLICATIONS FOR INDUSTRY AND POLICY FORMULATION

The results of this study confirm that marketers cannot exclusively rely on consumers' willingness to compromise on non-environmental product attributes for the sake of the environment, since eco-friendly options are assessed in terms of all features that apply to conventional alternatives. Furthermore, as illustrated in the results of the cluster analysis, different consumer groups may have different priorities in their evaluation and selection of particular products, which implies that marketing campaigns and intervention strategies are best tailored to the preference structures and profiles of specific target segments. A cluster such as the "indecisive shoppers" may for example benefit from information strategies that are focused on augmenting their environmental knowledge and understanding of pro-environmental alternatives, which could in turn strengthen their confidence in their own decision-making abilities. Marketing campaigns that focus on eco-friendly brand appeal and image enhancement surrounding innovative green technology may appeal to the "brand buyer" cluster. On the other hand, pricing policies or incentive schemes may be more effective in convincing a cluster such as the "price punters" to adopt energy-efficient, eco-friendly alternatives. In similar vein, strategies that emphasize the benefits and long term cost implications of investing in energy efficient technology may further promote pro-environmental choice behaviour among a group such as the "energy investors". A combination of strategies, both informational and contextual, would thus seem most appropriate to address the preference structures of various consumer segments in the South African white goods industry.

In terms of policy, households seem to prefer policies that promote the acceptance of new energy-efficient technology above strategies aimed at reducing current equipment usage (Poortinga, Steg &

Vlek, 2003; Steg and Vlek, 2009). Life-cycle assessments also demonstrate that economic and ecological benefits can be gained by replacing appliances older than ten years (Otto, Ruminy & Mrotzek, 2006). Globally, policy tools such as the “Japanese Top Runner” program and the European Union’s EcoDesign directive are focused on the elimination of low efficiency appliances from the market by coercing manufacturers to develop new energy efficient appliances with reduced environmental impact (De Almeida, Fonseca, Schlomann & Feilberg, 2011; Kimura, 2010). This concurs with the recommendations of Thaler and Sunstein (2003), that government and private institutions should “nudge” consumers toward behavior with positive consequences by means of “choice architecture” i.e. individuals are not restricted in their choice of alternatives, but the inefficient options are simply eliminated from their choice set.

In the local context persistent energy shortages since the 2008 energy crisis, compelled the South African government to enforce more stringent measures to eliminate inefficient appliances on the market, and to empower consumers to make informed choices by implementing labeling that compare with European Union standards (Covary, 2013). These measures are necessary and justified, as respondents were confident in their differentiation between A+ and C energy efficiency ratings. The challenge however remains for lower income households to afford A+ rated appliances and even though such barriers are surmounted, an energy-efficient, eco-friendly appliance still requires effective utilization to realize the long-term economic and financial benefits of green technology. Policy, regulation and strategies to encourage environmentally significant choice behaviour, therefore require careful consideration of the high levels of income inequality and heterogeneity of consumer populations in the South African context.

THEORETICAL CONTRIBUTION

Although many studies have tested and applied behavioural theories such as the Theory of Planned Behaviour and Norm-Activation Theory of Altruism to deduce the determinants of environmentally significant behaviour in developed countries, comparatively few have explored the relevance of these approaches in the culturally diverse and complex conditions of emerging economies such as South Africa. This study therefore contributes to the body of knowledge by establishing the relevance of an amalgamation of the Theory of Planned Behaviour and Norm-Activation Theory of Altruism as specified in Bamberg and Möser’s (2007) meta-analytic structural equation model, to explicate the underlying motivational factors that contribute to consumers’ pro-environmental intent in an emerging market context. It also provides theoretical insight that underlines consumers’ environmentally

significant choice behaviour with regard to their prioritization of the eco-friendly features of a product category that has lasting environmental implications. The conclusions drawn from the findings resonate existing empirical evidence that report on the inconsistency between consumers' actual observed choices and their assumed pro-environmental intent.

As indicated in chapter four, the intention-behaviour gap challenges much of the conventional thinking and singular approaches to theory that have dominated contemporary consumer behaviour research (Foxall, 1999; Wagner-Tsukamoto & Tadajewski, 2006). The argument put forward is that even though individuals may have developed a sense of moral obligation and intent to purchase products with eco-friendly features, the complexity of situational determinants and contextual conditions in which consumers' environmentally significant behaviour is negotiated cannot be ignored. In an emerging economy such as South Africa, multiple situational factors related to social, economic and political circumstances may influence a consumer's environmental thinking and decision-making. In addition, the influence of situational factors is often determined by certain personal capabilities such as literacy and experience. Integrative, multi-dimensional models that include a broader scope of factors may thus further provide important theoretical insights to address the complexities of environmentally significant behaviour in these emerging economies. For these reasons an integrative theoretical framework was proposed (i.e. chapter four), which is an adaptation of existing models based on existing literature that in part reflect the conclusions drawn from this study, and is meant to direct further investigations of environmentally significant choice behaviour of consumers in the South African major household appliance retail sector. The proposed model incorporates a combination of motivational constructs derived from Bamberg and Möser's (2007) meta-analytic structural equation model, as well as the construct associations proposed in Ölander and Thøgersen's (1995) Motivation-Opportunity-Abilities model. However, this model has not yet been tested and thus requires further empirical verification in future research.

LIMITATIONS AND FUTURE RESEARCH RECOMMENDATIONS

Notwithstanding the theoretical contribution of this study, results are based on a non-probable purposive sample and can therefore not be generalised to the larger South African population. In specifying the units of analysis, an important pre-requisite for participation in this study was prior experience in being responsible/ co-responsible for purchasing major household appliances for a household. Focus was directed toward the perspectives of middle to higher income consumers since

their contribution to the average ecological footprint may be substantially higher than the less affluent. The argument put forward was that higher income affords increased spending with at least some opportunity to demonstrate personal preferences when considering choice alternatives. For these reasons a non-probability purposive store intercept approach was used to recruit consumers who were in the process of acquiring major household appliances in retail outlets that offer a wide range of high-end appliances that is specifically targeted at the more affluent consumer segments. For the purposes of this study, this technique worked well in ensuring that participants were recruited according to the specified criteria. That being said, the approach was costly, time-consuming and did not allow for a representative sample to accurately reflect the broader study population.

The eventual sample were mostly female with a higher level of education and belonged to the White racial group. To better inform marketing campaigns and intervention initiatives, future studies could focus on more representative samples that encompass a broader geographical scope within the South African context. Representative data is not always easily attained in developing countries such as South Africa as sampling is often difficult and challenging due to lack of sampling frames (Burgess & Steenkamp, 2006) and comprehensive census data (Chokor, 2004). Careful consideration is thus required in specifying the units of observation and the approach used to select study participants, especially in light of the diversities among emerging market consumer populations. In terms of demographic profile, attempts that involved investigations over four decades in high income industrialized countries have yielded inconsistent conclusions about the relationship between socio-demographic variables and consumers' concern about environmental issues (Balderjahn, 1988; Kinnear, Taylor & Ahmed, 1974; Diamantopoulos, Schlegelmilch, Sinkovics & Bohlen, 2003; Roberts, 1996; Vining, & Ebreo, 1990; Wagner, 2003; Webster, 1975). Even under more ideal circumstances for investigation where researchers were able to plan their samples meticulously, the only decisive assumption that emerged was that women report stronger environmental attitudes and behaviors than men (Iyer & Kashyap, 2007; Zelezny, Chua & Aldrich, 2000). In some instances, female's gender tendency toward private-sphere environmentalism is however also contested based on females' leading role in performing routine household shopping behaviour (Wagner, 2003). In this study, observation in stores corroborated the prominent role of females in acquiring major household appliances. Demographic variables may vary depending on the type of behaviour in question, which necessitates clear specification of the relevance of certain aspects such as income and gender and how it may effect consumers' approach to specific types of environmentally significant behaviour. A more representative account of the cultural heterogeneity in the broader South African population may

also highlight further differentiation with regard to the effect of certain motivational factors such as subjective and moral norms.

In the development of the questionnaire, emphasis was directed toward potential pitfalls such as response bias and respondent fatigue. Response bias is recurrent concern in environmentally related studies (Bamberg & Möser, 2007; Mohr, Webb & Harris, 2001), since respondents' tend to overrate their willingness to choose pro-environmental options in relation to their actual behaviour (Mohr *et al.*, 2001; Steg and Vlek, 2009). Although complete elimination of response bias cannot be guaranteed, conjoint analysis was a useful approach to reveal respondents' choice behaviour and preferences in an indirect manner and therefore more adept in predicting their prioritization of eco-friendly features. The drawback of this approach is that it relies on hypothetical products, i.e. the attributes and levels included in the conjoint task was based on the researcher's judgment which may not correspond with the respondents' true preferences. Much effort was thus devoted to the design of the conjoint tasks to ensure valid and reliable measures without compromising on the ease of completing the questionnaires. Decisions pertaining to the inclusion of specific attributes and levels were guided by an extensive review of catalogues, brochures and websites of appliance manufacturers and retailers as well as prior empirical evidence regarding consumers' evaluation and selection of appliances.

Pretesting of the question format was essential in combating the potential risk of respondent fatigue and information overload. Furthermore, the question format and order was checked and approved by statistical advisors. To reduce respondent fatigue and information overload, conjoint tasks were divided in four sets of ten that were alternated with other scale items in the questionnaire. The first section covered basic socio-demographic information pertaining to gender, age, education, income, population group, area of residence, household size and marital status. These questions were included in the initial section of the questionnaire for ethical purposes. Respondents are often unwilling to divulge personal information such as income. By including demographic information at the beginning of the questionnaire they were confronted with the decision to disclose such information from the start, rather than completing the entire questionnaire only to opt out in the end because they were unwilling to share personal details such as age and income. The next section introduced the conjoint tasks with a projective technique and basic descriptions pertaining to the attributes that were included in the conjoint profiles. This section was imperative in familiarizing respondents with the conjoint tasks. Other scale items that were included in the questionnaire were derived from previous studies and adapted for the purposes of this study. All constructs were measured on six point Likert-type *Agreement* scales, which excluded a neutral middle point, so that respondents were forced to

agree or disagree. Although the questionnaires were lengthy, high response rates were obtained because they were administered in face-to-face interviews.

In terms of the data-collection and analyses, it is important to recognize that this research was limited in its application of the Conjoint Value Analyses (CVA) Sawtooth software package. Future research may thus benefit from assessing the relevance of various other applications and conjoint methodologies (e.g. adaptive/ hybrid- and choice-based conjoint) in predicting pro-environmental choice behaviour and extending the application of these methods to other product categories. In addition to using the conjoint results for clustering purposes, choice simulators can also be applied that would enable the researcher to simulate competitive scenarios and estimate the share of preferences that particular attribute combinations are likely to capture (Hair, Black, Babin, Anderson & Tatham, 2006).

Although quantitative methodologies such as conjoint analyses offer much potential in exploring consumers' preference structures and prioritization of eco-friendly features, there has been growing support for real-life research that incorporates "context" via qualitative research methods to gain an in depth understanding of how consumers assess the environmental attributes of products amidst other criteria (Wagner, 2003; Wagner-Tsukamoto & Tadjewski, 2006). Studies that adopt a phenomenological approach (in accordance with the underlying assumptions of Lewin's (1951) Person Situation Field Theory whereby information is gathered within the context-specific settings (e.g. retail outlets) to explore the subjectively perceived contextual circumstances that inhibit or promote environmentally significant behaviour, could substantially contribute to the existing body of knowledge and provide a basis for improved theoretical models. Qualitative approaches may be particularly useful in emerging contexts where large scale survey-based projects frequently encounter methodological challenges because a large proportion of the consumer populations are often characterized by lower literacy levels with communication constraints and thus unable to complete questionnaires (Burgess & Steenkamp, 2006; Chatterjee, 2008).

In combining the benefits of both quantitative and qualitative methods of data collection and analysis, mixed method research designs may be worthy of further consideration for future research endeavors. The underlying basis of a mixed method approach is pragmatism which supports the fusion of positivism and interpretivism to produce findings that are of practical value to resolve research problems (Denscombe, 2007). Although surveys could be used to explain the influence of certain motivational variables that have been proven to impact on environmentally significant choice behavior

in other developmental frameworks, empirical evidence that excludes context may fail to produce a comprehensive understanding of consumers' behavior as it does not account for situational features in relation to choice task, product attributes, sale setting and other contextual influences (Stern, 2000; Wagner-Tsukamoto & Tadajewski, 2006). For this reason, a pragmatic approach could be used to obtain the necessary qualitative insight into contextual circumstances and then combine it with quantitative techniques that allow for the generalizability of findings.

Ultimately, "science is built on the generalizability of our findings..." (Burgess & Steenkamp, 2006), and, as indicated in the concluding section of chapter four, research in emerging contexts can benefit from existing data collection and analytical techniques. Literature in the marketing, consumer science and environmental psychology disciplines provide several validated scales that can be used to explore relevant constructs in the local context. However, such scales would have to be adapted to comply with the conditions that prevail within emerging markets, which may require "cognitively less demanding" shorter, simpler versions of existing scales that reduce the data collection burden for the respondent (Burgess & Steenkamp, 2006). More specifically related to the results reported in chapter two, impetus exist for the further exploration of motivational constructs and the validation of existing scales in the South African context. Further scale development may benefit future attempts to discriminate between constructs such as an awareness of consequences and internal attribution and to comprehensively explore concepts such as perceived behavioural control. In the development of such scales attention should be devoted to combatting common method variance that may account for high correlations among factors.

In conclusion, research in emerging countries such as South Africa needs to be expanded, specifically to establish theoretical frameworks that explicate the inter relationship of significant influencing factors that may induce more ecological and sustainable consumer patterns in those contexts. The preceding chapters also suggest that theoretical models that underscore the importance of motivational constructs and which acknowledge situational forces and cognitive capabilities would be the first step towards strategic planning on different levels. Within the field of Consumer Science that is concerned with the well-being of consumers and that strives to facilitate, educate and inform consumers, the empirical verification of this conceptual framework would be significant in terms of efforts to further indicate and explicate the interrelationship of factors that contribute to environmentally significant choice behaviour in the South African major household appliance sector.

REFERENCE LIST

- Balderjahn, I. 1988. Personality variables and environmental attitudes as predictors of ecologically responsible consumption patterns. *Journal of Business Research*, 17:51-56.
- Bamberg, S. & Möser, G. 2007. Twenty years after Hines, Hungerford, and Tomera: a new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of Environmental Psychology*, 27:14-25.
- Burgess, J. 2003. Sustainable consumption: is it really achievable? *Consumer Policy Review*, 13(3):78-84.
- Burgess, S.M. & Steenkamp, J.E.M. 2006. Marketing renaissance: how research in emerging markets advances marketing science and practice. *International Journal of Research in Marketing*, 23:337-356.
- Chan, L. & Bishop, B. 2013. A moral basis for recycling: extending the theory of planned behaviour. *Journal of Environmental Psychology*, 36:96-102.
- Chatterjee, D.P. 2008. Oriental disadvantage versus occidental exuberance: appraising environmental concern in India: a case study in a local context. *International Sociology*, 23(1):5-33.
- Chokor, B.A. 2004. Perception and response to the challenge of poverty and environmental resource degradation in rural Nigeria: case study from the Niger Delta. *Journal of Environmental Psychology*, 24:305-318.
- Covary, T. 2013. South African appliance labeling programme: the pros and cons. *25 Degrees in Africa*, April/May 8(2):1-4.
- Diamantopoulos, A., Schlegelmilch, B.B, Sinkovics, R.R. & Bohlen, G.M. 2003. Can socio-demographics still play a role in profiling green consumers? A review of the evidence and empirical investigation. *Journal of Business Research*, 56:465-480.

De Almeida, A., Fonseca, P., Schlomann, B. & Feilberg, N. 2011. Characterization of the household electricity consumption in the EU, potential energy savings and specific policy recommendations. *Energy and Buildings*, 43:1884-1894.

Denscombe, M. 2007. *The good research guide for small-scale social research projects*. 3rd ed. Berkshire: McGraw-Hill.

Euromonitor International. 2013. Consumer appliances in South Africa. [Online] Available from: <http://www.euromonitor.com/consumer-appliances-in-south-africa/report> [Accessed: 2013-08-07].

Foxall, G.R. 1999. Putting consumer behaviour in its place: the Behavioural Perspective Model research programme. *International Journal of Management Reviews*, 1(2):133-158.

Hair, J., Black, W., Babin, B., Anderson, R. & Tatham, R. 2006. *Multivariate data analysis*. 6th Edition. New Jersey: Pearson Education Inc.

Iyer, E.S. & Kashyap, R.K. 2007. Consumer recycling: role of incentives, information, and social class. *Journal of Consumer Behaviour*, 6:32-47.

Kaiser, F.G. 2006. A moral extension of the theory of planned behavior: norms and anticipated feelings of regret in conservatism. *Personality and Individual Differences*, 41:71-81.

Kimura, O. 2010. *Japanese Top Runner approach for energy efficiency standards*. Central Research Institute of Electric Power Industry. [Online]. Available from: <http://criepi.denken.or.jp/jp/serc/discussion/index.html>. [Accessed: 2014-01-31].

Kinney, T.C., Taylor, J.R. & Ahmed, S.A. 1974. Ecologically concerned consumers: who are they? *Journal of Marketing*, 38:20-24.

Lewin, K. 1951. *Field theory in social science: selected theoretical papers*. New York: Harper.

Mohr, L.A., Webb, D.J. & Harris, K.E. 2001. Do consumers expect companies to be socially responsible? The impact of corporate social responsibility on buying behaviour. *The Journal of Consumer Affairs*, 35(1):45-72.

- Ölander, F. & Thøgersen, J. 1995. Understanding of consumer behaviour as a prerequisite for environmental protection. *Journal of Consumer Policy*, 18(4):345-385.
- Pricewaterhouse Coopers (PwC) & Economist Intelligence Unit. 2012. South African retail and consumer products outlook 2012-2016. [Online] Available from: <http://www.pwc.co.za/en/publications/retail-and-consumer-outlook.jhtml>. [Accessed: 2013-04-30].
- Poortinga, W., Steg, L. & Vlek, C. 2004. Values, environmental concern, and environmental behavior: A study into household energy use. *Environment and Behavior*, 36(1):70-93.
- Roberts, J.A. 1996. Green consumers in the 1990s: profile and implications for advertising. *Journal of Business Research*, 36:217-231.
- Steg, L. & Vlek, C. 2009. Encouraging pro-environmental behaviour: an integrative review and research agenda. *Journal of Environmental Psychology*, 29:309-317.
- Stern, P.C. 2000. Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56(3):407-424.
- Otto, R., Ruminy, A. & Mrotzek, H. 2006. Assessment of the environmental impact of household appliances. *Appliance Magazine.com*, April, 1-5. [Online] Available from: <http://www.appliancemagazine.com/print.php?article+1393&zone=215&first=1> [Accessed: 2011-08-13].
- Thaler, R.H. & Sunstein, C.R. 2008. *Nudge: Improving decisions about health, wealth, and happiness*. New Haven: Yale University Press.
- Tanner, C., Kaiser, F.G. & Wölfling Kast, S. 2004. Contextual conditions of ecological consumerism: a food-purchasing survey. *Environment and Behavior*, 36(1):94-111.
- Vining, J. & Ebreo, A. 1990. What makes a recycler? A comparison of recyclers and nonrecyclers. *Environment and Behavior*, 22(1):55-73.

United Nations. 2013. Millennium development goals and beyond 2015. [Online] Available from: <http://www.un.org/millenniumgoals/pdf/Goal-7-fs.pdf>. [Accessed: 2014-01-15].

Wagner, S.A. 2003. *Understanding green consumer behaviour: a qualitative cognitive approach*. London: Routledge.

Wagner-Tsukamoto, S. & Tadajewski, M. 2006. Cognitive anthropology and the problem-solving behaviour of green consumers. *Journal of Consumer Behaviour*, 5:235-244.

Webster, F.E. 1975. Determining the characteristics of the socially conscious consumer. *Journal of Consumer Research*, 2(3):188-196.

Zelezny, L.C., Chua, P. & Aldrich, C. 2000. Elaborating on gender differences in environmentalism. *Journal of Social Issues*, 56(3):443-457.

ADDENDUM A: QUESTIONNAIRE



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Denklelers • Leading Minds • Dikgopolo tša Dihlalefi

DEPARTMENT OF CONSUMER SCIENCE

Dear Respondent

I am currently enrolled for my Ph.D. at the University of Pretoria under guidance of Professor Alet Erasmus and Professor Adre Schreuder.

The subject of my research dissertation is environmentally significant choice behaviour when purchasing major household appliances. You would be of great assistance to me if you could complete the following questionnaire.

Please fill in the questionnaire anonymously. At no time will any attempt be made to identify you. Your answers will be bulked with those obtained from other people and appropriate statistical analysis will be performed on the bulked data.

The questionnaire consists of a number of sections. Please read the instructions at each section carefully before you indicate your answers: **every question must be answered for the questionnaire to be useful.** The questions are spread over several pages to allow for ease of completion: it will take approximately 20 minutes to complete.

With the questionnaire we will attempt to collect data in the context of an experimental study which means that the products and the product characteristics that are included in the questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that have been presented to you for your decision as to whether you would purchase the product or not.

By answering the questions I will assume that you have consented to participate in this research endeavour.

As a token of appreciation for your participation, there will be a lucky draw on 15 August 2012 whereby one lucky participant could win a top quality microwave oven. Should you wish to enter into this lucky draw, please provide your **CELL NUMBER ONLY** on the tear off slip that is provided and hand it over to the fieldworker separately.

Thank you very much for your time and cooperation.

Yours sincerely,

A handwritten signature in black ink that reads 'NSonnenberg'.

Nadine Sonnenberg (Cell number: 083 407 2934)
November 2011

✂-----

CELL NUMBER:

Respondent

For Office Use

V1 1

Please answer the questions in the SECTION A by circling a number in a shaded box appropriate to your answer or by writing your answer into the shaded box provided

SECTION A: Please tell us about yourself

1. What is your **gender**?

Male	1
Female	2

V2 5

2. What was your **age** at your last birthday?

V3 7

3. What is your **HIGHEST** level of **education**?

Lower than grade 12	1
Grade 12	2
Grade 12 + a Degree or Diploma	3

V4 10

4. What is your **approximate** total monthly **HOUSEHOLD INCOME** to the **nearest** R1000?

V5 12

5. In terms of the *Employment Equity Act*, to which **population group** do you belong?

Black	1
Coloured	2
White	3
Asian	4
Other (specify):	

V6 22

6. Do you belong to an **environmental** activist **group** or **organisation**?

Yes	1
No	2
I am thinking about it	3

V7 25

7. Please provide your **area of residence** within the greater Tshwane Metropolitan area

V8 27

Question 8 follows on the next page ...

8. What is your current **household size** (total of family members living in your house)

--

For Office Use

V9

--	--	--

 31

9. Please indicate your **marital status**?

Single	1
Married / Couple	2
Couple / Married with children	3
Single with children	4

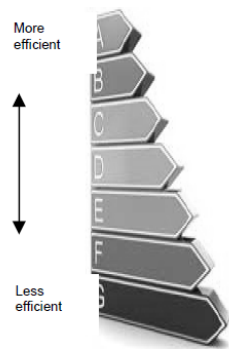
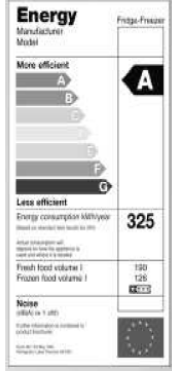
V10 38

SECTION B: **Setting the scene for what follows**

Place yourself in the following situation: *Your washing machine is broken and after consulting with an appliance repairman, you realise that it would not be feasible to have it fixed. You consequently have no other option but to purchase a new washing machine. You would probably consider ENERGY RATINGS and WASHING PROGRAMS of the washing machine you intend purchasing!*

ENERGY RATINGS

All new major household appliances have **energy labels**, which inform you about the **energy efficiency** of the appliance you want to buy. A washing machine's energy-efficiency rating is stated on its casing. Typically for a 6kg load on a cotton cycle at 60 °C for 1 hour:

	<p>A+ rating will use less than 1.02kW</p> <hr/> <p>A rating will use between 1.02kW and 1.14kW</p> <hr/> <p>B rating will use between 1.20kW and 1.38kW</p> <hr/> <p>C rating will use between 1.44kW and 1.62kW</p>	
---	--	--

SECTION B: *follows on the next page ...*



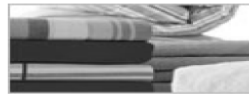
SECTION B: (cont.)

Setting the scene for what follows

Place yourself in the following situation: *Your washing machine is broken and after consulting with an appliance repairman, you realise that it would not be feasible to have it fixed. You consequently have no other option but to purchase a new washing machine. You would probably consider ENERGY RATINGS and WASHING PROGRAMS of the washing machine you intend purchasing!*

WASHING PROGRAMS

As many as 20 programs for washing, rinsing and spinning are available. Here are a few that you might want to consider when buying a new washing machine

	<p>Standard programs</p> <p><i>Conventional wash cycles for cottons, synthetics, delicate fabrics and woollens.</i></p>
	<p>Eco-friendly programs</p> <p><i>Use up to 50% less energy and/or water without compromising on results.</i></p> <p>Convenience programs</p> <p><i>Less than 30 min "quick wash" and "reduced ironing" cycles with reduced load.</i></p> <p>Hygiene programs</p> <p><i>High temperatures & high water levels for high standard of cleanliness sometimes with silver nano technology.</i></p>
	<p>Specialised programs</p> <p><i>For soft toys, pillows, sport shoes, sportswear, curtains. A "curtain" wash and or "first wash" is possible.</i></p>

What follows is a **PAIRWISE** presentation of offerings differing in respect of **CAPACITY, ENERGY RATING, PROGRAMS, BRAND PERCEPTION** and **PRICE**

Question 10

follows on the next page ..

For Office Use

Please consider each pair of **OFFERINGS** below and indicate your preference by making an "X" anywhere on the line provided to indicate your **considered choice** between each pair

10. Choose between **EACH** pair

SIEMENS

Capacity **10 - 11kg**
Energy rating **A+**
Programs **Convenience & Standard**
Brand **Reliable**
Price **R7 000**

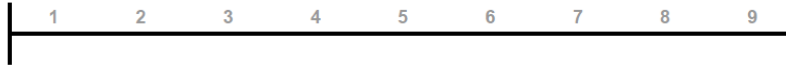
OR

 **LG**

Capacity **6.5 - 7kg**
Energy rating **C**
Programs **Specialised & Standard**
Brand **Innovative**
Price **R8 000**

Strongly prefer left

Strongly prefer right



V11 40

Miele

Capacity **8kg**
Energy rating **B**
Programs **Convenience & Standard**
Brand **Proudly South African**
Price **R3 000**

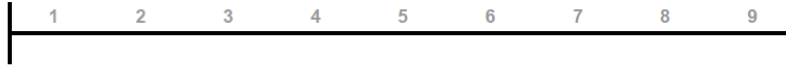
OR

 **SAMSUNG**

Capacity **6.5 - 7kg**
Energy rating **C**
Programs **Standard**
Brand **Eco-friendly**
Price **R18 000**

Strongly prefer left

Strongly prefer right



V12 44

AEG

Capacity **6.5 - 7kg**
Energy rating **B**
Programs **Specialised & Standard**
Brand **Prestigious**
Price **R10 000**

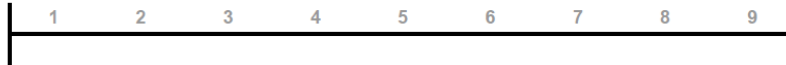
OR

 **Whirlpool**

Capacity **10 - 11kg**
Energy rating **A**
Programs **Eco-friendly & Standard**
Brand **Eco-friendly**
Price **R14 000**

Strongly prefer left

Strongly prefer right



V13 48

 **BOSCH**

Capacity **6.5 - 7kg**
Energy rating **B**
Programs **Hygiene & Standard**
Brand **Affordable**
Price **R18 000**

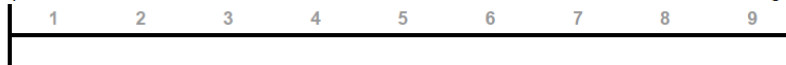
OR

AEG

Capacity **10 - 11kg**
Energy rating **A+**
Programs **Standard**
Brand **Eco-friendly**
Price **R14 000**

Strongly prefer left

Strongly prefer right



V14 52

Question 10 continues on the next page ...

This is an experimental study which means that the products and the product characteristics that are included in this questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that are presented to you

For Office Use

Please consider each pair of **OFFERINGS** below and indicate your preference by making an "X" anywhere on the line provided to indicate your **considered choice** between each pair

10. (cont.) Choose between **EACH** pair

SIEMENS

Capacity **8kg**
Energy rating **B**
Programs **Hygiene & Standard**
Brand **Prestigious**
Price **R5 000**

OR

Speed Queen
100 YEARS
1903 - 2008

Capacity **10 - 11kg**
Energy rating **A**
Programs **Specialised & Standard**
Brand **Affordable**
Price **R7 000**

Strongly prefer left



Strongly prefer right

V15 56

AEG

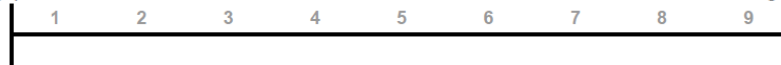
Capacity **6.5 - 7kg**
Energy rating **C**
Programs **Eco-friendly & Standard**
Brand **Proudly South African**
Price **R6000**

OR

SAMSUNG

Capacity **8kg**
Energy rating **A+**
Programs **Specialised & Standard**
Brand **Prestigious**
Price **R10 000**

Strongly prefer left



Strongly prefer right

V16 60

Speed Queen
100 YEARS
1903 - 2008

Capacity **10 - 11kg**
Energy rating **B**
Programs **Eco-friendly & Standard**
Brand **Innovative**
Price **R18 000**

OR

LG

Capacity **6.5 - 7kg**
Energy rating **C**
Programs **Convenience & Standard**
Brand **Proudly South African**
Price **R8 000**

Strongly prefer left



Strongly prefer right

V17 64

SIEMENS

Capacity **6.5 - 7kg**
Energy rating **A+**
Programs **Standard**
Brand **Innovative**
Price **R6 000**

OR

AEG

Capacity **10 - 11kg**
Energy rating **B**
Programs **Convenience & Standard**
Brand **Eco-friendly**
Price **R5 000**

Strongly prefer left



Strongly prefer right

V18 68

Question 10 continues on the next page ...

This is an experimental study which means that the products and the product characteristics that are included in this questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that are presented to you

For Office Use

Please consider each pair of **OFFERINGS** below and indicate your preference by making an "X" anywhere on the line provided to indicate your **considered choice** between each pair

10. (cont.) Choose between **EACH** pair



Capacity **8kg**
Energy rating **B**
Programs **Specialised & Standard**
Brand **Respected**
Price **R14 000**

OR

SIEMENS


Capacity **10 - 11kg**
Energy rating **C**
Programs **Convenience & Standard**
Brand **Eco-friendly**
Price **R6 000**

Strongly prefer left

1 2 3 4 5 6 7 8 9

Strongly prefer right

V19 72



Capacity **10 - 11kg**
Energy rating **A+**
Programs **Hygiene & Standard**
Brand **Affordable**
Price **R4 000**

OR



Capacity **8kg**
Energy rating **C**
Programs **Standard**
Brand **Respected**
Price **R3 000**

Strongly prefer left

1 2 3 4 5 6 7 8 9

Strongly prefer right

V20 76

SECTION C: Your level of experience in purchasing washing machines

Please answer the questions in the SECTION C by circling a number in a shaded box appropriate to your answer

11. How **often** have you **purchased** a washing machine?

I have never purchased a washing machine	1
Once	2
Twice	3
Three times	4
More than three times	5

V21 80

12. **When** was the last time you **purchased** a washing machine?

I have never purchased a washing machine	1
Prior to 2005	2
2005 to 2006	3
2007 to 2008	4
2009 to 2010	5
During 2011	6

V22 82

Question 13 follows on the next page ...

This is an experimental study which means that the products and the product characteristics that are included in this questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that are presented to you

For Office Use

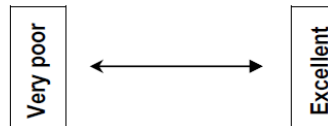
13. How experienced are you with purchasing washing machines?

Not at all	1
Limited	2
Average	3
Better than average	4
Very experienced	5

V23 84

SECTION D: Your knowledge of the eco-friendly features of washing machines

14. Consider each statement below and rate your knowledge on the scale supplied



Compared to other people, how would you describe your knowledge of the eco-friendly features (e.g. energy- and water saving features) of different types of washing machines?	1	2	3	4	5	6
In general, how would you describe your knowledge about the different types of eco-friendly washing machines on the market?	1	2	3	4	5	6
Compared to other people, how much experience do you have with the eco-friendly features of different types of washing machines claiming these attributes?	1	2	3	4	5	6

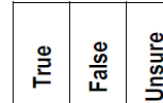
V24 86

V25 88

V26 90

SECTION E: Your general knowledge of washing machines

15. Please read each statement below and rate your knowledge on the scale supplied



Due to the complexity of its design, more resources are necessary for the production of a washing machine than for any other type of appliance	1	2	3
Certain ozone-depleting substances and hazardous heavy metals have been banned from being used in the component parts of appliances such as washing machines	1	2	3
Buying locally produced appliances may have less harmful consequences for the environment than buying imported ones	1	2	3
The actual use of a washing machine has far greater environmental impact than the initial production or eventual disposal thereof	1	2	3
Hard water affects the amount of detergent and volume of water needed for rinsing in a washing machines	1	2	3
In state-of-the-art washing machines, sensors monitor the washing process to keep the use of energy, water and detergent to a minimum	1	2	3
New washing machines need a lot less water for cleaning than those manufactured 30 years ago	1	2	3
It is better to replace a washing machine older than 10 years with a new one because the new appliances are more economical and environmentally friendly	1	2	3
The way in which electricity is generated in a specific region/ country has a large influence on the overall environmental impact of appliances	1	2	3
Some manufacturers use recycled materials to produce component parts for washing machines	1	2	3

V27 92

V28 94

V29 96

V30 98

V31 100

V32 102

V33 104

V34 106

V35 108

V36 110

Question 16 follows on the next page ...

This is an experimental study which means that the products and the product characteristics that are included in this questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that are presented to you

For Office Use

Please consider each pair of **OFFERINGS** below and indicate your preference by making an "X" anywhere on the line provided to indicate your **considered choice** between each pair

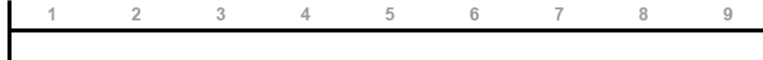
16. Choose between **EACH** pair


Capacity **10 - 11kg**
Energy rating **A**
Programs **Hygiene & Standard**
Brand **Prestigious**
Price **R8 000**

OR



Capacity **6.5 - 7kg**
Energy rating **B**
Programs **Specialised & Standard**
Brand **Proudly South African**
Price **R4 000**

Strongly prefer left




Strongly prefer right

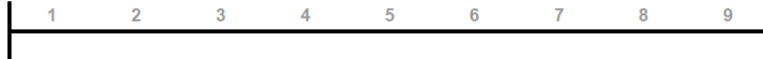
V37 112


Capacity **6.5 - 7kg**
Energy rating **A+**
Programs **Standard**
Brand **Proudly South African**
Price **R18 000**

OR


Capacity **10 - 11kg**
Energy rating **A**
Programs **Convenience & Standard**
Brand **Respected**
Price **R6 000**

Strongly prefer left



Strongly prefer right

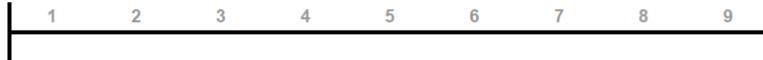
V38 116


Capacity **8kg**
Energy rating **B**
Programs **Eco-friendly & Standard**
Brand **Prestigious**
Price **R6 000**

OR


Capacity **10 - 11kg**
Energy rating **C**
Programs **Hygiene & Standard**
Brand **Innovative**
Price **R18 000**

Strongly prefer left



Strongly prefer right

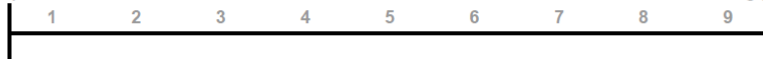
V39 120


Capacity **6.5 - 7kg**
Energy rating **C**
Programs **Eco-friendly & Standard**
Brand **Prestigious**
Price **R4 000**

OR


Capacity **8kg**
Energy rating **A+**
Programs **Convenience & Standard**
Brand **Proudly South African**
Price **R6 000**

Strongly prefer left



Strongly prefer right

V40 124

Question 16 continues on the next page ...

This is an experimental study which means that the products and the product characteristics that are included in this questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that are presented to you

For Office Use

Please consider each pair of **OFFERINGS** below and indicate your preference by making an "X" anywhere on the line provided to indicate your **considered choice** between each pair

16. (cont.) Choose between **EACH** pair

 **BOSCH**

Capacity **10 - 11kg**
Energy rating **A**
Programs **Standard**
Brand **Reliable**
Price **R5 000**

OR

SIEMENS

Capacity **8kg**
Energy rating **C**
Programs **Convenience & Standard**
Brand **Innovative**
Price **R14 000**

Strongly prefer left



Strongly prefer right

V41 128

SIEMENS

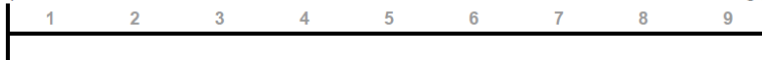
Capacity **10 - 11kg**
Energy rating **A**
Programs **Specialised & Standard**
Brand **Proudly South African**
Price **R4 000**

OR

AEG

Capacity **8kg**
Energy rating **A+**
Programs **Hygiene & Standard**
Brand **Affordable**
Price **R7 000**

Strongly prefer left



Strongly prefer right

V42 132

AEG

Capacity **8kg**
Energy rating **A**
Programs **Convenience & Standard**
Brand **Affordable**
Price **R3 000**

OR

 **LG**


Capacity **6.5 - 7kg**
Energy rating **B**
Programs **Hygiene & Standard**
Brand **Reliable**
Price **R7 000**

Strongly prefer left



Strongly prefer right

V43 136

 **DEFY**

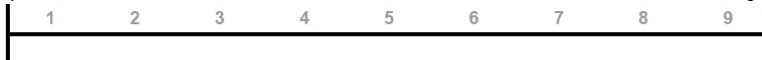
Capacity **10 - 11kg**
Energy rating **C**
Programs **Specialised & Standard**
Brand **Reliable**
Price **R7 000**

OR

 **Speed Queen**

Capacity **6.5 - 7kg**
Energy rating **A+**
Programs **Eco-friendly & Standard**
Brand **Eco-friendly**
Price **R5 000**

Strongly prefer left



Strongly prefer right

V44 140




Question 16 continues on the next page ...

This is an experimental study which means that the products and the product characteristics that are included in this questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that are presented to you



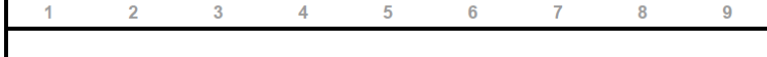
For Office Use

Please consider each pair of **OFFERINGS** below and indicate your preference by making an "X" anywhere on the line provided to indicate your **considered choice** between each pair

16. (cont.) Choose between **EACH** pair

 Capacity 8kg Energy rating C Programs Convenience & Standard Brand Reliable Price R5 000	OR	 Capacity 10 - 11kg Energy rating A+ Programs Hygiene & Standard Brand Respected Price R8 000
Strongly prefer left		Strongly prefer right
		

V45 144

 Capacity 8kg Energy rating A Programs Eco-friendly & Standard Brand Proudly South African Price R8 000	OR	 Capacity 6.5 - 7kg Energy rating B Programs Hygiene & Standard Brand Prestigious Price R3 000
Strongly prefer left		Strongly prefer right
		

V46 148

SECTION F: Your knowledge of the eco-friendly features of washing machines

17. Please **read** the statements below and for each **circle a number appropriate** to your answer

	Strongly disagree	←————→					Strongly agree	
	1	2	3	4	5	6		
Washing machines with eco-friendly features are impressive	1	2	3	4	5	6	V47 <input type="text"/> 152	
Washing machines with eco-friendly features are reliable	1	2	3	4	5	6	V48 <input type="text"/> 154	
Appliance retail outlets usually provide all the information you need about the eco-friendly features of washing machines	1	2	3	4	5	6	V49 <input type="text"/> 156	
Washing machines with eco-friendly features are available in all the major appliance retail outlets	1	2	3	4	5	6	V50 <input type="text"/> 158	
Washing machines with eco-friendly features are technologically advanced	1	2	3	4	5	6	V51 <input type="text"/> 160	
The functionality of washing machines with eco-friendly features is good	1	2	3	4	5	6	V52 <input type="text"/> 162	
Information about the eco-friendly features of washing machines are widely promoted	1	2	3	4	5	6	V53 <input type="text"/> 164	
If I wanted to, I could easily find a washing machine with eco-friendly features	1	2	3	4	5	6	V54 <input type="text"/> 166	
Eco-friendly washing machines are more expensive than the conventional washing machines	1	2	3	4	5	6	V55 <input type="text"/> 168	

SECTION F: *continues on the next page ...*

This is an experimental study which means that the products and the product characteristics that are included in this questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that are presented to you

For Office Use

SECTION F: Your knowledge of the eco-friendly features of washing machines

17. (cont.) Please read the statements below and for each circle a number appropriate to your answer

	Strongly disagree						Strongly agree		
The quality of washing machines with eco-friendly features is good	1	2	3	4	5	6		V56	<input type="text"/> 170
You can expect to pay more when eco-friendly features are added to the standard properties of a washing machine	1	2	3	4	5	6		V57	<input type="text"/> 172
Nowadays, there is a wide range of washing machines with built-in eco-friendly features	1	2	3	4	5	6		V58	<input type="text"/> 174
Washing machines with eco-friendly features are expensive	1	2	3	4	5	6		V59	<input type="text"/> 176
It is easy to find information about the eco-friendly features of washing machines	1	2	3	4	5	6		V60	<input type="text"/> 178

Please consider each pair of **OFFERINGS** below and indicate your preference by making an "X" anywhere on the line provided to indicate your **considered choice** between each pair

18. Choose between **EACH** pair

LG

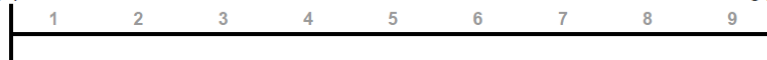
Capacity **6.5 - 7kg**
 Energy rating **A+**
 Programs **Convenience & Standard**
 Brand **Respected**
 Price **R4 000**

OR

DEFY

Capacity **8kg**
 Energy rating **B**
 Programs **Eco-friendly & Standard**
 Brand **Prestigious**
 Price **R14 000**

Strongly prefer left



Strongly prefer right

V61 180

Miele

Capacity **10 - 11kg**
 Energy rating **B**
 Programs **Standard**
 Brand **Respected**
 Price **R10 000**

OR

BOSCH

Capacity **6.5 - 7kg**
 Energy rating **A+**
 Programs **Eco-friendly & Standard**
 Brand **Reliable**
 Price **R3 000**

Strongly prefer left



Strongly prefer right

V62 184

Question 18 continues on the next page ...

This is an experimental study which means that the products and the product characteristics that are included in this questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that are presented to you

For Office Use

Please consider each pair of **OFFERINGS** below and indicate your preference by making an "X" anywhere on the line provided to indicate your **considered choice** between each pair

18. (cont.) Choose between *EACH* pair

Miele

Capacity **6.5 - 7kg**
 Energy rating **C**
 Programs **Specialised & Standard**
 Brand **Prestigious**
 Price **R18 000**

OR

BOSCH

Capacity **10 - 11kg**
 Energy rating **B**
 Programs **Standard**
 Brand **Innovative**
 Price **R10 000**

Strongly prefer left



Strongly prefer right

V63 188

Whirlpool

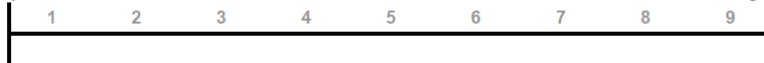
Capacity **10 - 11kg**
 Energy rating **A+**
 Programs **Standard**
 Brand **Affordable**
 Price **R14 000**

OR

LG

Capacity **8kg**
 Energy rating **A**
 Programs **Eco-friendly & Standard**
 Brand **Innovative**
 Price **R7 000**

Strongly prefer left



Strongly prefer right

V64 192

Speed Queen
100 YEARS 1909 - 2009

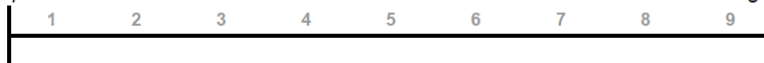
Capacity **10 - 11kg**
 Energy rating **C**
 Programs **Specialised & Standard**
 Brand **Proudly South African**
 Price **R5 000**

OR

Miele

Capacity **8kg**
 Energy rating **A**
 Programs **Standard**
 Brand **Reliable**
 Price **R10 000**

Strongly prefer left



Strongly prefer right

V65 196

Speed Queen
100 YEARS 1909 - 2009

Capacity **6.5 - 7kg**
 Energy rating **A**
 Programs **Specialised & Standard**
 Brand **Reliable**
 Price **R14 000**

OR

Whirlpool

Capacity **8kg**
 Energy rating **B**
 Programs **Eco-friendly & Standard**
 Brand **Eco-friendly**
 Price **R4 000**

Strongly prefer left



Strongly prefer right

V66 200

Question 18 continues on the next page ...

This is an experimental study which means that the products and the product characteristics that are included in this questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that are presented to you

For Office Use

Please consider each pair of **OFFERINGS** below and indicate your preference by making an "X" anywhere on the line provided to indicate your **considered choice** between each pair

18. (cont.) Choose between **EACH** pair

SAMSUNG

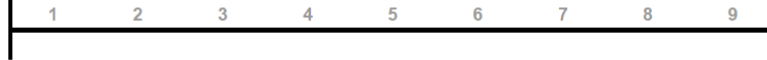
Capacity **8kg**
Energy rating **C**
Programs **Hygiene & Standard**
Brand **Proudly South African**
Price **R3 000**

OR

SIEMENS

Capacity **6.5 - 7kg**
Energy rating **A**
Programs **Specialised & Standard**
Brand **Affordable**
Price **R5 000**

Strongly prefer left



Strongly prefer right

V67 204

DEFY

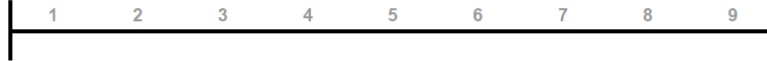
Capacity **8kg**
Energy rating **A**
Programs **Standard**
Brand **Eco-friendly**
Price **R7 000**

OR

Miele

Capacity **10 - 11kg**
Energy rating **C**
Programs **Eco-friendly & Standard**
Brand **Reliable**
Price **R10 000**

Strongly prefer left



Strongly prefer right

V68 208

Whirlpool

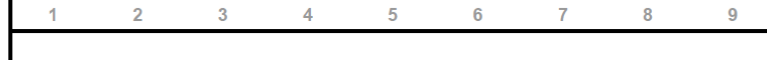
Capacity **8kg**
Energy rating **A+**
Programs **Convenience & Standard**
Brand **Innovative**
Price **R10 000**

OR

Miele

Capacity **6.5 - 7kg**
Energy rating **A**
Programs **Standard**
Brand **Respected**
Price **R3 000**

Strongly prefer left



Strongly prefer right

V69 212

SAMSUNG

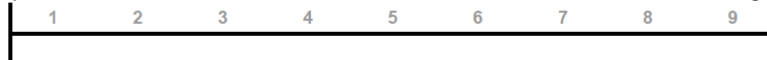
Capacity **10 - 11kg**
Energy rating **A+**
Programs **Eco-friendly & Standard**
Brand **Prestigious**
Price **R7 000**

OR

DEFY

Capacity **8kg**
Energy rating **C**
Programs **Hygiene & Standard**
Brand **Reliable**
Price **R6 000**

Strongly prefer left



Strongly prefer right

V70 216

SECTION G: follows on the next page ...

This is an experimental study which means that the products and the product characteristics that are included in this questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that are presented to you

For Office Use

SECTION G: General questions

19. Please read the statements below and for each circle a number appropriate to your answer	Strongly disagree					Strongly agree			
	1	2	3	4	5	6			
Most people who are important to me would approve of my choice of product if it has less harmful implications for the environment	1	2	3	4	5	6	V71	<input type="checkbox"/>	220
It is easy to compare washing machines in terms of their environmental impact	1	2	3	4	5	6	V72	<input type="checkbox"/>	222
It is mostly up to me whether or not I buy an eco-friendly appliance	1	2	3	4	5	6	V73	<input type="checkbox"/>	224
Buying an eco-friendly washing machine is not a difficult task	1	2	3	4	5	6	V74	<input type="checkbox"/>	226
Environmental problems can not only be blamed on government and industry – I am also responsible because of the choices I make	1	2	3	4	5	6	V75	<input type="checkbox"/>	228
I feel a personal, moral obligation to pay attention to information about products which are safe for the environment	1	2	3	4	5	6	V76	<input type="checkbox"/>	230
For me, buying a washing machine that is more eco-friendly is pleasant	1	2	3	4	5	6	V77	<input type="checkbox"/>	232
I would feel guilty if I knowingly bought an energy and water intensive washing machine if there are other more eco-friendly machines available	1	2	3	4	5	6	V78	<input type="checkbox"/>	234
I feel morally obliged to buy eco-friendly products, regardless of what others do	1	2	3	4	5	6	V79	<input type="checkbox"/>	236
If the choice is between a conventional and an eco-friendly appliance, I feel that I should buy the eco-friendly option for the sake of the environment	1	2	3	4	5	6	V80	<input type="checkbox"/>	238
For me, buying a washing machine that is more eco-friendly is satisfying	1	2	3	4	5	6	V81	<input type="checkbox"/>	240
I would feel guilty if I knowingly bought imported products despite the fact that there are local products available with less environmental impact	1	2	3	4	5	6	V82	<input type="checkbox"/>	242
I feel a personal, moral obligation to read and compare product information for environmentally safe components when I shop	1	2	3	4	5	6	V83	<input type="checkbox"/>	244
For me, buying a washing machine that is more eco-friendly is good	1	2	3	4	5	6	V84	<input type="checkbox"/>	246
In order to save the environment, people should be encouraged to buy eco-friendly appliances	1	2	3	4	5	6	V85	<input type="checkbox"/>	248
Most people who are important to me probably think that I should consider the environmental impact of the products I buy	1	2	3	4	5	6	V86	<input type="checkbox"/>	250
I would feel guilty if I knowingly purchased a washing machine from a manufacturer that pollutes the environment	1	2	3	4	5	6	V87	<input type="checkbox"/>	252
For me, buying a washing machine that is more eco-friendly is wise	1	2	3	4	5	6	V88	<input type="checkbox"/>	254
When using a washing machine, water is consumed which has certain environment implications	1	2	3	4	5	6	V89	<input type="checkbox"/>	256
I can help to solve environmental problems by choosing eco-friendly appliances	1	2	3	4	5	6	V90	<input type="checkbox"/>	258
There is an urgent need for something to be done about the depletion of natural resources as a result of people's use of appliances	1	2	3	4	5	6	V91	<input type="checkbox"/>	260
The next time I shop for a new washing machine, my intention is to consider its eco-friendly features and programmes	1	2	3	4	5	6	V92	<input type="checkbox"/>	262
I plan to stop buying products from companies who are guilty of polluting the environment even though it might be inconvenient for me	1	2	3	4	5	6	V93	<input type="checkbox"/>	264
My product choices can have an impact on the environment	1	2	3	4	5	6	V94	<input type="checkbox"/>	266
High energy consumption of household appliances contribute to environmental problems	1	2	3	4	5	6	V95	<input type="checkbox"/>	268

SECTION G: continues on the next page ...

This is an experimental study which means that the products and the product characteristics that are included in this questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that are presented to you

For Office Use

SECTION G: General questions

19. (cont.) Please read the statements below and for each circle a number appropriate to your answer

	Strongly disagree	1	2	3	4	5	6	Strongly agree	
I believe that most of my acquaintances expect that I should choose products that is better for the environment		1	2	3	4	5	6		V96 <input type="text"/> 270
In future, I intend to buy a washing machine that is more eco-friendly		1	2	3	4	5	6		V97 <input type="text"/> 272
Choosing eco-friendly appliances will help to solve wider environmental problems		1	2	3	4	5	6		V98 <input type="text"/> 274
I would feel guilty if I knowingly bought products that have a negative impact on the environment		1	2	3	4	5	6		V99 <input type="text"/> 276
I feel a personal moral obligation to buy products made by companies known for being environmentally responsible		1	2	3	4	5	6		V100 <input type="text"/> 278
I contribute to the depletion of natural resources when using a washing machine that requires more water and energy to operate		1	2	3	4	5	6		V101 <input type="text"/> 280
For me, buying a washing machine that is more eco-friendly is beneficial		1	2	3	4	5	6		V102 <input type="text"/> 282
If I would buy a new washing machine I would feel morally obliged to buy an eco-friendly one		1	2	3	4	5	6		V103 <input type="text"/> 284

Please consider each pair of **OFFERINGS** below and indicate your preference by making an "X" anywhere on the line provided to indicate your **considered choice** between each pair

20. Choose between **EACH** pair

DEFY

Capacity **8kg**
Energy rating **A+**
Programs **Standard**
Brand **Innovative**
Price **R4 000**

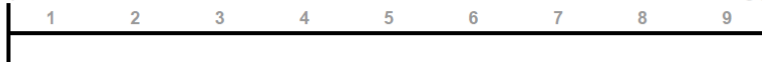
OR

SIEMENS

Capacity **10 - 11kg**
Energy rating **B**
Programs **Hygiene & Standard**
Brand **Proudly South African**
Price **R8 000**

Strongly prefer left

Strongly prefer right



V104 286

BOSCH

Capacity **6.5 - 7kg**
Energy rating **A**
Programs **Convenience & Standard**
Brand **Prestigious**
Price **R14 000**

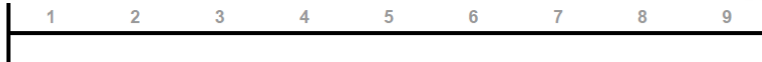
OR

SIEMENS

Capacity **8kg**
Energy rating **A+**
Programs **Specialised & Standard**
Brand **Reliable**
Price **R8 000**

Strongly prefer left

Strongly prefer right



V105 290

Question 20 continues on the next page ...

This is an experimental study which means that the products and the product characteristics that are included in this questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that are presented to you

For Office Use

Please consider each pair of **OFFERINGS** below and indicate your preference by making an "X" anywhere on the line provided to indicate your **considered choice** between each pair

20. (cont.) Choose between **EACH** pair

SAMSUNG

Capacity **6.5 - 7kg**
Energy rating **B**
Programs **Standard**
Brand **Affordable**
Price **R3 000**

OR

BOSCH

Capacity **8kg**
Energy rating **A+**
Programs **Specialised & Standard**
Brand **Respected**
Price **R18 000**

Strongly prefer left



Strongly prefer right

V106 294

Miele

Capacity **6.5 - 7kg**
Energy rating **C**
Programs **Hygiene & Standard**
Brand **Innovative**
Price **R5 000**

OR

LG

Capacity **10 - 11kg**
Energy rating **B**
Programs **Standard**
Brand **Affordable**
Price **R18 000**

Strongly prefer left



Strongly prefer right

V107 298

Speed Queen
100 YEARS
1909 - 2009

Capacity **8kg**
Energy rating **C**
Programs **Eco-friendly & Standard**
Brand **Respected**
Price **R14 000**

OR

Whirlpool

Capacity **6.5 - 7kg**
Energy rating **A**
Programs **Specialised & Standard**
Brand **Innovative**
Price **R6 000**

Strongly prefer left



Strongly prefer right

V108 302

Miele

Capacity **10 - 11kg**
Energy rating **B**
Programs **Convenience & Standard**
Brand **Eco-friendly**
Price **R8 000**

OR

Whirlpool

Capacity **8kg**
Energy rating **A**
Programs **Hygiene & Standard**
Brand **Proudly South African**
Price **R10 000**

Strongly prefer left



Strongly prefer right

V109 306

Question 20 continues on the next page ...

This is an experimental study which means that the products and the product characteristics that are included in this questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that are presented to you

For Office Use

Please consider each pair of **OFFERINGS** below and indicate your preference by making an "X" anywhere on the line provided to indicate your **considered choice** between each pair

20. (cont.) Choose between **EACH** pair

DEFY

Capacity **6.5 - 7kg**
Energy rating **B**
Programs **Eco-friendly & Standard**
Brand **Respected**
Price **R10 000**

OR

AEG

Capacity **8kg**
Energy rating **A**
Programs **Hygiene & Standard**
Brand **Prestigious**
Price **R4 000**

Strongly prefer left

Strongly prefer right

1 2 3 4 5 6 7 8 9

V110 310

AEG

Capacity **6.5 - 7kg**
Energy rating **A**
Programs **Hygiene & Standard**
Brand **Eco-friendly**
Price **R10 000**

OR

BOSCH

Capacity **10 - 11kg**
Energy rating **C**
Programs **Standard**
Brand **Affordable**
Price **R5 000**

Strongly prefer left

Strongly prefer right

1 2 3 4 5 6 7 8 9

V111 314

BOSCH

Capacity **8kg**
Energy rating **C**
Programs **Specialised & Standard**
Brand **Eco-friendly**
Price **R7 000**

OR

DEFY

Capacity **6.5 - 7kg**
Energy rating **A+**
Programs **Convenience & Standard**
Brand **Prestigious**
Price **R18 000**

Strongly prefer left

Strongly prefer right

1 2 3 4 5 6 7 8 9

V112 318

LG

Capacity **10 - 11kg**
Energy rating **A+**
Programs **Specialised & Standard**
Brand **Affordable**
Price **R6 000**

OR

Speed Queen
100 YEARS 1908 - 2008

Capacity **6.5 - 7kg**
Energy rating **B**
Programs **Convenience & Standard**
Brand **Reliable**
Price **R8 000**

Strongly prefer left

Strongly prefer right

1 2 3 4 5 6 7 8 9

V113 322

Thank you for your time and co-operation

This is an experimental study which means that the products and the product characteristics that are included in this questionnaire are fictitious. You will therefore not necessarily find a product in the market place with the combination of characteristics that are presented to you

ADDENDUM B: ETHICS APPROVAL



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

ETHICS COMMITTEE
Faculty of Natural and Agricultural Sciences

05 December 2011
Prof A Erasmus
Department of Consumer Sciences
University of Pretoria
Pretoria
0002

Dear Prof Erasmus

Re: EC111115-078 A model that depicts the environmentally significant choice behavior of South African consumers during their pre-purchase evaluation and selection of major household appliances

The project conforms to the requirements of the Ethics Committee.

Kind regards

Prof NH Casey
Chairman: Ethics Committee

Agriculture Building 10-20
University of Pretoria
Private bag X20, Hatfield 0028
Republic of South Africa

Tel: 012 420 4107
Fax: 012 420 32901

ethics.nas@up.ac.za

ADDENDUM C: EXPLORATORY FACTOR ANALYSES (EFA) OF THE MOTIVATIONAL ITEMS (SECTION G OF THE QUESTIONNAIRE)

The EFA results included in this addendum are linked to the results reported in chapter two, but is excluded from the chapter as it represents a manuscript that has to comply with the prescribed word count limitations of the *Journal of Environmental Psychology*. For the purposes of the thesis, the EFA results may provide valuable insight into the systematic elimination and final selection of items that formed the underlying basis of the structural equation models that are presented in chapter two.

Table 1 summarises the results of the EFA with Procrustes rotation, which produced a five factor solution for the motivational items that formed part of section G in the questionnaire. As illustrated in Table 1, items pertaining to a general awareness of consequences (GAWA) and those that address an awareness of consequences on a more personal level (PAWA) loaded positively on a single factor. Similarly, moral norms, attitudes and guilt items also loaded positively on a single factor. A confirmatory factor analyses, which is reported in chapter two, further substantiates the amalgamation of these constructs. In a recent article, Chan and Bishop (2013) debate the issue surrounding discriminant validity of the constructs included in the Theory of Planned Behaviour and argue that by definition, it may be improbable to expect totally discriminant (*i.e.* unrelated) factors in psychological data. With regard to the data extracted from section G, it was apparent that with the exception of social norm items that loaded as expected, factor loadings for items related to psychological constructs such as attitudes, intention, moral norms, guilt and perceived behavioural control were problematic. A careful consideration of the item loadings per factor with acknowledgement of the factor items contained in the original scales required the elimination of several items. As a first step, a threshold of 0.35 was employed for detecting relevant factor loadings – this threshold was considered appropriate based on the sample size ($N = 667$) (Mazzocchi, 2012:228). As a further measure, all items that loaded positively on more than one factor was eliminated from the data set. Based on the fore mentioned criteria, all items highlighted in Table 1 were eliminated from the data set and a sum total of between two to three items per construct was retained for further confirmatory factor analyses (CFA) that is reported in chapter two. In her recommendations to researchers building and testing structural equation models, Iacobucci (2010) explains that ideally, each construct would be measured by three indicator variables, although it would be acceptable if a few are measured by less – four or more indicator variables per construct may become excessive.

References:

- Chan, L. & Bishop, B. 2013. A moral basis for recycling: extending the theory of planned behaviour. *Journal of Environmental Psychology*, 36:96-102.
- Iacobucci, D. 2010. Structural equations modeling: fit indices, sample size, and advanced topics. *Journal of Consumer Psychology*, 20:90-98.
- Mazzocchi, M. 2008. *Statistics for marketing and consumer research*. Los Angeles. Sage.

TABLE 1: PROCRUSTES-ROTATED FACTOR PATTERN FOR MOTIVATION ITEMS

Item	Item label	Factor				
		1	2	3	4	5
<i>I would feel guilty if I knowingly bought an energy and water intensive washing machine if there are other more eco-friendly machines available</i>	GLT1	0.85	-0.02	-0.17	0.17	0.02
<i>I feel morally obliged to buy eco-friendly products, regardless of what others do</i>	MNO2	0.83	-0.09	-0.17	0.30	0.05
<i>For me, buying a washing machine that is more eco-friendly is satisfying</i>	ATT2	0.81	-0.04	0.10	0.03	-0.01
<i>If the choice is between a conventional and an eco-friendly appliance, I feel that I should buy the eco-friendly option for the sake of the environment</i>	MNO1	0.77	-0.05	0.03	0.14	0.04
<i>For me, buying a washing machine that is more eco-friendly is pleasant</i>	ATT1	0.73	0.01	0.22	-0.15	0.08
<i>For me, buying a washing machine that is more eco-friendly is good</i>	ATT3	0.60	0.21	0.10	0.00	-0.01
<i>For me, buying a washing machine that is more eco-friendly is wise</i>	ATT4	0.55	0.35	0.17	-0.11	-0.10
<i>I would feel guilty if I knowingly purchased a washing machine from a manufacturer that pollutes the environment</i>	GLT2	0.49	0.28	0.01	0.14	-0.10
<i>If I would buy a new washing machine I would feel morally obliged to buy an eco-friendly one</i>	MNO6	0.49	0.18	0.17	0.35	-0.05
<i>In future, I intend to buy a washing machine that is more eco-friendly</i>	INT3	0.46	0.26	0.23	0.07	-0.02
<i>I feel a personal moral obligation to pay attention to information about products which are safe for the environment</i>	MNO3	0.46	0.31	0.04	-0.06	0.04
<i>For me, buying a washing machine that is more eco-friendly is beneficial</i>	ATT5	0.44	0.34	0.20	0.01	-0.06
<i>When using a washing machine, water is consumed which has certain environmental implications</i>	GAWA2	-0.08	0.88	0.00	-0.13	0.02
<i>High energy consumption of household appliances contribute to environmental problems</i>	GAWA4	-0.05	0.84	-0.04	0.07	0.01
<i>My product choices can have an impact on the environment</i>	PAWA1	-0.07	0.82	0.01	0.11	0.06
<i>There is an urgent need for something to be done about the depletion of natural resources as a result of people's use of appliances</i>	GAWA1	0.11	0.74	-0.09	0.09	0.00
<i>Choosing eco-friendly appliances will help to solve wider environmental problems</i>	GAWA5	0.05	0.70	0.07	0.17	0.04
<i>I can help to solve environmental problems by choosing eco-friendly appliances</i>	PAWA2	0.19	0.68	0.01	0.02	0.01
<i>In order to save the environment, people should be encouraged to buy eco-friendly appliances</i>	GAWA3	0.36	0.50	0.05	-0.05	-0.03
<i>The next time I shop for a new washing machine, my intention is to consider its eco-friendly features and program</i>	INT4	0.41	0.40	0.14	0.03	-0.09
<i>Most people who are important to me would approve of my choice of product if it has less harmful implications for the environment</i>	SNO1	0.08	0.00	0.81	-0.19	0.14
<i>I believe that most of my acquaintances expect that I should choose products that is better for the environment</i>	SNO3	0.01	0.01	0.76	0.15	0.03
<i>Most people who are important to me probably think that I should consider the environmental impact of the products I buy</i>	SNO2	0.08	0.02	0.63	0.24	0.03
<i>I would feel guilty if I knowingly bought imported products despite the fact that there are local products available with less environmental impact</i>	GLT3	0.33	0.02	-0.11	0.63	0.16
<i>I plan to stop buying products from companies who are guilty of polluting the environment even though it might be inconvenient for me</i>	INT3	0.15	0.41	0.08	0.41	0.02
<i>I feel a personal, moral obligation to read and compare product information for environmentally safe components when I shop</i>	MNO4	0.37	0.16	0.06	0.40	0.11
<i>I intend to buy products made by companies known for being environmentally responsible</i>	INT2	0.03	0.03	0.06	0.39	-0.06
<i>In future I would not buy products that have a negative impact on the environment</i>	INT1	0.03	0.01	0.09	0.36	-0.07
<i>It is mostly up to me whether or not I buy an eco-friendly appliance</i>	PBC3	0.26	0.41	-0.24	-0.44	0.34
<i>Buying an eco-friendly washing machine is not a difficult task</i>	PBC2	-0.03	0.11	0.06	-0.01	0.82
<i>It is easy to compare washing machines in terms of their environmental impact</i>	PBC1	-0.04	-0.13	0.17	0.25	0.79

Note: GAWA = awareness of behavioural consequences in general; PAWA = awareness of consequences related to personal behaviour i.e. internal attribution, MNO= moral norm; GLT = guilt; SNO= subjective norm; ATT= attitude toward behaviour; PBC= perceived behavioural control, INT = intention

ADDENDUM D: CONFIRMATORY FACTOR ANALYSES (CFA) MODELS

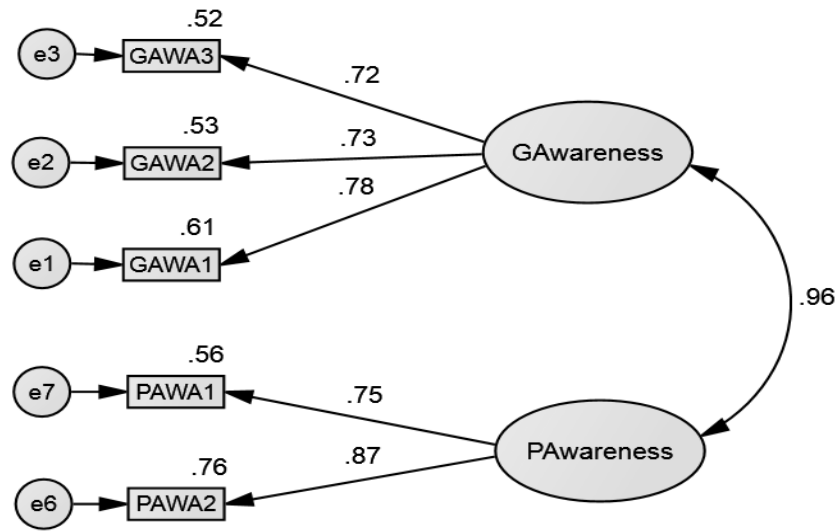


Figure 1. Two factor general awareness and personal awareness CFA model

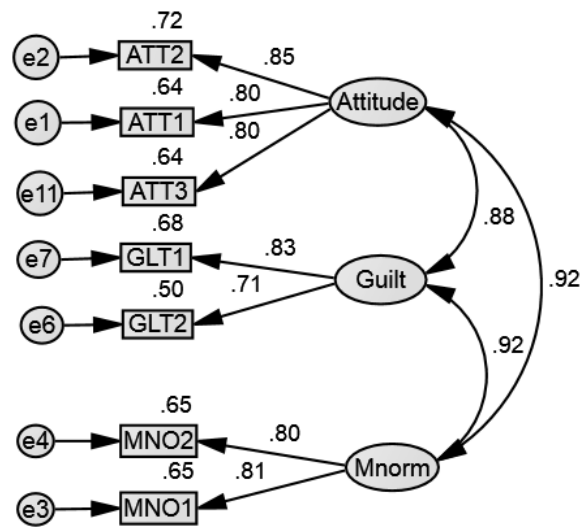


Figure 2. Three factor attitude, guilt and moral norm CFA model

ADDENDUM E: REVIEWERS' COMMENTS: MANUSCRIPT SUBMITTED TO THE *INTERNATIONAL JOURNAL OF CONSUMER STUDIES*

22-Jan-2014

Manuscript ID IJC-OA-2013-419 entitled "Using conjoint- and cluster analysis to explain consumers' preferences for eco-friendly appliances in an emerging market context" which you submitted to the International Journal of Consumer Studies, has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter. The reviewer(s) have recommended minor revisions to your manuscript. Therefore, I invite you to respond to the reviewer(s)' comments and revise your manuscript.

To revise your manuscript, log into <http://mc.manuscriptcentral.com/ijc> and enter your Author Center, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision. Please DO NOT upload your revised manuscripts as a new submission. You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript using a word processing program and save it on your computer. Please also highlight the changes to your manuscript within the document by using the track changes mode in MS Word or by using bold or colored text. Once the revised manuscript is prepared, you can upload it and submit it through your Author Center. When submitting your revised manuscript, you will be able to respond to the comments made by the reviewer(s) in the space provided. You can use this space to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please be as specific as possible in your response to the reviewer(s).

IMPORTANT: Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission. Because we are trying to facilitate timely publication of manuscripts submitted to the International Journal of Consumer Studies, your revised manuscript should be uploaded as soon as possible. If it is not possible for you to submit your revision in a reasonable amount of time, we may have to consider your paper as a new submission. If you feel that you will be unable to submit your revision within the time allowed please contact me to discuss the possibility of extending the revision time.

Once again, thank you for submitting your manuscript to the International Journal of Consumer Studies and I look forward to receiving your revision.

Kind regards,

Katherine Hughes

Editor, International Journal of Consumer Studies

katherine.hughes@btconnect.com

Reviewer(s)' Comments to Author:

Reviewer: 1

Comments to the Author

Very good work.

Just some few clarifications are needed:

ZAR6401 (1USD ~ R10.3) does this mean: >6400 ZAR (1 USD ~ 10.3 ZAR)???

Please correct or explain better the meaning

Later (line 49 of page 8) you define: (1USD = 10 ZAR) which is a bit different. Please align the information!

Please insert blank between value and unit of a measure.

Change 10Kg to 10 kg and similarly later to other values like this.

Reviewer: 2

Comments to the Author

This paper is interesting and the methods used are relevant and carefully executed. Furthermore, it is written in a clear way and in good English (but as a non-English person I can't be the best judge of that). Tables and graph are allright, too.

First, I have question-mark on data collection. As far as I understand Tshwane is an above-average town in terms of income among its population. It seems to be predominantly White in composition, while South Africa in general is Black: Respondents were about 80% White while SA in general is 80% Black. This choice is based on the fact that SA is moving up in consumption so that Tshwane captures the coming of SA consumption pattern in the near future. On the other hand, it seems as though the range of income among respondents is quite big as it is said that more than half of them were in the "middle to lower income segments" (p 12, l 12). Why was Tshwane chosen? Why is not

South African (in general) income levels described as comparison? This goes also for education level and ethnicity. I want to see respondents situated in relation to the general population of SA.

My "minor revision"-call concerns conclusions, and this has (perhaps) some repercussions on the literature. The most important point made in the conclusions, in my mind, is the second sentence in the last paragraph (page 14, line 17), which says that surveys tend to overestimate consumer's willingness to engage in environmentally responsible behaviour. The decomposition of attributes of washing machines gives us a better picture. But I think you can do more on the data produced. A universal problem with durable goods consuming energy is that an energy efficient variant is cheaper to use over its life cycle but often more expensive to purchase. So "price" in your study is purchasing price, but the total costs of a washing machine, including energy costs, may be lower. This opens for a discussion on "rational behaviour" and the critique from Kahneman (Thinking fast and slow) and other studies within behavioural economics (such as Thaler and Sunstein's "Nudge"). Or, alternatively (or both) a discussion around "Ecodesign" in the European Union (and Top-Runner Initiative in Japan) that aims to solve problems of that kind through the introduction of minimum-level standards. Elimination of the worst models, from an energy perspective, is a way to promote energy efficient equipment (the consumer can choose whatever model she likes, but not non-energy efficient ones).

Thirdly, the paper opens for discussions of a more sociological kind, for example in relation to Thorstein Veblen and his ideas on "conspicuous consumption" or James Duesenberry's idea about the relative income. Consumption is social, is their common theme, so that people in the move up in the social status ladder want to show off, or that people want to "keep up with Jones's". But your results show that very expensive machines get negative utility values among respondents, which means that "conspicuous consumption" is not a mechanism at work here in the case of washing machines in Tshwane (and in South Africa?). This is comforting for the future from an environmental point of view. (See also Elizabeth Shove & Alan Warde (1998), Inconspicuous consumption: the sociology of consumption and the environment. Lancaster University, Department of Sociology. <http://www.lancs.ac.uk/fass/sociology/papers/shove-warde-inconspicuous-consumption.pdf>).

ADDENDUM F: REVIEWERS' COMMENTS: MANUSCRIPT SUBMITTED TO THE *JOURNAL OF FAMILY ECOLOGY AND CONSUMER SCIENCES*

Reviewer 1:

TITLE: Challenges associated with environmentally significant choice behaviour in the South African major household appliance market: an integrative conceptual approach

Value and potential for publication

This is a very well conceived, written and evidenced paper. It may be considered quite long, but the elements are clearly discussed and developed and I feel that omitting certain sections would decrease the flow and workability of the paper, so am happy for it to stay as it is. My only real concern is that although the paper develops and presents a theoretical model this hasn't really been shown to work e.g. no results are yet applied to it. If the Journal editors are happy for this then so am I. Agreed it would be a very long paper were its 'proof' of working to be included. Are the authors thinking of publishing a second paper containing evidence that the theory works? I have very few minor errors in the script which could be addressed (see below). Otherwise I would be very happy to see this published.

Response: More papers will follow containing evidence for proposed conceptual framework

Relevance of title

I don't feel the title really reflects the contents of the paper, perhaps:

'The development of a theoretical model to investigate factors associated with environmentally significant choice behaviour in the South African major household appliance market: an integrative conceptual approach' or something similar may be a better representation of what is contained in the paper?

Response: Title changed as per recommendation

Abstract

Abstract and keywords seem appropriate. No changes suggested.

Headings and subheadings

These have been well used and seem appropriate. No changes suggested.

Clarity and meaningfulness of tables and graphics

One figure: the conceptual framework developed, seems clear and appropriate. No changes suggested.

Correctness of terminology

Very clear, well explained, well evidenced with references where required.

Use of literature (relevance, interpretation, adequate supportive argumentation)

The statement in the introduction: 'BRIICS' status represents important social and economic benefits for South Africa, but it also requires recognition of the profound environmental impact of ongoing economic growth' would benefit from a reference.

Response: Reference included

p.17: Azjen (2002) is cited in text but missing in the list.

Response: Azjen (2002) was added to reference list

Consider omitting the following dated reference which is used in combination with other up to date refs:

COOPER, T. 1994. Beyond recycling. The longer life option. *The New Economics Foundation*, November: 2-22.

Response: Reference omitted from text and removed from reference list

Clear and logical presentation of content (Write comments with reference to page and paragraph numbers. Use more pages if necessary)

Excellent, throughout this paper seems to build well and is well evidenced.

Response: Feedback is much appreciated. Thank you.

Reviewer 2:

TITLE

Challenges associated with environmentally significant choice behaviour in the South African major household appliance market: an integrative conceptual approach

Value and potential for publication

The question which factors determine buying environmentally friendly household appliances is a very important one – from a theoretical point of view as well as from a practical one. From a theoretical point of view it is important to develop a complete model which includes an overview on all potential factors. From a practical view the analysis might put special focus on factors which can be influenced by the producers and the government. This is what the author does when she / he includes special focus a person's abilities e.g. consumer's knowledge and experience.

Relevance of title

See above

Abstract

No comments

Headings and subheadings

No comments

Clarity and meaningfulness of tables and graphics

The paper might benefit from including some more graphics. Especially when it comes to the theoretical background and prior analysis it might be helpful to get a graphical overview on the influencing factors and their importance, e. g. by providing graphs of the explained path analysis as the one of Bamberg and Möser.

Response: Two additional figures were added to the theoretical background of the manuscript. Figure 1 illustrates the META-ANALYTIC STRUCTURAL EQUATION MODEL (Bamberg & Möser, 2007) and Figure 2 depicts the MODEL OF RECYCLING BEHAVIOUR (Ölander & Thøgerson, 1995; Thøgerson, 1994)

Correctness of terminology

As far as the page behind "Place figure 1 here" is concerned the author speaks several times about "subjective measure" (paragraph starting with "Based on the above..."). I am not sure about the meaning of these sentences. One gets the impression that the author does not always want to follow the quality criteria of operationalization, especially the objectivity. If my understanding is right I strongly recommend to change that to sth. like "objective measurement of subjective attitude / perception".

Response: The second paragraph (p.17) was changed to read as follows: "Based on the above, the situational opportunities concept in the proposed framework (Figure 1) is regarded as an objective

measure of subjective perceptions, specifically incorporating consumers' views on the availability, affordability and competitiveness of eco-friendly alternatives in the South African major household appliance market as well as the accessibility of information relating to the appliances' environmental implications”

Use of literature (relevance, interpretation, adequate supportive argumentation)

Generally speaking the used literature reflects the main theories suitable for the main central topic. Minor comment: Maybe an additional reference (besides WWF) to underline the growth and importance of the South African economy (in the introduction) might be found

Response: An additional reference was included:

NATIONAL STATISTICS OFFICES OF THE BRICS GROUP. 2013. BRICS joint statistical publication. 4th ed. Available on line. URL:

http://www.statssa.gov.za/news_archive/Docs/FINAL_BRICS%20PUBLICATION_PRINT_23%20MAR_CH%202013_Reworked.pdf. Accessed 11 August 2013.

Clear and logical presentation of content (Write comments with reference to page and paragraph numbers. Use more pages if necessary)

There are no pages numbers, so I cannot refer to them. The paper might benefit if the author puts a little bit more focus on the problems of operationalization of the relevant theoretical constructs and the problems that result, e. g. like she / he does when speaking about measuring environmentally friendly attitude.

Response: Concern was expressed in terms of the length of the manuscript and as a result less discussion was directed toward the measurement of the constructs. However, the conclusion of the manuscript includes some recommendations in this regard by highlighting existing scales for motivational factors “....several scale items have been developed for internal motivational factors such as the awareness of environmental consequences (Bamberg et al., 2007; Heath & Gifford, 2006), guilt (Bamberg et al., 2007), social norms (Oom Do Valle et al., 2005; Wall et al., 2007), moral norms (Thøgersen, 2006), attitudes (Bodur & Sarigöllü, 2005; Wall et al., 2007) and intention (Heath & Gifford, 2006; Wall et al.,2007) It is further pointed out that such scales would have to be adapted to comply with the conditions that prevail in the South African market and the specific behaviour under investigation. Response bias is also highlighted as an issue in the measurement of constructs related to pro-environmental behaviour. The last paragraph also draws attention toward conjoint analysis that may be of particular value in consumer evaluations of different combinations of product attributes. In

papers to follow, more emphasis will be directed toward the operationalization and measurement of the theoretical constructs.

Unfortunately the central graph with the conceptual framework was not provided (figure 1) which makes an evaluation a little bit difficult. As far as the developed framework is concerned the author might justify why she / he includes specific elements in the model and why not (see the page where “Place figure 1 here” is written). The article might benefit from that quite a lot.

Response: The inclusion of motivation is substantiated based on Stern’s (2000) views and the underlying assumptions of MOA as well as other integrative theories that motivations create a predisposition to act in an environmentally significant manner. The paragraph further elaborates: “As suggested by Ölander and Thøgersen’s (1995), the motivational factors are encapsulated by consumers’ intentions. Although Ölander and Thøgersen’s (1995) inclusion of the motivational component in the original MOA model was based on the Theory of Reasoned Action, they acknowledge other possibilities such as Schwartz’s (1977: 221-279) Norm-Activation model. Acknowledging these arguments and deducing that ESB inevitably encompasses a combination of self-interest and pro-social motives (Oom Do Valle et al., 2005; Oreg & Katz-Gerro, 2006; Schuler & Cording, 2006; Wall et al., 2007), the motivational component of the proposed model incorporates Bamberg and Möser’s (2007) meta-analytic structural equation model with inclusion of all the norm-activation constructs as well as those proposed in Theory of Planned Behaviour “ A further clarification is offered why perceived behavioural control is eliminated from the model, since it is encapsulated by the “facilitating opportunities” and “abilities” concepts of the original MOA model.

Minor comment:

(Page 2 of introduction): The relation between the population and the electricity consumption in South Africa might be right (the source is quite old) – but there is a certain risk that this relation is misunderstood, because the economic power (e. g. like GDP) is not taken into consideration.

Response: The following was added to the introduction: “In a recent economic survey, South Africa is criticized for having among the highest greenhouse gas emissions per unit of GDP in the world and has achieved less decoupling of real GDP and CO₂ emissions than most countries” (OECD, 2013).

Reference:

OECD. 2013. OECD economic surveys: South Africa 2013. *OECD Publishing*. Available on line. URL: http://dx.doi.org/10.1787/eco_surveys-zaf-2013-en. Accessed 11 August 2013.

Thank you very much for sending the figure.

I would have expected a more complex one. The topic is good for a Structural Equation model (as the author said in the meta-analysis). So it might be useful to develop a little bit more complex model which take different stages and variables into consideration.

Response: The figure was further extended as per recommendation