

Full Length Research Paper

South African postgraduate consumer's attitude towards global warming

M. A. O. Dos Santos

Department of Marketing Management, Faculty of Management, University of Johannesburg, South Africa.
E-mail: mariads@uj.ac.za. Tel: 011 559 1278. Fax: 011 5591477.

Accepted 20 December, 2010

The article explored postgraduate consumers' attitude towards global warming in South Africa. This is relevant in a world where the negative impact of global warming is already felt in some countries and there is a great deal of discussion by stakeholders around the mitigation of greenhouse gases. The data used in this article was collected using a specially designed questionnaire which incorporated questions relating to the persuasion (attitude formation) stage of innovation decision process. The findings of this study revealed that the respondents were passively involved with the global warming phenomenon; many were aware of its negative consequences; they were worried about global warming; they felt that it would impact their personal lives, South Africa and future generations. Opinion leadership and word of mouth communication within the respondent's social system occurred to a limited extent. This study demonstrated the respondents' attitude towards global warming which within the context of derived demand is significant since consumers are indirectly responsible for businesses' greenhouse gas emissions.

Key words: Attitude towards global warming, global warming mitigation, consumer social responsibility.

INTRODUCTION

The anthropogenic emission of greenhouses gases into the earth's atmosphere continues to increase as a result of man's dependence on fossil fuels. As the amount of greenhouse gases accumulates annually in the atmosphere, the average temperature on the planet continues to increase and raise concerns about its impact on the planet's whole infrastructure and ecosystem. Global warming and the resultant climate change have been shown to have a negative impact on human society, biodiversity and infrastructure (IPCC, 2001: 489 to 490).

LITERATURE REVIEW

Of the six different potential causes of climate change that has been proposed to explain the current warming of our planet, the one cause that is most widely accepted by the global community is the emission of greenhouses gases into the atmosphere as a result of human activity on this planet (Dessler and Parson, 2006: 73). Scientific evidence suggests that although natural processes such as volcanic eruptions, changes in solar output and

internal variability within the climate system may have contributed to more than a small fraction of the rapid warming in the last few decades, human greenhouse gas emissions are seen to be the main cause (Dessler and Parson, 2006: 73). This viewpoint is substantiated by ice core studies which reveal that prior to the industrial revolution, the concentration of carbon dioxide in the atmosphere is averaged at approximately 280 ppm (part per million), while its present concentration in the atmosphere is 370 ppm (Houghton, 2004: 31). This value continues to increase annually at an average rate of 1.5 ppm (taking into account the large variations in emissions from year to year) (Houghton, 2004: 31).

The greenhouse gas emissions that are released annually into the earth's atmosphere are derived mainly from the burning of fossil fuels namely coal, gas and oil. These raw materials are burnt in order to provide for four fifths of the world's energy needs (Spence, 2005: 9, 11). Other contributors to the accumulating concentrations of greenhouse gases in the atmosphere include deforestation, land use change (Houghton, 2004: 31 to 32), volcanic activity and the associated release of carbon

dioxide and methane from melting permafrost areas such as Siberia, due to global warming (IPCC, 2007:88).

The amount of anthropogenic carbon dioxide released into the earth's atmosphere is determined by five major factors that include (Dressler and Parson, 2006: 76 to 77):

- (1) Global population trends: As the number of individuals on the planet increase, the demand for energy, industry and agriculture increases, giving rise to increased carbon dioxide emissions
- (2) World economic growth: As individuals become more affluent, the demand for goods and services increases, bringing with it increased energy utilisation as more goods and services are produced to meet increasing demand.
- (3) Technological trends: These will determine the efficiency of energy utilisation and mix of carbon emitting and non-carbon emitting sources of energy that are utilised.
- (4) Governmental policies: These will impact on the amount of carbon dioxide released into the atmosphere, for example carbon taxes and carbon dioxide emission regulation.
- (5) Large historical events: This includes events such as wars, changing governments and the emergence of epidemic diseases.

Global warming and climate change is important because it has an impact on the survival of the human species on this planet and it has a negative influence on what people value, for example freshwater availability, food productivity, human health, recreational activities and the risks of extreme weather events such as droughts, floods and severe storms (Dressler and Parson, 2006:81). In Peru, for example, the amount of rain that is falling in Andes Mountain region as a result of global warming and climate change has dropped considerably and this has given rise to a decrease in crop yields. Some of the people living in this region are now starving while poverty in the region is increasing (Robinson, 2010). Global warming and climate change will not only impact on what people value and their lifestyles, but it will also affect natural unmanaged ecosystems by influencing the distribution of fauna and flora. As the average service temperature on the planet increases, the fauna and flora in an existing region will perish, as they cannot survive under rapidly changing climate conditions. Those species that can migrate will move into new areas where the prevailing environment is better suited for their survival. This occurs because the fauna and flora existing in a given region cannot adapt to the rapidly changing climatic conditions. From a business perspective, global warming and the resultant climate change will increase the risk of doing business, not only from an extreme event perspective, but also as a result of increased legislation and consumer pressure to limit the emissions of green

house gases. The insurance industry for example, is concerned about the intensity of extreme events brought about by climate change, as these increase their costs of doing business.

The adoption of global warming and its mitigation by consumers

Although businesses contribute a great deal to the greenhouse gas emissions currently produced, consumers are also responsible for the global warming and climate change problems currently faced by the world. The consumers' materialistic lifestyles encourage and facilitate planned obsolescence, while their demand for the products/services generated by businesses, stimulate business growth and development. According to a report by the Intergovernmental Panel on Climate Change (IPCC) in 2007, changes in consumer lifestyle and behaviour patterns can contribute to climate change mitigation across all sectors. This can be achieved by encouraging changes in consumption patterns and choice through education and training, the use of technologies that reduce carbon dioxide emissions, and an appropriate reward system that encourages carbon mitigation behaviours such as reducing transport emission through the use of public transport (IPCC, 2007:12).

The emission of greenhouse gases by individual consumer activities may not seem to be much when compared to the amounts released by industry. However, from an aggregate point of view, taking into account the 6.7 billion individuals (Robinson, 2010) living on this planet, the amount of greenhouse gases released into the atmosphere by the planet's human population becomes significant and critical. Cox (2007:129) illustrates this by pointing out that China is currently the world's second largest emitter of greenhouse gases. China has approximately 1.32 billion people who on average consume approximately 10 to 15% of the energy per capita of the average U.S. citizen. Shiva (2008:3) suggests that if mitigation and adaptation to global warming and climate change is to take place, all aspects of human life in all sectors of the society need to change, including how people shop, move, live and eat.

Although global warming is an issue that has emerged in recent decades, it is only now that the scientific community is certain that global warming and the resultant climate change is a major threat (Spence, 2005:19). This statement is supported by Dressler and Parsons (2001:2) who maintain that global warming is the most difficult and serious environmental issue that has emerged within the last few decades. This environmental phenomenon occurred due to the pervasive use of fossil fuels, for the provision of energy, in all sectors of the world economy. The extensive debate around the issue of global warming and the subsequent climate change suggests that the adoption of global warming as a crucial issue has not

been adopted by a critical mass of the world's population. The question that one may ask is "Why?" Consumers do contribute to the emission of greenhouse gases into the atmosphere, not only through their lifestyles and consumption behaviours, but also as a result of the derived demand which in business marketing states that consumers are ultimately responsible for the demand of business products and services. For example, the demand for aircraft engines is ultimately determined by the number of individuals who travel to destinations by air and by the use of air transport for the movement and distribution of goods that ultimately satisfy consumer needs.

An innovation is defined as an idea, practice or object that is perceived as new by the relevant individual or other unit of adoption (Rogers, 2003:12; Hawkins and Mothersbaugh, 2010). According to Rogers, many innovations require a lengthy period of many years from the time they become available to the time when they are widely adopted (Rogers, 2003:1). This situation becomes even more difficult when a "preventive innovation," which is defined as the prevention of an undesired event in the future by adoption of a new idea, is the innovation that needs to be adopted. (Rogers, 2003:176). It is suggested in this study that global warming is a preventive innovation as consumers need to adopt the scientific fact of global warming in order to participate in the mitigation of this phenomenon. The fact that global warming has been debated for some time does not mean that it cannot be regarded as an innovation. According to Rogers (2003: 12) and Hawkins and Mothersbaugh (2010: 248), the newness in an innovation is determined by the individual; in other words, if the individual perceives the innovation as new, then it is new. In addition Rogers (2003:12) states that an innovation need not just involve new knowledge, but may mean that although a consumer may have known about the innovation for some time, they may not have developed an attitude towards it or they may not have adopted or rejected it.

Rogers (2003:164) and Erbil and Akincitürk (2010:1393) suggest that in order for a consumer to adopt an innovation, he/she will have to go through the innovation-decision process that is conceptualised as consisting of five stages namely:

- (a) Knowledge: This occurs when an individual (or other decision making unit) is exposed to the innovation's existence and gains some understanding of how it functions.
- (b) Persuasion: This occurs when an individual (or other decision making unit) forms a favourable or unfavourable attitude towards innovation.
- (c) Decision: This occurs when an individual (or other decision making unit) engages in activities that lead to a choice to adopt or reject the innovation.
- (d) Implementation: This occurs when an individual (or other decision making unit) puts an innovation into use. Re-invention is especially likely to occur at the implementation stage.

(e) Confirmation: This occurs when an individual (or other decision making unit) seeks reinforcement of an innovation decision that has already been made, but he/she may reverse this previous decision if exposed to conflicting messages about the innovation.

In addition, Seligman (2006:115) states that the adopter's mental mechanics (sense making) at each stage of the innovation decision process compels the individual to sensible action, encouraging him/her to progress through the different stages already mentioned. Schiffman and Kanuk (2007: 511 to 512) suggest that the five stages a consumer goes through before adopting an innovation consist of:

- (i) Awareness: This is the stage where the consumer is first exposed to innovation.
- (ii) Interest: The consumer is interested in the innovation and searches for information.
- (iii) Evaluation: The consumer conducts a "mental trial" in order to decide whether this product or service will satisfy a need.
- (iv) Trial: The consumer uses the product on a limited basis.
- (v) Adoption: If the trial is favourable, the consumer decides to use the product/service in full, but if the trial is unfavourable the consumer then rejects the product or service.

According to Schiffman and Kanuk (2007:512), there are three limitations associated with this model. The first limitation is the fact that consumers often identify a need before they become aware of the potential options or solutions. This issue is addressed by Rogers (2003:172) who states that for certain innovations such as the treatment of a new insect pest that is destroying one's garden, the need may come first, but for many new ideas, the innovation itself may create a need or assist in identifying a latent need or motive. This statement is substantiated by Hawkins and Mothersbaugh (2010: 368) who make the point that consumers often are not aware of their motives. The second limitation identified by Schiffman and Kanuk (2007:512) is the fact that the consumer may evaluate and reject the product at each stage of the innovation decision process. This limitation is addressed by Rogers (2003: 177 to 178) who states at each stage in the innovation decision process that there is a possibility that the consumer will reject the innovation. This issue is inherent in the model since consumers would not proceed to the next stage if they rejected the innovation at any point in the innovation decision process. The third limitation associated with the proposed model and identified by Schiffman and Kanuk (2007: 512) is the fact that the model does not explicitly include a post-adoption or postpurchase evaluation that could lead to a strengthened commitment to the innovation or to a decision to discontinue use. As a result of these limitations, Schiffman and Kanuk (2007: 513) propose an

enhanced adoption process model that takes cognisance of these three limitations namely recognition of a need, evaluation/rejection at each stage of the model and post adoption/postpurchase evaluation of the innovation.

A comparison of Rogers' model with that of Schiffman and Kanuk reveals that in actual fact these two models are very similar in that the content of each of the stages is very similar even though the headings are different. For example in the knowledge stage, Rogers states that the consumer needs to be exposed to innovation, in other words, the consumer needs to be aware of the innovation. Similarly, Schiffman and Kanuk state that in the awareness stage, the consumer needs to be exposed to the innovation. The main difference between the Rogers model and that of Schiffman and Kanuk is that in Rogers model, there is a confirmation stage which does not exist in Schiffman and Kanuk's model, and Rogers suggests in his model that at each stage of the adoption process there is a continuous gathering of information in order to facilitate each stage in the model.

The innovation decision process by the individual consumer is also influenced by a number of different factors relating to the innovation itself, in this instance, it is the issue of global warming. These innovation characteristics have been defined by Rogers (2003:14), Schiffman and Kanuk (2007:503 to 504) and Mohr et al. (2005:173) as being:

(a) Relative advantage: It is the degree to which potential consumers perceive the innovation as being better than the idea it supersedes. In the case of global warming, this is not the case, as consumers will have to modify their behaviours in order to assist in the mitigation of greenhouse gas emissions. Changing consumers' behaviour is difficult and this characteristic suggests that the rate of adoption of global warming will tend to be slow.

(b) Compatibility: It is seen as the extent to which an innovation is perceived as being consistent with the existing values, past experiences and needs of potential adopters (Rogers, 2003:14; Hawkins and Mothersbaugh, 2010:252). According to Rogers (2003:15), the adoption of an incompatible innovation often requires the prior adoption of a new value system which is a relative slow process. Global warming is a phenomenon that needs consumers to become less materialistic, less individualistic and more concerned about the impact of global warming on society and all aspects of the natural environment.

(c) Complexity: This refers to the degree to which an innovation is perceived as difficult to understand and use. According to Hawkins and Mothersbaugh (2010: 252), the more difficult the innovation is to use and understand, the slower will be the diffusion. Global warming is a phenomenon that is difficult to understand from a consumer's perspective since it requires an understanding of anthropogenic causes of global warming and their impact on the planet's climate and ecosystems (Spence, 2005:24).

(d) Trialability: The degree to which an innovation can be

tried or used on a limited basis. Everyone on this planet contributes to the phenomenon of global warming and therefore everyone can do their part to assist in its mitigation. Consumers need to perceive that their contribution to the mitigation of global warming is significant in the sense that they can be opinion leaders in their community and in so doing encourage others to participate in the mitigation and/or they can decide that if everyone played their part, this problem could be solved, and therefore they should contribute to this effort.

(e) Observability: The degree to which the result of an innovation is visible to others. According to Spence (2005:24), climate experts are increasingly certain about the changes in climate at a global and continental level, but it becomes a lot more difficult to predict what to expect within countries, either regionally or locally. One of the difficulties associated with the adoption of global warming is the fact that consumers are aware of the fact that weather has a tendency to vary over a different time spans and therefore any change in climate may be perceived as just part of a natural climatic cycle.

Mohr et al. (2005:173 to 175) suggest that the inventors of new products need to understand the aforementioned characteristics of the innovation in order to understand how quickly a product will take off in the marketplace. According to the statements made by Mohr et al., these characteristics of the innovation influence the evaluation stage of the consumer decision making process. In this study, it is suggested that the characteristics of the innovation, in this case global warming, will influence the amount of information gathered about the phenomenon and the evaluation of global warming itself.

Although the characteristics of an innovation influence the innovation decision process itself, the characteristics of the individual may also have an impact on the adoption process itself. For example, the individual's degree of innovativeness, the individual's level of involvement in global warming issues, the individual's concern for the natural environment, society and so on. In this exploratory study, the persuasion stage of the innovation-decision process was investigated in order to determine whether consumers' had developed a favourable or unfavourable attitude towards global warming. In this study, the knowledge stage of Roger's innovation decision process is not discussed since a previous exploratory study by Dos Santos (2010), has investigated this issue.

Rogers (2003:174 to 177) further describes the persuasion stage of the innovation-decision process as being that stage in the process where the individual forms a favourable or unfavourable attitude toward the innovation. Rogers (2003:174 to 175) defines an attitude as:

"A relatively enduring organisation of an individual's beliefs about an object that predisposes his or her actions".

According to Rogers (2003:175), the main type of thinking at the persuasion stage is affective or felt. He also states that it is during the persuasion stage that the consumer may form an attitude or change his/her attitude towards the innovation. The consumer during the persuasion stage is more psychologically involved with the innovation and he/she actively seeks information about the new idea, decides which information is credible and at the same time decides how it is to be interpreted (Rogers, 2003:175). As the consumer processes the information, he/she may mentally apply the new idea to his/her present or anticipated future situation before deciding whether or not to try the innovation (adopting global warming as a scientific fact). The uncertainty associated with an innovation may force the consumer to seek out opinion leaders on the topic in order to ensure accuracy in their understanding of global warming and its consequences (Rogers, 2003:175).

PROBLEM STATEMENT

Human activities on this planet are continuously increasing the levels of carbon dioxide and other greenhouse gases in the atmosphere due to the inert nature of the carbon dioxide molecule (Houghton, 2004:9) and the fact that other greenhouse gas molecules take some time to dissipate from the atmosphere. Taking methane as an example, the average lifetime of a methane molecule in the atmosphere is approximately ten years (Archer, 2007:115). As the concentrations of these molecules increase in the atmosphere, their greenhouse effect increases and as it does so, the average temperature on this planet also increases, resulting in global warming.

In order to mitigate the effects of global warming, consumers need to change their lifestyles, cultures, consumption patterns and behaviours. This becomes particularly significant when the current population on this planet is 6.7 billion and rising (Robinson, 2010) and the standard of living in countries such as China and India continue to increase as a result of improving economies. Consumers are not only responsible for their direct consumption and disposal of products that they purchase, but they are also responsible for business demand according to the derived demand business concept. For consumers to participate in the mitigation of greenhouse gases, they need to adopt the scientific fact that global warming is happening.

As stated earlier, Rogers (2003:164) states that in order to adopt an innovation a consumer goes through a number of stages that includes the persuasion stage (attitude stage). This study examines consumer's attitudes toward global warming since consumer attitudes determine their actions in relation to the innovation.

OBJECTIVES

The primary objective of this study is to determine the

consumer's attitude towards global warming, while the secondary objectives for this study are to:

- (1) Discuss global warming and its associated risks in relation to society, business and the natural environment.
- (2) Comment on the innovation-decision process and factors that influence this process, taking into account the persuasion stage of Rogers' (2003: 168 to 172) model on the innovation-decision process.
- (3) Evaluate and discuss consumer's attitudes in relation to global warming, taking into account the persuasion stage of Rogers' (2003:168 to 172) model on the innovation-decision process.

RESEARCH METHODOLOGY

In order to design a questionnaire that addressed the appropriate issues in relation to the persuasion component of Rogers (2003:168-172) model on the innovation-decision process, the researcher carried out secondary research using journal articles extracted from electronic data bases and academic textbooks that discussed issues relating to global warming and the innovation-decision process. Once this had been achieved, a questionnaire was designed using a 7 point Likert scale. The questionnaire asked the respondents to indicate their degree of agreement or disagreement with each of a series of statements related to the persuasion stage of Rogers (2003:168 to 172) model on the innovation-decision process. The values that were assigned to each response variable varied from 7 (disagree very strongly) to 1 (agree very strongly), while a value of 4 represented the neutral option.

The questionnaire was subjected to evaluation by three renowned researchers who analysed and commented on the questionnaire. The comments made by these individuals were then used to modify the questionnaire. The questionnaire was then pretested in the field using four respondents who were similar to the target audience. This was done in order to determine whether they experienced any difficulties with the design of questionnaire itself and the questions being asked. Once this had been done, the questionnaire was administered to a convenience sample consisting of one hundred and fifty-nine post graduate students studying at a South African University based in Johannesburg. Seventy four of the respondents were males, while the remaining eighty five were females. Of these respondents, ninety-one were studying at night and working either full time or part-time, while the remaining students were focusing on their post-graduate studies. Those that were currently focusing on their studies probably had worked before since a pre-requisite for many of the graduates doing B. Tech was that they had either been gainfully employed for either a year before they applied to study or they had a mandatory 500 hours meaningful work experience. All the respondents in this study had either completed a B. Com degree or a National Diploma in the Faculty of Management. Post-graduate students were selected for this study due to the fact that they had more life experience than undergraduate students and many of them had been or were gainfully employed. The age breakdown of the respondent's in the sample is shown in Table 1. The breakdown by the home language of the respondents is seen in Table 2. The responses that were obtained from this sample were then analysed and evaluated using descriptive statistics.

The questions used in this survey are subsequently discussed. According to Rogers (2003: 175), when an individual is in the persuasion stage of the innovation decision process, this person is more psychologically involved with the innovation and he/she actively seeks information about the new idea.

In this questionnaire, the following statements were asked to

Table 1. Breakdown of respondents by age.

Age (years)	No. of respondent	% of sample
20 - 29	128	80.5
30 - 39	26	16.4
40 - 49	4	2.5
50 - 59	1	0.6

N = 159; n = 159.

Table 2. Breakdown of respondents by home languages.

Language	No. of respondent	% of sample
English	59	37.1
Afrikaans	13	8.2
Nguni (Zulu, Xhosa, Swati and Ndebele)	27	17.0
Sotho (Sepedi, Sesotho and Tswana)	37	23.3
Venda/Tsonga	5	3.1
Other	16	10.1

N = 159; n = 157.

measure the degree of involvement of the respondent:

- (a) When I am aware of programmes on global warming I make a point of finding out what they have to say;
- (b) When I see an article on global warming I read it; and
- (c) I actively search for information on global warming.

The first two questions were asked because an individual may be aware of global warming and interested in it, but they may not be highly involved in the topic and will therefore only read or listen to information when they come across it. On the other hand, a consumer may be very well involved in the topic of global warming and they may actively seek information on it. This is the reason for the third question.

Rogers (2003:175) states that in the persuasion stage of the innovation decision process, the individual seeks innovation evaluation information in order to reduce uncertainty about the innovation's consequences. The following questions were incorporated in the questionnaire in order to determine whether the respondents were aware of the consequences of global warming.

- (a) I am not worried about the consequences of global warming;
- (b) Global warming's positive consequences outweigh its negative consequences; and
- (c) Nature will adapt to global warming.

Rogers (2003:175) suggests that in developing a favourable or unfavourable attitude towards an innovation, an individual may mentally apply the new idea to his/her present or anticipated situation before deciding whether or not to try it. In the case of this study, the following three statements were incorporated in the questionnaire.

- (a) I feel that global warming does have an impact on my life;
- (b) I do not feel that global warming has an impact on South Africa; and
- (c) I do feel that global warming will not have a major impact on future generations.

Rogers (2003: 175) suggests that since all innovation carries some

degree of uncertainty, individuals will seek social reinforcement from others to determine whether their attitude toward the object (in this case global warming) is an appropriate one. In this study, questions relating to the family and the respondents friends were used since these individuals can have a strong influence on the respondent and the respondent usually has a strong relationship tie with these individuals.

- (a) I discuss global warming issues with my family;
- (b) My family does not know about global warming;
- (c) My family does not think global warming is an important issue;
- (d) I do not discuss global warming issues with my friends; and
- (e) My friends are not interested in global warming issues.

The questionnaire was administered to the respondents just prior to the commencement of lectures in the evening or as was the case with the B. Com. Hons. marketing students during their orientation session at the university.

MAJOR FINDINGS AND DISCUSSION

In analysing the results of the knowledge stage of the innovation-decision process, the statistics will be given under the following headings:

- (i) Psychological involvement
- (ii) Consequences
- (iii) Vicarious trial
- (iv) Opinion leaders/social circle

Psychological involvement

The results obtained for the level of psychological involvement by the respondents reveal that although the majority of respondents (41.5%) agree with the statement

Table 3. Psychological involvement.

Psychological involvement	n	Mean	Standard deviation	Cumulative valid % of respondents that disagree	Cumulative valid % of respondents that are neutral	Cumulative valid % of respondents that agree
When I am aware of programmes on global warming I make a point of finding out what they have to say	159	4.18	1.319	28.3	30.2	41.5
When I see an article on global warming I read it	159	4.22	1.525	28.3	27.7	44.0
I actively search for information on global warming	157	3.08	1.441	61.8	24.8	13.4

N = 159.

“When I am aware of programmes on global warming I make a point of finding out what they have to say”, the majority of the respondents disagreed or were neutral. A similar result was obtained for the statement “When I see an article on global warming I read it.” In this instance, 44% of the respondents would read it while the rest were either neutral or they disagreed with the statement. An analysis of the responses to the statement “I actively search for information on global warming” revealed that the majority of respondents did not actively search for information on global warming while 24.8% were neutral and 13.4% actively searched for information. This result suggested that 41 to 44% of the respondents were rather passively involved with the topic of global warming while the remaining respondents were either neutral or not interested enough to find out about the phenomenon. The passively involved respondents (41 to 44%) would read or find out what programmes had to say about global warming, provided they come across them but they would not actively search for information on the topic. This is reflected in the responses to the last statement “I actively search for information on global warming”, where the number of respondents who disagreed with the statement was 61.8%. This issue is of concern to those stakeholders interested in the mitigation of global warming since they need to come up with strategies that will encourage individuals to be curious about global warming and want to learn about it (Table 3).

Consequences

An analysis of the responses obtained for the consequences component of this questionnaire indicated that for the three statements, most of the respondents were worried about the consequences of global warming particularly in relation to its negative consequences. There were however some respondents who believed that nature would adapt to the consequences of global warming (25.8%) and that the positive consequences of global warming outweighed its negative consequences (12.2%). It is

interesting to note that 17% of respondents were not worried about the consequences of global warming. For all three of the statements that fall under consequences, there were quite a number of respondents that selected the neutral option. A comparison of the answers obtained in the study’s psychological involvement with those made in the study’s consequences revealed that although the majority of consumers were worried about the consequences of global warming, they did not actively seek information about the phenomenon and they tended to be passively involved with it. One possible explanation for this is that of fear. If consumers become very fearful about something they tend to distort, they reject or avoid the object that is causing the fear (Hawkins and Mothersbaugh, 2010: 411 - 412) (Table 4).

Vicarious trial

Rogers (2003:175) defines vicarious trial as occurring when an individual mentally applies the new idea to his/her present or anticipated situation before deciding whether or not to try it. An analysis of the responses to the statement “I feel that global warming does have an impact on my life,” revealed that most respondents (60.4%) agreed with the statement, while 30.2% disagreed with the statement and 9.4% remained neutral. Although this statement showed that the majority of respondents were able to see how the negative consequences of global warming could have an impact on their lives, it also indicated to some extent the relevance of global warming to the individual. Responses to the statement “I do not feel that global warming has an impact on South Africa,” indicated that most of the respondents (84.8%) disagreed with the statement, while 7.6% of the respondents agreed with the statement and 7.6% remained neutral. What is interesting about this result is that a comparison of the responses obtained with this statement and those obtained in the previous statement, revealed that although many of the respondents saw global warming as having an impact on South Africa

Table 4. Consequences.

Consequence	n	Mean	Standard deviation	Cumulative valid % of respondents that disagree	Cumulative valid % of respondents that are neutral	Cumulative valid % of respondents that agree
I am not worried about the consequences of global warming	159	2.84	1.735	69.2	13.8	17.0
Global warming's positive consequences outweigh its negative consequences	156	2.91	1.555	59.0	28.8	12.2
Nature will adapt to global warming	159	3.36	1.730	54.1	20.1	25.8

N = 159.

Table 5. Vicarious trial.

Vicarious trial	n	Mean	Standard deviation	Cumulative % of respondents that disagree	Cumulative % of respondents that are neutral	Cumulative % of respondents that agree
I feel that global warming does have an impact on my life	159	4.55	2.027	30.2	9.4	60.4
I do not feel that global warming has an impact on South Africa	158	2.32	1.556	84.8	7.6	7.6
I do feel that global warming will not have a major impact on future generations	159	2.83	2.096	69.2	6.9	23.9

N = 159.

South Africa, they did not see it having an impact on their personal lives (24.4%). In other words, global warming will not really affect me (the respondent), but it will affect others. Similarly many of the respondents (69.2%) saw global warming as having a major impact on future generations while 23.9% felt it would not have an impact in the future and 6.9% of the respondents remained neutral. On the whole, the results revealed that most respondents felt that global warming would have an impact on their lives, South Africa and future generations. However, these feelings do not appear to have an impact on their psychological involvement with global warming nor they do they appear to motivate respondents to learn more about global warming and its consequences.

This study also revealed that there was the lack of consistency in the responses made by some of the respondents. For example, if respondents perceived global warming as having an impact on South Africa, one would assume that they would feel that global warming would have an impact on their lives right now (for example the proposed carbon dioxide tax on new cars in South Africa) and on future generations. This does not appear to be the

case, for instance 84.8% of the respondents feel global warming will affect South Africa, but only 60.4% feel it has an impact on their lives and 69.2% feel it will impact future generations (Table 5).

Opinion leaders/social circle

Schiffman and Kanuk (2007: 482) define opinion leadership (word of mouth communication) as "a process by which one person (opinion leader) influences the actions or attitudes of others, who may be opinion seekers or recipients." Opinion leadership is important because it is informal and does not represent a commercial selling source. In this study, family and friends were selected as they were perceived to be the most influential in an individual's life. Rogers (2003:175) states that when an individual wants to know whether his/her thinking is on the right track, he/she will seek information from his/her near peers. Similarly, family attitudes toward global warming will also have an impact on the individual through the consumer socialisation process.

Table 6. Opinion leaders/social circle.

Opinion leaders/Social scale	N	Mean	Standard deviation	Cumulative % of respondents that disagree	Cumulative % of respondents that are neutral	Cumulative % of respondents that agree
I discuss global warming issues with my family	158	3.70	1.631	42.4	24.7	32.9
My family does not know about global warming	154	2.98	1.705	68.8	13.0	18.2
My family does not think global warming is an important issue	158	3.06	1.623	61.4	15.2	23.4
I do not discuss global warming issues with my friends	157	3.61	1.608	48.4	21.7	29.9
My friends are not interested in global warming issues	157	3.60	1.605	49.7	22.9	27.4

N = 159.

The results obtained for the statement “I discuss global warming issues with my family,” revealed that only 32.9% of respondents discussed global warming issues with their family, while the remainder were either neutral (24.7%) or they do not discuss global warming issues with their family (42.4%). This response was interesting in the context of the next two statements namely:

- (i) My family does not know about global warming (where 68.8% of the respondents disagree with the statement, 13% are neutral and 18.2% of the respondents agree).
- (ii) My family does not think global warming is an important issue (61.4% disagree, 15.2% are neutral and 23.4% agree).

The response to the initial statement indicates that the majority of the respondents do not discuss global warming issues with their family even though statements relating to the family and global warming reflect that the majority of the respondents’ families are aware of global warming and they see global warming as an important issue. This is an important finding since families play an important role in consumer socialisation (Solomon, 2009:466) and influences consumer behaviour. The other issue that may be raised as a result of the responses obtained is; if over 60% of the respondents’ families are interested in global warming and they see it as important why do most of the respondents remain neutral or do not discuss global warming issues with their family?

The last two statements under opinion leadership ask the respondents if they discuss global warming issues with their friends and if their friends are interested in global warming issues. The responses to these statements appear to indicate that approximately 49.7%

of respondents’ friends were perceived to be interested in global warming issues, while 22.9% remained neutral and the rest (27.4) do not discuss global warming issues with their friends.

In addition, many of the respondents appeared to discuss global warming issues with their friends. In response to the statement “I do not discuss global warming issues with my friends”, the responses showed that 48.4% do discuss global warming issues with their friends, 21.7% remained neutral, while 29.9% do not discuss global warming issues with their friends (Table 6).

MANAGERIAL IMPLICATIONS

The results in this study revealed a number of interesting results that have important implications for managers. These findings will be discussed using the previous headings of: Psychological involvement, Consequences, vicarious trial and opinion leadership/social circle

Psychological involvement

In order for consumers to improve their knowledge about global warming and in so doing develop an attitude towards it, they need to be psychologically involved with this phenomena. Schiffman and Kanuk (2007:286) state that a person’s level of involvement plays a key role in the amount of attention that is given to a message and how it is decoded. If consumers are to adopt the scientific fact of global warming, they need to become psychologically involved with the phenomena and they need to feel that they have a social responsibility toward assisting

in its mitigation. Similarly, if consumers are not motivated to learn about global warming, its consequences and mitigation; communicating these issues will become difficult as a result of selective exposure, selective attention and a relatively passive level of involvement. The results obtained for psychological involvement also reveal that a relatively high percentage of the respondents (approximately 25 to 30%) reflect neutral orientation toward attaining knowledge of global warming. It is suggested that stakeholders such as businesses, governments and non-governmental organisations that are interested in getting consumers to participate in greenhouse gas emission mitigation use the marketing and retailing principle of market segmentation. Market segmentation in this instance refers to dividing a given market into meaningful, relatively similar and identifiable segments or groups (Lamb et al., 2008:153). In this instance, stakeholders could segment particular populations (their market) using their attitudes toward global warming as a segmentation base. For example, the consumers who passively learn about global warming, the consumers who are neutral and those that do not concern themselves with learning about global warming. This would enable stakeholders to develop more appropriate and specific communication strategies that appeal to the identified segments or groups of individuals.

Consequences

As stated previously under the consequences results, the results obtained indicate that most of the respondents in this study do appear to be aware of the negative consequences of global warming. What is interesting to observe is the fact that even though the majority of the respondents are aware of the negative consequences of global warming, they do not actively search for information about it and they appear to be passively involved in the phenomenon. It is proposed that two possible reasons for this may be that the negative consequences of global warming are so frightening that they do not want to know about it or the respondents perhaps feel that there is no extreme urgency relating to the mitigation of the phenomenon. Schiffman and Kanuk (2007:299) suggest that when fear appeals are used in advertisements, there is a negative relationship between the intensity of the fear appeals and their ability to persuade, for example intense fear appeals tend to be less persuasive than more moderate appeals. Similarly, Hawkins and Mothersbaugh (2010: 411-412) comment on the fact that recent research suggests that creating fear in a communication message is not enough. The research suggests that communication messages must make people feel accountable to act by playing on guilt or regret emotions in order to induce them to perform the desired behaviours.

Vicarious trial

The results of the responses relating to vicarious trial are interesting in that they reveal that a vast majority of the respondents do see global warming having an impact on them, South Africa and future generations. However, there are still a large percentage of the respondents who do not feel that global warming will not have an impact on their personal lives but will have an impact on South Africa and to a lesser extent an impact on future generations. These responses suggest that some of the respondents may feel that "bad things happen to others but will not happen to me" or they may feel that there is no sense of urgency when it comes to global warming issues, since it will happen in the future and not in the present. This result may also be explained by the fact that some of the respondents are not adequately or correctly informed about global warming and its consequences. Fear could also be an issue in this instance, as respondents may not want to see the impact of global warming on their lives. Here, the statements of the questionnaire also measure to some extent the degree of relevance of the topic to the individual respondent in relation to themselves, their country of residence and/or birth and their descendants.

Opinion leadership/social circle

As stated earlier, opinion leadership and an individual's social circle play an important role in the dissemination of information. The results obtained here reveal that although the majority of respondents' families are aware of global warming and they see it as an important issue, they tend on the whole not to discuss it amongst themselves. In this study, only 32.9% of the respondents state that they discuss global warming issues with their family. This is an important finding in that it indicates that word of mouth communication amongst family members is not very strong. This is a critical factor since the family does play an important role in consumer socialisation and it does have a strong influence on the behaviour of individuals within the family group. If parents do not talk about global warming, its consequences and mitigation, how are future generations going to take this phenomenon seriously?

The results obtained for the statements relating to the respondents' friends, their discussions and level of interest in global warming reveal that approximately 15% of respondents speak to their friends more about global warming than their parents. This finding suggests that some respondents may feel more comfortable talking about global warming issues with their friends rather than discussing these issues with their parents. This finding may be important during the development of communication messages about global warming targeted at this group or type of consumer.

Linder (2006:103) states that international environmental groups and a few Western governments have invested considerable resources in the social marketing of risk claims about global warming. These social marketing programmes emphasise personal culpability and assign responsibility to the individual rather than to industrial resources. This is understandable since demand in business markets is ultimately derived from consumer demand.

Global warming is a phenomenon that needs to be addressed by governments, businesses and consumers due to its critical nature in relation to survival on this planet. Although an individual's contribution to greenhouse gas emissions may seem as insignificant when compared to large businesses, the cumulative effect of more than 6 billion people on this planet releasing greenhouse gases into the atmosphere is quite large. This is demonstrated by the fact that China is now the second largest emitter of greenhouse gases into the atmosphere even though emission per person in China is much lower than that of an individual in the United States. The reason why this is so is due to the fact that it has so many people whose standard of living encourages greater consumption of energy.

LIMITATIONS OF THE STUDY

The limitations of this study arise due to the fact that the sample consists of postgraduate students, the majority of whom have or are working in meaningful jobs. As a result, the findings in this study cannot be projected to the overall population in South Africa. The study does however provide interesting insights about specific consumers and their attitudes toward global warming. These insights give an indication of what may be expected from a more comprehensive sample that reflects South African population more closely.

RECOMMENDATIONS FOR FUTURE RESEARCH

Rogers (2003:168 to 172) proposes a five stage model to explain the innovation-decision process. This study focused on the second stage proposed by Rogers in order to determine how consumers responded to the persuasion stage of this model. The opportunity therefore exists to examine the issue of global warming taking all five stages of the innovation-decision process into account. This is particularly relevant in a global community which is already experiencing the negative impacts of global warming. What is currently needed in relation to global warming is a critical mass of consumers who adopt the scientific fact of global warming and who are prepared to develop mitigation attitudes and behaviours that assist governments and businesses in mitigating the effects of global warming.

REFERENCES

- Archer D (2007). *Global Warming: Understanding the Forecast*. Malden: Blackwell Publishing Company.
- Cox HM (2007). Current issues in Global Warming and Mitigation Efforts: Focus on California. *APCG Year Book*. 69:115-132.
- Dessler AE, Parson EA (2007). *The Science and Politics of Global Climate Change: A Guide to the Debate*. Cambridge: Cambridge University Press.
- Dos Santos MAO (2010). An Exploratory Study Examining the Knowledge Stage of the Innovation Decision Process Proposed by Rogers in Relation to Global Warming by South African Consumers. Presented at the Global Business and Technology Association Twelfth Annual International Conference, Kruger National Park Vicinity, Mpumalanga, South Africa, July 5-9th, 2010.
- Erbil Y, Akincitürk N (2010). An exploratory study of innovation diffusion in architecture firms. *Sci. Res. Essays*, 5(11):1392-1404.
- Hawkins DJ, Mothersbaugh DL (2010). *Consumer Behaviour: Building Marketing Strategy*. Eleventh Edition. New York: McGraw-Hill Irwin.
- Houghton J (2004). *Global Warming: The Complete Briefing*. Third Edition, Cambridge: Press Syndicate of the University of Cambridge.
- Intergovernmental Panel on Climate Change (IPCC) (2001). *Climate Change 2001: Impacts, Adaptation, and Vulnerability*. Cambridge: The Press Syndicate of the University of Cambridge.
- Intergovernmental Panel on Climate Change (IPCC) (2007). *Climate Change 2001: Impacts, Adaptation, and Vulnerability*. New York: Cambridge University Press.
- Lamb CW, Hair JF, McDaniel C, Boshoff C, Terblanche NS (2008). *Marketing*. Third South African Edition, South Africa: Oxford University Press.
- Linder SH (2006). Cashing-in on Risk Claims: On the For-profit Inversion of Signifiers for "Global Warming." *Soc. Semiotics*, 16(1):103-132.
- Mohr J, Segupta S, Slater S (2005). *Marketing of High Technology Products and Innovations*. Second Edition, New Jersey: Pearson Prentice Hall.
- Robinson T (2010). Man on Earth. *Discovery World, DSTv*, Monday 3rd of May, 21:00-21:55
- Rogers EM (2003). *Diffusion of Innovations*. Fifth Edition, New York: The Free Press.
- Schiffman LG, Kanuk LL (2007). *Consumer Behaviour*, Ninth Edition, New Jersey: Pearson-Prentice Hall.
- Seligman L (2006). Sensemaking throughout adoption and the innovation decision process. *Eur. J. Innov. Manage.*, 9(1):108-110.
- Shiva V (2008). *SOIL NOT Oil: Climate Change, Peak Oil and Food Insecurity*. London: Zed Books Ltd.
- Solomon MR (2009). *Consumer behaviour: Buying, Having, and Being*. Global and Ninth Edition, Boston: Pearson.
- Spence C (2005). *Global Warming: Personal Solutions for a Healthy Planet*. New York: Palgrave Macmillan.