

Full Length Research Paper

Environmental concern of South African cohorts: An exploratory study

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Environmental issues receive ever increasing attention in society and a general level of concern is expressed in society, yet specific action-related programmes (such as recycling campaigns) do not experience the success that could be expected, given the level of attention and concern. This poses questions regarding the awareness and actions towards environmental issues. These are however, influenced by attitudes, making them critical. The focus of this quantitative study was to investigate the attitudes (and their components) of South Africans towards environmental and recycling issues. The study was conducted among a convenience sample of 139 respondents using a self administered paper-based survey. The findings show that respondents exhibited relatively positive attitudes towards environmental issues. No significant differences were, however, found between groups based upon gender or income, while significant differences were found between older and younger respondents. This paper indicates that organisations involved in environmental issues (including recycling) can harness positive attitudes to increase the success of programmes that are introduced.

Key words: Environmental concern, environmental attitudes, actions, recycling.

INTRODUCTION

Environmental issues are widely-discussed in all sectors of society, with the focus on related topics such as climate change, carbon emissions and recycling. It has been suggested by researchers on these topics that this attention has been driven by various factors such as the media, politics, scientists and environmental disasters that have been experienced (Bohlen, Schlegelmilch and Diamantopoulos, 1993). In turn, this information has contributed to environmental concern among citizens, resulting in action among households. One specific environmental action individuals can take in this context, is by recycling waste items from their households (Barr, 2007).

Various studies have investigated the attitudes towards environmental concerns (Barr, 2007; Dunlap, van Liere,

Mertig and Jones, 2000; Grob, 1995; Schahn and Holzer, 1990), while others have attempted a multi-construct perspective (Bohlen et al., 1993). Other studies have specifically investigated the nature of environmental concerns in specific contexts such as university environments and in communities, including kerb-side recycling programmes (Guagnano, Stern and Dietz, 1995; Hopper and Nielsen, 1991; Oskamp, Harrington, Edwards, Sherwood, Okuda and Swanson, 1991; Kok and Siero, 1985; Van Liere and Dunlap, 1978).

Past studies have investigated differences between various cohort groups such as gender, income and age groups, but no studies have been conducted in the developing country context (as South Africa) to determine the awareness, attitudes and actions among various cohort groups. It is this aspect which serves as the focus of this research.

The paper provides an overview of the nature of environmental issues, and then proposes a model of environmental concern which serves as the conceptual framework for the study. The study and its results are

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then presented, followed by the implications of these findings.

The purpose of the paper

Consumer behaviour identifies the importance of awareness and attitudes due to their effect on behaviour, and this is also the case when investigating environmental concern. Various studies have been conducted into these issues, but none have been undertaken among South African cohorts. If action-based projects (such as recycling programmes) are to be a success, members of communities need to have the awareness and attitudes necessary to make the action outcome possible. This poses the question: what are the awareness, attitudes and actions among South Africans regarding environmental issues? Further, to what extent do differences exist between these cohort groups with regard to environmental concern?

Thus, the primary research objective for this study was to determine the environmental concern within South Africa. The secondary objectives were to:

1. Determine the awareness of South Africans regarding environmental issues
2. Determine the attitudes of South Africans towards environmental issues
3. Determine the actions South Africans take with regard to environmental concerns

The nature of environmental concern

Environmentalism is regarded as a concern for the preservation, restoration or improvement of the natural environment, its resources and the prevention of pollution (Farlex Lexicon, 2009). The values that are held towards the physical environment are regarded as environmental values or environmental concern (Barr, 2007). It is generally thought that concern for the environment is a recent phenomenon, however, the earliest record of concern being expressed for the environment was recorded in 1864 by George Perkins Marsh in his book *Man and Nature* (Anon, 2009a). This was one of the first works to connect human actions with the environment. He was of the opinion that the collapse of civilisations could be associated with environmental degradation.

Environmental issues cover a wide range of aspects that are all linked to the physical environment of the planet, as well as the actions of humans that place the survival of the planet in jeopardy. Topics that form part of environmental issues include pollution, the use of renewable energy, conservation of scarce resources, climate change (global warming and carbon footprints) and genetically-modified food (Anon, 2009b; Dunlap et al., 2000). The common theme in these issues is the

effects of human activity on the survival of all life.

A MODEL OF ENVIRONMENTAL CONCERN

Research into consumer behaviour with respect to environmental issues has indicated the importance of a number of aspects, namely awareness, attitudes and actions. These are impacted by a number of influencers such as psychological and situational influencers, and the environmental values of the individual. A model linking these aspects is proposed in Figure 1. The aim of this paper is not to test this model, but to propose this model as a conceptual framework. This paper examines the three aspects of individual behaviour (i.e. awareness, attitudes and action), and to investigate the extent of the differences, if any, between various cohort groups with respect to environmental concern.

Influencers

Situational influences

These variables are linked to the personal situation of the individual, such as the access to a recycling centre, the demographics of the individual, as well as the individual knowledge and experience of the individual (Barr, 2000). Access to recycling has increased with the introduction of kerb-side recycling, which has proved to be more efficient due to the access and convenience it provides the individual (Guagnano, Stern and Dietz, 1995). From a demographic perspective, research has indicated that young, female, better-educated, high income individuals living in single-family dwellings are more likely to play an active part in waste management (Barr, 2007). The individual's experience also plays a role in that previous recycling experience tends to act as a predictor of future recycling behaviour (Barr, 2007). It has also been suggested that the actions of family and friends influence recycling actions of individuals, specifically in the case of kerb-side recycling (Oskamp et al., 1991).

Psychological influences and environmental values

This refers to the personality characteristics and perceptions of individuals that impact on their actions. Environmental values are regarded as the type of relationship that exists between individuals and their natural environment (Corralize and Berenguer, 2000). It is suggested that individuals who are more altruistic and feel closer to nature, are more likely to have a level of environmental concern (Barr, 2007).

One theory that has been used to explain recycling behaviour is Schwartz's norm activation theory, as illustrated in Figure 2. This theory suggests that the likelihood of recycling increases when an individual is aware of the

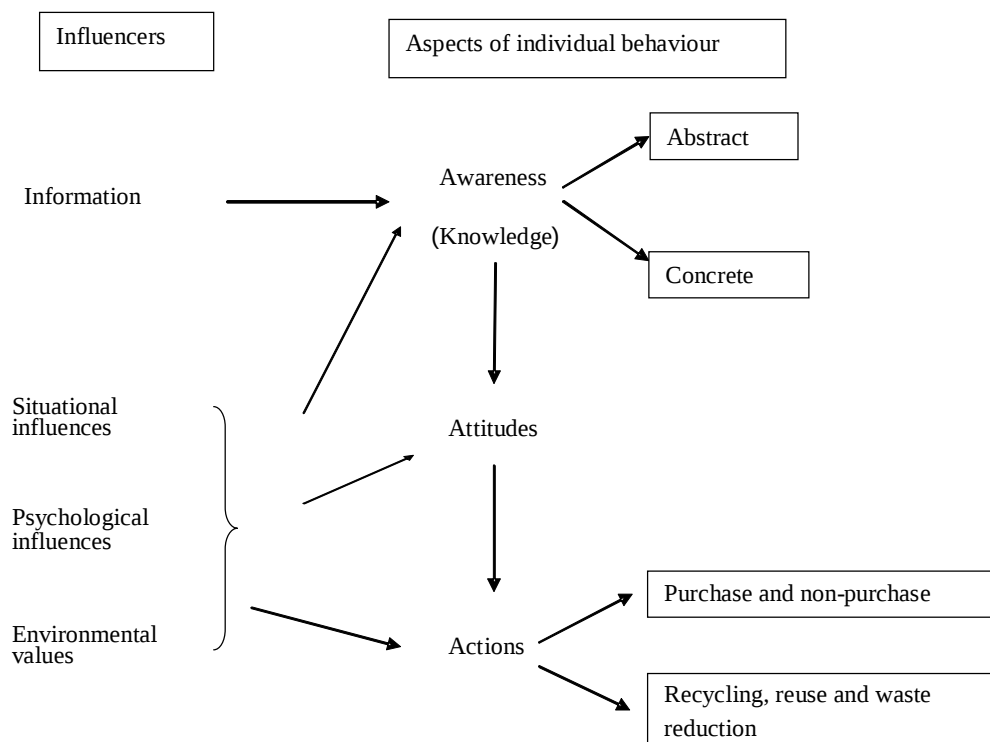


Figure 1. A model of environmental concern. Adapted from Barr (2007); Bohlen et al. (1991); Oskamp et al. (1991); Kok and Siero (1985).

combined with a sense of personal responsibility to impact the environmental condition (Stern, Dietz and Kalof, 2005). This is behaviour that is driven by a personal norm, such as altruism, and this in turn has effect on both environmental attitudes and actions such as recycling (Stern et al., 2005; Vining and Ebreo, 1990). Hopper and Nielsen suggest that recycling reflects altruism, and that this model is appropriate when examining recycling behaviour (1991).

Recycling behaviour can be regarded as altruistic behaviour, as the customer invests time and effort to advantage someone else (either the recycler or the organisation itself) without receiving any kind of compensation. For engaging in this behaviour, the consumer experiences a number of intrinsic benefits. They include a feeling of impacting on the environment for the common good of society (Huge Brodin and Anderson, 2008; Hopper and Nielsen, 1991), as well as the ability of future generations to enjoy the environment. The New Environmental Paradigm (NEP) seeks to provide a measure of environmental values held by an individual (Dunlap et al., 2000). This paradigm measures the values or worldview of individuals, which indicates the relationship between the individual and the environment (Dunlap et al., 2000). These values thus reflect the propensity of an individual to display environmental concern, as it discriminates between environmentalists and the general public (Dunlap et al., 2000).

Aspects of individual behaviour

Three aspects of individual behaviour can be identified, namely awareness (knowledge), attitudes and actions. These components are reflected in Figure 1. In the figure, it can be seen that a consumer's awareness of a particular topic of subject influences the consumer's attitude or disposition to the topic or subject. This attitude in turn influences the action or behaviour of the consumer. The three aspects are subsequently discussed in more detail.

Awareness (knowledge)

This is influenced by the information at the disposal of the consumer. Research conducted in the US regarding environmental issues indicated that 87% of U.S. adults are concerned about the condition of the natural environment, 80% believe that protecting the environment will require changes in lifestyle, 75% consider themselves environmentalists and 50% claim to look for environmentally-friendly labels (Follows and Jobber, 2000 in Cleveland, Kalamas and Laroche, 2005; Phillips, 1999 in Prakash, 2002). This type of concern is not regarded as being specific to any market segment (Bohlen et al., 1993). Other research conducted indicates that 33% of respondents claim not to have bought from organisations that have poor environmental records while 47% of

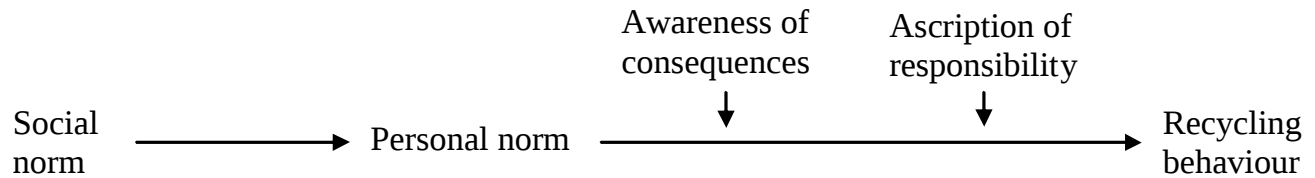


Figure 2. Model of altruistic behaviour. Source: Hopper and Nielsen (1991).

respondents dismiss environmental claims as gimmicks (Prakash, 2002). It could be assumed that knowledge of environmental issues contributes to behaviour; however research has shown mixed results in this regard (Oskamp et al., 1991). Moderate links have been found between knowledge and actions in other studies, though it has been suggested that it depends on the ways in which the knowledge is determined (Oskamp et al., 1991).

It has been suggested that two types of environmental knowledge can be identified (Schahn and Holzer, 1990). Abstract knowledge refers to the general knowledge that an individual has about the state of the environment and the general awareness of environmental issues (Barr, 2007). Concrete knowledge refers to the specific knowledge regarding actions, such as recycling centres and what can be recycled. In research conducted by Schahn and Holzer, it was found that abstract knowledge had no effect on the relationship between attitudes and behaviour, but concrete knowledge impacted this relationship (1990).

Attitudes

Attitudes generally refer to the overall positive or negative dispositions held by the respondents towards any activity (Kok and Siero, 1985). Blackwell, Miniard and Engel (2006) view attitudes as global or overall evaluative judgements. According to Kotler (2003), an attitude is a person's enduring evaluation, emotional feeling and action tendency towards an object or idea. Attitudes lead people to behave in a fairly consistent way towards those objects or ideas. Through doing and learning, people develop attitudes which in turn influence their buying behaviour. These attitudes are not however completely set, but can be fickle and even long established attitudes can change over time (Blackwell et al., 2006). Albarracín, Johnson and Zanna (2005) postulate that attitudes are evaluative tendencies, which can both be inferred from and have an influence on beliefs, affect and overt behaviour. While it has been suggested that attitudes alone do not provide a complete picture of recycling (Bohlen et al., 1993), they are important as they affect behavioural intentions (Kok and Siero, 1985). Research has indicated that attitudes can be used to predict behaviour when they are held with greater conviction by the individual (De

Young, 2000). McGuinness, Jones and Cole (1977) found that many consumers express positive attitudes towards the environment, but do very little and know even less. There is thus a difference between the attitudes of customers with regard to environmental issues and the behaviour that is exhibited by customer (Prakash, 2002). Some studies have indicated that the cost associated with this behaviour may affect the actual behaviour exhibited (McGuinness et al., 1977).

Two theories of attitudes can be used in this context. Firstly, the Tri-component theory of Attitudes suggests that attitudes comprise three components, namely beliefs (cognition), feelings (affect) and behavioural (action) components. Hodgetts (1993) describes three basic components of attitudes as follows:

1. The cognitive component (belief) is the set of values and beliefs a person has about a person, object or event which forms the basis for an attitude. If they are negative about the person, object or event, then the person's attitude will be negative. If the values and beliefs changed, then the basis for the attitude would change and the person would then have a positive attitude about the person, object or event.
2. The behavioural component (action) refers to the tendency to act, or behave, in a particular way towards the person, object or event as a result of the attitude. If a person's attitude about a person, object or event is positive, then the person's resultant behaviour is likely to be positive (Hodgetts, 1993).
3. The affective component (affect) is the emotional feeling attached to the attitude or the emotion that is felt with regard to the person, object or event. For example if the person has a positive feeling, then the attitude will be positive (Hodgetts, 1993). Emotions impact future behaviour towards recycling, and it has been suggested that intense emotions increase the likelihood of behaviour that is deemed to be appropriate (Grob, 1995).

There is also social pressure regarding expressing environmentally-friendly attitudes (Prakash, 2002). Not being concerned about the state of the environment is not always politically correct with many expressing concern due to social desirability pressure. This concern does then not translate into specific behaviours that reflect this concern. It has further been suggested that campus environments do not reflect an environmentally-friendly attitude (Dahl and Neumayer, 2001). Further, the link between

attitudes and action in the case of environmental matters, is not perfectly congruent, with actions being affected by factors in the environment such as effort and convenience (Oskamp et al., 1991).

Secondly, Fishbein's theory of reasoned action indicates that behavioural intention is linked to two aspects, namely attitude towards the behaviour, as well as the subjective norms (Schiffman, Bednall, O'Cass, Paladino, Ward and Kanuk, 2008; Kok and Siero, 1985). The attitude towards the behaviour is linked to the perceived consequences of the behaviour for the set of beliefs. This means that the individual is able to evaluate the consequences of certain behaviour, and resultantly develop attitudes based on the perceptions of these consequences. When it comes to environmental issues, it is a widely-held view that the effect of the current behaviour (of individuals) will have potentially devastating consequences for the planet, with the extinction of various species, including human life. (There is no universal agreement on these consequences, with some scientists arguing that phenomena such as global warming do not exist.) Beliefs regarding the consequences of these environmental issues are necessary, as it impacts the appropriateness of behaviour in the future (Grob, 1995).

Actions

Actions reflect the behaviour that flows from awareness and attitudes. Three possible behaviours associated with environmental concern can be identified, namely waste reduction, reuse and recycling (Barr, 2007). Waste reduction encourages individuals to use less of a specific item (e.g. power) while recycling comes about when products are converted into other products and reused in manufacturing. Recycling is an activity that requires effort on the part of the user, whether in the form of storing, sorting or transporting. All these efforts are done by the consumer without consideration of any reward from the recycler (the organisation who will collect the waste). The alternative to the process described above is that all waste is collected at a source (i.e. the home or business), and once it reaches the landfill, the items are separated out for recycling. The problem currently experienced with this alternative is that in many cases, the recyclables are 'contaminated' and cannot be recycled (Jordan, 2009).

Action can further be classified as purchasing and non-purchase related (Bohlen et al., 1993). Purchasing behaviour that reflects environmental concern is linked to the purchase of environmentally-friendly products, while non-purchase behaviour includes other actions that are taken in the area of environmental awareness, such as encouraging others to recycle.

Contributing to the success of a recycling programme is awareness of, and access to these facilities. Prakash (2002) suggests that lack of access to a recycling project is one of the greatest factors limiting involvement in a

recycling project. The actual behaviour of customers is a function of the education that they have about environmental issues and recycling programmes, as well as the access they have to these programmes (Prakash, 2002; Vining and Ebreo, 1990). Further, a belief that an individual can make a difference also impacts action (Hopper and Nielsen, 1991 in Barr, 2007). Previous studies at higher educational institutions indicated that attempts to recycle glass bottles and aluminium cans had not been successful (Dahl and Neumayer, 2001). The reasons given why they 'did not work' were linked to the fact that no education of the programme had been provided. Thus, action is dependent on access to information (awareness).

HYPOTHESES DEVELOPMENT

Research conducted into environmental issues has investigated differences between groups of individuals who are concerned with environmental issues, and those who are not concerned (Stern et al., 2005). It has been suggested in previous studies that females are more altruistic than men (Stern et al., 2005). This view has received attention with regard to research into environmental issues. In some studies into environmental concerns, females have shown more concern about the environment than men, while other studies have shown the opposite (Stern et al., 2005). Research indicates that gender did not show a difference with regard to nuclear power (Griffin, 1978 in Stern et al., 2005), and differences between the genders were not significant when investigating a gasoline tax and associated political action (Stern et al., 2005). Despite these findings, no research has been conducted in this context to determine whether there are differences between the genders with regard to their attitudes towards the environment. Thus, H_1 has been formulated.

H_1 : Females have higher levels of awareness, more positive attitudes, as well as a higher level of action with respect to environmental issues than males.

There has been an increase in publicity and discussion regarding environmental issues in all media which has increased the awareness of environmental issues specifically among those in younger cohort groups (Stern et al., 2005). The explanation for this is found in the exposure to information specifically among this cohort group. Previous research indicates that university students exhibit higher levels of environmental concern (Stern et al., 2005), leading to the formulation of H_2 .

H_2 : Younger respondents have higher levels of awareness, more positive attitudes, as well as a higher level of action with respect to environmental issues than older respondents.

Anecdotal views suggest that those who are more

Table 1. Reliability of the research instrument.

Dimension	No. of items	Cronbach alpha	Reliability
Awareness	12	0.852	High reliability
Attitudes	23	0.849	High reliability
Action	13	0.916	High reliability

information, affecting the development of attitudes. This view has not been tested in this context. Thus H_3 can be formulated.

H_3 : Affluent respondents have higher levels of awareness, more positive attitudes as well as a higher level of action with respect to environmental issues than less affluent consumers.

METHODOLOGY

Use was made of a quantitative methodology in this research, as a self-administered survey was used to collect the data from respondents. Specifically, the research was descriptive in nature, with the aim to conduct an initial exploration of the attitude towards environmental issues.

The target population of the study included consumers residing in the Gauteng Province of South Africa. A convenience sample of 139 respondents was drawn. The research instrument consisted of four sections:

Section A: Demographics of the respondents.

Section B: Measurement of abstract knowledge on a five-point unlabelled Likert scale (where 1=unconcerned and 5= very concerned). There was also measurement of some concrete knowledge regarding questions posing where to recycle and what can be recycled.

Section C: Attitudes to environmental issues, including belief and affect components. The 23 statements are derived from a study done by Bohlen et al. (1993), as well as from Maloney, Ward and Braucht (1975). The scale used was a five-point unlabelled Likert scale (where 1=strongly disagree and 5= strongly agree).

Section D: Actions or behaviours exhibited with respect to environmentalism. They are also linked to the studies conducted by Bohlen et al. (1993), Vining and Ebreo (1990) and Maloney et al. (1975), and contain statements that relate to both buy- and non-buying actions. The scale used was a five-point unlabelled Likert scale (where 1=never and 5= always).

Pre-testing was undertaken among 15 similar respondents. Based on the pre-test, changes were made to the layout and wording of a number of questions. Data analysis was done using SPSS. Prior to conducting analysis, negative statements were recoded. A total awareness, attitude and action score was calculated, by determining an average of the responses received. The reliability of the measurement set and distribution of results were furthermore determined using a Cronbach alpha. Overall scores were calculated for the components of the measurement set used in the study and non-parametric tests (Mann-Whitney U test and Kruskal-Wallis) were used to test the formulated hypotheses.

RESULTS

A total of 139 usable responses were received. The

following sections report on the reliability and the distribution of the results for the measurement set: the respondent profile, the findings in terms of the attitude of respondents towards environmental concern and the results of the hypotheses testing.

Reliability of results

Reliability of the measurement set measuring attitude towards environmental concern was measured using Cronbach's alpha or the coefficient alpha technique. A value of less than 0.7 typically indicates a low level of internal reliability (Hair, Bush and Ortinau, 2006). The reliability of the Awareness statements (Section B) was 0.838, which exceeds the suggested value. After recoding negatively-phrased statements, the Cronbach on the 23-item Awareness scale (Section C) was 0.849, which is greater than the suggested value. The reliability of the Action statements (Section D) was 0.909, which is also greater than the suggested value. The measurement set is thus deemed as reliable. These findings are summarised in Table 1.

Analysis of the distribution of results with regard to the measurement set (using a Kolmogorov-Smirnov test) indicated that the results were not normally distributed. The non-normal distribution of results and the fact that a relatively small sample was involved in the study, suggest the use of non-parametric tests to test the hypotheses formulated earlier in the paper.

Respondents' profile

Table 2 provides the profile of the respondents in the research. The majority of the respondents are typically aged between 20 and 29 (51.1%), female (65.5%) with a matric certificate (35.5%) or higher. A total of 41% of the respondents have full-time employment, while 38.1% are students. The Nguni languages (25.9%), Sotho languages (25.2%) and English (21.6%) predominate as the home language of the respondents. With regard to income, the groups with the highest percentages were those earning above R30 0001 (19.8%) and those earning below R2 500 (19%). With regard to nationality, 92% indicated South African nationality. This respondent profile does not reflect the broader South African population, with higher incomes and a higher employment level than the general population, thus affecting the extent to which the findings can be generalised.

Table 2. Respondent profile.

Characteristic	Distribution (%)
Age (Years)	
<20	18
20-29	51.1
30-39	10.8
40-49	10.8
50-59	7.2
>60	2.1
Gender	
Male	34.5
Female	65.5
Education	
Primary school	2.8
High school	11.5
Matric	35.3
Technical	13.7
Undergraduate	20.1
postgraduate	14.4
Education diploma	2.2
Employment status	
Full-time	41.0
Part time	12.2
Students	38.1
Housewives	3.6
Retired	2.9
Unemployed	2.2
Home language	
Afrikaans	15.1
English	21.6
Nguni	25.9
Sotho	25.2
TshiVenda	6.5
Other African languages	2.2
Other European languages	0.7
Net monthly household income (R)	
<2 500	19
2 501 – 4 500	9.1
4 501 – 6 000	6.6
6 001 – 8 000	7.4
8 001 – 11 000	9.9
11 001 – 16 000	13.3
16 001 – 30 000	14.9
>30 001	19.8
Nationality	
South African	92
Other	8

Awareness of environmental issues

Respondents were asked to indicate whether they knew where their closest recycling facilities were located. A total of 29.1% said they did, 59.6% said they did not, while a further 12.3% were unsure. The respondents were also asked to indicate how concerned they were about various environmental issues on an unmarked 5-point Likert scale (1 = unconcerned and 5 = very concerned). The highest level of concern was expressed with regard to the quality of drinking water (mean = 4.37; SD = 0.851), water quality (mean = 4.34; SD = 0.925) and air quality (mean = 4.05). The two statements related to water issues were two of the three statements which had a standard deviation of less than 1. The responses received were used to calculate a mean awareness score of 3.75. The findings are reflected in Table 3.

The attitudes to environmental concern

The statements and their associated means and standard deviations are presented in Table 2. From this table it can be seen that the highest mean (4.33) can be found on two statements, specifically 'Each of us, as individuals, can make a contribution to environmental protection' and 'If all of us, individually, made a contribution to environmental protection, it would have a significant effect'. The former statement also has the lowest standard deviation (0.856). The statement with the lowest mean (2.73) indicates that this is currently not as important in political decision-making. The findings are reflected in Table 4.

Initially, an overall attitude score was calculated. This was done by adding all the responses on each item, and dividing this by the number of statements or scale items (23). This resulted in a mean of 3.65 and a standard deviation of 0.525. This can be regarded as a relatively positive attitude towards environmental issues (3.65 out of a possible 5), and the small standard deviation indicates little variance among the respondents. This score can be compared to a mean of 4.07 in the study conducted by Bohlen et al. (1993) among a sample of 600 respondents in the UK, using similar attitude statements.

Actions regarding environmental concerns

From the responses received, it can be seen that there are few actions exhibited that reflect an environmental concern. The statement with the highest mean is the first statement which indicates that an environmental choice would be considered, but that the price of the alternative would be considered (mean = 3.37). Taking into account that this was measured on a five-point scale, these responses do not indicate a high level of action with regard to environmental issues, despite high levels of awareness of these issues (as indicated earlier). Details on the findings are reflected in Table 5.

Table 3. Awareness of environmental issues.

Issue	Mean	Std. deviation
Climate change	3.76	1.160
The hole in the ozone layer	3.65	1.230
Melting polar ice caps	3.36	1.294
Air quality	4.05	0.956
The quality of drinking water	4.37	0.851
Global warming	4.01	1.078
Motor vehicle pollution	3.61	1.060
Food contamination by pesticides	3.84	1.122
Food contamination by hormones and antibiotics	3.61	1.149
Genetically-modified food	3.26	1.330
Noise pollution	3.06	1.352
Water quality	4.34	0.925
Mean awareness score	3.75	0.696

Table 4. Descriptive statistics on the statements.

Statement	Mean	Std deviation
Environmental changes are one of the most important issues facing society today	3.83	1.056
We should pay a considerable amount of money to preserve the environment	3.32	1.077
I would not buy from an organisation that pollutes the environment	3.17	1.195
I would be prepared to be inconvenienced if it meant it would help save the environment	3.35	1.141
Unless each one of us recognises the need to protect the environment, future generations will suffer the consequences	4.23	0.923
Each of us, as individuals, can make a contribution to environmental protection	4.33	0.856
The benefits of protecting the environment justify the expense involved	3.51	1.038
The environmental policies of the main political parties are one issue I consider before deciding how to vote	2.73	1.166
Green issues should be a main consideration when deciding what we do in the future	3.39	1.027
Personally, I cannot help slow down environmental deterioration	3.36*	1.196
The importance of the environment is frequently exaggerated	3.53*	1.278
Recycling takes more effort than it is worth	3.68*	1.179
Even if each of us contributed towards environmental protection, the combined effect would not make a difference	3.85*	1.214
Too much fuss is made about environmental issues	3.71*	1.136
The government should take responsibility for environmental protection	3.83	1.122
The increasing destruction of the environment is a serious problem	4.07	0.983
Everyone is personally responsible for protecting the environment in their everyday life	4.16	0.942
Issues relating to the environment are very important to me	3.51	1.058
Organisations should always put profitability before environmental protection	3.47*	1.268
I believe it is important to recycle products even if I am inconvenienced	3.41	1.015
I feel guilty when I do not recycle	2.83	1.237
People who recycle show their concern for the environment	4.21	0.880
If all of us, individually, made a contribution to environmental protection, it would have a significant effect	4.33	0.928
Mean attitude score	3.65	0.525

*recoded.

Respondents were also to indicate whether they recycled any items. A total of 27.6% of respondents indicated that they did recycle, 45.5% indicated that they did not, 20.3% recycle sometimes while 6.5% recycle when

it is convenient. Reasons supplied by those who do not recycle include a lack of time and facilities for recycling. This supports the statements of Prakash regarding access and knowledge of recycling facilities.

Table 5. Action statements and their descriptive.

Statement	Mean	Std. deviation
I choose an environmentally-friendly alternative if one of a similar price is available	3.37	1.260
I choose environmentally-friendly products regardless of the price	2.76	1.182
I try to find out about the environmental effects of a product before I buy it	2.54	1.204
I try to buy environmentally-friendly detergents and cleaning materials	2.77	1.233
I buy products that have not been tested on animals	3.04	1.405
I prefer to buy recycled paper products	2.72	1.128
When possible, I prefer to buy organically grown fruit and vegetables	3.23	1.282
I encourage other people to recycle	2.79	1.246
I take shopping bags when doing grocery shopping	3.21	1.446
I boycott organisations that are not environmentally responsible	2.40	1.221
I have changed to products that are environmentally-friendly	2.61	1.140
I would join an environmental group to protect the environment	3.03	1.267
I make a special effort to buy products in recyclable containers	2.88	1.189
Mean action score	2.87	0.875

Table 6. Gender and individual aspects of behaviour.

Dimension	Males (N = 40)		Females (N = 74)		p value
	Mean	Std deviation	Mean	Std deviation	
Awareness	3.62	0.739	3.75	0.695	p=0.308
Attitude	3.51	0.529	3.71	0.532	p=0.179
Action	2.68	1.002	2.61	0.865	p=0.375

Hypothesis testing

The following findings were made in terms of the hypotheses formulated for the paper.

H₁: Females have higher levels of awareness, more positive attitudes, as well as a higher level of action with respect to environmental issues than males.

The mean scores on each of the aspects indicate that females have higher scores on the awareness, attitudes and actions reflecting environmental concern, as reflected in Table 6.

Analysis on the various components using a Mann-Whitney *U* test indicated that despite the higher means, the differences between males (*Md* = 3.63, *n* = 40) and females (*Md* = 3.75, *n* = 74) were not statistically significant with respect to awareness (*U* = 1308.50, *z* = -1.019, *p* = 0.308, *r* = -0.01), attitudes (*U* = 1323.50, *z* = -1.345, *p* = 0.179, *r* = -0.12) or action (*U* = 1854.50, *z* = -0.886, *p* = 0.375, *r* = -0.08). These findings are consistent with findings in previous studies. From these findings, the hypothesis is not accepted.

H₂: Younger respondents have higher levels of awareness, more positive attitudes, as well as a higher level of action with respect to environmental issues than older respondents.

The age categories were collapsed into two categories for the purposes of testing the abovementioned hypothesis. The subsequent groups that were created are Group 1 (29 and younger) and Group 2 (those 30 and older). From the means calculated, those aged 30 and older reflected higher means (more positive) than those 29 and younger. In all instances, Group 2 has higher means than Group 1. The findings are reflected in Table 7.

Analysis using a Mann-Whitney *U* test also indicated statistically significant differences (at the 95% confidence level) between those 29 and younger (*Md* = 3.61, *n* = 85) and those 30 and older (*Md* = 3.91, *n* = 33, *U* = 984, *z* = -2.511, *p* = 0.012, *r* = -0.23), but not with respect to awareness or actions. Based on these results, Hypothesis 2 is partially accepted.

H₃: Affluent respondents have higher levels of awareness, more positive attitudes, as well as a higher level of action with respect to environmental issues than less affluent consumers.

Income categories were collapsed into four groups for the purpose of testing the above mentioned hypotheses. Group 1 consisted of those earning R4 500 per month and less (*n* = 34), Group 2 those between R4 501 and R11 000 per month (*n* = 29), Group 3 included those who earned between R11 001 and R30 000 per month (*n* =

Table 7. Age and the individual aspects of behaviour.

Aspect	Group 1 (N = 85)		Group 2 (N = 33)		p value
	Mean	Std deviation	Mean	Std deviation	
Awareness	3.68	0.694	3.99	0.664	0.162
Attitudes	3.55	0.538	3.87	0.527	0.012
Actions	2.79	0.796	3.09	0.831	0.115

Table 8. Income and the individual aspects of behaviour.

Aspect	Group 1 (N = 34)		Group 2 (N = 29)		Group 3 (N = 34)		Group 4 (N = 24)		p value
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Awareness	3.47	0.705	3.92	0.716	3.72	0.686	3.92	0.587	0.490
Attitudes	3.26	0.504	3.71	0.552	3.77	0.525	3.73	0.551	0.075
Actions	2.66	0.834	3.03	0.794	2.72	0.943	3.15	0.466	0.326

34) while Group 4 was those who were earning more than R30 000 per month ($n = 24$). The awareness dimension has this highest mean among Groups 2 and 4, while Group 3 has the highest mean score on the attitude dimension. In the case of actions, Group 4 has the highest mean score, indicating that as the more affluent group, they are more likely to exhibit behaviour that reflects environmental concerns. In the case of environmental actions, the standard deviation scores are the highest in the study, except in the case of Group 4, where they are the lowest ($SD = 0.466$). The findings are reflected in Table 8.

Further analysis was done using a Kruskal-Wallis Test, which indicated no statistically significant differences between the various income groups with regard to their total awareness score ($\chi^2(3, n = 94) = 2.420, p = 0.490$), their attitude score ($\chi^2(3, n = 104) = 6.898, p = 0.075$) or their action score ($\chi^2(3, n = 100) = 3.461, p = 0.326$). From these findings, the hypothesis is not accepted.

DISCUSSION

High levels of concern have been expressed concerning water and water quality issues, as well as air quality, which resulted in an overall awareness score of 3.75. The total attitude score was slightly lower at 3.65, and the action score was 2.75. This indicates that while the awareness and attitude scores are similar, the action scores are considerably lower. Further analysis will be needed to determine the reason for the decline in scores. Analysis of the findings did not find significant differences between the genders or income groups with regard to the awareness, attitudes and actions, however significant differences were found between the age groups with regard to their attitudes towards environmental issues. Thus, the cohorts do not differ significantly with regard to their awareness, attitudes and actions of environmental

concerns. This means that there is the challenge to effect changes in these areas among all cohort groups.

The *managerial implications* of this research indicate that while the level of awareness and the attitude score show a measure of positivity, these scores are not as high as expected, based on previous studies. From the findings it can be seen that the respondents have a high level of knowledge and relatively positive attitudes concerning environment issues, it does, however, not transfer into behaviour. Further, these scores are reflected after a period of education, but this has not translated into action. It is thus necessary to encourage action specifically among all cohort groups.

Education among all cohort groups needs to continue, and needs to focus on developing action that reflects the environmental concern that is reflected in the attitudes. Younger cohorts do not appear to be more concerned, despite their exposure to these issues. This raises questions about the education that has taken place in the past, and how it should be changed to make a greater impact on this cohort group. The possibility exists that a crisis may stimulate the cohort group to change their actions. Droughts, energy crises, as well as increasing energy costs are all examples of drivers that can have an effect on the action of individuals. An example in the US has been the increase in the price of fuel, which has prompted an interest in more fuel-efficient vehicles.

This low action score creates a challenge for organisations that are involved in the recycling industry. Creative ways need to be considered to encourage participation in recycling and other programmes. Previous research has shown the limited effect of financial and other incentives, while some success has been experienced with the use of block leaders. This means that these organisations may have to develop possible behavioural strategies to increase participation in these programmes. This is specifically relevant in the case of Eskom and the power supply challenges currently facing South Africa. This

could also lead organisations to question their commitment to providing recyclable packaging, as the actual commitment of consumers to action may lead them to question whether this, in fact, is important to customers.

The *limitations of the research* are associated with the profile of the respondents at it does not reflect the South African population, thus impacting on the extent to which these findings can be generalised. Due to the nature of environmental concerns and the use of self-reporting in the research, the attitude scores are more positive due to social desirability among the respondents. The size of the sample also does not provide a comprehensive and representative picture of all members of these cohort groups.

There are a number of directions for future research. These include expanding the sample to get a broader profile of the perspectives of South Africans, not just focusing on those in the Gauteng area of South Africa. This more representative sample will enable the testing of the extent to which the findings can be generalised. Research among population groups can also indicate differences, using this demographic as a segmentation variable. Multiple regression can also be used to determine a profile of recyclers and non-recyclers among various cohort groups. Testing of the model proposed in this paper using statistical methods also can be a focus of further research.

Conclusion

The research investigated the awareness, attitudes and actions towards environmental issues among a convenience sample of South African cohorts to determine differences with regard to environmental concerns. With environmental issues being in a development phase in South Africa, this research has indicated that the respondents have a relatively high awareness of environmental issues and relatively positive attitudes. Despite this, the action scores in this arena are relatively low. The action component among these groups needs to be the focus of the actions of organisations and environmental groups to increase participation and involvement of communities to give expression to their awareness and actions.

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