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THE EFFECT OF PERSUASIVE MESSAGES ON STUDENTS' GLOBAL WARMING OPINIONS:

A FOCUS ON SOURCE CREDIBILITY

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A thesis submitted to the Faculty of Humanities, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of MA: Community-Based Counselling Psychology.

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DEDICATION

To my parents

with sincere thanks

for their support, unconditional love and assistance

throughout all of my life’s endeavors

ACKNOWLEDGEMENTS

First and foremost, I would like to thank Professor Gillian Finchilescu for all of the support and direction that you gave me during the process of this research. Without your dedication and guidance, I would not have learnt all that I have. I am most grateful for having you as my supervisor. Thank you for sharing your great knowledge and for being as patient as you were.

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TABLE OF CONTENTS

DEDICATION iii

ACKNOWLEDGEMENTS iv

TABLE OF FIGURES x

CHAPTER 1 1

INTRODUCTION 1

1. RATIONALE 1

2. AIMS 4

CHAPTER 2 5

LITERATURE REVIEW 5

2.1 THEORETICAL PREMISE 5

2.2 REVIEW OF LITERATURE 6

2.2.1 Significant early studies 7

2.2.2 Contemporary studies 9

2.2.3 counter-attitudinal messages and counter-argumentation 10

2.2.4 Message framing 14

2.2.5 Elaboration Likelihood 18

2.2.6 Personal Relevance 22

2.2.7 Functions of Attitudes 24

2.2.8 Source Bias 26

2.2.9 Timing 26
2.3 CONCLUSION 28
CHAPTER 3 29
METHODOLOGY 29
3.1 RESEARCH QUESTIONS 29
3.2 HYPOTHESES 29
3.3 SAMPLE 30
3.4 DESIGN 30
3.4.1 Variables 30
3.5 Materials 31
3.5.1 Testing instruments 31
3.5.2 Stimulus material 31
3.6 PROCEDURE 32
3.7 DATA ANALYSIS 34
3.8 ETHICAL CONSIDERATIONS 35
3.8.1 No harm 35
3.8.2 Privacy and confidentiality 35
3.8.3 Informed consent to research 36
3.8.4 Debriefing 36
CHAPTER 4 37
RESULTS 37

4.1 FULL SCALE 37
4.1.1 Instrument reliability 39
4.2 ANALYSIS OF THE FULL SCALE 39
4.3 FACTOR ANALYSIS 41
4.3.1 FACTOR 1: 42
support for general changes (GC) 42
4.3.2 FACTOR 2: 44
support of specific changes (SC) 44
4.3.3 FACTOR 3: 45
motivation toward the support of specific changes that would change one's own lifestyle (SCL) 45
4.3.4 FACTOR 4: 47
degree of attention paid to global warming (DA) 47
4.3.5 FACTOR 5: 48
degree to which global warming is seen as a true problem (TP) 48
4.3.6 FACTOR 6: 50
support of specific changes that would not have a great impact on one's own lifestyle (SCNL) 50
4.4 ANALYSIS OF EACH FACTOR 51
4.4.1 Factor 1 52
support for general changes (GC) 52
4.4.2 Factor 2 54

support of specific changes (SC) 54

4.4.3 Factor 3 57

motivation toward the support of specific changes that would change one's own lifestyle (SCL) 57

4.4.4 Factor 4 59

degree of attention paid to global warming (DA) 59

4.4.5 Factor 5 61

degree to which global warming is seen as a true problem (TP) 61

4.4.6 Factor 6 63

support of specific changes that would not have a great impact on one's own lifestyle (SCNL) 63

CHAPTER 5 66

DISCUSSION 66

5.1 INITIAL HYPOTHESES 66

5.2 MAIN FINDINGS 66

5.2.1 finding 1: significant declines in concern for global warming over time 67

5.2.2 finding 2: greatest persuasion in factor 2 by low credibility source 73

5.3 CONCLUSION 77

CHAPTER 6 79

CONCLUSIONS, LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH 79

6.1 CONCLUSIONS 79

6.2 LIMITATIONS 81

6.3 DIRECTIONS FOR FUTURE RESEARCH 82

REFERENCES 84

APPENDICES 91

TABLE OF FIGURES

Figure 1: The influence of dissonance in decision-making processes 16

Figure 2: Elaboration likelihood continuum 18

Figure 3: Design of the study 30

Figure 4: Procedure of the study 34

Figure 5: Format of Likert-type scales used 35

Figure 6: The impact of the Japan crisis on pretest responses 69

Figure 7: Change of attitude as a consequence of reduced perceived threat over time 72

Figure 8: The many factors that can influence attitude change through persuasion 74

Figure 9: Two-fold use of knowledge on persuasive process 80

CHAPTER 1

INTRODUCTION

1. RATIONALE

Several of the attitudes, beliefs and opinions that people hold are shaped and influenced by external sources of information. These sources include the institutions that they are affiliated with, including religious, educational and cultural institutions; and the individuals that they are associated with. The latter includes a countless number of options including caregivers, mentors, teachers, peers and so on. One of the main ways by which the influential nature of such source's can be categorised is according to their level of credibility (Sternthal, Dholakia & Leavitt, 1978). Such credibility is synonymous with sources' levels of expertise and trustworthiness (Milburn, 1991). Understanding the effect of source credibility on persuasive processes will allow for greater insight into the manner by which people's attitudes and consequent behaviours are shaped.

This study sought to understand the extent to which a source's level of credibility can influence the attitudes of others. According to Pornpitakpan (2004), credibility is the term used to refer to a source's level of expertise in a particular field together with the trustworthiness of the source. A source's lack of expertise in the relevant field leads to mistrust regarding their persuasive opinions thereby their influence on others' opinions and attitudes. As stated by Milburn (1991, p. 107) "If a person is not considered to be an expert on a particular topic, or if trustworthiness comes into question, then that person is likely to be ineffective in changing people's attitudes".

An exploration into the dynamics of persuasion by sources of varying credibility is relevant to today's society for two main reasons. Firstly, to assist in gaining the knowledge required to build mechanisms of resistance to persuasive messages when the intended attitude change may be detrimental to the target and/or community. Secondly, to highlight the importance of developing strategies of persuasion by which credible sources can assist in encouraging

individuals to actively take part in behaviours that are beneficial for themselves and their respective communities. Both of these rationales will be elaborated on below.

Every community, be it large or small, collectivistic or individualistic, has an important commonality, i.e. the presence of community members who are perceived as being more powerful and influential than others. These community dynamics have been referred to by Sidanius and Pratto (1999, p. 315) as forming part of the 'Social Dominance Theory'. This theory argues that social hierarchies are apparent in all communities and consist of those who fall under the 'dominant group', i.e. community members with 'positive social value' such as power, authority and wealth, and those who fall under the 'subordinate groups', i.e. community members that possess 'negative social value' such as a lack of power, authority and wealth (Sidanius & Pratto, 1999, p. 315).

There are various trajectories that can be adopted in order to acquire such positions of power and influence that are synonymous with credibility; one of the most common is through academic and financial success, "Money confers and reflects great status and authority" (Wanko, 2003, p. 163). The past few decades have given rise to an ever growing number of professions and a higher prevalence of educational opportunities that have allowed more people to become experts in their respective fields and to gain a certain degree of credibility. As indicated by Argyle (1994), education is one of the main ways through which one can gain success and upward mobility in the hierarchy and rankings of society. These rankings are a reflection of their status within the community and their level of credibility as perceived by others.

These channels to successful attainment of credibility do not offer any guarantee of immunity to corruption, therefore, great levels of credibility are in no way linked to high levels of humanity. Figures of high credibility can, in many instances, offer others unfavourable suggestions and influences. However, this usually does not prevent people from taking the opinions of credible sources as holding more weight than the opinions of those who are seen as being less credible. For this reason, studies similar to the one proposed will be beneficial in not only the enhancement of current understandings regarding such persuasive processes but also in the development of defence mechanisms that could serve as a buffer against the adoption of potentially detrimental opinions from figures of high credibility. According to De

Wet (2010), there is a need for the development of models of persuasion that assist in teaching people to be critical recipients of persuasion.

The second abovementioned rationale for this study was that it would contribute towards highlighting the importance of developing strategies of persuasion by credible sources that could assist in encouraging individuals to actively take part in behaviours that are beneficial for themselves and their respective communities. With reference to this rationale, it is necessary to take the South African context into consideration. South African communities are all faced with a countless number of problems and dilemmas that require mass social support and agreement if they are to be successfully combated. These problems include a lack of education, the HIV/AIDS epidemic, environmental destruction, crime, poverty, alcohol and drug abuse to name a few; all of which affect the quality of life for all South Africans (Duncan, Bowman, Naidoo, Pillay & Roos, 2007). The battle towards resolving these issues is one that needs great civil support, and in order to gain this required support, mass attitude change needs to take place.

This study explored source credibility which also has implications for the manner by which South Africans, who are experts in their relevant fields, could be mobilised to use their credibility and public trust in an effort to encourage their fellow community members to adopt the required attitudes that are essential for the positive development of their communities and ultimately, a better quality of life for all South Africans. As indicated by Stanley (2004), motivational techniques have to be developed that assist in increasing the awareness of people to the social issues that surround them and to highlight ways by which they can help themselves and their communities in the battle against such issues.

It is believed that credible sources could play a vital role in providing this awareness in an effort to bring about positive and useful changes in the attitudes of people towards such issues. Smith (2007) points out that there is a need to empower communities in their struggle against the problems they are faced with by providing community members with relevant expert information, ideas and tactics for decision making.

This study chose to focus specifically on the issue of global warming. The reasons behind this are that it is a stimulus that is not highly value-laden such as alternative concepts of racism or sexism. This topic has no bounds by gender, race or culture which makes it a suitable topic

for exploration as it minimises the extraneous variables that could play a role in the persuasive processes. Having said this, it is also a serious issue in the world today that has not received the attention that it deserves (Rachlinski, 2000). The plight of global warming is a perfect example of an issue with a high potential for future repercussions that would require mass attitude change and consideration in order to be reduced.

It was hoped that carrying out this study on a topic that is of great importance to the wellbeing of future generations could lead to a better understanding of persuasive processes in such contexts. As such, these understandings could then serve as a template for future work with other world issues. The abovementioned rationales form the reasoning behind the current study, however in order to fully understand the processes of persuasion, the more basic premises need to first be clarified. This study while therefore concentrate primarily on one of the premises that have been highlighted through past research, namely, the role of source credibility in persuasive processes.

2. AIMS

The main aim of this study was to investigate the effects of persuasive messages from agents of varying credibility in altering targets' opinions on global warming. Based on this, there are two main objectives forming the basis of the study. Firstly, to explore the differences in opinion change generated by influence agents viewed as holding little to no credibility compared to those perceived as holding high levels of credibility. Secondly, to investigate whether persuasive messages have any effect on targets that are exposed when compared to those that are not exposed to such persuasive tactics.

CHAPTER 2

LITERATURE REVIEW

This chapter serves the purpose of elaborating on the theoretical premise of the study while also exploring various other studies that have been carried out on the topic of persuasion. Throughout the review of literature, it will be noticed that agreement on the dynamics surrounding persuasive processes is hard to find due to the wide array of studies that are inconsistent with each other. Knowledge of the manner by which people are continuously influenced by various external sources serves to highlight the urgency by which an understanding of such complicated processes needs to be gained. These understandings would allow for the development of strategies by which people can be buffered against detrimental influences, while also allowing for the mobilisation of positive influences.

2.1 THEORETICAL PREMISE

This study finds its theoretical basis in the Elaboration Likelihood Model (ELM) proposed by Petty and Cacioppo (1986). Persuasion typically occurs in situations where one is confronted by persuasive messages that encourage a change in opinion or attitude in a specific direction (i.e. a particular advocacy). In such situations, the ELM postulates that there are two main routes by which persuasion can take place; a central and peripheral route. The former is that which results when the target (i.e. the recipient of the message) takes part in issue-relevant thinking and careful consideration of the information presented by the advocacy, while the latter is evident when persuasion occurs in the absence of any careful thought regarding the advocacy. In these instances persuasion occurs as a result of simple cues present within the context. An example of such peripheral cues is that of expert sources, in other words, sources of high credibility.

The ELM holds much common ground with another model, i.e. the Heuristic-Systematic Model (HSM) proposed by Chaiken (1987). The HSM postulates that targets can adopt either a systematic or heuristic mode when presented with persuasive information. When a decision

is made based on consideration and elaboration of all relevant information it can be said that a systematic mode has been used. The heuristic mode involves a more superficial or 'peripheral' route to persuasion whereby heuristic cues, such as the source of the message, are used as the primary influences to making a decision.

Both the ELM and HSM propose that when message relevant thinking is high, peripheral or heuristic cues have a minimal effect on persuasion, so targets holding high concern for the issue at hand will normally adopt a systematic or central route to persuasion, thereby generating issue relevant thoughts and accounting for the possible merits of the advocacy. Targets who hold little concern about the issue will usually adopt a heuristic or peripheral route, relying mostly on simple inferential cues such as source credibility to persuade them.

The following review of literature serves the purpose of evaluating the pattern of research related to the construct of persuasion. Throughout this section, the reality of the inconsistencies that prevail within this domain of investigation will become most apparent. Furthermore, similar methodologies from which the current study was adopted will be elaborated on.

2.2 REVIEW OF LITERATURE

Decades of research have been dedicated to understanding processes of persuasion. Despite the vast amounts of research that have been dedicated to this domain; insight into these processes remains incongruous. Much of the work that has been done has only highlighted the very complex nature of this concept. Conclusions have been hard to reach given that many studies have been discrepant with each other. Brinol and Petty (2009) attest to the difficulty of reaching such conclusions by explaining that the extent of incongruity within the field of research for persuasion is such that the development of a single mechanism by which persuasion is effective remains inconclusive (Brinol & Petty, 2009).

However, the difficulty that has faced the field only serves to emphasise the great need for more conclusive and congruent results to be achieved. An understanding of persuasive processes is highly important, as stated by Bettinghaus (1968, p. 9), "persuasion is an important part of the daily life of every human being". As a result, there is a sense of urgency in developing greater understandings of this concept. It is for this reason that this study

attempted to provide greater clarity of the dynamics of persuasion with regards to source credibility. The following includes an account of several studies that are relevant to this report.

Studies that have been included comprise of the earlier yet highly significant studies that laid the groundwork for all subsequent studies. In addition to this, studies that have investigated persuasive processes according to source credibility, counter-argumentation, message framing, timing and personal relevance to the advocacy have all been included as they hold value for the current study. Throughout this section, the ambiguous nature of the pattern of studies within this realm will become most apparent.

2.2.1 SIGNIFICANT EARLY STUDIES

Numerous studies have been carried out over the last few decades, all of which highlighted the importance of understanding the dynamics of persuasion and credibility. Earlier studies concentrated primarily on the simple cause and effect relationship between persuasion and credibility. Hovland and Weiss (1951) conducted one of the earliest studies that led to the recognition of source credibility as an important variable in persuasive processes. They found that significantly greater participants had changed their opinions in the direction of the persuasive messages when they were attributed to sources of high credibility. Interestingly, it was also found that with time participants were likely to disagree more with the sources of high credibility and to agree with those of low credibility. This was attributed to the idea of a 'sleeper effect' which assumes that people tend to retain information with time however they are likely to forget the source of the information, thereby increasing the likelihood of agreement with sources of low credibility (Hovland & Weiss, 1951).

The success of high credibility sources in persuading recipients was later also attributed to their ability to facilitate learning (Hovland, Janis & Kelley, 1953). Attempts to gain a more expansive understanding of persuasive processes led to recognition of the dynamics surrounding persuasive effects that are brought about when messages are adequately understood by recipients in comparison to when they are not. Hovland et al. (1953) found that sources of high credibility tend to facilitate learning, while this tendency is much less in sources of low credibility.

Consequently higher learning of persuasive messages leads to a greater persuasive effect and attitude change in the direction of the messages. As a result, higher source credibility is more successful in inducing attitude change (Hovland et al., 1953). In addition to this, sources of high credibility were considered to bring about higher levels of message acceptance due to the favourable outcomes and correctness that are thought to accompany such sources. Since these favourable associations are tied to the source, and the source tied to the message, this leads to favourable associations being related to the message and therefore, a higher degree of agreement with the message leading to attitude change in the direction thereof (Hovland et al., 1953).

Thus far it had been established that high source credibility was most successful in persuading opinions. However, later studies worked to uncover the manner by which these processes can be mobilised for corrupt purposes. Perhaps the most significant experiment that served to spark interest in this domain was that carried out by Milgram (1963) who was motivated to understand how people could carry out orders that were not only cruel but also potentially fatal. His experiment examined the extent to which credibility can persuade behaviours in a participant when requested to inflict harm on another (Milgram, 1963). Astonishingly, it was found that the majority of participants (approximately 65%) could be persuaded into inflicting pain through electric shock on another person. Hofling, Brotzman, Dalrymple, Graves and Pierce (1966) further emphasized the potentially dangerous effects of persuasion through high credibility sources. They found that 95% of their participants, all of whom were nurses, were successfully persuaded by the requests of a caller who deceitfully claimed to be a doctor. They were persuaded to administer dangerous levels of a drug to patients simply because it was requested by a caller of supposedly high credibility. These shocking results are testimony to the strong effects that sources of credibility can have on the opinions and actions of others (Hofling et al., 1966).

These early studies laid the foundation for all subsequent studies that proceeded them. Great concern arose as a result of a growing appreciation of the manner by which people's attitudes are so easily persuaded by sources perceived as credible. As a result, many became interested in investigating such processes in an attempt to fully understand them.

2.2.2 CONTEMPORARY STUDIES

Much debate was sparked as a result of the abovementioned studies, and this prompted many researchers to continue investigating the underlying dynamics of persuasion. They explored the ability of credible figures to persuade others into adopting behaviours or opinions that are potentially detrimental for those involved. Such investigations are crucial in generating the knowledge needed for the development of critical mechanisms that can serve as a buffer against such processes.

Many studies continued to show that sources of high credibility can be most successful in persuading attitudes. One such study is that of Lampinen and Smith (1995) who investigated the effects of misleading post event information on both adult and child witnesses when they originated from sources of varying credibility. The participants were all people who had witnessed a crime, after which they were exposed to persuasive information that served the purpose of obstructing their recollections of the criminal event. This information was presented by either a high or low credibility source, thereby manipulating source credibility as the independent variable. After such exposure, the participants' accurate recollection of the events was measured through memory tests (Lampinen & Smith, 1995).

It was found that in adults, the post-event persuasive information impaired performance on memory tests to a larger extent when they originated from a source of high credibility. This effect was even more pronounced in children, whose performance was impaired almost exclusively when misleading information was presented by a source of high credibility (Lampinen & Smith, 1995). This worked as evidence of the powerful effect of highly credible sources on recipients.

Fragale and Heath (2004) found similar results when they investigated the possible inferences made between the beliefs held by participants and the credibility of the source that they perceived persuasive messages as originated from. After being provided with evidence against two suspects of a crime from either high or low credibility sources, participants who found one of the suspects to be guilty usually misattributed the relevant incriminating evidence to a source of high credibility. Such misattributions were found to be due to the assumption that one's beliefs are true and that true beliefs come from sources of high credibility. Their results showed that participants attributed statements that they believed to sources of high credibility rather than low credibility. Interestingly, when told that their

beliefs were incorrect, participants did not display any evidence of inferences between beliefs and their source.

Further investigations of the influence of credible sources were carried out by Brief, Buttram, Elliott, Reizenstein and McCline (1995) who's study was largely drawn from the findings of Milgram's (1963) experiment. The researchers' aim was to investigate whether or not subordinates would be persuaded by requests from their superiors to use race as a discriminating factor during a hiring process, and additionally, to examine possible variant effects of persuasion when observability is high or low. The results showed that subordinates were successfully persuaded and followed instructions to use race as a criterion during the hiring process. This occurred even in the event that discrimination against a particular race was inconsistent with the participant's internalised attitude towards that race. This showed that the use of racist behaviours, even within a formal cooperation, can be promoted by credible sources, once again making the potentially detrimental effect of such processes most apparent.

This disturbingly prevalent predicament of corruptive persuasion exists not only in organisations but also in the community context. Hierarchies of credibility exist in all areas of society; and people's attitudes and opinions are at risk of being persuaded into directions that could have a potentially damaging effect. It is this dilemma faced by all communities that this study sought to look into further. However, in order to ameliorate these corrupt effects in future, a deep understanding of persuasive processes is highly necessary. While studies discussed thus far predominantly indicated the superior persuasive effects of high credibility sources, further investigations that will be discussed hereon will highlight the discrepancies that have more recently come to light.

2.2.3 COUNTER-ATTITUDINAL MESSAGES AND COUNTER-ARGUMENTATION

Counter-argumentation is a response that has been found to be activated in most situations where recipients are confronted by persuasive messages that are in opposition to their current opinion (Cook, 1969; Dean, Austin & Watts, 1971; Hass & Reichig, 1977). Such persuasive efforts are referred to as being counter-attitudinal, which can be likened to the persuasive arguments used in the current study.

Some studies have found that higher credibility promotes persuasion by inhibiting counter-argumentation when the advocacy is in opposition to initial opinions (Bochner & Insko, 1966; Cook, 1969). This was found to be due to the greater weight that is attached to messages put forth by higher credibility sources (Hass & Reichig, 1977). In contrast, later studies were found to show that high credibility could in fact increase counter-argumentation due to the perceived superior strength of persuasive attacks that originate from them (Hass, 1981). Others found that when an advocacy is one that is closer to the initial opinions of the recipient, sources of low credibility have greater persuasive power than those of higher credibility (Dean et al., 1971).

These contrasting effects of source credibility will be explored in the following sections by first delving into studies that found high credibility to be associated with greater persuasion, followed both those that found lower credibility sources to hold greater persuasive power in certain instances.

2.2.3.1 HIGH CREDIBILITY AS AN INHIBITOR OF COUNTER-ARGUMENTATION

Many studies that have investigated counter-argumentation according to source credibility have found that higher credibility leads to the inhibition of counter-argumentation, thereby promoting persuasion. An example of such a study is that which was conducted by Cook (1969). It was shown that when faced with messages that oppose their initial opinion, people will review their current position and understandings of the advocacy. This leads to the development of counterarguments, especially when their own arguments seem more credible than that of the source. Such counter-argumentation reinforces their current position and usually leads to a consequent reduction in opinion change (Cook, 1969).

Therefore, Cook (1969) found that credible sources tend to inhibit counter-argumentation, which forms part of the reason why they are more successful in persuasion. Hence the results showed that when faced with persuasive messages that are in opposition to initial attitudes, participants are more likely to change their opinions in the direction of the messages when they are attributed to sources of high credibility (Cook, 1969).

Similar effects were demonstrated by Bochner and Insko (1966) in their study which made use of both highly credible and moderately credible sources. Interestingly, the researchers found that when the advocacy was close in relation to the recipient's initial attitude, influence

was greater when the source of persuasion was of a moderate credibility. However, once again it was found that when the persuasive messages are adamantly opposed to the recipient's initial opinions, a source of high credibility was needed to create the greatest persuasive effects (Bochner & Insko, 1966).

Hass and Reichig (1977) attempted to provide an explanation for these processes by demonstrating how sources of high credibility are given more weight than those of low credibility. This was shown when the persuasiveness of highly credible sources increased through their implicit refutation of counterarguments, whereas in sources of low credibility, implicit refutations appeared to decrease their persuasiveness. The researchers attributed this to how implicit refutations from sources of low credibility remind the participants of the counterarguments and their strength, whereas with sources of high credibility the persuasive weight due to their level of expertise allowed for persuasiveness to increase.

2.2.3.2 LOW CREDIBILITY AS AN INHIBITOR OF COUNTER-ARGUMENTATION

Most of the abovementioned assumptions failed to adequately take into account the extent to which the targets were committed to their initial attitude. Consequently, later studies paid more attention to both the content of counter-attitudinal messages, i.e. the strength or weakness of the argument presented; and the degree of commitment shown by participants to their initial opinion. When these complex dynamics were taken into greater consideration, it was found that results contrasted to the majority of the abovementioned studies. Accounts of these more complex studies are elaborated on below.

When faced with counter-attitudinal messages, people holding positions to which they are highly committed to are thought to be most resistant to persuasion by highly credible sources. It was suggested by Hass (1981) that such a scenario causes the person to develop stronger counterarguments in comparison to instances where the same counter-attitudinal messages are presented by a source of low credibility. It is the strength of the 'persuasive attack' as perceived by the target that elicits the generation of either strong or weak counterarguments. When the source is highly credible, the persuasive attack seems much stronger, thereby leading to an increased motivation to counter-argue and a reduction in attitude change. Therefore, when the target holds a position that they are firmly committed to, the presentation of counter-attitudinal messages is thought to be most persuasive when portrayed by a source of lower credibility due to the assumption that counter-arguing will be reduced (Hass, 1981).

While high credibility has been proven by several studies to have persuasive power, many others have yielded different results. Hunt (1972) presented participants with an advertisement which was followed by another advertisement that countered the information offered by the first. This counter-advertisement was attributed to one of four sources, all of which differed in their credibility. Additionally, the counter-advertisement was offered either with or without supporting evidence. The results concluded that when the counter-advertisement came from sources of high credibility, they were equally persuasive as when they came from low credibility sources if presented with supporting evidence. However, when there was no supporting evidence, high credibility sources were more persuasive than low credibility ones.

Further disparate findings were also found by Dean et al. (1971) together with Bock and Saine (1975). These researchers found that in the event that persuasive messages were in favour of a position that the participants were likely to favour, sources of low credibility seemed to have a greater influence. Therefore, when the advocacy being promoted is favoured by participants, sources of lower credibility had more influence on opinion than sources of higher credibility (Dean et al., 1971; Bock & Saine, 1975).

More recent discrepancies were created through a study conducted by Tormala and Petty (2004) who studied the certainty of attitudes after resisting persuasive attacks from sources of varying credibility. This was an extension of previous research (Tormala & Petty, 2002) which had shown that people are perceptive of their own resistance to persuasion, which leads to a higher certainty of their initial attitude. Once source credibility was included in the procedure it was found that resistance to counter-attitudinal communications led to an increased certainty of one's initial attitude only when the persuasive messages originated from a source of high expertise. Resistance to sources of low expertise had no affect on attitude certainty. Therefore, these researchers found that once a recipient has resisted persuasive attempts from a source of high credibility, the result is that they become more certain of their own position, thereby becoming highly resistance to future persuasive attempts. Once again, the persuasive power of high source credibility was found to be questionable.

It can be seen that studies measuring persuasion according to source credibility have been contradictory thus far. Some studies yielded results that indicated greater success in

persuasion when counter-attitudes were tackled by high credibility sources, while others found that sources of lower credibility are more successful. Yet again, the discrepant nature of knowledge generated on persuasion continued to become most apparent.

2.2.4 MESSAGE FRAMING

Another topic that has been investigated extensively is the role of message framing on persuasion, and how the characteristics of persuasive messages can vary the extent to which they bring about an attitude change. This is also an area that has struggled to reach concrete conclusions as a result of discrepant results across studies.

Studies have shown that the manner by which a persuasive message is framed most often has an impact on the effectiveness of the message in inspiring change, especially when framed in terms of positive versus negative outcomes. According to the negativity bias effect, there is a tendency of weighing negative outcomes more heavily than positive outcomes. The Prospect theory suggests that people evaluate information regarding uncertain alternatives according to their potential gains (positive framing) or losses (negative framing) (Smith & Petty, 1996). It is said that risky options seem more desirable when framed negatively rather than positively.

The effects produced by differentially framed messages (i.e. negative versus positive framing) on persuasiveness were investigated by Smith & Petty (1996). They suggested that the framing of messages in addition to the quality of arguments posed would have an effect on the success of persuasion. The results obtained supported the stance that message framing impacts message processing (Smith & Petty, 1996). When messages were framed negatively more processing would result which influenced the extent of persuasion. When presented with strong arguments, message processing was found to result in successful persuasion whereas weak arguments were found to have less persuasive effect. The study found that negatively framed weak arguments resulted in reduced message agreement, while optimal message agreement was produced by negatively framed strong arguments. Positively framed arguments portrayed a similar trend, though to a lesser extent. This can be accounted for by the negativity bias effect whereby negative outcomes are weighted more heavily than positive outcomes.

The negativity bias effect suggests that, in judgmental processes, potential losses are more salient than potential gains. Accordingly, a persuasive message that emphasizes the possible

negative consequences of failure to engage in a recommended behavior (negative frame) should have a greater judgment impact than a message that lists the possible positive consequences of engaging in the same behavior (positive frame) (Tykocinski, Higgins & Chaiken, 1994).

Another interesting model that has given rise to greater understandings of persuasive processes is that of the "cognitive dissonance theory" (Festinger, Riecken & Schachter, 1956). This theory is concerned with the relations between cognitions and cognitive elements which include beliefs, opinions, knowledge of the environment and attitudes (Festinger et al., 1956). According to Festinger et al. (1956, p. 25), dissonance is described as a state of discomfort that is created when two cognitive elements in a person are incongruent with each other,

> *"Dissonance and consonance are relations among cognitions that is, among opinions, beliefs, knowledge of the environment, and knowledge of one's own actions and feelings. Two opinions, or beliefs, or items of knowledge are dissonant with each other if they do not fit together that is, if they are inconsistent, or if, considering only the particular two items, one does not follow from the other.".*

Cognitions are said to be consonant when they are consistent with each other and dissonant when they are inconsistent. Such inconsistencies between one's cognitions create an uncomfortable and aversive state that is most often avoided (O'Keefe, 1990). When dissonance is present, the person will make all attempts to reduce it. Greater magnitudes of dissonance lead to increased pressure to reduce it (O'Keefe, 1990). According to Festinger et al. (1956, p. 26) there are three main ways by which dissonance can be reduced;

> *"The person may try to change one or more of the beliefs, opinions, or behaviors involved in the dissonance; to acquire new information or beliefs that will increase the existing consonance and thus cause the total dissonance to be reduced; or to forget or reduce the importance of those cognitions that are in a dissonant relationship."*

The cognitive dissonance theory suggests that the success of persuasion is highly affected by dissonance. The sequence of this process is shown in the figure below as put forth by O'Keefe (1990, p. 64).



FIGURE 1: THE INFLUENCE OF DISSONANCE IN DECISION-MAKING PROCESSES

This theory suggests that when dissonance is experienced, all attempts will be made to reduce it. As explained by Bettinghaus (1968), the distress caused by cognitive dissonance causes one to be selective in the information that they choose to attend to. When exposed to information that is discrepant with one's own beliefs or opinions, attempts at dissonance reduction may be found in the development of counterarguments or through complete resignation to the advocacy. Hence, dissonance has implications for persuasive communications.

Tykocinski et al. (1994) conducted a study that broadened understandings on the role of cognitive dissonance on persuasion outcomes. Their study involved the use of persuasive messages that encouraged breakfast eating. The negatively framed messages involved an outline of the potential negative consequences related to not eating breakfast (e.g. poor performance, failing at school etc) whereas the positively framed messages outlined the possible consequences of eating breakfast, such as performing better in tests and being successful. This was investigated against a second independent variable, namely the participants' self-discrepancies. More specifically, the effect that is produced when the persuasive messages activate self-discrepancies of the participants was explored. In other words, at times, the information that was provided worked to highlight the dissonant nature of the participants' own cognitions.

This study explored the possibility that activating a self-discrepancy through the framing of a persuasive message would undermine motivation to yield to the message (Tykocinski, et al, 1994). Participants' sensitivity to the matter was said to activate a discrepancy system,

causing emotional distress which is thought to lead to counter-arguing and consequent reductions in compliance to the persuasive messages (Tykocinski et al., 1994)

To investigate this, participants were randomly assigned to different conditions which exposed them to either negatively or positively framed persuasive messages. Questionnaires that probed into the participants' intentions for engaging in the behaviour, together with their general motivational feelings towards the persuasive messages, a measure of their behavioral commitment and delayed actions were all used to collect data on the consequent success of the persuasive messages (Tykocinski et al., 1994).

The results obtained showed that if participants hold a pre-established goal similar to the advocated goal, then discrepancy activation tends to facilitate persuasion rather than impair it (Tykocinski et al., 1994). In other words, the distress that results from such discrepancy activation will most often encourage the participant to commit to the recommendations. However, if the advocated goal is not pre-established, then the activation of self-discrepancies is dealt with through the use of counter-arguments and subsequent reductions in yielding to the recommendations.

These results were in contrast to that which was found by Jones, Sinclair and Courneya (2003) who carried out a study that examined the effects of source credibility for the encouragement of physical exercise in university students when persuasive messages were framed differently. They found that out of all the conditions, students who were exposed to positively framed messages from a source of high credibility expressed the most positive intentions towards physical exercise, with negatively framed messages from low credibility sources having the least positive impact.

Once again, investigations into the effect of message framing on persuasive attempts have been disparate. While the majority of studies have shown that negatively framed messages are more successful at persuading opinions, others have shown that in certain situations, positively framed messages may in fact be more useful.

2.2.5 ELABORATION LIKELIHOOD

2.2.5.1 HIGH CREDIBILITY AS INDUCING ELABORATIONS

According to the Elaboration Likelihood Model (ELM) there is an elaboration continuum that conceptualizes the success of persuasion processes. This continuum ranges from high elaboration to low elaboration. High elaborations involve the use of central cues whereby information relevant to the advocacy is considered and greater levels of message relevant thinking take place, all of which contribute towards the making of a decision to follow or reject an advocacy. Low elaboration occurs in the absence of message relevant thinking and scrutiny. This is most often found when the advocacy is not personally relevant or interesting, or when motivation and opportunity for more elaborative processes is lacking. In such situations, the use of simple cues takes prominence, whereby a decision is made based on factors such as source credibility (Petty & Cacioppo, 1986).

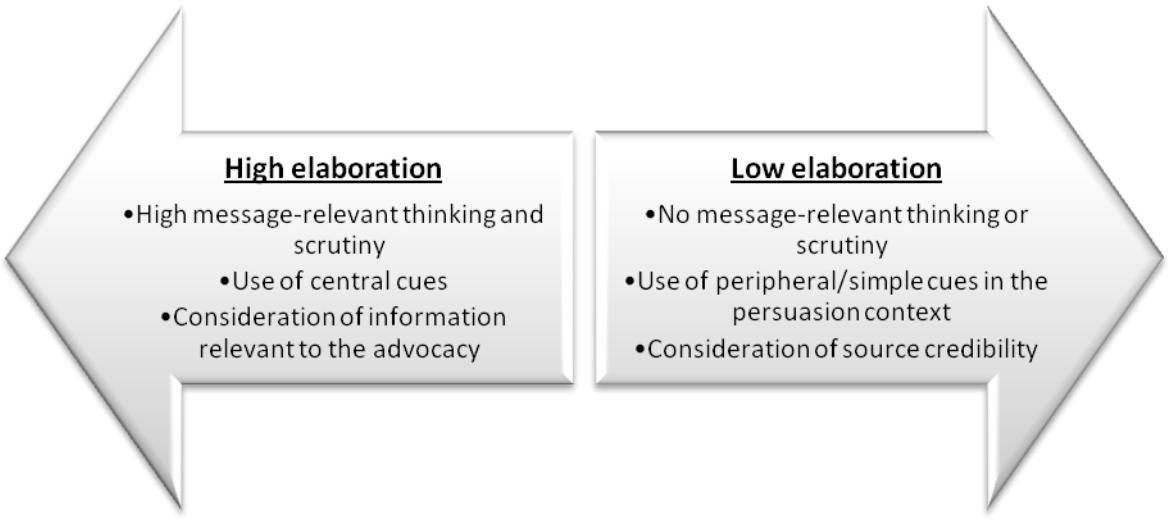


FIGURE 2: ELABORATION LIKELIHOOD CONTINUUM

If there are high degrees of motivation together with the ability to process persuasive messages, then "persuasion is more likely to occur as a function of relatively careful scrutiny and consideration of information relevant to the central merits of the advocacy" (Fabrigar, Priester, Petty & Wegener, 1998, p. 340). However, if the motivation and ability to process such messages is low, then persuasion is more likely to occur as a function of "simple inferences or association based on peripheral cues in the persuasion context" (Fabrigar et al.,

1998, p. 340). Such peripheral cues include adherence to sources of information that are relevant to the advocacy and who are perceived as being credible.

Petty and Cacioppo (1981) proposed that motivation to take part in message relevant thinking (i.e. high elaboration) increases when such messages are presented by a source of higher credibility. Therefore, unlike sources of low credibility, when a highly credible source is involved, it is the content of a message (i.e. its strength or weakness) that will determine the resulting attitude change. In these instances, message scrutiny was assumed to result in greater attitude change when the message argument is strong (Petty & Cacioppo, 1981). Therefore, in high elaboration contexts, the quality and strength of the message was found to be most important. However, sources of high credibility were needed in order to induce these higher levels of elaboration.

Several other studies have been conducted that are in agreement with the above. DeBono and Harnish (1988) found that when elaboration of the advocacy is neither high nor low, it is the credibility of the source that influences the extent to which issue relevant thinking will take place. Sources of high credibility tend to generate more issue relevant thinking thereby placing more emphasis on the strength of the arguments posed by the advocacy. Similarly, Heesacker, Petty and Cacioppo (1983) also found that with high elaboration participants, strong and weak arguments were differentially persuasive only with highly credible sources while differences in persuasive effect of strong and weak messages were insignificant when presented by sources of low credibility. It was also found that sources of higher credibility stimulate higher levels of message relevant thinking and scrutiny (counter-argumentation) even when presented to people who do not typically do so, as shown by the low elaboration participants (Heesacker et al., 1983).

From the abovementioned studies, it can be seen that the elaboration likelihood model is one area of the domain of persuasion that has received the most agreement. The effect of high credibility in inducing message relevant thinking and scrutiny is an aspect that has been found consistently. However, these findings are at times overridden by the effect of high credibility as a simple peripheral cue. While low elaboration contexts have been associated with higher message relevant thinking as a consequence of exposure to high credibility sources, other studies have been known to show the complete opposite. High credibility in

such instances could in fact be used as a peripheral cue with minimal message relevant thinking.

2.2.5.2 HIGH CREDIBILITY AS A SIMPLE CUE

The above studies have emphasised the role of highly credible sources in inducing higher message relevant thinking and scrutiny. However, several studies have instead found that the role of highly credible sources is most apparent when being used as a simple peripheral cue. In other words, the credibility of a source has been found to play the part of affecting opinions in the absence of message processing (Petty & Cacioppo, 1986).

This was demonstrated by Chaiken and Maheswaran (1994) who examined the role of source credibility in the HSM and found that when task importance was low, message ambiguity or strength had no role while credibility of the source as a heuristic cue was the primary determinant of attitudes. Results also showed that when task importance was high, ambiguous message content gave rise to both heuristic and systematic processing. In this case, credibility of the source (heuristic cue) biased the judgements of participants regarding systematic cues, thereby influencing their resultant attitude.

This leads to the conclusion that when participants are exposed to vague and unclear persuasive messages, they will look for other cues within the persuasion context that can assist them in making their decision. The presence of source credibility as a simple cue led to its incorporation in the decision-making process, thereby causing messages from higher credibility sources to be viewed more positively than those that were associated with low credibility sources (Chaiken & Maheswaran, 1994).

Similar results were found by Priester and Petty (1995) who confirmed that participants within low elaboration conditions displayed post-message attitude change as a result of simple cues, i.e. source credibility, resulting in more attitude change when the source was of high credibility. Within high elaboration conditions, participants paid minimal attention to the source of the communication, hence displaying equal amounts of message scrutiny in the presence of both high and low credibility sources.

While high credibility has previously been associated with higher issue relevant thinking (DeBono & Harnish, 1988; Petty & Cacioppo, 1981), in many other instances it has been found that in high elaboration likelihood situations, the credibility of the source does not play

a role in the outcome of the persuasive attempts. Instead, when elaboration is high, the importance of message quality and accuracy becomes highlighted (Priester & Petty, 1995), while the value of source credibility as a simple cue is emphasised when elaboration and message relevant thinking is low.

This latter trend was further highlighted through a study conducted by Kauffman, Stasson and Hart (1999). These researchers found that low elaboration participants rated weak communications more positively when they originated from sources of high credibility, while the impressions of high elaboration participants were not affected by this peripheral cue (i.e. the source's high credibility). Priester and Petty (1995) found similar results which further reiterated the idea that low elaboration participants displayed post-message opinion change as a result of simple cues, i.e. source credibility, resulting in more attitude change when the source was of high credibility. High elaboration participants paid minimal attention to the source of the communication, hence displaying equal amounts of message scrutiny in the presence of both high and low credibility sources (Priester & Petty, 1995).

In order to further demonstrate the use of source credibility as a powerful persuasive tool, Yalch and Elmore-Yalch (1984) performed a study which found that when messages were more difficult to understand, their participants would use peripheral routes, i.e. simple cues in the persuasion context, to determine their judgement. In this case, sources of higher credibility were most persuasive. With regards to messages that were simpler to understand, participants were found to use more central cues as the basis of their judgement. In such situations, they would actively take part in processing the content of the messages provided. This caused source credibility to have no effect on persuasiveness (Yalch & Elmore-Yalch, 1984). Similar results were concluded by Moore, Hausknecht and Thamodaran (1986) who found that persuasive messages were most successful in the event that strong arguments were presented by sources of high credibility simply because participants that take part in message-relevant thinking are able to be persuaded by the strength of the message, while those who do not take part in issue relevant thinking are able to use the high credibility of the source as a peripheral cue to persuasion. However, contrary to results obtained from many other studies, source credibility was found to have no effect when the arguments were weak (Moore et al., 1986).

This section has served to highlight the inconsistencies that exist when considering the role of credibility in high or low elaboration conditions. When looking at the array of research that has attempted to investigate the role of source credibility in low and high elaboration contexts, it becomes evident that there continue to be disparities in current understandings. While the majority of literature points to the use of high source credibility as a peripheral cue (Kauffman et al., 1999; Moore et al., 1986; Priester & Petty, 1995; Yalch & Elmore-Yalch, 1984), many others have also highlighted the use of high credibility as a manner by which to induce higher levels of message-relevant thinking such that persuasion can occur through central routes.

2.2.6 PERSONAL RELEVANCE

Another matter that has received attention is the effect of personal relevance on persuasion. Personal relevance refers to a person's involvement in an issue that is presented persuasively. Studies in this realm have been concerned with the effect that personal relevance to a particular advocacy can affect the outcomes of persuasion.

A study by Stoltenberg and Davis (1988) investigated persuasive effects of source credibility when used on participants that found the issue at hand personally relevant. They found that argument quality had a greater impact on the level of persuasion when presented by sources of high credibility. Furthermore, participants were least likely to follow recommendations put forth through weak arguments presented by a highly credible source, and most likely to internalise such recommendations when they were presented through strong arguments by a highly credible source (Stoltenberg & Davis, 1988). This revealed that in some instances, the use of a high credibility source could in fact hinder persuasiveness.

The impact of personal relevance on persuasion was investigated by Liberman and Chaiken (1996). Their study involved treatment conditions distinguished by the manipulation of personal relevance of the task at hand. Their results showed that the degree of personal relevance and subsequent strength of an attitude could negatively affect the success of persuasive messages relative to the topic, i.e. higher relevance and strength of an attitude may be more resistant to persuasion towards attitude change (Liberman & Chaiken, 1996).

Further studies that agreed on this matter included that of Marsh, Hart-O'Rourke and Julke (1997, p. 563) who found that, "increasing personal relevance led to more negative attitudes" towards the messages, which consequently led to the arguments presented being perceived as less trustworthy. This was attributed to "thorough processing of the high relevance participants... high personal relevance leads to highly elaborative processing of the verbal content" (Marsh et al, 1997, p. 572). This careful processing, which is defensive in nature, results in a minimized persuasive effect.

A rationale for these trends was provided by Fabrigar et al (1998) who conducted a study similar to the abovementioned, where personal relevance and its impact on the "elaboration of persuasive appeals" were further exposed (Fabrigar et al, 1998, p. 339). These researchers found that the accessibility of an attitude not only determines its personal importance and relevance, but also the extent to which knowledge relevant to the attitude exists. Furthermore, attitude accessibility is said to represent the frequency at which these attitudes together with other relevant information have been activated in the past. Therefore as stated by (Fabrigar et al, 1998, p. 342),

> *"Because highly accessible attitudes are typically attitudes that have been frequently activated in the past, attitude-relevant information linked to these attitudes is also likely to be highly accessible because of frequent past activation"*

As a result, "increased message topic attitude accessibility led to enhanced elaboration of a persuasive message on that topic" (Fabrigar et al, 1998, p. 345), thus it is the quality of persuasive messages that is most important in encouraging attitude change in such instances. When personal relevance is high, persuasion is optimal when the messages are of a high quality due to the high elaborations that take place. Petty, Cacioppo and Goldman (1981) found results in their study that were congruent with these trends. Their study showed that when personal relevance was high, persuasion of attitude was based primarily on the quality of the arguments presented, while participants with low personal relevance to the communication where influenced solely by the credibility of the source (Petty et al., 1981).

It can be seen that the majority of studies thus far have found that the persuasive effect of messages is increased when personal relevance and subsequent defensiveness is decreased.

Due to previously formed alliances with particular attitudes, high-relevance participants have been found to be more motivated towards rejecting persuasive messages compared to low-personal-relevance subjects (Marsh et al, 1997).

2.2.7 FUNCTIONS OF ATTITUDES

The functional approach to persuasion addresses the notion that "attitudes towards objects, issues or people can serve different functions for different individuals" (Petty & Wegener, 1998, p. 227). Examples of these attitude functions include an 'ego-defensive' function "whereby the attitude serves the function of protecting a person from accepting undesirable or threatening truths about him or herself" (Petty & Wegener, 1998, p. 227). A 'utilitarian' function is indicative of an attitude object that provides a person with rewards and punishments, while a 'value expressive' attitude gives the person opportunity to act in a manner that is "in accordance with their underlying values" (Petty & Wegener, 1998, p. 227). Lastly, a 'social-adjustive' attitude serves the function of allowing the person to either "identify with (or distance themselves from) particular social groups" (Petty & Wegener, 1998, p. 227).

As stated by Petty and Wegener (1998, p. 228)

> *"A key notion of the functional approach is that it is important to understand the functional basis of people's attitudes in order to understand how to change those attitudes"*

It is suggested that the matching of attitude functions in persuasive messages is more conducive to attitude change as opposed to attitude mismatching of the attitude functions in persuasive messages (Petty & Wegener, 1998). These processes were elaborated on by Lavine and Snyder (1996) who suggested that such persuasive effects are brought about by two main processes. Firstly, matching of attitude functions can create persuasion in the event that thought processing of the message is low because "simple inferences could lead to message acceptance" as soon as the person finds that the function of the persuasive message matches their personal function for holding the initial attitude under question (Lavine & Snyder, 1996, p. 583). Secondly, when processing of the persuasive messages is high, functional matching will promote persuasion by biasing "recipients' evaluations of the persuasiveness of the arguments", causing the message to be "perceived as more persuasive

than messages that contain functionally-irrelevant information" (Lavine & Snyder, 1996, p. 583).

All of these researchers favored the view that matching of messages to the functional basis of an attitude leads to increased persuasiveness. Lavine and Snyder (1996) investigated this by differentiated their participants as either high or low self monitors. High self monitors were classified as participants who regarded positive presentations of themselves to others as being of primal importance and the driving force behind their attitudes and behaviors. Low self monitors were participants who regarded their values and feelings as the most important sources of their attitudes and subsequent behaviour. All of these participants (both high and low self monitors) were presented with messages that either matched or mismatched the assumed function of the attitude. It was found that persuasive messages that appealed to values were successful in motivating low self monitoring participants to generate favorable thoughts towards the message, while this effect was created in high self monitoring participants when exposed to persuasive messages that appealed to image (Lavine & Snyder, 1996). This confirmed that matching of the functional basis of messages enhances persuasive power.

In contrast to this Petty and Wegener (1998) found that the persuasive power of messages that match the functional basis of participant's attitudes can at times be the very opposite of what was previously found by Lavine and Snyder (1996). While these researchers agreed that "the effect of argument strength was greater when the message content matched the functional base of product attitudes", their results showed that this is only the case in situations where the message quality is strong (Petty & Wegener, 1998, p. 234). This is because matched messages were given higher consideration and were thus subjected to heavier scrutiny. When messages were matched, strong arguments increased persuasion while weak arguments decreased persuasion. It was thus concluded that "when the evidence is weak, content that matched the functional basis of attitudes was in fact less persuasive than content that mismatched the functional basis" (Petty & Wegener, 1998, p. 234).

It can be seen that studies accounting for the functional basis of attitudes and their role in persuasion are yet to fully grasp the dynamics that surround such processes. With each subsequent study, new persuasive processes become highlighted that allow for greater understandings of this domain to be developed.

2.2.8 SOURCE BIAS

While source credibility is assuredly one of the greatest cues in persuasion, it nonetheless has its shortcomings. Studies have recently been conducted to understand the manner by which participants' perception of a credible source's values can affect persuasion outcomes. These led to the realization that while the credibility of a source may be high, this does not automatically ensure successful persuasion.

To highlight these dynamics, De Cremer (2004, p. 293) carried out a study that investigated differences in participants' experience of credible sources that were portrayed as being biased versus not biased. These differences were calculated from averages obtained through the use of questionnaires that were completed by each participant which probed into their opinion on the source under question. The results obtained allowed for the following conclusion; that if the participants viewed the credible source as being biased, the importance attached to information offered by them was negatively affected. No matter how accurate the information provided, when participants realized that the source was biased, no more importance would be assigned to the information offered thereafter (De Cremer, 2004). This was found to be due to a decrease in the amount of trust generated by the source, (De Cremer, 2004).

While studies in this area have managed to associate high credibility with greater persuasive power, this power is conditional. Source's who are perceived to be unfair or biased would in fact have the opposite effect on persuasion outcomes. This highlights the need for studies that can bring attention to variables within the process of persuasion that have an effect on persuasion outcomes.

2.2.9 TIMING

Much attention has been dedicated to understanding the effects of timing within persuasion situations. Such investigations have indicated that persuasion outcomes are affected by the time at which participants are informed of the credibility of a source. One of the earlier studies on this matter was conducted by Sternthal et al. (1978) who investigated the possible effects of disclosing the source's credibility at different times during the procedure, i.e. before or after the persuasive messages. It was found that when identified prior to exposure of the messages the high credibility sources were most successful in inducing persuasion. However, when the source was identified after the messages, credibility had no effect on

attitudes. The lack of effect in the latter was attributed to the notion that when identified after the persuasive stimuli, 'thought generation processes' would have already taken place, thereby limiting the effect of source credibility on the persuasive process (Sternthal et al., 1978).

In more recent years, Tormala, Brinol and Petty (2006) were able to use these dynamics of timing to demonstrate the possible reverse effects of source credibility on persuasion. Participants were provided with both strong and weak arguments for the promotion of a product, and were only given information regarding the source of the messages after providing their opinion of the product. Results showed that after exposure to weak arguments, participants developed unfavourable opinions of the product which became even less favourable once they learnt that the source is of a high credibility. However, participants who formed primarily positive opinions after the persuasive communication (due to strong arguments) favoured the product even more after learning that the source of the messages was of a high credibility. In both instance, these effects were similar yet to a lesser extent when the source was said to be of low credibility.

Later, this same procedure was carried out again by Tormala, Brinol and Petty (2007) with the additional measure of ensuring that the entire process was under high elaboration conditions. These results showed that source credibility affected attitudes regardless of timing; however the nature of these effects differed. When source credibility was presented before the messages this prompted issue relevant thinking whereby high source credibility led to increases in message favourability and consequent persuasion. In the event that they were presented after the messages, the direction of thinking could not be affected so late in the decision making process. Instead, confidence in the messages already presented was either strengthened (by high credibility sources) or weakened (by low credibility sources). This confirmed that confidence in the validity of a message is directly linked to credibility of the source (Tormala et al., 2007).

Such studies have allowed for a growing understanding of the manner by which timing affects persuasion outcomes. While there is much agreement that optimal persuasion occurs when the high credibility of a source is offered prior to exposure to persuasive messages, these processes are not yet fully understood. There are studies that have shown post-exposure of high source credibility to reduce persuasion (Tormala et al., 2006), or to enhance

persuasion (Tormala et al., 2007) while others have shown it to not have any effect at all (Sternthal et al., 1978). This further reiterates the need for research within the field of persuasion.

2.3 CONCLUSION

It can be seen that while much of the literature emphasises the superior role of high credibility sources in inducing persuasion, there still remains vast amounts of research that have touched on processes in which the opposite effect is evident. The role of credibility in persuasion processes is yet to be accurately deciphered and understood. It seems that credible sources have the ability to persuade targets depending on the degree of elaboration, message relevance, timing of source credibility disclosure, and framing, together with various other variables that were delved into above. Much research is required in order to gain a detailed and clear understanding of these dynamics in order to be able to mobilise them accordingly when needed. This research study aimed to contribute towards these understandings.

CHAPTER 3

METHODOLOGY

3.1 RESEARCH QUESTIONS

This research study was quantitative in nature, and made use of a quasi-experimental research design. Details regarding the sampling, materials, design, procedure, variables, data analysis, ethical concerns and validity of the study will be discussed below.

The two main research questions that were targeted through this study were the following:

- Firstly, does the level of source credibility affect persuasive power of counter-attitudinal messages on global warming?
- Secondly, do persuasive opinions have an effect on attitudes?

3.2 HYPOTHESES

The hypotheses were directly linked to the abovementioned research questions and were as follows;

- Hypothesis 1: greater levels of credibility would be more successful at persuading opinions in the directions of the persuasive messages
- Hypothesis 2: targets receiving persuasive messages would evidence attitude change while those who did not receive persuasive messages would not.

Hypothesis 1 was investigated through a two-way analysis of variance after which Hypothesis 2 was explored through a planned comparison comparing the Control group with the Experimental Groups.

3.3 SAMPLE

The sample consisting of 250 students were found through convenience sampling. All of the participants were first-year engineering students who were randomly assigned to three groups, namely the Control, Experimental Group 1 and 2. These participants were of varying age, race and gender; however exact values for these were not required as they were not relevant to what was being investigated.

3.4 DESIGN

The study was implemented as a 3×2 mixed model group design with one between subjects variable and one within subjects variable. The table below illustrates this format.

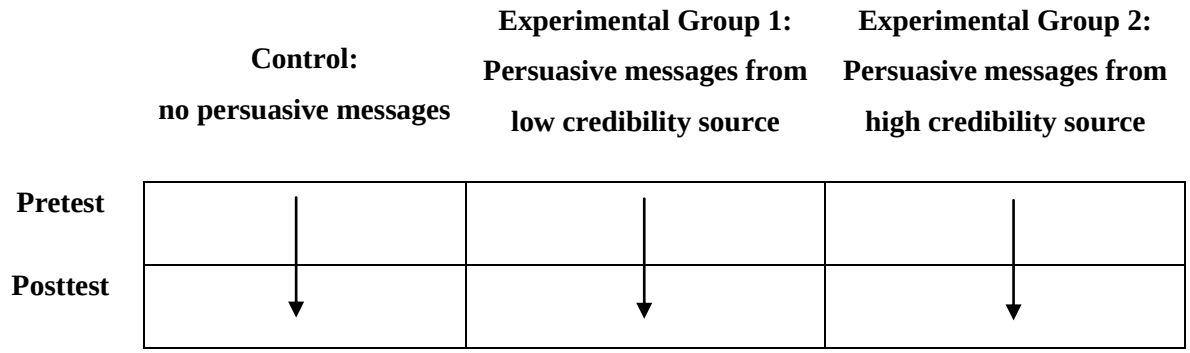


FIGURE 3: DESIGN OF THE STUDY

3.4.1 VARIABLES

This study involved the use of two independent variables. The first was the subject's variable of 'source credibility' which was manipulated by altering the source of the persuasive information's level of credibility. This was operationalised through the use of two experimental conditions, one where the source of the persuasive information was said to be of low credibility (i.e. a student) and another where the source was of a high credibility (i.e. an environmental scientist) in addition to a control. These conditions were used to explore the effect that source credibility has on participant opinions on global warming over time. In line with this, the second independent variable was a within subjects variable of 'time of testing' which was operationalised through the pretest and posttest conditions. The dependant

variable was 'global warming opinion' which was to be measured over time by comparing the responses obtained from the posttest questionnaire to those of the pretest questionnaire.

3.5 MATERIALS

3.5.1 TESTING INSTRUMENTS

The study made use of identical pretest and posttest questionnaires[1] which consisted of 40 items that were responded to through four-point Likert type scales. All of the items probed into the participants' opinions of global warming. The scaling and anchoring of all the items were kept consistent, with greater scores resembling greater concern for global warming.

The questionnaires were derived and adapted from measures used in a study conducted by Krosnick, Holbrook & Visser (2000, p. 239) on "The impact of the fall 1997 debate about global warming on American public opinion". This original questionnaire was adapted through minor changes that worked to replace its original emphasis on the USA to that of South Africa. In addition to this, questions that seemed wholly irrelevant to this study were excluded. In terms of the summation of scores, all participants' responses to the 40 items of the questionnaire were averaged to form their score for the full scale. A high score indicated high concern while a low score indicated low concern.

3.5.2 STIMULUS MATERIAL

All posttest questionnaires were preceded by an article that was different for each condition. One of these was an article that stated several exercise myths[2] (derived from http://www.ideafit.com/fitness-library/10-exercise-myths). These messages were non-persuasive with regards to global warming and were handed to the Control.

The experimental groups each received a paper with persuasive messages of an anti-environmental stance that were derived from a study conducted by McCright and Dunlap (2000). These messages encouraged readers to view global warming as a tactic being used by governments as a manner by which to gain power over people. Thus, they promoted the view

[1] Appendix A

[2] Appendix D

that global warming claims should not be taken seriously. Most importantly, these written papers were identical in every way except for the indicated source of the information. Those that were given to Experimental Group 1 indicated the source to be a student, i.e. of low credibility[3]; while those that were given to Experimental Group 2 indicated the source to be an environmental scientist, i.e. of high credibility[4].

Other materials that were used included a participant information sheet[5] together with a separate piece of paper that asked for each participant's student number and address[6] which was attached to the front of both the pretest and the posttest questionnaires.

3.6 PROCEDURE

All participants were asked to fill out a pretest questionnaire that probed into their attitudes and opinions regarding environmental issues, specifically that of global warming. The questionnaire was completed by each participant during the session and placed in a sealed box. Approximately two months later the same classes were handed an article that was read, after which a posttest questionnaire (identical to the pretest) was once again completed in the session and placed in a sealed box.

The experimental and control conditions were randomly assigned within the class. The article that was received by respondents within Experimental Group 1 contained persuasive information from a source of low credibility (a student) that was attached to the front of their posttest questionnaires. They were asked to read this article before answering the questions. The same procedure was carried out for Experimental Group 2, and while the article they received was identical to that of Experimental Group 1, the only difference was that the author was indicated as being of high credibility (an environmental scientist). The Control

[3] Appendix B

[4] Appendix C

[5] Appendix E

[6] Appendix F

group respondents received the posttest measure with an article on exercise myths, i.e. messages of a non persuasive nature.

Both the pretest and posttest questionnaires had a separate sheet attached requesting each participant's student number and email address. The student numbers were required in order to match the pre and post test questionnaires while participants' email addresses were later used to forward a summary of the report at the conclusion of the study as a method of debriefing.

The entire procedure is synthesized in the illustrations below.

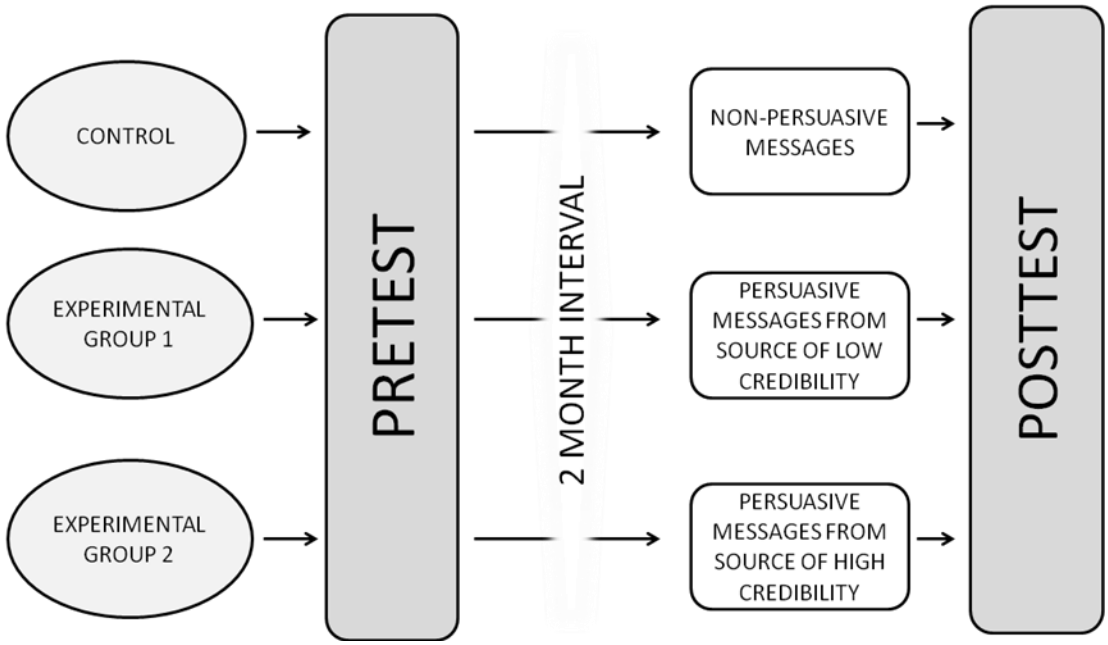


FIGURE 4: PROCEDURE OF THE STUDY

3.7 DATA ANALYSIS

Each participant's responses to the 40 items of the pretest questionnaire were averaged in order to gain a measure of the individual's initial level of concern towards global warming. Similarly, each participant's responses to the 40 items of the posttest questionnaire were also averaged in order to derive a measure of their final level of concern towards global warming. The averages of each participant in the posttest were then compared to their average in the pretest to ascertain any differences of opinion across time.

All of the scores represented by the four point scale were structured in such a way that higher scores indicated higher concern, with lower scores indicating a lower degree of concern towards global warming. This is illustrated below.

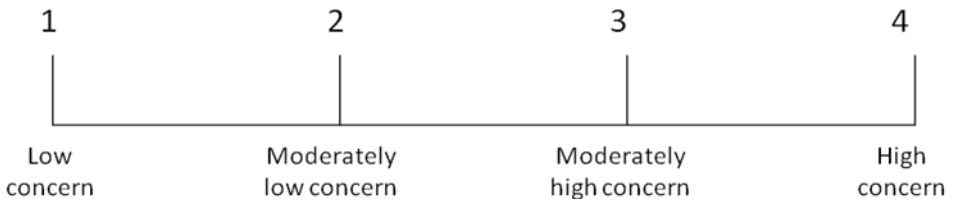


FIGURE 5: FORMAT OF LIKERT-TYPE SCALES USED

As shown in the figure above, higher averages represented higher environmentally concerned attitudes, whereas lower averages represented lower environmentally concerned attitudes in both the pretest and the posttest.

3.8 ETHICAL CONSIDERATIONS

The undertaking of this research study was accompanied by a great deal of responsibility for the researcher. Such a task included careful consideration of numerous ethical concerns, the majority of which fall under two main categories. As specified by Gravetter and Forzano (2009, p. 99) these are; the responsibility to "ensure the welfare and dignity of the individuals"; and "to ensure that public reports of their research are accurate and honest" (Gravetter & Forzano, 2009, p. 99). All concerns relevant to the study are discussed below.

3.8.1 NO HARM

It was ensured that all the information included within the articles and questionnaires were not of the type to cause harm. Furthermore, the information offered through the debriefing process emphasized that none of the persuasive messages were of the opinion of the researcher. Ethics clearance was obtained prior to the undertaking of the study[7].

3.8.2 PRIVACY AND CONFIDENTIALITY

In order to protect the privacy and confidentiality of each participant it was ensured that the personal information requested from them was minimal. No personal details pertaining to participants were required other than their student numbers and email addresses. Participants' student numbers were used exclusively for pairing up of the pre and posttest questionnaires

[7] Appendix G

while their email addresses were required in order to forward them each a copy of the research report summary and debriefing material.

A separate sheet of paper was provided for them to enter this information which was later destroyed thereby preserving their anonymity. All questionnaires were placed in sealed boxes that were provided in the session. In addition to this, participants were informed of any possible limits to confidentiality in the participant information sheet that was handed to them prior to taking part in the study.

3.8.3 INFORMED CONSENT TO RESEARCH

All participants were handed a Participant Information Sheet that contained details of the study. In addition to a brief explanation of the research process, it was also stated that returning of the first questionnaire would be regarded as informed consent to the entire research procedure and that participation or non-participation would not be accompanied by any advantages or disadvantages. Additionally, all participants were informed of their right to withdraw at any given point and that a summary of the report would be forwarded to each individual at the conclusion of the study.

3.8.4 DEBRIEFING

At the end of the study, participants received information relevant to the nature of the study so that they could be clear on its true nature, purpose and conclusions. A summary of the report was forwarded to all participants' email addresses which disclosed the true nature of the study as a manner of debriefing and explained that the anti-environmental persuasive messages were not of the opinion of the researcher. The instructions given to all participants at the beginning of the study were somewhat deceptive regarding the true function of the study (in order to prevent priming of their responses); therefore debriefing served the purpose of clarifying these deceptions and explaining the study's intentions. All measures were taken to respond to any further questions the participants may have had about the study.

CHAPTER 4

RESULTS

The aim of this study was to establish whether or not messages that originate from a source of high credibility are more effective in changing people's opinions compared to messages from a source of low credibility. The independent variables were 'time of testing' and 'source credibility'. These were represented by the pre and posttest experimental conditions whereby the source's level of credibility was manipulated. The source was said to be of low credibility (i.e. a student) in Experimental Group 1 and of a high credibility in Experimental Group 2 (i.e. an environmental scientist). Lastly, a control group was put through the same procedure with the exception of receiving persuasive messages. These conditions were used to explore the effect that source credibility has on the dependant variable of 'global warming opinions' over time. This was measured by comparing the responses obtained from the posttest questionnaire to those of the pretest questionnaire.

Further analyses were conducted by carrying out a two way ANOVA on each of the six factors that were brought to the fore through a maximum likelihood factor analysis. These factors were recognised as representing different facets of the respondents' attitude towards global warming.

4.1 FULL SCALE

All of the data collected from the pre and post tests were included in the following analysis. Those that were excluded were done so on the basis of an invalid number of responses. The statistics of all the data, their means and standard deviations, are given in the table below.

Table 1

General statistics of all data

Variable	Mean	Std Dev	N	Skewness	Kurtosis
Pretest	3.14	0.34	193	-1.03	1.85
Posttest	2.94	0.44	193	-0.35	-0.37
Reversed and transformed pretest	0.61	0.17	193	0.43	0.30
Reversed and transformed posttest	0.70	0.21	193	0.10	0.58

In order to assess the normality of the results, the skewness and kurtosis of the data was examined. Normality refers to the distribution of values and the degree to which they resemble a characteristic bell-shaped form (Howell, 2008). An acceptable range of values for normality is generally taken to be between -1 and 1 (Sheskin, 2004).

All values of skewness outside of the range of normality were rectified through the use of a logarithmic transformation. If the responses had been found to be positively skewed, a logarithmic transformation would have been sufficient prior to the undertaking of an ANOVA. However, a logarithmic transformation can only be carried out on values that are positively skewed. Therefore, values that were found to be negatively skewed were first reversed in order to make them positively skewed after which they were put through a logarithmic transformation. This is the process that was implemented on the data given below, as the responses were found to be negatively skewed.

While initially the scale had been constructed in such a way that high scores denoted high concern, with low scores representing low concern, these procedures reversed the direction of such scores. Therefore, within this analysis, high scores came to represent low concern while low scores indicated high concern. All of the original values for skewness and kurtosis are shown in the table below together with the reversed and transformed values.

In terms of the distribution of the results, the skewness of the pretest values was found to be outside the range of normality, the posttest was within the normal range. However, since the analyses to follow involved a comparison of the pretest and posttest values, it was necessary for both to be reversed and logarithmically transformed.

4.1.1 INSTRUMENT RELIABILITY

Reliability is an important criterion that refers to the consistency with which a measurement procedure would be able to produce the same results if the same respondents were to be measured under the same conditions (Gravetter & Forzano, 2009). This study made use of the Cronbach's coefficient alpha to assess the instrument's reliability. Values that were above 0.7 were accepted as appropriate values for reliability (Cohen & Swerdlik, 2005). As is shown in the table below, the reliability of the questionnaire for the pretest and posttest were both found to be appropriate.

Table 2

Cronbach alpha of pre and posttest measure

Section	Alpha coefficient
Pretest questionnaire	0.88
Posttest questionnaire	0.94

4.2 ANALYSIS OF THE FULL SCALE

The method by which the data was analysed was through the use of a mixed design, two-way analysis of variance (ANOVA). This is a statistical technique by which the differences in the means of groups can be tested (Howell, 2008). The following sections will present the ANOVA analyses that were conducted on all the data.

The table below shows the results that were obtained from the ANOVA that was carried out on all the pre and posttest data that were reversed and put through a logarithmic transformation.

Table 3

All data ANOVA results

Effect	SS	Df	MS	F	P
Intercept	162.09	1	162.09	2598.92	0.00
Group	0.08	2	0.04	0.61	0.55
Error	11.85	190	0.06		
TIME	0.83	1	0.83	60.46	0.00*
TIME*Group	0.06	2	0.03	2.29	0.10
Error	2.60	190	0.01		

*significant effects

The following table shows the overall pre and post test least square (LS) means of the control and experimental conditions for all the data.

Table 4

Pre and post test means of reversed and transformed values

	N	LS Mean	Standard Dev.
Overall Pretest	193	0.61	0.17
Overall Posttest	193	0.70	0.21
Pretest Control	52	0.63	0.20
Posttest Control	52	0.71	0.21
Pretest Experimental Group 1	66	0.59	0.17
Posttest Experimental Group 1	66	0.72	0.21
Pretest Experimental Group 2	75	0.60	0.16
Posttest Experimental Group 2	75	0.67	0.22

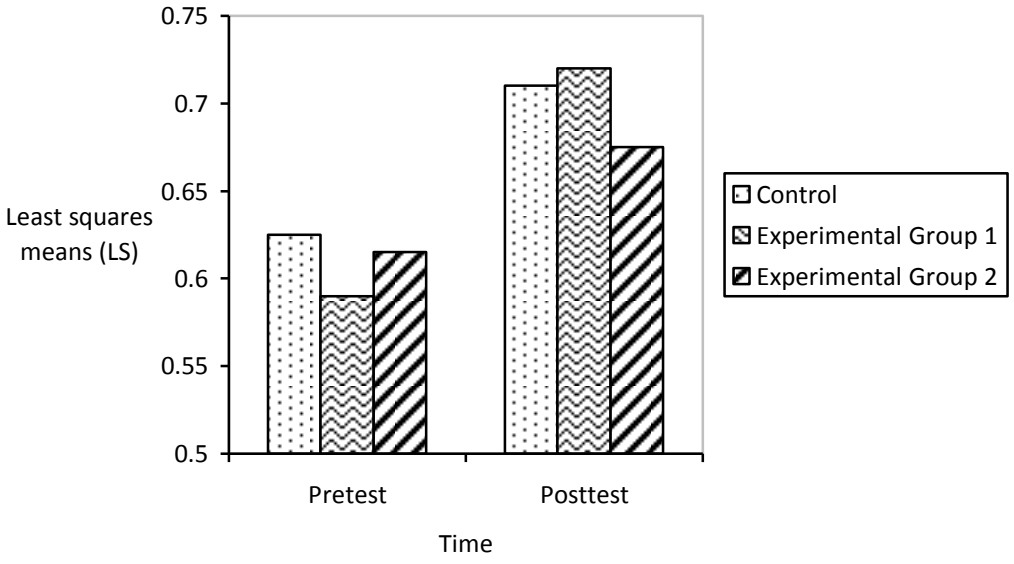
Note that due to the reversal and logarithmic transformations that were carried out prior to the ANOVA, higher scores came to represent a greater decline in concern toward global warming. The above results show that although there were significant declines in concern towards global warming over time, there were no interactions between group and time. All

groups experienced significant changes, more specifically a decline in concern, with time. In other words, all of the responses from the pretest averaged significantly higher than that of the posttest.

The following graph illustrates these results.

Graph 1

All data findings



From these findings it is evident that there was a significant decline in global warming concern across all three groups. Therefore all of the results within the pretest evidenced a significantly greater concern towards global warming compared to the posttest results. While the difference with time was significant, no significant group and interaction effects were found.

4.3 FACTOR ANALYSIS

In order to assess changes in opinion with regard to specific global warming behaviours, a maximum likelihood factor analysis was carried out on the responses to the 40 items of the pre-test questionnaire. This resulted in 6 factors with eigenvalues above 1 being extracted.

These factors were rotated using the varimax normalised method, after which loadings above 0.4 were taken as being significant.

This process allowed for the identification of a set of dimensions that were initially latent. The six factors were each found to represent a different underlying phenomenon. These are given below.

- Factor 1 - a measure of support for general changes (GC) that could assist in curbing the plight of global warming.
- Factor 2 - a measure of support for specific changes (SC).
- Factor 3 - a measure of support for specific changes that would change one's own lifestyle (SCL).
- Factor 4 - the degree of attention paid to global warming (DA).
- Factor 5 - degree to which global warming is seen as a true problem (TP).
- Factor 6 - measure of support for specific changes that would not have a great impact on one's own lifestyle (SCNL).

The internal consistency of the questionnaire sections related to each factor were also calculated through the use of Cronbach's coefficient value. The reliability within each factor will be provided in the following sections together with the factors' descriptive statistics.

4.3.1 FACTOR 1:

SUPPORT FOR GENERAL CHANGES (GC)

Items within this factor that were included based on loading values above 0.4 are given below.

Table 5

Items included in Factor 1

ITEM NUMBER	Item question	LOADING VALUE
13	How important is the issue of global warming to you personally?	0.41
19	How much do you think South Africa should do about global warming?	0.73
20	How much do you think governments in other countries should do about global warming?	0.56
21	How much do you think South African businesses should do about global warming?	0.64
22	How much should average people do about global warming?	0.65

Table 6

Basic statistics of Factor 1

Variable	Mean	Std Dev	N	Skewness	Kurtosis
Pretest	3.47	0.53	201	-1.24	2.20
Posttest	3.21	0.66	201	-0.73	0.24
Reversed and transformed pretest	0.38	0.32	201	0.47	-0.55
Reversed and transformed posttest	0.52	0.36	201	0.01	-0.99

The table above shows that the value for skewness fell outside the required range of normality and proved to be negatively skewed. As a result, the means had to be reversed in order to make them positively skewed, after which a logarithmic transformation was carried out to normalise the values.

Table 7

Cronbach alpha of Factor 1

Measure	Alpha coefficient
Pretest	0.83
Posttest	0.87

This table shows that all of the Cronbach Alpha coefficients were above 0.7 for both the pre and post test, thereby establishing that the measure is reliable for this factor.

4.3.2 FACTOR 2:

SUPPORT OF SPECIFIC CHANGES (SC)

Items within this factor that were included based on loading values above 0.4 are given below.

Table 8

Items included in Factor 2

ITEM NUMBER	Item question	LOADING VALUE
33	Would you favour or oppose the implementation of a program that significantly lowered greenhouse gases but raised your monthly electricity bill by R25 a month?	0.68
34	Would you favour or oppose the implementation of a program that significantly lowered greenhouse gases but raised your monthly electricity bill by R50 a month?	0.76
35	If the South African government were thinking of passing a law that would reduce the amount of air pollution that the country puts out by 85% by the year 2050, and if that would cost your household an extra R100 in taxes every year on average, would you favour this law or oppose it?	0.78
36	If the South African government were thinking of passing a law that would reduce the amount of air pollution that the country puts out by 85% by the year 2050, and if that would cost your household an extra R200 in taxes every year on average, would you favour this law or oppose it?	0.79

Table 9

Basic statistics of Factor 2

Variable	Mean	Std Dev	N	Skewness	Kurtosis
Pretest	2.71	0.76	195	-0.36	-0.34
Posttest	2.53	0.78	195	-0.08	-0.30

The table above shows that the skewness for both the pre and post test was within the normal range; therefore these values could be used as they are.

Table 10

Cronbach alpha of Factor 2

Measure	Alpha coefficient
Pretest	0.84
Posttest	0.86

This table shows that all of the Cronbach Alpha coefficients were above 0.7 for both the pre and post test, thereby establishing that the measure is reliable for this factor.

4.3.3 FACTOR 3:

MOTIVATION TOWARD THE SUPPORT OF SPECIFIC CHANGES THAT WOULD CHANGE ONE'S OWN LIFESTYLE (SCL)

Items within this factor that were included based on loading values above 0.4 are given below.

Table 11

Items included in Factor 3

ITEM NUMBER	Item question	LOADING VALUE
	Please indicate agreement or disagreement to the possible government actions:	
24	Increase taxes on electricity so people use less of it	0.76
25	Increase taxes on fuel so people either drive less, or buy cars that use less fuel	0.79
26	Increase the cost of items that are bought from countries that do not control air pollution	0.48
27	Charge power companies an extra tax for each ton of air pollution they put out	0.43

Table 12

Basic statistics of Factor 3

Variable	Mean	Std Dev	N	Skewness	Kurtosis
Pretest	2.44	0.66	202	-0.04	-0.35
Posttest	2.42	0.68	202	-0.19	-0.11

As shown in the table above, the values for skewness within this factor fell within the normal range.

Table 13

Cronbach alpha of Factor 3

Measure	Alpha coefficient
Pretest	0.71
Posttest	0.73

This table shows that all of the Cronbach Alpha coefficients were above 0.7 for both the pre and post test, thereby establishing the measure as reliable for this factor.

4.3.4 FACTOR 4:

DEGREE OF ATTENTION PAID TO GLOBAL WARMING (DA)

The items within this factor that were included based on loading values above 0.4 are given below.

Table 14

Items included in Factor 4

ITEM NUMBER	Item question	LOADING VALUE
3	Would you say that the average temperatures where you live have been higher or lower in the last three years than before that?	0.43
5	Would you say that the average temperatures around the world have been higher or lower in the last three years than before that?	0.52
6	You may have heard about the idea that the world's temperature may have been going up slowly over the past 100 years. What is your personal opinion about this – do you think that this has probably been happening, or do you think it probably has not been happening?	0.65
7	How sure are you that the world's temperature has been going up?	0.64
14	How much do you feel you know about global warming?	0.43
15	How much have you thought about global warming before today?	0.44

Table 15

Basic statistics of Factor 4

Variable	Mean	Std Dev	N	Skewness	Kurtosis
Pretest	3.08	0.44	201	-0.74	0.57
Posttest	2.88	0.47	201	-0.00	-0.04

These values for skewness fell within the normal range and allowed for the values to be used as they are in the analysis.

Table 16

Cronbach alpha of Factor 4

Measure	Alpha coefficient
Pretest	0.71
Posttest	0.71

This table shows that all of the Cronbach Alpha coefficients were above 0.7 for both the pre and post test, thereby establishing the measure as reliable for this factor.

4.3.5 FACTOR 5:

DEGREE TO WHICH GLOBAL WARMING IS SEEN AS A TRUE PROBLEM (TP)

Items within this factor that were included based on loading values above 0.4 are given below.

Table 17

Items included in Factor 5

ITEM NUMBER	Item question	LOADING VALUE
8	Do you think a rise in the world's temperature is being caused mostly by things people do?	0.72
9	If nothing is done to reduce global warming in the future, how serious of a problem do you think it will be for South Africa?	0.51
10	If nothing is done to reduce global warming in the future, how serious of a problem do you think it will be for the world?	0.66
11	If nothing is done to reduce global warming in the future, how much do you think it will hurt you personally?	0.47
12	If nothing is done to reduce global warming in the future, how much do you think it will hurt future generations?	0.69
17	Do you think most scientists agree or disagree with one another about the causes of global warming?	0.57
18	Scientists use the term 'global warming' to refer to the idea that the world's average temperature may be about five degrees Fahrenheit higher in 75 years than it is now. Overall, would you say that global warming would be good or bad?	0.51
40	Do you think that people are to blame for global warming?	0.58

Table 18

Basic statistics of Factor 5

Variable	Mean	Std Dev	N	Skewness	Kurtosis
Pretest	3.38	0.50	201	-1.31	1.97
Posttest	3.08	0.62	201	-0.47	-0.19
Reversed and transformed pretest	0.44	0.28	201	0.59	-0.12
Reversed and transformed posttest	0.60	0.33	201	-0.15	-0.86

The table above shows that the pretest value for skewness fell outside the required range of normality and proved to be negatively skewed. As a result, the means had to be reversed in

order to make them positively skewed, after which a logarithmic transformation was carried out to normalise the values.

Table 19

Cronbach alpha of Factor 5

Measure	Alpha coefficient
Pretest	0.82
Posttest	0.88

This table shows that all of the Cronbach Alpha coefficients were above 0.7 for both the pre and post test, thereby establishing the measure as reliable for this factor.

4.3.6 FACTOR 6:

SUPPORT OF SPECIFIC CHANGES THAT WOULD NOT HAVE A GREAT IMPACT ON ONE'S OWN LIFESTYLE (SCNL)

The items within this factor that were included based on loading values above 0.4 are given below.

Table 20

Items included in Factor 6

ITEM NUMBER	Item question	LOADING VALUE
	Please indicate agreement or disagreement to the possible government actions:	
29	Build air conditioners, refrigerators and other appliances that use less electricity	0.55
30	Build new homes and offices that use less energy for heating and cooling	0.60
31	Lower the amount of greenhouse gases that power plants are allowed to release into the air	0.54
32	Include education on global warming in school curricula	0.56

Table 21

Basic statistics of Factor 6

Variable	Mean	Std Dev	N	Skewness	Kurtosis
Pretest	3.41	0.55	196	-1.46	3.38
Posttest	3.32	0.61	196	-0.77	0.14
Reversed and transformed pretest	0.37	0.33	196	0.51	-0.35
Reversed and transformed posttest	0.46	0.35	196	0.16	-1.03

The table above shows that the pretest was negatively skewed. As a result, the means had to be reversed in order to make them positively skewed, after which a logarithmic transformation was carried out to normalise the values.

Table 22

Cronbach alpha of Factor 6

Measure	Alpha coefficient
Pretest	0.77
Posttest	0.82

This table shows that all of the Cronbach Alpha coefficients were above 0.7 for both the pre and post test, thereby establishing the measure as reliable for this factor.

4.4 ANALYSIS OF EACH FACTOR

The data within each of the abovementioned factors was analysed through the use of a mixed design, two-way analysis of variance (ANOVA). The use of this statistical technique allows for the mean differences between groups to be tested (Howell, 2008). The following sections will present the ANOVA analyses that were conducted within each of the 6 factors.

The analyses of Factors 2, 3 and 4 were performed on the original mean values as they were because their skewness was within the normal range. However, the mean values of Factors 1, 5 and 6 were negatively skewed; hence the ANOVA's within these factors were carried out on values that had been previously reversed and logarithmically transformed. As a result, it

should be noted that the meaning of values within Factors 1, 5 and 6 became reversed, such that lower mean values represented higher concern, with higher mean values indicating lower concern in global warming.

4.4.1 FACTOR 1

SUPPORT FOR GENERAL CHANGES (GC)

The ANOVA results for Factor 1 are shown in the table below.

Table 23

ANOVA of Factor 1

Effect	SS	Degree of Freedom	MS	F	P
Intercept	80.03	1	80.03	422.56	0.00
Group	0.24	2	0.12	0.06	0.53
Error	37.50	198	0.19		
TIME	1.99	1	1.99	43.72	0.00*
TIME*Group	0.08	2	0.04	0.88	0.42
Error	8.99	198	0.05		

*significant effects

The above results show that significant effects were found with time, i.e. from the pretest to the posttest. However, no significant interactions were found between time and groups, thereby evidencing a general decline in concern towards the 'support of general changes'. Hence there were significant changes in opinion towards the 'support of general changes' regardless of the independent variable to which it was subjected. The following table shows the least square means, standard deviations and numbers within the pre and post test conditions for Factor 1.

Table 24

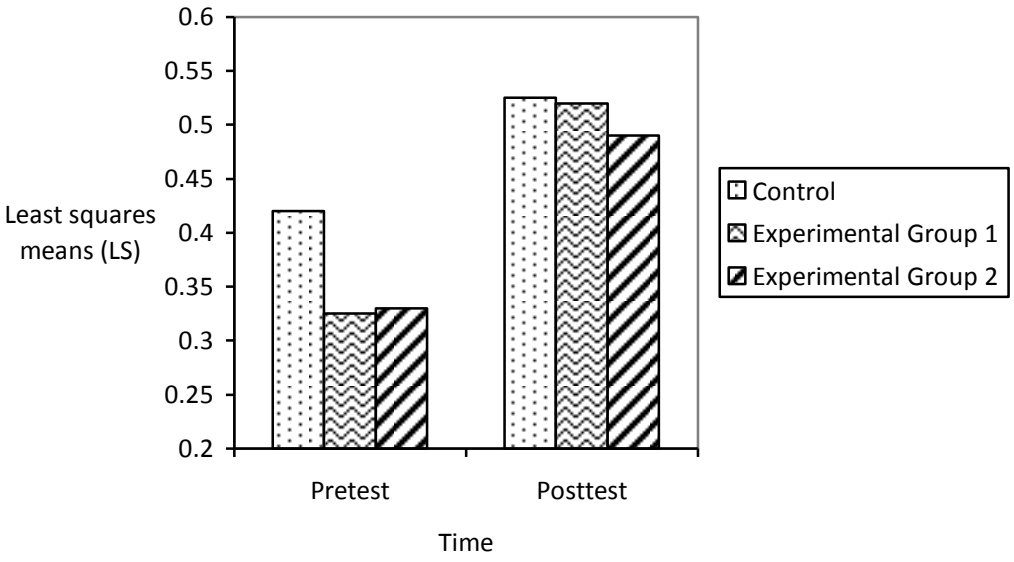
Least square means of Factor 1 pre and post conditions

	N	LS Mean	Standard Dev.
Overall Pretest	201	0.38	0.32
Overall Posttest	201	0.52	0.36
Pretest Control	57	0.43	0.34
Posttest Control	57	0.54	0.37
Pretest Experimental Group 1	67	0.35	0.31
Posttest Experimental Group 1	67	0.53	0.37
Pretest Experimental Group 2	77	0.36	0.31
Posttest Experimental Group 2	77	0.49	0.36

Note that due to the conversion and logarithmic transformation that were carried out prior to the ANOVA, higher scores represent lower support for general changes to deal with global warming. These results are illustrated in the table below.

Graph 2

Factor 1 findings



4.4.2 FACTOR 2

SUPPORT OF SPECIFIC CHANGES (SC)

The ANOVA that was carried out for Factor 2 yielded the following results.

Table 25

ANOVA of Factor 2

Effect	SS	Degree of Freedom	MS	F	P
Intercept	2632.94	1	2632.94	2961.21	0.00
Group	0.57	2	0.29	0.32	0.72
Error	170.72	192	0.89		
TIME	3.22	1	3.22	10.93	0.00*
TIME*Group	2.37	2	1.19	4.02	0.02*
Error	56.63	192	0.30		

*significant effects

The above analysis indicates that there were significant main effects for time as well as a significant interaction between group and time. An analysis of the simple effects was conducted through the use of Tukey's HSD test. The results for this are given below.

Table 26

Tukey's HSD test on Factor 2

Group	Pre-post HSD Value
Control	0.98
Experimental Group 1	0.00*
Experimental Group 2	0.87

*significant effects

This test indicated that the only group with a significant decline in concern toward the support of specific changes was Experimental Group 1. These changes were in the direction of the persuasive messages, thereby showing that the source of low credibility was most successful in persuading the participants' opinions. The Control and Experimental Group 2 did not evidence any significant differences from pre to post testing. The least square means of the pre and post test conditions in Factor 2 are given below.

Table 27

Least square means of Factor 2 pre and post conditions

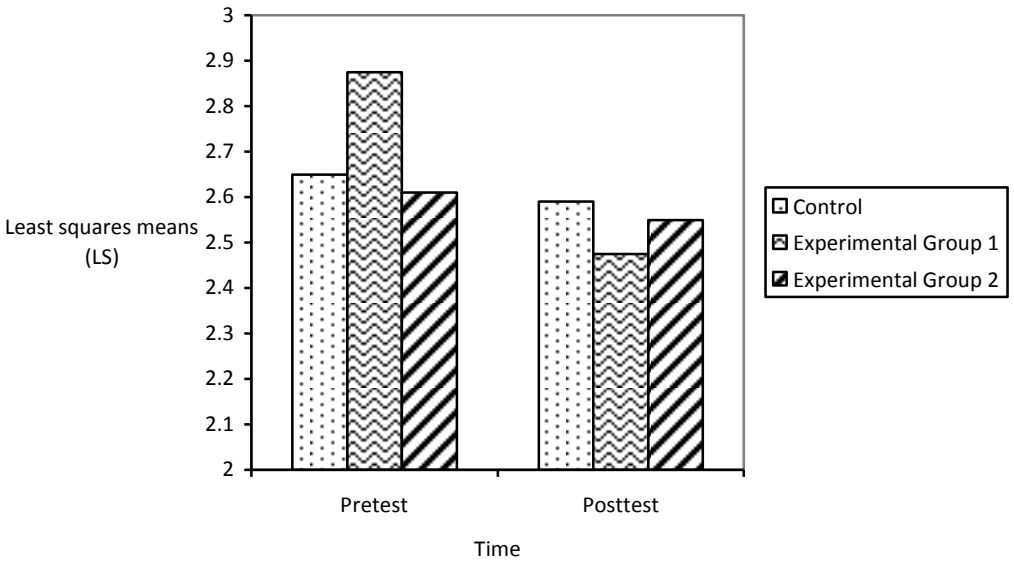
	N	LS Mean	Standard Dev.
Overall Pretest	195	2.71	0.76
Overall Posttest	195	2.53	0.78
Pretest Control	55	2.65	0.86
Posttest Control	55	2.58	0.75
Pretest Experimental Group 1	65	2.87	0.66
Posttest Experimental Group 1	65	2.47	0.74
Pretest Experimental Group 2	75	2.61	0.77
Posttest Experimental Group 2	75	2.54	0.83

These analyses made it evident that Experimental Group 1 was the only condition to show significant changes in opinion from the pretest to the posttest. During the pretest, Experimental Group 1 evidenced a significantly greater support for specific changes as compared to the Control and Experimental Group 2 ($p<.05$). In contrast, Experimental Group 1 showed significantly lower levels of support for specific changes in the posttest when compared to the other conditions.

These results confirmed that respondents within this group had a significantly greater decline in concern for the support of specific changes from the pretest to the posttest compared to other conditions. The Control and Experimental Group 2 had directionally similar yet insignificant changes from the pretest to the posttest. Therefore, only Experimental Group 1 evidenced significant changes over time with regards to support for specific changes (SC). The following graph portrays these findings.

Graph 3

Factor 2 findings



4.4.3 FACTOR 3

MOTIVATION TOWARD THE SUPPORT OF SPECIFIC CHANGES THAT WOULD CHANGE ONE'S OWN LIFESTYLE (SCL)

The results of the ANOVA carried out on Factor 3 are shown below.

Table 28

ANOVA of Factor 3

Effect	SS	Degree of Freedom	MS	F	P
Intercept	2342.53	1	2342.53	3292.84	0.00
Group	0.72	2	0.36	0.51	0.60
Error	141.57	199	0.71		
TIME	0.04	1	0.04	0.18	0.67
TIME*Group	0.03	2	0.01	0.07	0.93
Error	39.32	199	0.20		

*significant effects

The above ANOVA results show that there were no significant interactions or group main effects within Factor 3. This indicates that there were no significant changes in opinion between the groups or across time regarding support for specific changes that would change one's own lifestyle. The least square means of the pre and post test conditions for Factor 3 are given below.

Table 29

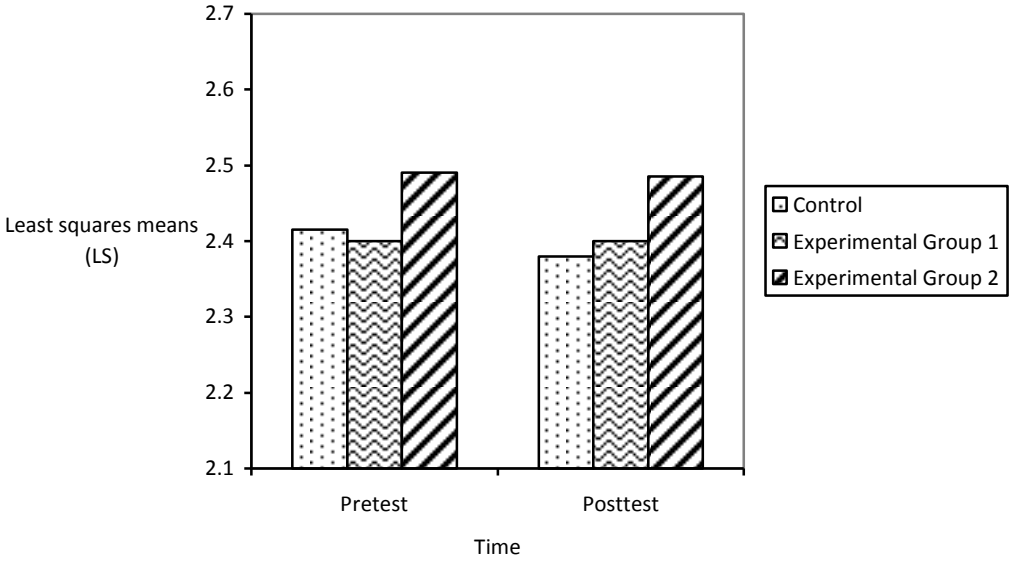
Least square means of Factor 3 pre and post conditions

	N	LS Mean	Standard Dev.
Overall Pretest	202	2.43	0.66
Overall Posttest	202	2.41	0.68
Pretest Control	58	2.42	0.73
Posttest Control	58	2.38	0.72
Pretest Experimental Group 1	67	2.40	0.67
Posttest Experimental Group 1	67	2.39	0.68
Pretest Experimental Group 2	77	2.49	0.61
Posttest Experimental Group 2	77	2.48	0.66

These results are illustrated in the graph below.

Graph 4

Factor 3 findings



4.4.4 FACTOR 4

DEGREE OF ATTENTION PAID TO GLOBAL WARMING (DA)

The ANOVA results for Factor 4 are given in the table below.

Table 30

ANOVA of Factor 4

Effect	SS	Degree of Freedom	MS	F	P
Intercept	3504.72	1	3504.72	11727.88	0.00
Group	0.02	2	0.01	0.03	0.97
Error	59.17	198	0.30		
TIME	4.48	1	4.48	37.61	0.00*
TIME*Group	0.56	2	0.28	2.34	0.10
Error	23.58	198	0.12		

*significant effects

Once again, these findings evidence significant changes over time for all groups, with insignificant interaction effects and group main effects. The least square means for each pre and post condition in Factor 4 is shown below.

Table 31

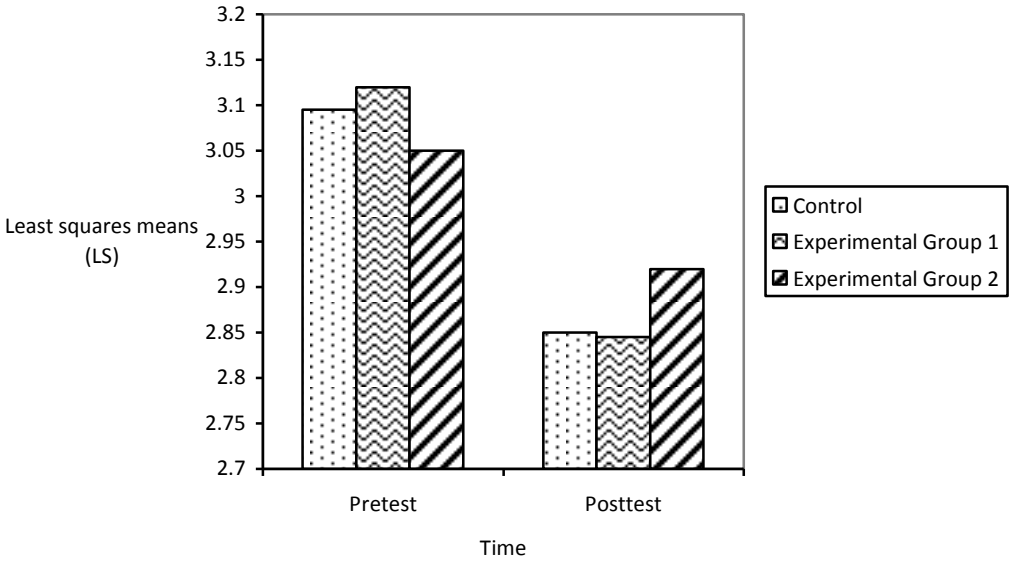
Least square means of Factor 4 pre and post conditions

	N	LS Mean	Standard Dev.
Overall Pretest	201	3.08	0.44
Overall Posttest	201	2.87	0.47
Pretest Control	56	3.09	0.42
Posttest Control	56	2.85	0.43
Pretest Experimental Group 1	68	3.12	0.42
Posttest Experimental Group 1	68	2.84	0.46
Pretest Experimental Group 2	77	3.04	0.45
Posttest Experimental Group 2	77	2.93	0.47

The analysis indicated that all groups had a significant decline in the degree of attention being paid to global warming. However, interaction effects and group main effects were found to be insignificant. The following graph illustrates these results.

Graph 5

Factor 4 findings



4.4.5 FACTOR 5

DEGREE TO WHICH GLOBAL WARMING IS SEEN AS A TRUE PROBLEM (TP)

The ANOVA results for this factor are shown in the table below.

Table 32

ANOVA of Factor 5

Effect	SS	Degree of Freedom	MS	F	P
Intercept	108.83	1	108.83	780.95	0.00
Group	0.05	2	0.03	0.19	0.82
Error	27.59	198	0.14		
TIME	2.38	1	2.38	49.36	0.00*
TIME*Group	0.11	2	0.06	1.19	0.31
Error	9.55	198	0.05		

*significant effects

Similarly to the majority of the findings, interaction effects and group main effects were insignificant, however all of the conditions evidenced significant changes in the degree to which global warming is seen as a true problem over time. The least square means, number and standard deviations of the Factor 5 pre and post test conditions are shown below.

Table 33

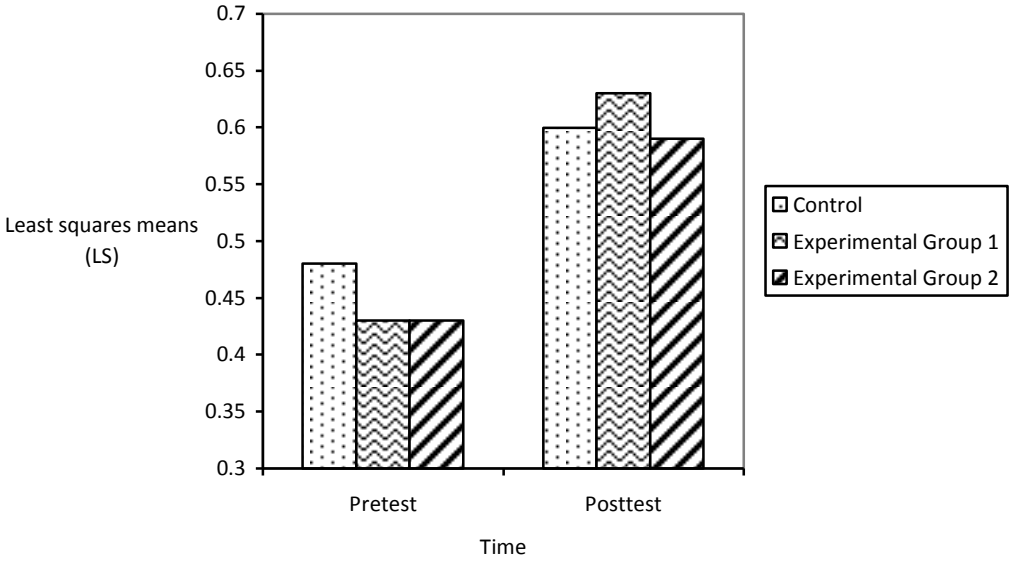
Least square means of Factor 5 pre and post conditions

	N	LS Mean	Standard Dev.
Overall Pretest	201	0.45	0.28
Overall Posttest	201	0.60	0.33
Pretest Control	57	0.48	0.27
Posttest Control	57	0.59	0.33
Pretest Experimental Group 1	68	0.43	0.27
Posttest Experimental Group 1	68	0.63	0.33
Pretest Experimental Group 2	76	0.43	0.29
Posttest Experimental Group 2	76	0.59	0.34

These results are illustrated in the graph below.

Graph 6

Factor 5 findings



4.4.6 FACTOR 6

SUPPORT OF SPECIFIC CHANGES THAT WOULD NOT HAVE A GREAT IMPACT ON ONE'S OWN LIFESTYLE (SCNL)

The ANOVA results for this factor are shown in the table below.

Table 34

ANOVA of Factor 6

Effect	SS	Degree of Freedom	MS	F	P
Intercept	66.06	1	66.06	424.70	0.00
Group	0.23	2	0.11	0.72	0.49
Error	30.02	193	0.16		
TIME	0.68	1	0.68	8.88	0.00*
TIME*Group	0.14	2	0.07	0.91	0.40
Error	14.78	193	0.08		

*significant effects

The ANOVA for Factor 6 evidenced significant effects over time for all three groups, with insignificant group main effects and interaction effects. Therefore, all groups' support for specific changes that would not have a great impact on one's own lifestyle showed significant declines over time. The following table shows the least square means of the pre and post test conditions for Factor 6.

Table 35

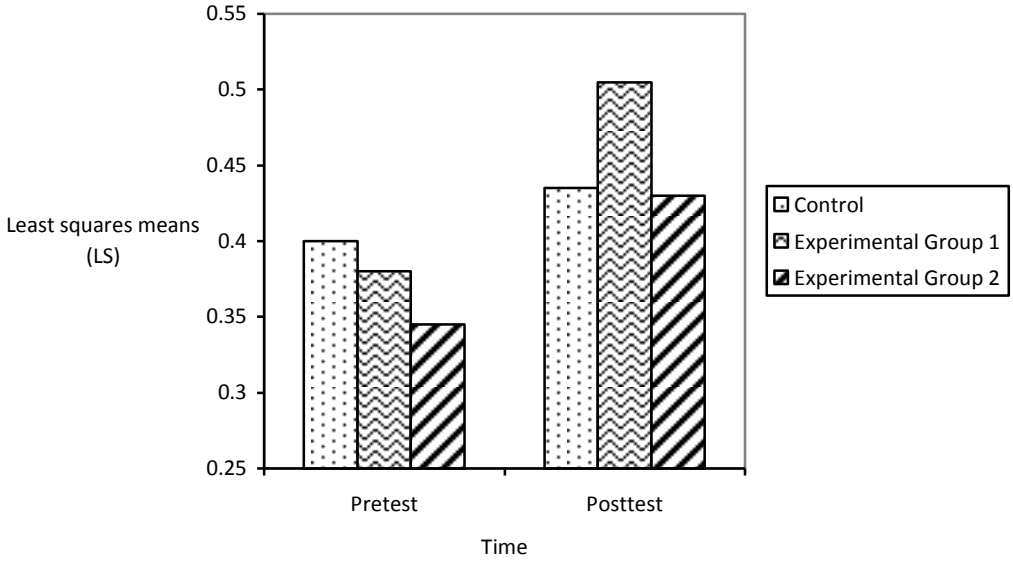
Least square means of Factor 6 pre and post conditions

	N	LS Mean	Standard Dev.
Overall Pretest	196	0.37	0.33
Overall Posttest	196	0.46	0.35
Pretest Control	54	0.40	0.36
Posttest Control	54	0.43	0.39
Pretest Experimental Group 1	66	0.38	0.31
Posttest Experimental Group 1	66	0.51	0.35
Pretest Experimental Group 2	76	0.34	0.32
Posttest Experimental Group 2	76	0.43	0.32

These findings are illustrated in the graph below.

Graph 7

Factor 6 findings



CHAPTER 5

DISCUSSION

5.1 INITIAL HYPOTHESES

The results that were obtained in this study did not support the hypotheses that were initially posed. Hypothesis 1 anticipated that the level of source credibility would impact attitude change such that higher source of credibility would cause greater attitude change in the direction of the persuasive messages. The persuasive messages that were presented by low or high credibility sources were counter-attitudinal in nature. These anti-environmental messages had been derived from a study conducted by McCright and Dunlap (2000). They persuaded the recipients towards an anti-global warming stance whereby their concern towards global warming would have been reduced. Therefore it was expected that if such messages were to be effective, declines in concern towards global warming would be greatest for Experimental Group 2, less for Experimental Group 1, and with no changes across time for the Control. This was not shown through the results because all groups, including the Control, showed significant declines in concern towards global warming.

Hypothesis 2 stated that targets receiving persuasive messages would evidence attitude change while those who did not would show no changes in attitude over time. As a result, it had been anticipated that Experimental Group 1 and 2 would have significantly greater declines in concern for global warming compared to the Control. This hypothesis was also not supported as it was found that there were no differences between the control group and the experimental groups' concern over time. Instead, they all reflected the same significant attitude changes over time.

5.2 MAIN FINDINGS

Having said this, there were 2 interesting findings brought to the fore through the analyses that would require some attention. These are listed below.

1) All groups showed a significant decline in global warming concern over time. This was the case for the full scale and all factors, with the exception of Factor 3 which stood for the measure of support for specific changes. Other than Factor 2 (measure of support of specific changes) most of the analyses also showed that although there was a change in global warming opinions over time, there were no interaction effects. This suggests that the persuasive messages and differing credibility of the sources had no significant persuasive effect.

2) Factor 2 represented respondents' motivation towards implementing specific changes that could aid in ameliorating the problem of global warming. Within this factor, persuasive messages from a low credibility source (i.e. Experimental Group 1) had a significantly greater persuasive effect on participants' opinions on global warming compared to other groups. More specifically, the low credibility source was the only condition that was successful in persuading a decline in the support for specific changes that would assist in amending the problem of global warming.

These findings will be discussed further in the sections below.

5.2.1 FINDING 1: SIGNIFICANT DECLINES IN CONCERN FOR GLOBAL WARMING OVER TIME

The ANOVA that was carried out on all pre and posttest responses indicated that the formerly drawn hypotheses were invalid for this study. However, it is interesting that all of the results across all 3 conditions evidenced a generally higher global warming concern in the pretest compared to the posttest. While this may not be congruent with what was previously expected, there is nonetheless a viable explanation for these results. More specifically, the high levels of concern that were found in the pretest that took place on the 16th of May 2011 could be linked to its close proximity to the heavily broadcasted Japan crisis that took place on the 11th of March 2011.

The Japan earthquake, tsunami and nuclear crisis took place shortly before the pretest. According to the New York Times, the earthquake that took place off the coast of Japan caused a tsunami that destroyed much of the Northern part of the country (Fackler, 2011). Rescue efforts were met with a third disaster whereby explosions, leaks and overheating at the Fukushima Daaichi Nuclear Power station caused a mass of radioactive gases to be

released into the atmosphere. This caused the contamination of water sources, and surrounding ocean, which threatened the health and lives of many thousands of people (Fackler, 2011).

These events were not only perceived as threatening to the wellbeing of people that were directly impacted by it, but it also created an immense rise in the international awareness of environmental issues, and the potential harm that can be caused through their neglect. Such an event may have induced a greater awareness of global warming's destructive potential on the lives of all people. As mentioned by Ungar (1992), events such as this are found to initiate reactions in people that resemble a 'social scare'.

In this light, the reaction of the general public to the Japan 2011 crisis can be likened to the greenhouse crisis of 1988 whereby the United States became swamped with drought, forest fires and intense heat (Schneider, 1989). Prior to these 1988 events, scientists had been placing much effort into raising the public's awareness of environmental issues that had been accumulating largely as a result of neglectful human activity (Ungar, 1992). However, they had failed to accomplish this until the public themselves was impacted by the extremely awkward heat and drought that took place in 1988. As mentioned by Ungar (1992, p. 483), "scientists' claim-making activities were ignored [for] so long and then rendered viable by the summer of 1988".

Historically it has been found that the public's awareness of the seriousness of potential threats, such as global warming, only arise once the potential threat shows signs of materializing (Ungar, 1992). In the same way, the world's attitude towards global warming, and the threat that it resembles, became actualized through the Japan crisis of 2011. This was found in the manner by which most of the responses within the control and experimental conditions all reflected a heightened concern over the environment and its gradual deterioration. The respondents were highly concerned about global warming and open to making changes that could assist in the reduction its possible effects on their own lives.

The role of the media also affected these results. When a certain environmental disaster is covered by the media, it has been found that people's level of engagement with the problems that surround the disaster tends to rise (Stamm, Clark & Eblacas, 2000). Such engagement includes a heightened degree of attention, cognition and motivation towards action. In other

words, the public becomes more aware of the importance of being attentive to the environment, as they are reminded though world events that its neglect could threaten their own lives. The following diagram is adapted from Stamm et al. (2000, p. 221) and illustrates this process.

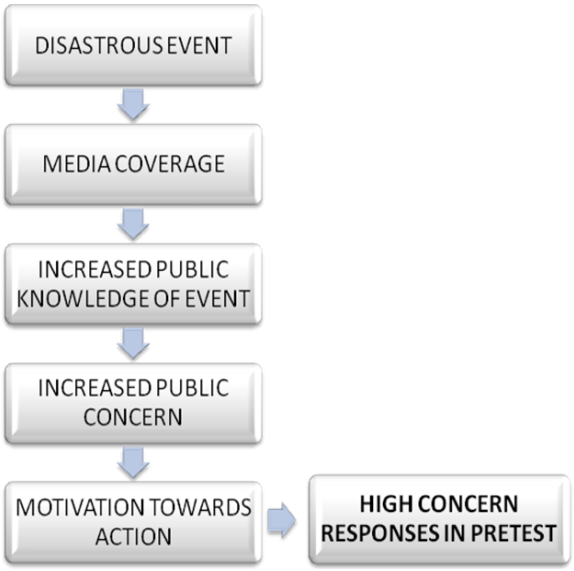


FIGURE 6: THE IMPACT OF THE JAPAN CRISIS ON PRETEST RESPONSES

The awareness that is generated as a consequence of amplified media attention is accompanied by a greater amount of energy being placed into thinking about the environment. This in turn creates an increase in the public's motivation towards aiding in the prevention of such potential threats. The effects of these processes were seen in the pretest, as many of the responses reflected a heightened degree of awareness and motivation towards assisting in reducing the effects of global warming.

This heightened concern showed significant declines in the posttest as a greater degree of resistance was apparent in the participants' willingness to make the necessary changes to their lifestyles. While this change within the experimental conditions could have been linked to the anti-global warming messages received prior to the posttest, such an explanation has been rendered inadequate through the significant and similar declines in concern found within the control.

Having said this, an exploration of the literature brought a valid explanation to the fore. Simply put, when an environmental crisis occurs there is only so much media attention and subsequent public concern that it can draw. Such concern tends to be time-limited and will gradually be placed onto other matters, depending on what other world events are taking place. As argued by Stamm et al. (2000, p. 220), the media coverage of an environmental situation is "at least partly responsible for focusing people's attention on environmental problems".

Mazur and Lee (1993) found that the public's concern regarding environmental dilemmas tends to follow the amount of media attention it receives. Therefore, with time, and as the attention of the media became gradually less focused on the Japan crisis, it is somewhat inevitable that people's concern over such matters experiences similar declines. As a result, the posttest, which took place several months after the Japan crisis, would have captured responses that reflected a lesser degree of concern due to the lack of media and public attention that was being drawn to such issues. The environment no longer seemed as threatening as people's cognitions surrounding the Japan crisis were reduced. Consequently, their motivation towards making changes that could aid in reducing the effects of global warming had dropped significantly.

It is most apparent that many scientists lack consensus on the details pertaining to global warming (Rachlinski, 2000). While the lack of media attention contributed to these results, the study's outcomes may have also been affected by a lack of confidence in the scientific field, as a result of its discrepant nature. As stated by Rachlinski (2000, p. 305),

> *"... because of a lack of a scientific consensus on the degree of climate change that the planet will experience, society is unlikely to achieve a consensus on the need to undertake costly preventative measures."*

A basic lack of confidence in the field of science's conviction regarding the factual basis of climate change is an attitude that is pervasive and has gradually developed since the concept of global warming was born. Many have lost faith in the credence of such claims and as a result, are unwilling to sacrifice the comforts in their lives for a cause that may in fact be fictitious (Rachlinski, 2000). However, given these circumstances, why is it that this doubt had minimal effect on the pretest responses? In light of the effect of a lack of scientific

consensus, why is it that the participants had previously reflected a high degree of concern and motivation towards the amelioration of global warming? This is simply because of the close proximity of the measure to the Japan crisis, an event that stood to question their doubts for a limited time.

Drabek (1986) argues that disastrous events activate panic in all individuals that come into contact with it, whether it is through the media or other communication mediums. Once panic is initiated, the recipients of such messages are likely to undertake activity that is of a protective or preventative nature. This sense of panic and potential threat to one's own life overrides the doubtful attitude of the public for a limited time. Therefore many will actively endorse and support movements, campaigns or attitudes that are likely to provide relief from the potential danger. However, with time, and with less direct media reminders of such threats, the urgency of global warming activism lessens, and the public move on to once again adopting their previous doubtful attitudes. This process is called a 'decay of effect' that takes place over time (O'Keefe, 1990).

In addition to this, Ittelson, Proshansky, Rivlin and Winkel (1974) suggest that while the public may have a desired standard of living in which environmental threats are minimal, the responsibility is mostly theirs to make changes to their lifestyle. In order for this to happen, each person must subjectively experience the gains of such changes as outweighing their costs (Ittelson et al., 1974). When panic ensues, the threat to one's life seems magnified, thus the cost of lifestyle changes may seem minimal in comparison. However, as panic subsides, the perceived threat will decrease therefore the cost of lifestyle changes may once again be viewed as superfluous. The following diagram illustrates this dynamic.

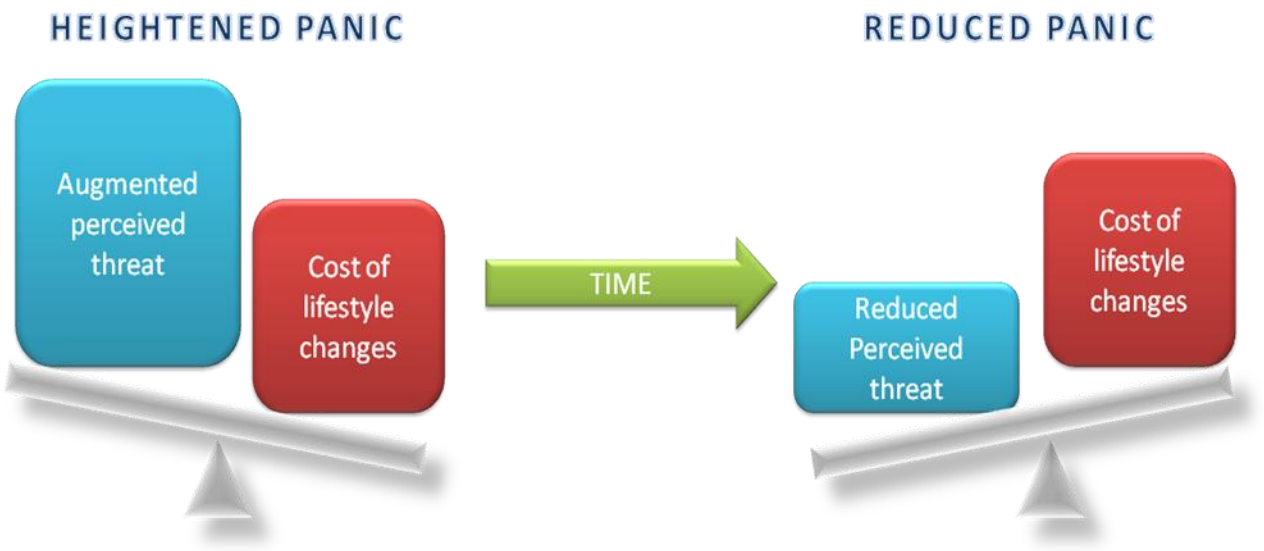


FIGURE 7: CHANGE OF ATTITUDE AS A CONSEQUENCE OF REDUCED PERCEIVED THREAT OVER TIME

The abovementioned processes served to act as a significantly confounding variable on the measure of persuasion. The general reduction in concern over time is evidence of the strong influence that the Japan crisis event initially had on their opinions. While this may have contaminated the responses obtained, it served to reveal the great effect that the media has on people's opinions. The media is in itself a credible source in today's society. It has been found to have an effect on the knowledge that people have of the environment, their opinions and behavioral intentions (Ungar, 1992). Interestingly, Ungar (1992) suggests that the ability for the media to sway people's opinions on global warming and other such environmental threats is far superior to that of environmental scientists.

While the abovementioned processes explain the reasons for a heightened awareness and concern in the pretest compared to the posttest, it would also be important to acknowledge that on the most part, the persuasive messages and source credibility did not seem to have much of an effect. This was evident through the lack of interaction effects on most of the analyses that were carried out and the similar declines in concern toward global warming that were found in the pre and posttest of the control as compared to the experimental conditions.

This lack of persuasive power could have been as the result of several reasons. Firstly, given that global warming and environmental issues are of a big concern in the world today, this would have caused the messages put forth to be highly relevant to the majority of participants. This high issue relevance would have caused increased message-relevant

thinking followed by message scrutiny and counter-argumentation (Cook, 1969; Dean et al., 1971; Hass & Reichig, 1977; Liberman & Chaiken, 1996). This process would have reduced the persuasive power of the messages thereby causing the experimental conditions to lack the extent of opinion change that was expected.

5.2.2 FINDING 2: GREATEST PERSUASION IN FACTOR 2 BY LOW CREDIBILITY SOURCE

Factor 2 represented motivation towards implementing specific changes that could aid in ameliorating the problem of global warming. Within this factor, it was found that the low credibility source had the greatest persuasive effect on opinions. This finding served to overturn all of the initial assumptions that had been made regarding the possible effects of the study. The significant effect of a low credibility source in persuading opinions over and above that of a high credibility source was unexpected. However, such contrasting findings are characteristic of this field in social psychology (Brinol & Petty, 2009). The bounds of persuasion are yet unknown and this study served to emphasise the need for further explorations within this domain.

As stated by Brinol and Petty (2009) the development of a single mechanism by which persuasion is effective remains inconclusive. Throughout its history of investigation, source credibility has sometimes been associated with increased attitude change and sometimes with decreased influence (Brinol & Petty, 2009). The many studies that were discussed in the literature review section generated the awareness of multiple factors that are responsible for having various effects on persuasion outcomes. Within the Elaboration Likelihood Model (ELM) itself, several factors can be highlighted as having an impact on resultant attitude change. The following diagram is adapted from Brinol and Petty (2009, p. 52) and illustrates some of these processes.

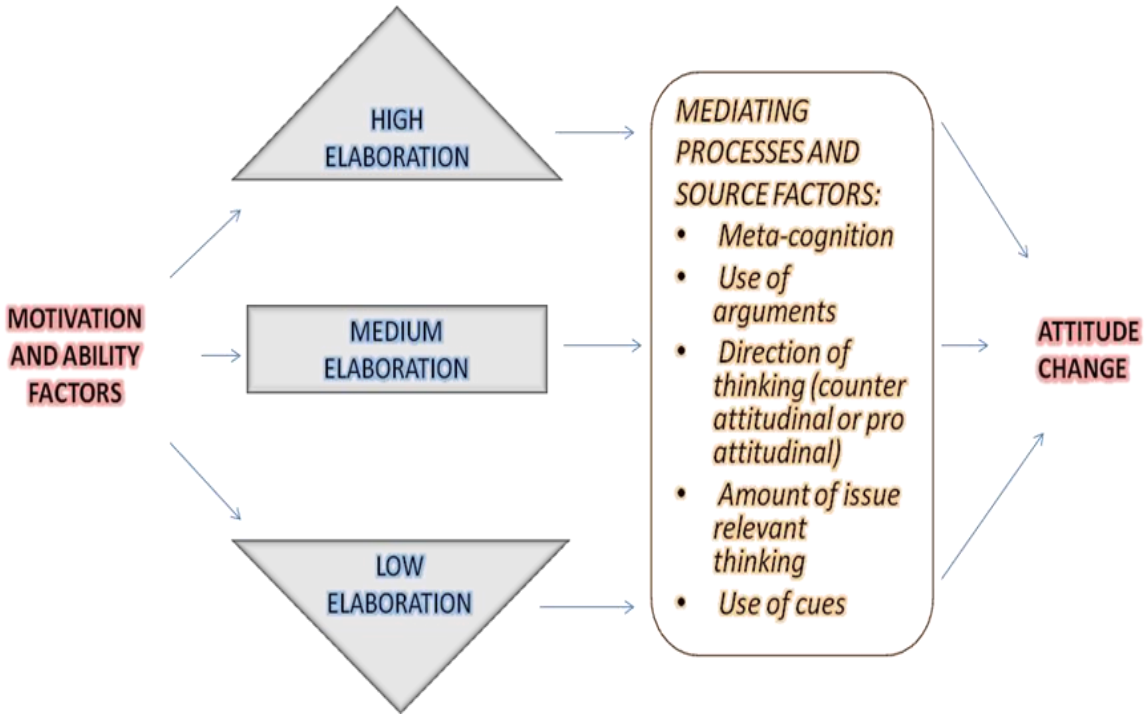


FIGURE 8: THE MANY FACTORS THAT CAN INFLUENCE ATTITUDE CHANGE THROUGH PERSUASION

When taking these factors into account, it becomes clear that there are several effects that may have caused the resultant findings for the measure of support for specific changes (Factor 2). These factors, together with their possible contribution towards producing such findings will be explored below.

As was explained above, the effect of the media on drawing people's attention to certain events and inducing issue-relevant thinking is astounding (Ungar 1992). After the Japan crisis and the diversion of media attention to other more up-to-date world events, the attention of the public was consequently diverted away from that of environmental issues. As a result, the preservation of the environment and the amount of attention paid to lifestyle habits that may hinder the reduction of global warming became less important. Before even administering the posttest and exposing the respondents to persuasive messages, their attitudes had already undergone a reduction in concern. Therefore, the persuasive messages that were offered only served to promote the direction that they were already headed in. As mentioned by Bochner and Insko (1966), the influence of moderate credibility sources is far greater than that of high credibility sources when the advocated messages are closer to the recipients own attitudes.

From this it can be said that the persuasive power of the student (who was labeled as a low credibility source) could have overtaken the high credibility source's ability to persuade attitudes simply because the persuasive messages were in fact in the direction of the respondents' own gradually developing opinion. Dean et al. (1971) together with Bock and Saine (1975) were also in favour of this dynamic as they had found that when persuasive messages were in favour of a position that the participants were likely to favour, low credibility sources had a greater influence.

In addition to this, it must be noted that the low credibility source was stated to be a student. This may have in itself served the role of a confounding variable since the respondents were themselves also students. Identification with the source of a persuasive message increases as the respondents'' similarities to the source rise. As a result, it is safe to say that the majority (if not all) of the students that were used as participants had in fact identified with the low credibility source simply because they were also students. Brinol and Petty (2009) argue that cues such as the extent to which the source is "likeable, attractive, [and] similar" all play a role in producing more persuasion. Therefore, the persuasive power of a source increases if they are deemed similar to oneself. As a result, when being questioned on specific changes that could help to curb global warming, the respondents' own tendencies towards the gradual reduction of concern in environmental issues together with their identification with the low credibility source all played a role in influencing their responses and producing significant declines of concern in global warming; declines that were greater than the Control and Experimental Group 2.

The above explanations are relevant for respondents who were somewhat uninterested in the topic of global warming, and who had as a result of low elaborations taken greater notice of peripheral cues to influence their decisions. When accounting for those who may have been committed to their positions and hence fallen within the category of high elaboration, there are additional explanations that can serve to justify the greater persuasive power of the low credibility source. These are discussed below.

As stated by Hass (1981), within high elaboration situations, the strength of any persuasive message increases as the credibility of the source increases. However, in many cases, the strength of such counter-attitudinal persuasive attacks will activate thinking that is conducive to the development of counterarguments. Heesacker et al. (1983) emphasized these same

dynamics by pointing out that high credibility sources are reacted to through high levels of issue relevant thinking which leads to even greater levels of message scrutiny.

In other words, when a source is regarded as highly credible, their persuasive attacks on one's position seem stronger. This induces a greater degree of motivation towards generating counterarguments that can preserve one's own position. Therefore in such cases, high credibility sources have been found to have limited success in influencing attitude change. In contrast to this, low credibility sources are associated with less motivation towards generating counterarguments because their persuasive attacks seem weaker as a consequence of their weak credibility. This leads to less scrutiny and greater persuasive power (Heesacker et al., 1983).

In addition to this, it is possible that the persuasive messages offered may have been perceived as being relatively weak. In such situations, it has been found that weak arguments have less persuasive power when they originate from a highly credible source compared to one of low credibility (Tormala et al., 2006). This is especially relevant to high elaboration likelihood situations where messages induce issue-relevant thinking. When such messages are perceived as coming from a highly credible source they lead to greater levels of issue relevant thinking.

In cases where the messages are based on weak arguments, issue-relevant thinking will lead to the realization that the messages are ineffective, thereby minimizing persuasive power. In contrast, the persuasive attack of messages from low credibility sources is regarded as negligible in comparison, thereby leading to less issue-relevant thinking and failure to notice the arguments' fragility. This serves as yet another explanation for the superior persuasive power of the low credibility source when it came to support for specific changes (Factor 2).

The framing of the persuasive messages may have elevated the impact of the abovementioned factors by increasing their persuasive power. As found by Tykocinski et al. (1994), the framing of messages in such a way that makes use of the negativity bias effect can serve to increase persuasion. In other words, persuasive messages which emphasize potential losses that may accompany a lack of attitude change have greater success in persuading then messages that highlight potential gains. This is because, within high elaboration situations,

potential losses are regarded as being more salient than gains, thereby eliciting greater attention.

The persuasive messages used could be regarded as negatively framed because they alluded to the idea that the public is being somewhat fooled into believing that global warming is taking place, as a means by which to justify the increase of taxes and the cost of living. Thus the article was suggesting that if attitude change does not take place in the direction of the advocacy, the public would be unjustifiably robbed of their money. The following is an excerpt from the article and highlights the negatively framed nature of the messages,

> *"Global Warming is a scare tactic that is used and encouraged by many environmentalists and governments to gain political power over the masses. It's being used as a political tool to increase taxes and prices on products that are claimed to contribute to global warming".*

When this is combined with the superior persuasive effects of low credibility sources in such contexts, the findings for the support of specific changes seem justified. In other words while the negatively framed messages worked to intimidate the reader into persuasion, the additional impact of identifying with the occupationally similar low credibility source further persuaded them into adopting the stance of the advocacy.

5.3 CONCLUSION

To conclude, this section has served to provide various reasons for findings that pointed to an overall reduction in global warming concern across all conditions, together with an exceptionally greater reduction in concern for the support of specific changes within the low credibility condition. This discussion has highlighted several factors that when considered accumulatively, would have resulted in the current findings. The former finding was explained as precipitating through an interaction between several variables such as that of the Japan crisis event, its close proximity to the pretest, together with reactions that have previously been found to be habitual human responses to such panic situations. The latter finding could be explained as a result of possible accumulative effects between variables including the participant favorability of an advocacy, the strength of the persuasive attack and

consequent counter-argumentation, together with message framing and respondents' identification with the source.

CHAPTER 6

CONCLUSIONS, LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

6.1 CONCLUSIONS

The findings of this study did not align with the hypotheses that were previously explored. However, as suggested by Perloff (2010), global understandings of the dynamics of persuasion are still in need of maturation and development, therefore the current study may have served to highlight areas whose further exploration could enable a better understanding and contribution to the field.

Brinol and Petty (2009) argue that research on persuasion has been contradictory and thus inconclusive. Consequently it seems that complications within this field are to be expected, as many researchers have experienced similarly irresolute results. Much of the research has shown that the effect of source credibility is yet to be understood (Brinol & Petty, 2009, p. 51);

> *"… Source credibility was sometimes associated with increased attitude change and sometimes with decreased influence. Also, support for any one mechanism by which persuasion worked was not compelling…"*

While the investigation of persuasion has proven to be more challenging than expected, it is an area that requires much future attention as it can contribute towards the development of models that would assist in eradicating corrupt persuasive tactics. One prime example of the misuse of persuasive powers is found in the manner by which many people have been prompted into positions of powerlessness and oppression (Freire, 1970; Gramsci, 1971). An

understanding of persuasive processes would allow for the development of mechanisms of resistance that would shield the public from being influenced by persuasive messages that could be detrimental to the positive progression of society. As suggested by De Wet (2010) a good grasp of these processes can assist in reducing negative social influences, by teaching people to be more critical recipients of persuasive messages through exposure to comprehensible and inclusive models of persuasion.

Such knowledge could also be used to promote the success of positive social influences. Not only is persuasion the most frequently used and effective method of social influence, but it is also regarded as a process that if mastered, could hold the key to inducing mass attitude change (Lewis, 2001). South Africa could highly benefit from the implementation of strategies that influence the public into adopting behaviours which would assist in reducing the prevalence of several social issues. For instance, the development of campaigns that use their understandings of persuasive processes to promote the benefits of education, sexually responsible behaviours, and abstinence from drug or alcohol abuse would be of much value to our society. These are examples of issues that if rectified, could reduce the incidence of HIV/AIDS, teenage pregnancy, crime and poverty, all of which pose great problems to the development of this country (Duncan et al., 2007).

The following diagram illustrates the two main benefits of mastery over persuasive processes.

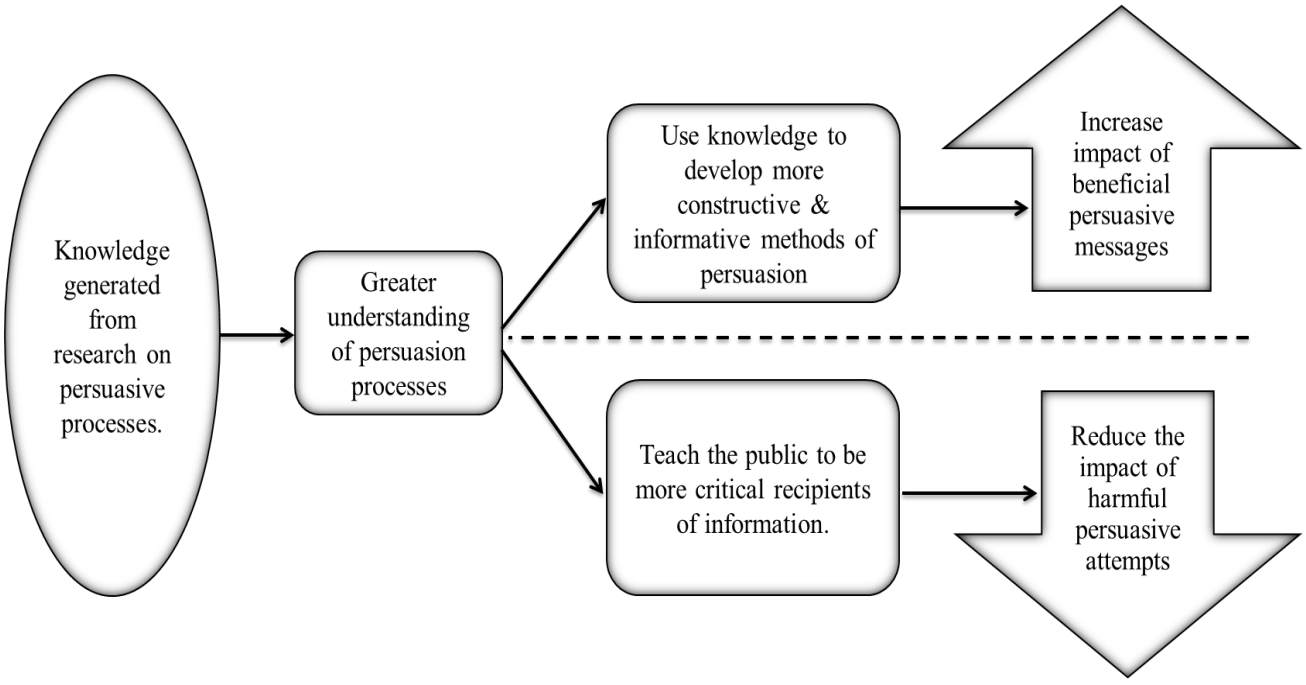


FIGURE 9: TWO-FOLD USE OF KNOWLEDGE ON PERSUASIVE PROCESS

Areas that require such influence are plentiful, and also include attitudes towards the environment, together with attitudes of racism, prejudice, discrimination, gender inequality, and oppression. Therefore, understanding persuasive processes would allow for the development of models that can teach people to critically analyze potentially corrupt persuasive attacks while also being useful, when appropriate and ethical, to persuade society towards more positive ways of living.

6.2 LIMITATIONS

This study was purposefully designed in such a way as to limit the degree of control and experimental rigor that was exerted over the conditions. This served to maximize the external validity of the study; however it also conversely limited the degree to which confounding variables could be eliminated. Many of these extraneous variables had their effect on the results thereby producing unexpected findings. One of the most profound confounding variables was found to be that of the Japan crisis which occurred prior to and in close proximity to the pretest session. Such variables served to contaminate the internal validity of the study.

While the respondents may have been effected by the world events of the time, it is also possible that several other factors could have influenced their responses, most of which were not regulated by the study. For instance, the degree of media exposure that may have affected the respondents' opinions was not controlled. The perceived strength or weakness of the persuasive messages together with the manner by which they were framed (i.e. negatively or positively) was not accounted for. In terms of the testing process, the procedures that were put in place to ensure the reading of the persuasive messages were minimal. Therefore exposure of all respondents to the persuasive stimuli could not be guaranteed.

A further limitation was the use of a student as the source of low credibility in Experimental Group 1. This did not account for the fact that all the respondents were themselves also students and thus their identification with the low credibility source would have increased the success of persuasion. As mentioned by Brinol & Petty (2009) the persuasive power of a source increases when they are perceived as being similar to oneself. Additionally, the time between the reading of the persuasive messages and completion of the posttest was also not

regulated thereby not accounting for whether the messages were adequately learnt or not and the impact that this may have had on resultant persuasion.

Other variables that were not controlled included the level of elaboration in the testing situation, the impact of counter-argumentation on the results and the composition of participants within each group. The lack of control over the composition of each group meant that their representational ability of the entire population of South Africa was lacking. All of these variables may have had their effect on the results; therefore controlling them may have been beneficial.

On the other hand, all of the participants were of a relatively similar age and interest, as they were all first year engineering students. While this was advantageous in terms of the study's internal validity, it consequently limited the external validity of the study, thereby restricting generalisability of the results.

6.3 DIRECTIONS FOR FUTURE RESEARCH

The results yielded in this study all brought attention to the complicated dynamics of persuasion. The confounding effect of several variables on the results became apparent. It seems that the best way to address such complications in future research would be to make use of more rigorous experimental designs. Variables such as message framing, elaboration likelihood, source similarity, initial respondent attitude, message strength and consequent scrutiny are all in need of further exploration. In order to ensure that the results are protected from contamination, the internal and external validity needs to be ensured.

Internal validity can be promoted through the rigorous control of all other variables. It is acknowledge that external validity would be difficult to maintain within rigorous experimental conditions, however, the generalisability of the results should be supported by ensuring that the sample population is representative of the overall population. In addition to this, the composition of groups should be matched across all conditions in order to minimize the effect of group dissimilarities on the results.

Due to the dynamic nature of persuasive processes, it is suggested that future research be dedicated to exploring each of the variables involved separately. To name a few, some of the

variables that should be investigated include timing, source credibility, personal relevance to the advocacy, and issue-relevant thinking. It is suggested that the influence of each of these variables be explored fully in the absence of all other confounding variables through experimental designs.

While the use of rigorous experimental designs seems preferable in ascertaining the cause and effect processes in persuasion, the use of qualitative studies within this domain could also serve to be of much value. Qualitative studies that are focused on persuasion are limited and could highlight additional variables that play a role in these processes. Such studies are needed in order to draw attention to these factors and to mobilize further quantitative studies in the right direction.

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APPENDICES

APPENDIX A: PRE AND POST TEST QUESTIONNAIRE 92

APPENDIX B: LOW CREDIBILITY PERSUASIVE MESSAGES (EXPERIMENTAL GROUP 1).....97

APPENDIX C: HIGH CREDIBILITY PERSUASIVE MESSAGES (EXPERIMENTAL GROUP 2).....98

APPENDIX D: NON-PERSUASIVE MESSAGES (CONTROL GROUP).....99

APPENDIX E: PARTICIPATION SHEET.....100

APPENDIX F: SHEET FOR STUDENT DETAILS 102

APPENDIX G: ethics clearance certificate 103

APPENDIX A: PRE AND POST TEST QUESTIONNAIRE

INSTRUCTIONS

AFTER READING THE INSERT, ANSWER ALL QUESTIONS FROM PAGE 1 - 5

PLACE A CLEAR TICK IN THE APPROPRIATE BOX TO INDICATE YOUR RESPONSE

1) How much do you trust the things that scientists say about the environment?

1. NOT AT ALL		2. VERY LITTLE		3. QUITE A BIT		4. ALOT	

2) How have the weather patterns where you live been in the last three years compared to before?

1. VERY STABLE		2. QUITE STABLE		3. QUITE UNSTABLE		4. VERY UNSTABLE	

3) Would you say that the average temperatures where you live have been higher or lower in the last three years than before that?

1. MUCH LOWER		2. A LITTLE LOWER		3. A LITTLE HIGHER		4. MUCH HIGHER	

4) As far as you know, how would you say the weather patterns around the world have been in the last three years compared to before?

1. VERY STABLE		2. QUITE STABLE		3. QUITE UNSTABLE		4. VERY UNSTABLE	

5) Would you say that the average temperatures around the world have been higher or lower in the last three years than before that?

1. MUCH LOWER		2. A LITTLE LOWER		3. A LITTLE HIGHER		4. MUCH HIGHER	

6) You may have heard about the idea that the world's temperature may have been going up slowly over the past 100 years. What is your personal opinion on this – do you think this has probably been happening, or do you think it probably has not been happening?

1. DEFINITELY NOT HAPPENING		2. PROBABLY NOT HAPPENING		3. PROBABLY HAPPENING		4. DEFINITELY HAPPENING	

7) How sure are you that the world's temperature has been going up?

1. VERY UNSURE		2. SOMEWHAT UNSURE		3. SOMEWHAT SURE		4. VERY SURE	

8) Do you think a rise in the world's temperature is being caused mostly by things people do?

1. DEFINITELY NOT		2. PROBABLY NOT		3. PROBABLY YES		4. DEFINITELY YES	

9) If nothing is done to reduce global warming in the future, how serious of a problem do you think it will be for South Africa?

1. NOT SERIOUS AT ALL		2. NOT SO SERIOUS		3. SOMEWHAT SERIOUS		4. VERY SERIOUS	

10) If nothing is done to reduce global warming in the future, how serious of a problem do you think it will be for the world?

1. NOT SERIOUS AT ALL		2. NOT SO SERIOUS		3. SOMEWHAT SERIOUS		4. VERY SERIOUS	

11) If nothing is done to reduce global warming in the future, how much do you think it will hurt you personally?

1. NOT AT ALL		2. VERY LITTLE		3. QUITE A BIT		4. ALOT	

12) If nothing is done to reduce global warming in the future, how much do you think it will hurt future generations?

1. NOT AT ALL		2. VERY LITTLE		3. QUITE A BIT		4. ALOT	

13) How important is the issue of global warming to you personally?

1. NOT IMPORTANT AT ALL		2. NOT TOO IMPORTANT		3. A LITTLE IMPORTANT		4. VERY IMPORTANT	

14) How much do you feel you know about global warming?

1. NOTHING		2. VERY LITTLE		3. QUITE A BIT		4. ALOT	

15) How much have you thought about global warming before today?

1. NOT AT ALL		2. VERY LITTLE		3. QUITE A BIT		4. ALOT	

16) Do you think most scientists believe that global warming is happening or is not happening?

1. DEFINITELY NOT HAPPENING		2. PROBABLY NOT HAPPENING		3. PROBABLY HAPPENING		4. DEFINITELY HAPPENING	

17) Do you think most scientists agree or disagree with one another about the causes of global warming?

1. MOSTLY DISAGREE		2. SOMETIMES DISAGREE		3. SOMETIMES AGREE		4. MOSTLY AGREE	

18) Scientists use the term "global warming" to refer to the idea that the world's average temperature may be about five degrees Fahrenheit higher in 75 years than it is now. Overall, would you say that global warming would be good or bad?

1. VERY GOOD		2. A LITTLE GOOD		3. A LITTLE BAD		4. VERY BAD	

19) How much do you think South Africa should do about global warming?

1. NOTHING		2. VERY LITTLE		3. QUITE A BIT		4. ALOT	

20) How much do you think governments in other countries should do about global warming?

1. NOTHING		2. VERY LITTLE		3. QUITE A BIT		4. ALOT	

21) How much do you think South African businesses should do about global warming?

1. NOTHING		2. VERY LITTLE		3. QUITE A BIT		4. ALOT	

22) How much should average people do about global warming?

1. NOTHING		2. VERY LITTLE		3. QUITE A BIT		4. ALOT	

23) Do you think the government should or should not be able to limit air pollution from South African businesses?

1. DEFINITELY SHOULD NOT		2. PROBABLY SHOULD NOT		3. PROBABLY SHOULD		4. DEFINITELY SHOULD	

For the following questions, please indicate agreement or disagreement to the possible government actions.

<u>The South African government should:</u>

24) Increase taxes on electricity so people use less of it

1. VERY BAD IDEA		2. BAD IDEA		3. GOOD IDEA		4. VERY GOOD IDEA	

25) Increase taxes on fuel so people either drive less, or buy cars that use less fuel

1. VERY BAD IDEA		2. BAD IDEA		3. GOOD IDEA		4. VERY GOOD IDEA	

26) Increase the cost of items that are bought from countries that do not control the air pollution

1. VERY BAD IDEA		2. BAD IDEA		3. GOOD IDEA		4. VERY GOOD IDEA	

27) Charge power companies an extra tax for each ton of air pollution they put out

1. VERY BAD IDEA		2. BAD IDEA		3. GOOD IDEA		4. VERY GOOD IDEA	

28) Build cars that run completely on electricity

1. VERY BAD IDEA		2. BAD IDEA		3. GOOD IDEA		4. VERY GOOD IDEA	

29) Build air conditioners, refrigerators and other appliances that use less electricity

1. VERY BAD IDEA		2. BAD IDEA		3. GOOD IDEA		4. VERY GOOD IDEA	

30) Build new homes and offices that use less energy for heating and cooling

1. VERY BAD IDEA		2. BAD IDEA		3. GOOD IDEA		4. VERY GOOD IDEA	

31) Lower the amount of greenhouse gases that power plants are allowed to release into the air

1. VERY BAD IDEA		2. BAD IDEA		3. GOOD IDEA		4. VERY GOOD IDEA	

32) Include education on global warming in school curricula

1. VERY BAD IDEA		2. BAD IDEA		3. GOOD IDEA		4. VERY GOOD IDEA	

33) Would you favour or oppose the implementation of a program that significantly lowered greenhouse gases but raised your monthly electricity bill by R25 a month?

1. TOTALLY OPPOSE		2. PROBABLY OPPOSE		3. PROBABLY FAVOUR		4. TOTALLY FAVOUR	

34) Would you favour or oppose the implementation of a program that significantly lowered greenhouse gases but raised your monthly electricity bill by R50 a month?

1. TOTALLY OPPOSE		2. PROBABLY OPPOSE		3. PROBABLY FAVOUR		4. TOTALLY FAVOUR	

35) If the South African government were thinking of passing a law that would reduce the amount of air pollution that the country puts out by 85% by the year 2050, and if that would cost your household an extra R100 in taxes every year on average, would you favour this law or oppose it?

1. TOTALLY OPPOSE		2. PROBABLY OPPOSE		3. PROBABLY FAVOUR		4. TOTALLY FAVOUR	

36) If the South African government were thinking of passing a law that would reduce the amount of air pollution that the country puts out by 85% by the year 2050, and if that would cost your household an extra R200 in taxes every year on average, would you favour this law or oppose it?

1. TOTALLY OPPOSE		2. PROBABLY OPPOSE		3. PROBABLY FAVOUR		4. TOTALLY FAVOUR	

37) Let's assume that the world's average temperature will definitely be about five degrees Fahrenheit higher in 100 years than it is now. Do you think this would cause any changes anywhere around the world?

1. DEFINITELY NOT		2. PROBABLY NOT		3. PROBABLY YES		4. DEFINITELY YES	

38) Do you think global warming can be reduced **without** people like you making any major changes in your lifestyle?

1. DEFINITELY YES		2. PROBABLY YES		3. PROBABLY NOT		4. DEFINITELY NOT	

39) Do you think global warming will be reduced only if people like you make major changes in your lifestyle?

1. DEFINITELY NOT		2. PROBABLY NOT		3. PROBABLY YES		4. DEFINITELY YES	

40) Do you think that people are to blame for global warming?

1. DEFINITELY NOT		2. PROBABLY NOT		3. PROBABLY YES		4. DEFINITELY YES	

APPENDIX B: LOW CREDIBILITY PERSUASIVE MESSAGES (EXPERIMENTAL GROUP 1)

GLOBAL WARMING - TRUTH OR FIB?

AUTHOR: John Thomas (1st year student, University of Chicago)

This paper has been written in an attempt to bring about a critical awareness of the manner by which Global Warming has been used as a tactic to scare masses of people into restricting and changing their lifestyles for what has been claimed as the 'betterment of the world and its future'. We've been told that our use of fuel, electricity, and even burning wood or smoking is what will eventually cause future generations to suffer – could this really be true? Are normal people like you really the ones to blame for this supposed 'warming up' of the earth?

The answer is no. The following is a brief list of how claims on Global Warming have been falsified:

- It has been found that environmental organisations have altered their findings and reports in order to create scientific consensus on global warming.
- Warming of the earth is due to warming and cooling cycles that occur naturally roughly every hundred thousand years due to orbital shifts – even so, current global temperatures are still lower than the earth has previously experienced in the past.
- Warming of the earth will happen naturally in time with or without YOUR help – it is a natural occurrence.
- By most scientific accounts, man-made emissions have had no more than a minuscule impact on the climate.
- 98% of total global greenhouse gas emissions are natural (mostly water vapor); only 2% are from man-made sources. (NOAA, 2005)
- Weather forecasting is only about 50% accurate for 10 days into the future. How then can claims about climate patterns far into the future be made? Projections of future climate changes are uncertain, at best.
- If the entire world is included and CO_2 emissions are severely restricted, the science is not clear what impact, if any, it would have on the world's climate. **So to claim otherwise, is mere speculation.**

The TRUTH is that Global Warming is a scare tactic that is used and encouraged by many environmentalists and governments to gain political power over the masses. It's being used as a political tool to increase taxes and prices on products that are claimed to contribute to global warming, e.g. fuel. It's claimed that these increased taxes are being used in efforts to reduce gas emissions and develop more 'environmentally friendly' systems when in reality they are being used to make politicians wealthier.

APPENDIX C: HIGH CREDIBILITY PERSUASIVE MESSAGES (EXPERIMENTAL GROUP 2)

GLOBAL WARMING - TRUTH OR FIB?

AUTHOR: Professor Bruce White (Environmental Scientist, University of Chicago)

This paper has been written in an attempt to bring about a critical awareness regarding the manner by which Global Warming has been used as a tactic to scare masses of people into restricting and changing their lifestyles for what has been claimed as the 'betterment of the world and its future'. We've been told that our use of fuel, electricity, and even burning wood or smoking is what will eventually cause future generations to suffer – could this really be true? Are normal people like you really the ones to blame for this supposed 'warming up' of the earth?

The answer is no. The following is a brief list of how claims on Global Warming have been falsified:

- It has been found that environmental organisations have altered their findings and reports in order to create scientific consensus on global warming.
- Warming of the earth is due to warming and cooling cycles that occur naturally roughly every hundred thousand years due to orbital shifts – even so, current global temperatures are still lower than the earth has previously experienced in the past.
- Warming of the earth will happen naturally in time with or without YOUR help – it is a natural occurrence.
- By most scientific accounts, man-made emissions have had no more than a minuscule impact on the climate.
- 98% of total global greenhouse gas emissions are natural (mostly water vapor); only 2% are from man-made sources. (NOAA, 2005)
- Weather forecasting is only about 50% accurate for 10 days into the future. How then can claims about climate patterns far into the future be made? Projections of future climate changes are uncertain, at best.
- If the entire world is included and CO_2 emissions are severely restricted, the science is not clear what impact, if any, it would have on the world's climate. **So to claim otherwise, is mere speculation.**

The TRUTH is that Global Warming is a scare tactic that is used and encouraged by many environmentalists and governments to gain political power over the masses. It's being used as a political tool to increase taxes and prices on products that are claimed to contribute to global warming, e.g. fuel. It's claimed that these increased taxes are being used in efforts to reduce gas emissions and develop more 'environmentally friendly' systems when in reality they are being used to make politicians wealthier.

APPENDIX D: NON-PERSUASIVE MESSAGES (CONTROL GROUP)

EXERCISE MYTHS

(Derived from http://www.ideafit.com/fitness-library/10-exercise-myths)

Exercise Myth 1. You Will Burn More Fat If You Exercise Longer at a Lower Intensity. The most important focus in exercise and fat weight control is not the percentage of exercise energy coming from fat but the total energy cost, or how many calories are burned during the activity. The faster you walk, step or run, for example, the more calories you use per minute. However, high-intensity exercise is difficult to sustain if you are just beginning or returning to exercise, so you may not exercise very long at this level. It is safer, and more practical, to start out at a lower intensity and work your way up gradually.

Exercise Myth 2. If You're Not Going to Work Out Hard and Often, Exercise Is a Waste of Time. This kind of thinking keeps a lot of people from maintaining or even starting an exercise program. Research continues to show that any exercise is better than none. For example, regular walking or gardening for as little as an hour a week has been shown to reduce the risk of heart disease.

Exercise Myth 3. Yoga Is a Completely Gentle and Safe Exercise. Yoga is an excellent form of exercise, but some styles are quite rigorous and demanding both physically and mentally. As with any form of exercise, qualified, careful instruction is necessary for a safe, effective workout.

Exercise Myth 4. If You Exercise Long and Hard Enough, You Will Always Get the Results You Want. In reality, genetics plays an important role in how people respond to exercise. Studies have shown a wide variation in how different exercisers respond to the same training program. Your development of strength, speed and endurance may be very different from that of other people you know.

Exercise Myth 5. Exercise Is One Sure Way to Lose All the Weight You Desire. As with all responses to exercise, weight gain or loss is impacted by many factors, including dietary intake and genetics. All individuals will not lose the same amount of weight on the same exercise program. It is possible to be active and overweight. However, although exercise alone cannot guarantee your ideal weight, regular physical activity is one of the most important factors for successful long-term weight management.

APPENDIX E: PARTICIPATION SHEET

UNIVERSITY OF THE WITWATERSRAND
School of Human and Community Development
Private bag 3, Wits 2050, Johannesburg, South Africa

Email: shiva_mmm@hotmail.com
Tel: 072 385 6996
Supervisor: Professor Gillian Finchilescu

PARTICIPANT INFORMATION SHEET

Dear Student

My name is Shiva Mahoney and I am conducting research for the purposes of obtaining a Masters at the University of the Witwatersrand. My area of focus is an examination of people's opinions on the issue of global warming. The study aims to identify attitudes on global warming and the degree to which it is perceived to be a problem in today's society. I would like to invite you to participate in this study.

Participation will entail the completion of two separate questionnaires and a short reading. Each will take no more than 10 minutes to complete. Participation is voluntary, and no participant will be advantaged or disadvantaged in any way for choosing to complete or not complete the questionnaire. While questions are asked about your personal opinions, only your student number and email address will be required and these will not be used for identification purposes, as such you will remain anonymous. At the conclusion of the study a summary of the research report will be sent to all participants to fully inform them of the nature of the study and its conclusions.

Your questionnaire will not be seen by any other person at any time and will only be processed by myself. Your responses will only be looked at in relation to all other responses. This means that results presented in the research report will be in the form of group responses and not individual perceptions.

If you choose to participate in the study, please complete the two questionnaires when given to you as carefully and honestly as possible. These will be handed to you at different times, i.e. one now and another in a few weeks together with a short reading. Please ensure that you clearly state your student number and email address on the sheet attached to the front of both questionnaires. Once you have completed all the questions, place in one of the sealed boxes provided at the front of the class. These boxes will remain sealed, and once collected the contents will only be seen by myself. No one else will have access to the completed questionnaires, thereby guaranteeing your confidentiality.

Your participation in this study will be greatly appreciated. Returning of the completed questionnaire will be regarded as your consent to participation in the abovementioned process, however all participants have the right to withdraw at any point of the study. Thank you for your contribution,

Kind Regards

Shiva Mahoney

APPENDIX F: SHEET FOR STUDENT DETAILS

PLEASE ENTER THE FOLLOWING INFORMATION AS CLEARLY AS POSSIBLE.

STUDENT NUMBER: _____

EMAIL ADDRESS: _____

APPENDIX G: ETHICS CLEARANCE CERTIFICATE

(please check hardcopy)