2012

The influence of level of issue relevance and emotional appeals in public service ads on attitudes and behavioral intentions toward global climate change

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by

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A thesis submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Journalism and Mass Communication

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Iowa State University

Ames, Iowa

2012

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ACKNOWLEDGMENTS

I would like to take this opportunity to express my deepest and sincerest gratitude for the support that I have received during past years from all generous people around me.

First and foremost, Professor Sela Sar, my major advisor, for his guidance, patience, and support throughout this research and the writing of this thesis. Without his insights and words of encouragement, it would not have been possible for me to overcome all obstacles in the completion of this study. I simply could not wish for a better advisor and mentor.

I also owe my gratitude to my committee members for their efforts and contributions to this thesis: Professor Lulu Rodriquez and Professor Douglas Bonett. It is a pleasure to thank Professor Rodriquez for her valuable advice, support, and friendship on both academic and personal aspects and Professor Bonnett for his advice and incomparable knowledge of statistical analysis.

Many thanks go to Greenlee School of Journalism and Communication for granting me an opportunity to learn and grow on the communication domain.

Last but not least, I would like to give my special thanks to my family and my best friends, Wannawut K. and Isara R., for their perpetual moral support that has enabled me to accomplish my goals.

ABSTRACT

This study examines the main and interactive effects of two emotional appeals (fear and happy) in public service advertisements and the degree to which this topic is assessed as relevant to people's lives on participants' attitude toward the advertisement, their attitude toward global climate change as an issue, and their intention to practice behaviors expected to mitigate global climate change. The hypotheses posed were not supported. In absolute terms, however, the results of this experiment showed that participants with high issue relevance reported more positive attitude toward the advertisement, more positive attitude toward global climate change, and greater behavioral intention after viewing a global climate change advertisement.

CHAPTER 1

Statement of the Problem

Global climate change or global warming has been considered one of the world's top environmental threats since the year 2007 (Langer, 2007). This may be because the phenomenon has been shown to have negative impacts on peoples and nations all over the planet. For example, scientists believe that climate change leads to more extreme weather patterns, fomenting more droughts, causing more intense hurricanes, and creating longer periods of dry conditions or intense rain. These climatic changes are likely to adversely affect agricultural production systems. Extreme weather conditions also have profound influences on the ecosystem (WWF, 2010). Rapid changes in global temperatures can cause variations in the duration of seasons, effectively altering animal habitat and behavior, such as the feeding period for young birds (WWF, 2010). Such changes in climate will put much stress on ecosystems. Many studies also warn of the incremental extinction of animal and plant species caused by high temperatures (Shah, 2009). Climate change can also bring about surges of epidemic outbreaks. Severe fluctuations in temperature can directly affect public health as plagues related to food and water contamination ensue. In addition, a warmer climate contributes to the expansion of disease-carrying insects such as mosquitoes. Finally, thawing polar ice caps can bring about rising sea levels likely to inundate the lowlands and sink coastlines (Environmental Defense Fund, 2010).

Severe effects on the climate are being blamed on the accumulation of "greenhouse" gases such as carbon dioxide (CO_2) in the atmosphere (Shah, 2009). Scientists agree that human activities are the major triggers of this phenomenon (Langer, 2007). Thus, to reverse this trend, scientists and environmentalists have launched aggressive communication

campaigns to protect the earth (e.g. Skinner, 1997). Such campaigns intend to encourage people to adopt "environmentally friendly" practices such as switching to "green" power (Environmental Defense Fund, 2010). But with consequences not immediately seen, people have been balking at the idea of changing their ways. In fact, many now question whether climate change is indeed real (Kreosnick et al., 2000).

Targeting Emotions in Persuasive Communication

One way by which people's knowledge of, attitudes about, and behavior toward protecting the planet can be changed is through persuasive communication campaigns (Tellis, 1950), specifically those that make use of public service ads or PSAs. To date, there is growing scholarly support that such campaigns are better suited toward changing attitudes, a goal that is best reached by tapping audiences' emotions rather than changing their cognitions (Gardner, 1994).

Emotion is defined as "episodic, relatively short-term, biologically-based patterns of perceptions, experience, physiology, action, and communication that occur in response to specific physical and social challenges and opportunities" (Keltner and Gross, 1999, p. 468). Emotion, as a concept, is different from mood in that "emotions have an object" (p. 21) while "mood is not tied to any specific object" (O'Shaughnessy and O'Shaughnessy, 2003, p. 24). Shaver and Colleges (1987) classify emotions into six basic categories: love, happiness, surprise, anger, sadness and fear. Levy (1983) found that these categories can be replicated across diverse cultures and across age groups. He concluded that the basic emotional terms are probably universal.

Emotions are a particular form of human communication similar to when animals communicate by using tone of voice, facial expression, and gestures. Because emotions can

be understood by people around the world, one can say that emotions are a universal language. Thus, when used as communication devices, emotions can transcend cultural, linguistic, demographic, and social boundaries (Parkinson, 1995). Gordon (2005) views emotions as one of the most significant factors that influence people's decision-making process because emotions direct decisions and can be the catalyst that causes decisions to be made faster. Addressing the emotional side can assist significantly in gaining the acceptance of decisions made (Gordon, 2005). Wallbott and Scherer (1986), conducting research in 27 countries in five continents, found that the representation of an emotion affects how audiences perceive a particular topic or issue.

Out of the range of possible human emotions, persuasive communication campaigns have often focused on fear. This is because for most people, fear has a significant effect on behavior, leading them to seek ways of removing or coping with the threat and therefore the danger. Communication practitioners have long taken advantage of this relationship by using the threat of danger to evoke fear and thus enhance behavioral change toward the recommended practice. Thus, to increase people's awareness of global climate change, many PSAs frequently utilize threatening information (often embedded in fear appeals) to heighten people's concern about the issue and to act in accordance with the recommended practices that aim to protect the earth (Rogers, 1983).

Issue Involvement and Relevance

People's attitudes and behavioral intentions are influenced not only by advertising appeals, but also by the degree to which people are involved with the topic and the subject of the ad (Petty et al., 1983). According to Cacioppo and Petty (1979), there are two routes to attitude change depending upon the degree to which people find a topic or issue personally

relevant—the central and peripheral routes. When issue relevance is high, people tend to process messages via the central route. That is, people are likely to be highly focused, absorbing information in ways that develop enduring attitudes. Conversely, under low relevance conditions, messages are more likely to be processed through the peripheral route. That is, people's attitudes appear to be affected by the presence of simple acceptance and rejection cues in the persuasion context (Cacioppo & Petty, 1979).

This study explores the interaction between emotional appeals (i.e., fearful versus happy appeals) and the relevance of global climate change on individuals. It also attempts to determine the impact of this interaction on people's attitudes and behavior toward the issue. The results of this study can be useful in both theoretical and practical ways. On the theoretical side, it aims to offer insights into the use of happy and fear appeals on audience members for whom the climate change issue may be relevant to varying degrees. As such, the findings of the study are expected to contribute to the further development of persuasion theory. On the practical side, by understanding how emotions are deployed, environmentalists are able to take advantage of different appeals to enhance people's environmental awareness and persuade them to engage in activities that protect the environment. In addition, advertising agencies can apply the results as part of advertising strategies aimed at creating persuasive messages for different target audiences.

The underlying assumption is that fearful and happy emotions play an important role in mediating message reception. According to the protection motivation perspective, individuals apply two cognitive processes to respond to fear appeals: they appraise the threat and they find a way to cope with it. That is, when people are exposed to fearful messages, they tend to assess the magnitude of the danger and the probability of its occurrence as well

as the effectiveness of the way to handle such danger (Roger, 1975). Because fearful content is likely to trigger a thoughtful consideration of the risky situation and how people can protect themselves (Roser & Thompson, 1995), it can be inferred that fear appeals as applied in message design will require more cognitive resources to process. However, there are very few studies that examine the use of cognitive resources to process happy appeals.

The elaboration likelihood model (ELM) proposes that individuals tend to think more elaborately about messages that are relevant to them (Cacioppo & Petty, 1979). Simply put, people are likely to spend more time and resources to process messages they consider to be highly significant because of their applicability to their everyday lives. These characteristics of people for whom an issue is highly relevant (i.e., their willingness to spend more cognitive resources and time on the topic or issue) fit nicely with the use of fear appeals, which theoretically require more cognitive resources to process. Such expenditure of cognitive energy thus leads to more persuasive effects. In the case of global climate change, it leads to more enduring attitude change and a greater intention to adopt environment-friendly behaviors.

Chapter 2 of this thesis presents the literature regarding how people perceive emotional appeals in advertising, the theoretical frameworks that guided the analysis, and relevant research on the topic. The chapter concludes with three hypotheses and a research question formulated based on the literature review. In Chapter 3, the methods used to execute the study are presented. Chapter 4 includes the results and data analysis. Chapter 5, the last chapter, presents research conclusions, implications, and suggestions for future studies.

CHAPTER 2

Literature Review and Theoretical Framework

The current study examined the role of two emotional appeals—fear versus happy—in shaping audience's reactions to PSAs that aim to enhance people's intentions to help protect the environment and mitigate global climate change. It also explored the interaction of these two advertising appeals with the level of personal relevance people hold about the global climate change issue. This chapter discussed the characteristics of each emotional appeal, and how they are depicted in advertisements. In addition, the role of issue relevance in persuasive communication was reviewed. The interactive effects of these two variables and the study's hypotheses and research questions were presented.

Emotional Appeals in Advertising

Current advertising literature indicates that individuals are prone to memorize and be persuaded by information that appeals to their emotions. According to scholars, this is because emotion makes information not only more salient (e.g., Carstensen & Mikels, 2005), but also more vivid (Tellis, 1950). For instance, a fearful story can lead to stress and anxiety (LaTour, & Zahra, 1988), whereas a happy story can bring about joy (Tellis, 1950). Once their emotions are aroused, audiences can be persuaded to act in ways that are specified in the messages (Mehta & Purvis, 2006). This study focuses on fear and happy appeals because these two emotions are categorized as "basic emotions" or emotions that can be understood by audiences all over the world (Huang, 1997, p.24).

Fear appeals. Fear is an emotion that can activate human behavior. It originates from the perception of potential harm or threat or the expectation of danger, loss, refusal, or failure (Shaver et al., 1987). In contrast to happy appeals, fear appeals have been known to produce

stress and anxiety, conditions that normal people seek to minimize, if not eradicate (LaTour, & Zahra, 1988). Rogers (1975) defines fear appeals as "the contents of communications describing the unfavorable consequences that may result from failure to adopt the communicator's recommendations" (p. 94). Hence, fear appeals are categorized as negative allurements (Lucas & Benson, 1930).

Messages that aim at inducing fear often show an awful, abhorrent picture, such as a disgusting scene. Advertisements may convey fear by depicting an unfamiliar or unpredictable circumstance or by showing a situation in which audiences are made to feel vulnerable (Shaver et al., 1987). Roger and Thistlethwaite (1970) found that ads with fear appeals successfully increase intentions to stop smoking. In political campaigns, fear appeals are used ostensibly to "motivate citizens to pay greater attention to related information in the news and to seek out more such information from political and non-political sources" (Brader, 2006, p. 144). According to scholars, people are less likely to respond to fear appeals because they usually represent a sense of unpleasantness and insecurity (LaTour, & Zahra, 1988). This feeling stimulates people to undertake immediate response for survival and to cope with threat or danger (Huang, 1997). Regarding global climate change, messages that use fear appeals may visually depict, for example, frightening scenarios such as drought and devastating floods. Such scenes display the expected outcomes should people fail to protect the environment.

In ads, fear is induced in two ways. People may become fearful of the negative consequences of not abiding by the message and fearful of the negative outcomes as stipulated in the message (Keller & Block, 1996). Fear appeals generally coax people to get rid of practices or behaviors that may cause adverse outcomes or goad them to set up

response patterns that might prevent the occurrence of noxious events. Thus, fear is closely related to both stimulus and response events (Rogers, 1975).

It is said that the way people respond to fear appeals goes through three phases. First, fear appeals create a dangerous situation enough to activate an individual's sense of risk and susceptibility. Second, the ads provide a means to reduce fear. And third, fear appeals are always attached to a promise of security to tempt audiences to pursue the suggested behavior (LaTour & Zahra, 1988).

Happy appeals. Happiness is a positive feeling frequently related to joy (Lazarus, 1991). This feeling begins with favorable consequences for the self or for one's social domain (Shaver et al., 1987). Thus, happy appeals are classified as positive allurements (Lucas & Benson, 1930). In advertisements, these appeals are demonstrated by characters who are smiling or laughing (Shaver et al., 1987), images and depictions of pleasant environments or beautiful sceneries, or celebratory events that indicate achievements (Houle & Feldman, 1991). People respond more positively to a happy appeal than a negative appeal because messages with happy appeals provide a sense of pleasure and security (Mitchell et al., 2001). This feeling allows them to relax and to refresh (Huang, 1997). With regards to global climate change, messages that use a happy appeal may visually depict, for example, smiling figures in beautiful and pristine natural scenarios to represent what people can obtain and continue to enjoy from green and clean surroundings.

Happy appeals have been shown to result in attitude change when they provide gain-related information, or information that emphasizes the benefits that may accrue to the individual and to society at large by following a recommended behavior (Huang, 1997). For example, the Coca-Cola Company constantly displays in its ads people who look refreshed,

happy and relaxed while consuming their products (Huang, 1997). These appeals are also often used to market products targeted toward children to distract them from processing any disclaimer that explains any potential harm from incorrect use (Wicks et al., 2009). Because happy appeals are easier to understand, they may play an important role in persuading people to adopt practices that mitigate global climate change. However, few have examined the use of happy appeals in this context.

Protection Motivation Theory

Protection motivation theory postulates four cognitive-related factors that mediate people's choice of a coping behavior when they face a threat or are exposed to fear stimuli (Tanner et al., 1991). These are as follows: (1) level of noxiousness of a depicted event; (2) the likelihood of occurrence of that event; (3) the perceived efficacy of the recommended behavior; and (4) the perceived ability (by audience members) to follow the suggested behavior (Rogers, 1975). These four factors can be divided into two groups. The first two can be said to be factors that constitute "threat appraisal," defined as people's assessments of personal risk and severity of harm. The two latter factors can be said to make up "coping appraisal," defined as assessments of the effectiveness of the suggested behavior and the individual's ability to carry out the response (Roser & Thompson, 1995, p. 106). Individuals evaluate and weigh these four types of information to arrive at their attitudes about the suggested behavior by using their available sources such as their experience (Rogers, 1975). According to this theoretical framework, these two cognitive processes lead to motivations to protect oneself (Rogers, 1975).

Fear appeals alert audiences to danger (LaTour & Zahra, 1988) so that people can appraise the seriousness of the problem and the probability that the danger will be at hand.

They then evaluate their ability to handle it and change their attitudes accordingly (Rogers, 1975). Thus, audiences' responses to fear appeals lean on the seriousness of the pending risk they perceive (Rogers, 1975). So long as an ad's suggestion is sufficient to relieve fear and the associated strain, it yields a sense of relief (LaTour & Zahra, 1988). The more severe the potential harm, the more likely the individual will follow the ad's recommendation (Rogers, 1975). Simply put, fear appeals can trigger recipients to think about the threat and how to protect themselves against it (Roser & Thompson, 1995).

The Limited Capacity Model of Motivated Media Message Processing

The limited capacity model of motivated media message processing is based on the assumption that humans have limited cognitive resources available to process information (Lang, 2000). According to Lang (2000), the processing of information involves three steps: (1) encoding the message, (2) storing the information in memory, and (3) retrieving the information. Encoding refers to the process of extracting a message from the environment and transferring it to an audience's mental map. Storage is defined as a process by which an individual links new information with other information stored in memory. Retrieval involves searching for a particular piece of information from the memory network and reactivating it in working memory. The amount of message processing that occurs is dependent on available cognitive resources. If a recipient does not allocate enough resources to the task, information processing is incomplete (Lang, 2000).

The amount of resources needed to encode can be allocated both by intentional and unintentional processes. Apparently, people can control the allocation of these resources when they process information reflecting their goals, but they cannot control resources that are automatically activated based on the features of the stimulus (Lang, 2000), such as

whether the stimulus is emotionally and motivationally pertinent (Lang et al., 1990). Put another way, stimuli that are high in emotional content are automatically allocated more resources (Lang et al., 1996).

Leshner and Colleges (2010) suggest that the emotional content of media messages can automatically activate two subsystems of human emotion, the appetitive and aversive (Lang et al., 2005), which are considered fundamental human emotional responses (Berntson & Cacioppo, 2000). A purpose of the appetitive system is to take positive action while that of the aversive system is to protect one from danger (Cacioppo et al., 1999). An aversive system will be activated and will intensify as the stimuli become more negative and arousing. Because negative stimuli automatically require more resources to be encoded (Lang, 2006), people are said to summon abundant resources with which to process information when exposed to fear appeals. As a negative appeal (Lucas & Benson, 1930), fear appeals are associated with avoidance reaction in terms of both responding to and thinking about the situation (Nabi, 2002). Generally, more negative and/or arousing content tend to increase aversive activation in audiences, an indication that more resources were allocated to the encoding process (Leshner et al., 2010).

Aside from emotional appeals, several factors may also influence audiences' reaction to ads that ask them to assist in the global effort to protect the environment. One such factor is perceived issue relevance.

Issue Relevance

The perceived relevance of an issue is said to influence the extent to which audiences pay attention to messages (Celsi & Olson, 1998), their information seeking behavior, the way

they process information, and the extent to which they are persuaded by persuasive messages about that issue (Gordon et al., 1998).

Issue relevance refers to the degree to which people perceive the message as significant to them (Gordon et al., 1998). Simply put, it refers to an individual's personal feelings of connectedness to a given issue (Krugman, 1965). Something is said to be personally relevant when "people perceive it to be self-related or in some way instrumental in achieving their personal goals and values" (Celsi & Olson, 1998, p. 211). Frequently, issue relevance has been described as an interest or a drive; it has also been regarded as a motivational state. Individuals are not only motivated to attend to information about the object or issue of relevance but also driven to search for more information and to seriously evaluate alternative solutions to a problem (Gordon et al., 1998).

Scholars argue that issue relevance has two origins—situational and instinctive (Celsi & Olson, 1998). Situational relevance refers to the physical and social views emanating from one's immediate surroundings, which are dynamic and alterable depending on the situation. Instinctive relevance refers to the intrinsic attributes of the individual, which are somewhat steady, enduring structures of relevant knowledge obtained from experience and accumulated in long-term memory (Celsi & Olson, 1998). This knowledge includes the perceived connections between objects or actions as well as essential self-relevant consequences (Celsi & Olson, 1998). The level of issue relevance increases in line with three factors: the individual's motivation, opportunity, and ability to process information (Batra & Ray, 1985). As the felt relevance of an issue rises, a person pays more attention to the message, exercises greater cognitive effort to understand the message, and engages in more elaboration of the message (Celsi & Olson, 1998). Higher levels of perceived relevance, therefore, ignite deeper

message processing and thus pave the way for stronger message effects (Roser & Thompson, 1995). Issue relevance also plays an important part in changing beliefs, attitudes and behavior (Swinyard & Coney, 1978). Persons for whom an issues has greater relevance are prone to develop more enduring attitudes about that issue (Petty & Cacioppo, 1986) and consequently, will comply more with the behavioral recommendations being offered (Roser, 1990).

According to ELM, message relevance is one of the crucial antecedents of message elaboration (Sengupta, Goodstein & Boninger, 1997), which promotes attitude change (Petty, Cacioppo & Schumann, 1983). People for whom an issue is low in relevance have little motivation to process a message in-depth (Sengupta et al., 1997). Motivations to process information and the level of processing opportunity (Shiv et al., 2004), in turn, determine the accessibility of that information in memory. Heuristics, which refers to people's reliance on simple evaluative thoughts that arise from a low-effort inspection of message claims, also can affect persuasion (Shiv et al., 2004). Thus, the attitudes of individuals who find an issue low in relevance are established primarily through heuristics or cues that are easy to process (Sengupta, Goodstein & Boninger, 1997), such as paying attention to celebrity endorsers and other elements of pictorial presentation that aim to attract attention (Petty, Cacioppo & Schumann, 1983). The superficial character of this process prevents the formation of a strong memory link between the cue and the attitude object. Because cues will not be naturally retrievable on future presentations of the attitude object, this attitude can easily decay over time (Sengupta, Goodstein & Boninger, 1997).

On the other hand, people for whom an issue is high in relevance are more motivated to process information (Sengupta, Goodstein & Boninger, 1997). For these individuals, the

quality of argumentation, such as "verbal, visual, or execution-related content" that is informative about the issue (Zhu & Meyers-levy, 2005, p.334) is more important (Petty, Cacioppo & Schumann, 1983). They will expend more effort to inspect message claims, use higher cognitive resources to process these claims (Shiv et al., 2004), and undergo deeper message processing (Petty & Cacioppo, 1986). That is, they will process the message via the central route, leading to more enduring attitude change (Petty, Cacioppo & Schumann, 1983). The attitudes resulting from central processing are likely to remain relatively stable over time (Sengupta, Goodstein & Boninger, 1997).

Sengupta et al. (1997) found that under low issue relevance conditions, the use of cues related to an issue are likely to create significantly greater attitude persistence than the use of unrelated cues. However, the advantage of relevant cues disappears under high elaboration processing conditions because those for whom the issue is highly relevant tend to elaborate on the messages anyway. When personally pertinent knowledge is prompted in memory, a motivational state is generated and drives consumers' overt behaviors (Celsi & Olson, 1998). The sort and intensity of personal pertinence perceived in a situation also direct the concentration of cognitive processing and therefore influence the meanings that are introduced (Celsi & Olson, 1998). Under low relevant conditions, the primary impact of advertising is that of increasing people's awareness of the products or services being advertised. Behavior change happens as a consequence of delicate shifts in belief structures. Attitudes can be altered to be in line with adopted behavior (Swinyard & Coney, 1978).

In summary, ELM postulates that individuals engage in either heuristic processing or systematic processing depending on the perceived relevance of the information. If the issue is relevant, individuals will elaborate the message systematically via the central route (i.e., by

focusing on the central message of the ads). On the other hand, heuristic processing occurs when individuals use mental shortcuts or peripheral routes when elaborating on or thinking about an issue (Cacioppo & Petty, 1979). Attitudes generated through peripheral routes are less stable, less resistant to counter-arguments, and less predictive of subsequent behavior than messages elaborated through the central route (Mitchell et al., 2001).

Hypotheses and Research Question

Given the foregoing literature, one can therefore examine the main and interaction effects of emotional appeals and the level of issue relevance on people's intention to perform recommended behaviors that aim to protect the environment. People may be persuaded by different types of advertisements depending on the degree to which they are personally involved with an issue. In this study, individuals who prioritize global warming and are aware of the types of activities that can destroy the environment are classified as those for whom global climate change has high issue relevance. On the other hand, those who neglect or do not care much about the environment are classified as seeing global climate change as low in relevance. Given that fear appeals require greater cognitive resources to process and that those who find an issue highly relevant are motivated to spend more cognitive energy to process information about the topic, it can be surmised that those in the high issue relevance condition will respond more to ads with fear appeals. Thus, the following hypotheses were considered for this study:

Hypothesis 1: Those for whom global climate change is high in relevance will demonstrate more positive *attitudes toward ads* with fear appeals than ads with happy appeals.

Hypothesis 2: Those for whom global climate change is high in relevance will demonstrate more positive *attitudes toward global climate change* as discussed in ads with fear appeals than in ads with happy appeals.

Hypothesis 3: Those for whom global climate change is high in relevance will demonstrate greater *intentions to follow the recommended behavior* presented in ads with fear appeals than the recommendations in ads with happy appeals.

Because the relationship between attitude, behavioral intention and perceived low issue relevance is not clear, the following research question is asked:

Research Question: What is the attitude toward ads, the attitude toward global warming, and the behavioral intention of people who see global climate change as low in relevance?

Testing H1, H2, and H3 calls for a 2x2 factorial design as follows:

Issue relevance	Advertising appeals	
	Fear	Happy
High		
Low		

CHAPTER 3

Method

This study investigated the main and the interactive impact of emotional appeals (fear and happy) and level of relevance people attach to the global climate change issue (high and low) on people's attitudes toward global climate change, their attitudes toward ads that persuade them to behave a certain way, and their intention to perform environmentally friendly activities. Specifically, the study examined the effect of the two independent variables (type of emotional appeals and level of issue relevance) on the three dependent variables (attitude toward global warming, attitude toward the ad, and behavioral intention). In addition, the study also explored the interaction effect of these two independent variables.

Study Design and Participants

The experiment employed a 2 (emotional appeals: fear versus happy appeal) x 2 (level of issue relevance: high versus low relevance) between-subjects factorial design. The combination of two levels of two independent factors produced a total of four groups. The used of a 2 x 2 factorial experiment provided information on interaction effects, main effects, and simple main effects. Table 1 describes the experimental design applied in this study.

Table 1. Conditional diagram of the 2 x 2 factorial design

	Appeals	
	Fear	Happy
High issue relevance	I	II
Low issue relevance	III	IV

A pretest was conducted in February 2011 with 115 undergraduate students, 32 males and 83 females, attending Iowa State University. These participants were invited to an

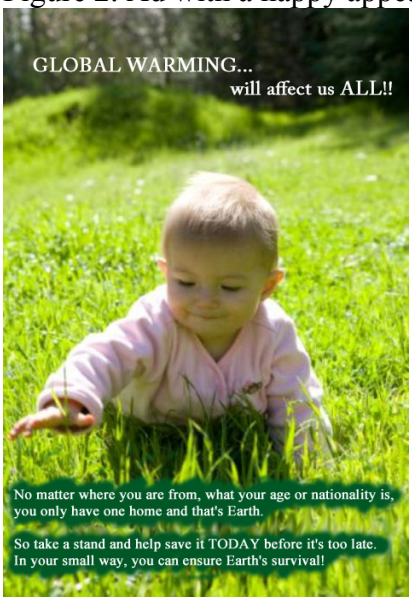
experimental room where they were asked to read and sign a consent form. They then were invited to participate in two studies. In study 1, subjects were asked to indicate the extent to which they find global climate change relevant to their lives. In study 2, subjects were asked to evaluate an advertising piece about global warming.

Stimulus Development

Two types of advertisements were developed: (1) an advertisement with a fear appeal and (2) an advertisement with a happy appeal. The advertisement with the fear appeal depicted a sad and fearful child in a barren and scorched landscape (Figure 1). The advertisement with a happy appeal depicted a picture of a smiling child in a green and clean environment (Figure 2). The ad with the happy appeal is a modified version of a photo titled *Baby in Garden*, taken by Anastasia Kontaxaki. The ad with the fear appeal was represented by an actual PSA produced by the environmental advocacy group Greenpeace. Both advertising pieces have textual messages adapted from Eugene Cubillo's (2009) campaign slogan, **"**Things you can do to reduce global warming."

Figure 1. Ad with a fear appeal

Figure 2. Ad with a happy appeal



Experimental Procedure

After signing the consent form, participants were asked to answer questions that aim to tap the relevance of the global climate change issue to their personal lives. Subjects' scores on perceived relevance of the topic were summed and averaged. Then, subjects were categorized into groups of low, moderate, or high issue relevance. Subjects having a moderate level of issue relevance, whose percentile fell between 66.67 and 33.33, were used as a point of comparison between those in the high and low issue relevance conditions. Subjects in both groups were then randomly assigned to each of the two experimental conditions (exposed to ads with fear appeal versus happy appeal).

High and low issue relevant subjects were asked to evaluate a version of the advertisement about global warming according to the experimental condition to which they had been assigned. They were told there was no time limit for this task; thus, they could assess the ads at their own pace. After seeing the advertisement, they were asked to answer questions regarding their attitude toward global climate change, their attitude toward the advertisement, and their behavioral intentions. Some demographic data were collected toward the end of the questionnaire. After returning the completed questionnaire, participants were debriefed and thanked for their participation.

Independent Measure

The students' perceived level of issue relevance was a pre-stimulus measure that were ascertained by using 12 semantic differential items scored on seven-point scales (important to me /unimportant to me, of no concern to me /of concern to me, irrelevant to me /relevant to me, means a lot to me/means nothing to me, valuable/worthless, trivial/fundamental, matters to me/doesn't matter to me, uninteresting to me /interesting to me, significant to me

/insignificant to me, vital/superfluous, boring/interesting, essential/nonessential). These scales have been adapted from the Personal Involvement Inventory (PII) index developed by Zaichkowsky (1985). In order to determine whether these 12 items measured the same concept, Cronbach's alpha was calculated. The procedure yielded an acceptable measure of similarity among the 12 items (alpha = 0.946). The index was thus considered reliable.

Scores on the items were summed and averaged. Then, low and high issue relevant groups were established based on percentiles below 33.33 and above 66.67, respectively. The results yielded 34 subjects in the high issue relevance group and 38 subjects in the low relevance group. After answering these questions, the subjects were randomly assigned to the two treatment conditions in the second study. The random assignment method produced the number of subjects for each cell in the 2x2 factorial design as shown in Table 2.

Table 2. Numbers of subjects for pre-test in the 2 x 2 factorial design

Issue relevance	Advertising appeals		Total
	Fear	Happy	
High	16	22	38
Low	18	16	34
Total	34	38	72

Dependent Measures

Attitude toward the advertisement was measured by four items scored on a seven-point semantic differential scale adapted from marketing handbooks. The index includes the following items: (1) poorly done/ well done; (2) not informative/ highly informative; (3) not useful/ very useful; and (4) not convincing/ very convincing. In order to determine whether these four items measured the same concept, reliability analysis was conducted by computing

for Cronbach's alpha. The procedure yielded an acceptable measure of similarity among the four items (alpha = 0.888).

Attitude toward global climate change was measured using four-items presented as semantic differential scales. Subjects were asked to indicate the extent to which they consider global warming as (1) real/ not real, (2) harmful/ not harmful, (3) dangerous to the current generation/ not dangerous to the current generation, and (4) dangerous to future generations/ not dangerous to future generations. The computed Cronbach's alpha for this index suggests that the four items measured the same construct (Alpha = 0.757).

Behavioral intention was measured by utilizing a two-item seven-point semantic differential scale adapted from Passy and Sujan (2006). These items asked: (1) How probable is it that you will perform environment-friendly activities in the near future? (2) How probable is it that you will perform environment-friendly activities every time? The answers to these questions yielded an acceptable Cronbach's alpha (0.831), indicating that there is considerable similarity between these two items.

Manipulation and Background Assumption Checks

The experimenter determined whether the subjects perceived the fear appeal and the happy appeal differently by conducting an appeal measures test. To do this, subjects were asked to indicate whether the ad displayed a positive (happy) scene or a negative (fearful) scene. The fear and happy appeal manipulation check involved a two-item, seven-point semantic differential scale (fearful/not fearful at all, happy/ not happy) as employed by Nabi et al. (2007). Scores on the items were summed and averaged to form an overall measure of perception of fear and happy appeal. An analysis of variance (ANOVA) test was used to analyze the difference between fear and happy scenes. The results showed that the

participants viewed the ad that showed fear appeal as significantly different (M = 2.67, SD = 1.25) from the ad that displayed a happy appeal (M = 4.29, SD = 1.24), F (1,112) = 46.80, p < .01, 95% CI [1.16, 2.08]. Thus, the manipulation of ad appeals was successful.

In addition, the degree of arousal caused by emotional appeals in ads was checked to support the assumption that fear appeal leads to more arousal than happy appeal. To do this, each student was asked to indicate the degree of arousal he/she perceived according to the type of appeal to which they were exposed. The degree of arousal caused by fear and happy appeals manipulation check involved a two-item, seven-point semantic differential scale (emotionally calm/emotionally aroused, very still/stimulated). Scores on the items were summed and averaged to form an overall measure of degree of arousal. An independent samples t-test was used to analyze the difference in degree of arousal evoked by the fear and happy scenes. The results show that the degree of arousal caused by fear appeal ad (M = 4.34, SD = 1.34) was significantly greater than the degree of arousal caused by happy appeal ad (M = 3.42, SD = 1.34), t = -5.624, p < .01, 95% CI [-1.241, -0.597]. Thus, the assumption was supported.

Data Analysis Method

Data analysis was conducted utilizing the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including frequencies, cross tabulations, percentile value, and means were computed for each independent measure. A two-way ANOVA was used to determine significant interaction effects between the level of issue relevance and type of emotional appeal on participants' attitude toward the ads, attitude toward the issue, and behavioral intentions. A t-test was used to determine whether there is a significant difference between the two types of emotional appeals (simple-main effect). A t-test was also used to

find the main effects of the two independent variables. A .05 level of significance was used for each of these tests.

Summary of Theories and Method

This study explored the main and the interaction effects between emotional appeals (fear versus happy appeals) and the level of issue relevance (high versus low) on individual's attitude toward advertisements about global climate change, attitudes toward global climate change as an issue, and intention to perform activities considered friendly toward the environment.

Based on the tenets of the protection motivation theory and the limited capacity model of motivated media message processing, fear appeals were hypothesized to require more cognitive resources to process. This was so because fear appeals generally require individuals to spend greater cognitive resources to assess the severity of the threat and their ability to protect themselves from the threat (Rogers, 1975). Fear appeals also activate people to automatically allocate cognitive resources toward the processing of threat messages (Lang, 2000).

The study also hypothesized that level of issue relevance influences information processing. ELM states that as the level of perceived relevance increases, individuals tend to elaborate more about the incoming message. That is, they are likely to pay more attention to the message, have greater ability to process the message, and show more willingness to spend cognitive resources to expound on the message (Cacioppo & Petty, 1979). Because fear appeals require cognitive resources to be processed and individuals for whom an issue is highly relevant are willing to spend their resources toward information processing, such individuals are expected to respond more to fear appeals or find ads with fear appeals more

persuasive. As a result, these individuals will tend to have more positive attitudes toward the advertisement and toward the issue of global warming. This also leads to greater intention to adopt environment-friendly behaviors.

Therefore, it was hypothesized that those who find the global climate change issue highly relevant to their lives will have more positive attitude toward the advertisement and toward the issue of global warming, and will report greater intentions to comply with the ad's behavioral recommendations when such ads use fear appeals versus happy appeals. Because the relationship between emotional appeal and low level of issue relevance is still unclear, a general research question was posed about the connection between these two variables.

To test the hypotheses and answer the research question, undergraduate students were recruited to participate in this study. In the first part of the study, they were asked to answer a series of questions about their attitude toward global climate change. These measures were used to determine the level of topic relevance as high, moderate or low. Those having a moderate level of issue relevance were used as a point of comparison between those for whom the issue has high and low relevance. In the second part of the study, subjects in the high and low issue relevance groups were randomly assigned to each of the two experimental conditions (exposed to ads with fear appeal versus happy appeal). They then were asked to evaluate the advertisements, to evaluate global climate change as an issue, and to indicate the likelihood that they will perform behaviors that aim to protect the environment.

CHAPTER 4

Results

The purpose of this study was to explore how different types of emotional appeals appearing in advertisements (fear versus happy) affects different types of audiences who have different levels of concern about global climate change (high versus low) in terms of three dependent variables: (1) their attitude toward the ad, (2) their attitude toward global climate change as an issue, and (3) their intention to follow behavioral recommendations that aim to protect the environment. For each dependent variable, scores were first summed and the means were computed. Then, an ANOVA was conducted to determine any statistically significant interaction and main effects between the independent and the dependent variables. A t-test was used to check for significant treatment effects (simple-main effect) of the independent variables on the dependent variables.

The experiment was conducted with 154 undergraduate students at Iowa State University as participants in March 2011. Thirty-seven (24%) were male and 117 (76%) were female. The participants' age ranged from 18 to 29 years. The majority (88.2%) were White. The rest of the sample was composed of 8.5% Asian, 0.7% African American, and 2% Hispanic non-white or multiracial students. Around 0.7% preferred not to disclose their race.

Scores on the 12 items that measured issue relevance (important to me /unimportant to me, of no concern to me /of concern to me, irrelevant to me /relevant to me, means a lot to me/means nothing to me, valuable/worthless, trivial/fundamental, matters to me/doesn't matter to me, uninteresting to me /interesting to me, significant to me /insignificant to me, vital/superfluous, boring/interesting, essential/nonessential) were summed and averaged (alpha =. 954). Then, groups of high, medium, and low level of issue relevance were

established. Participants whose average scores were greater than or equal to 5.25 were classified as belonging to the group that assign a high level of relevance to the issue; those whose average scores were less than or equal to 4.1667 were classified as belonging to the low relevance group. Those whose scores were more than 4.1667 but less than 5.25 were classified as the moderate relevance group. There were 53 participants in the high and low relevance groups; 48 were placed in the moderate level. Table 3 presents the means of and descriptive information about the participants in each group.

Table 3. Groups of issue relevance by number and percentage of participants

Issue relevance	Mean	Frequency	Percent
High	5.8459	53	34.4
Medium	4.6840	48	31.2
Low	3.1855	53	34.4
Total		154	100

Participants in the high and low issue relevance groups were then randomly assigned to one of the two treatment conditions. The breakdown of participants in each cell of the 2x2 factorial design is shown in Table 4.

Table 4. Numbers of participants in each cell of the 2 x 2 factorial design

Issue relevance	Advertising appeals		Total
	Fear	Happy	
High	33	20	53
Low	21	32	53
Total	54	52	106

Analysis of Appeal Measure Test

In order to determine whether participants perceived a fear stimulus in the fear appeal ad and a happy stimulus in the happy appeal ad, both groups were asked to indicate the degree of fear and happiness depicted in advertisement to which they were exposed. High

scores indicated high degrees of perceived happiness. Scores on the items were summed and averaged to form an overall measure of perceived fear and happy appeals. Independent-samples t-test results showed that participants viewed the fear appeal ad (M = 2.81, SD = 1.26) as significantly different from the happy appeal ad (M = 3.70, SD = 1.34), t = 3.53, p = .001, 95%CI [0.39, 1.40] (Table 5). Thus, the manipulation was successful.

Table 5. The results of the t-test for appeal measure

Types of appeal	Frequency	Mean	Std. Deviation
Fear	54	2.8056	1.26423
Happy	52	3.7019	1.34405

	t	df	Sig (2-tailed)	Mean Difference	Std. Error Difference	95% CI of the difference	
						Lower	Upper
Equal variances assumed	3.538	104	.001	0.89637	0.25335	.39396	1.39878
Equal variances not assumed	3.534	102.987	.001	0.89637	0.25365	.39332	1.39942

Hypotheses and Research Question Testing

Attitude toward the advertisement

H1: Those for whom global climate change is high in relevance will demonstrate more positive attitudes toward ads with fear appeals than ads with happy appeals.

The scores on the four seven-point semantic differential scales (poorly done/ well done; not informative/ highly informative; not useful/ very useful; and not convincing/ very convincing) were summed and averaged (alpha = .876).

A t-test was performed to analyze the treatment effect (simple-main effects) of emotional appeals for participants who were in the high relevance group on their attitude toward the advertisement. The results (Table 6) revealed no significant difference in attitude

toward the advertisement among high issue relevance group members shown the ad with fear appeal (M = 4.25, SD = 1.65) and the ad with the happy appeal (M = 4.20, SD = 1.53). Thus, H1 was not supported.

Table 6. Results of a t-test for attitude toward the advertisement for participants with high level of issue relevance

Types of appeal	N	Mean	Std. Deviation	Std. Error
Fear	21	4.2500	1.65265	.36064
Happy	32	4.2031	1.52458	.26951

	T	df	Sig (2-tailed)	Mean Difference	Std. Error Difference	95% CI of the difference	
						Lower	Upper
Equal variances assumed	-.106	51	.916	-.04688	.44261	-.93545	.84170
Equal variances not assumed	-.104	40.440	.918	-.04688	.45022	-.95649	.86274

To determine the difference in attitude toward the advertisement of participants in the low relevance group, a t-test was performed. The results revealed no significant difference in attitude toward the advertisement among low issue relevant participants who saw the advertisement with fear appeal (M = 3.80, SD = 1.39) and those who saw the advertisement with happy appeal (M = 3.33, SD = 1.18). However, in absolute terms, this low relevance group tended to have a more positive attitude toward the global climate change ad presented with a fear appeal rather than a happy appeal. Table 7 presents the results of the t-test for attitude toward the advertisement among participants categorized in the low issue relevance group.

Table 7. Results of the t-test for attitude toward the advertisement for participants with low level of issue relevance

Types of appeal	N	Mean	Std. Deviation	Std. Error
Fear	33	3.8030	1.38879	.24176
Happy	20	3.3250	1.18405	.26476

	T	Df	Sig (2-tailed)	Mean Difference	Std. Error Difference	95% CI of the difference	
						Lower	Upper
Equal variances assumed	-1.282	51	.206	-.47803	.37299	-1.22685	.27079
Equal variances not assumed	-1.333	45.225	.189	-.47803	.35853	-1.20005	.24399

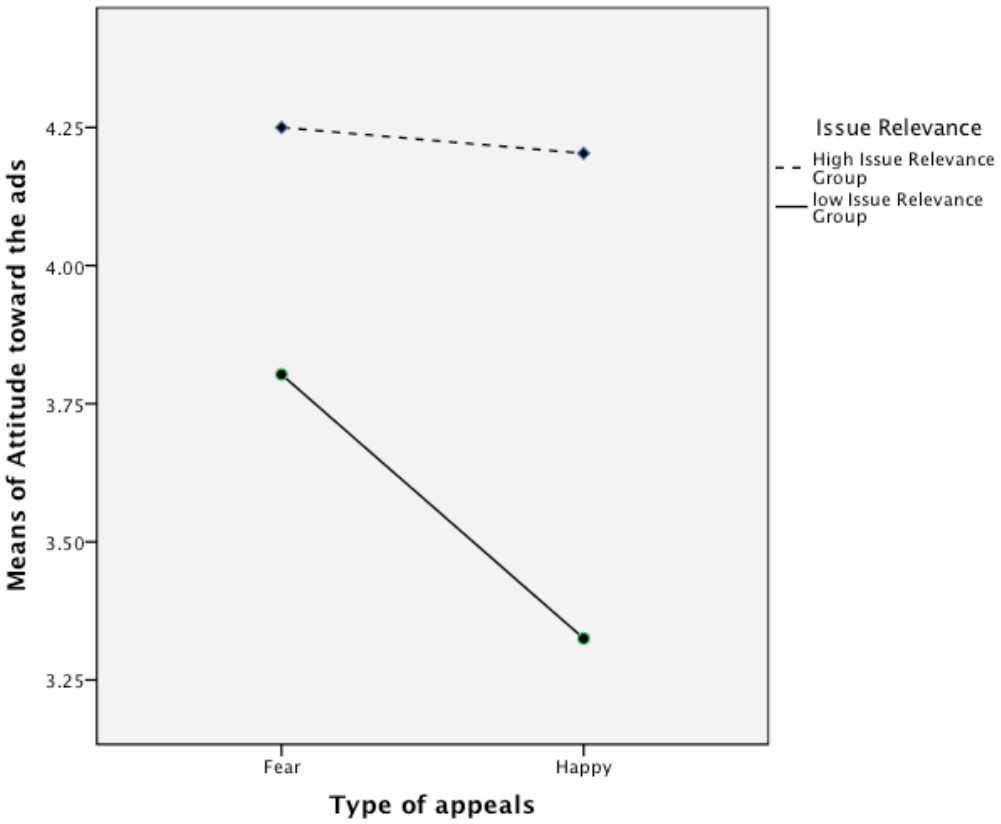
A two-way ANOVA was performed to determine whether level of issue relevance and type of emotional appeals combined produce significantly different effects on attitude toward the ad. A significant interaction effect was not detected. Table 8 shows the interaction and main effects of issue relevance and emotional appeals on attitude toward the advertisement.

Table 8. Results of the ANOVA test for attitude toward the advertisement by levels of relevance

Issue Relevance	Appeals	Mean	Std. Deviation	N
High	Fear	4.2500	1.65265	21
	Happy	4.2031	1.52458	32
	Total	4.2217	1.56099	53
Low	Fear	3.8030	1.38879	33
	Happy	3.3250	1.18405	20
	Total	3.6226	1.32435	53
Total	Fear	3.9769	1.49785	54
	Happy	3.8654	1.45644	52
	Total	3.9222	1.47170	106

Source	Type III sum of Square	df	Mean Square	F	Sig.
Issue Relevance	11.031	1	11.031	5.233	.024
Appeal	1.731	1	1.731	.821	.367
Issue * Appeal	1.168	1	1.168	.554	.458
Error	215.037	102	2.108		
Total	1858.063	106			

Figure 3. Interaction effect of level of issue relevance and emotion appeals on attitude toward the advertisement



The results indicate no significant main effect for type of appeal. However, the ad demonstrating fear appeal (M = 3.98) did not evoke more positive attitude toward the advertisement than the one that exhibited a happy appeal (M = 3.87), revealing a significant main effect for level of issue relevance. Those who saw the issue as high in personal

relevance reported a more positive attitude toward the advertisement (M = 4.22) than those who saw climate change as low in relevance (M = 3.62; F (1, 102) = 5.23, p = .02).

A t-test was conducted to determine the effect size of level of issue relevance on attitude toward the advertisement. The results showed that the high issue relevance group demonstrated more positive attitude toward the advertisement (M = 4.22, SD = 1.56) than the low issue relevance group (M = 3.62, SD = 1.32), t = -2.130, p =. 035, 95%CI [-1.16, -.041]. Table 9 shows the results of the t-test and the effect size of issue relevance on participants' attitude toward the advertisement.

Table 9. Results of the t-test for main effect of level of issue relevance on attitude toward the advertisement

Issue Relevance	N	Mean	Std. Deviation	Std. Error
High	53	4.2217	1.56099	.21442
Low	53	3.6226	1.32435	.18191

	T	df	Sig (2-tailed)	Mean Difference	Std. Error Difference	95% CI of the difference	
						Lower	Upper
Equal variances assumed	-2.130	104	.035	-.59906	.28119	-1.15667	-.04145
Equal variances not assumed	-2.130	101.311	.036	-.59906	.28119	-1.15684	-.04127

Attitude toward global climate change

H2: Those for whom global climate change is high in relevance will demonstrate more positive attitudes toward the topic as shown in ads with fear appeals than in ads with happy appeals.

The participants' scores on the four semantic differential scales (real/ not real, harmful/ not harmful, dangerous to the current generation/ not dangerous to the current generation, and

dangerous to future generations/ not dangerous to future generations) were summed and averaged (alpha = .885).

A t-test was performed to analyze the treatment effect of emotional appeals on attitude toward the issue, global climate change, for those who were members of the high issue relevance group. As presented in Table 10, participants who had seen the ad with the fear appeal (M = 6.23, SD = 1.04) reported no significant difference in attitude toward global climate change from those who had seen the ad with a happy appeal (M = 6.31, SD=. 79). Thus, H2 was not supported.

Table 10. Results of a t-test for attitude toward global climate change for subjects with high level of relevance

Types of appeal	N	Mean	Std. Deviation	Std. Error
Fear	21	6.2262	1.03653	.22619
Happy	32	6.3125	.79057	.13975

	t	df	Sig (2-tailed)	Mean Difference	Std. Error Difference	95% CI of the difference	
						Lower	Upper
Equal variances assumed	.343	51	.733	.08631	.25138	-.41836	.59098
Equal variances not assumed	.325	34.903	.747	.08631	.26588	-.45351	.62613

There was also no significant difference in attitude toward global climate change between low issue relevance participants who saw the advertisement with fear appeal (M = 4.17, SD = 1.53) and those who saw the advertisement with happy appeal (M = 4.31, SD = 1.29). However, participants in the low relevance group tended to be more concerned about global climate change when the ads were presented with a happy appeal rather than a fear appeal. Table 11 summarizes the results of a t-test to determine the difference in attitude toward global climate change for those who consider the topic low in relevance.

Table 11. Results of a t-test for attitude toward global climate change for subjects with low level of relevance

Types of appeal	N	Mean	Std. Deviation	Std. Error
Fear	33	4.1667	1.53306	.26687
Happy	20	4.3125	1.29492	.28955

	t	df	Sig (2-tailed)	Mean Difference	Std. Error Difference	95% CI of the difference	
						Lower	Upper
Equal variances assumed	.355	51	.724	.14583	.41059	-.67846	.97013
Equal variances not assumed	.370	45.497	.713	.14583	.39378	-.64704	.93870

An ANOVA was employed to determine the interaction effect between level of issue relevance and type of emotional appeals on attitude toward the issue. A significant interaction effect was not found. The main effects of the two independent variables were then computed.

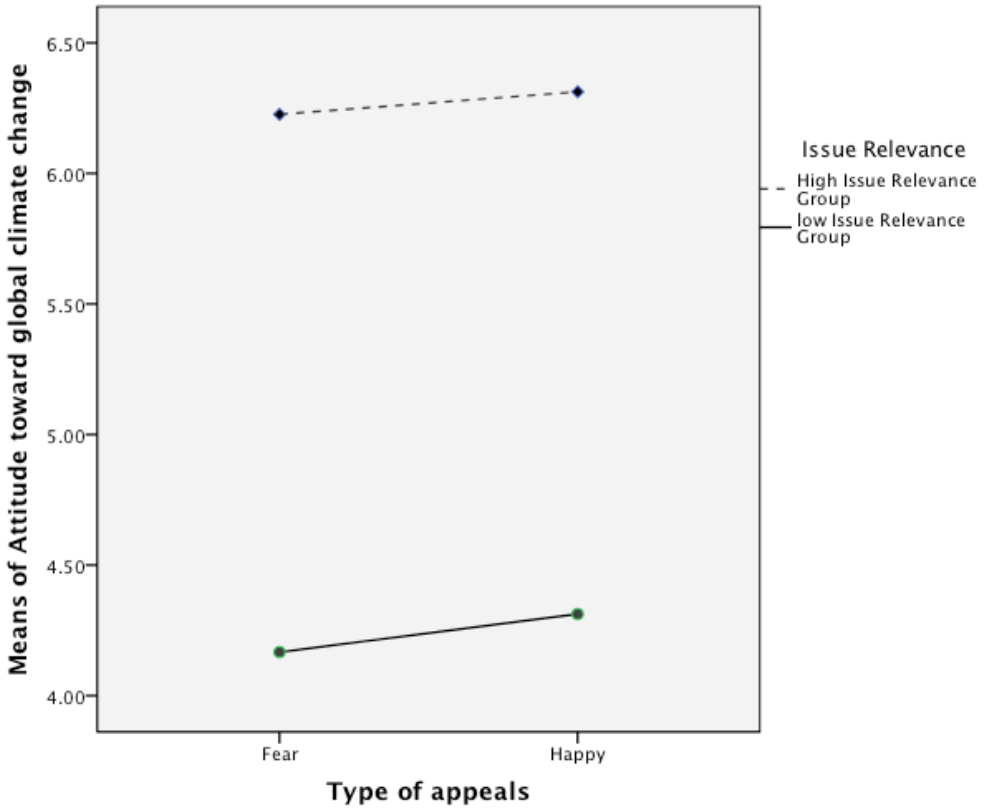
Although the type of emotional appeal produced no significant difference in attitude toward global climate change, a main effect of issue relevance level was revealed. Table 12 shows the interaction and main effects of level of issue relevance and type of emotional appeals on attitude toward global climate change using an ANOVA.

Table 12. Results of an ANOVA for attitude toward global climate change by level of issue relevance

Issue Relevance	Appeals	Mean	Std Deviation	N
High	Fear	6.2262	1.03653	21
	Happy	6.3125	0.79057	32
	Total	6.2783	.88749	53
Low	Fear	4.1667	1.53306	33
	Happy	4.3125	1.29492	20
	Total	4.2217	1.43669	53
Total	Fear	4.9676	1.68865	54
	Happy	5.5433	1.40353	52
	Total	5.2500	1.57473	106

Source	Type III sum of Square	df	Mean Square	F	Sig.
Issue Relevance	103.534	1	103.534	71.388	.000
Appeal	0.339	1	0.339	0.233	.630
Issue * Appeal	0.22	1	.011	0.015	.902
Error	147.931	102	1.450		
Total	3182.00	106			

Figure 4. Interaction effect of level of issue relevance and emotion appeals on attitude toward global climate change



A t-test was conducted to determine the effect size of relevance level on attitude toward global climate change. Those in the high issue relevance group demonstrated significantly more positive attitude toward global climate change (M = 6.28, SD =. 89) than those in the low relevance group (M = 4.22, SD = 1.44, t = -8.87, p = .000, 95%CI [-2.52, -

1.60]. Table 13 shows the results of the t-test and the effect size of issue relevance on participants' attitude toward global climate change.

Table 13. Results of a t-test for the main effect of level of issue relevance on attitude toward global climate change

Issue Relevance	N	Mean	Std. Deviation	Std. Error
High	53	6.2783	.88749	.12191
Low	53	4.2217	1.43669	.19734

	T	Df	Sig (2-tailed)	Mean Difference	Std. Error Difference	95% CI of the difference	
						Lower	Upper
Equal variances assumed	-8.866	104	.000	-2.0566	.23196	-2.51659	-1.59661
Equal variances not assumed	-8.866	86.642	.000	-2.0566	.23196	-2.51768	-1.59553

Behavioral Intention

H3: Those for whom global climate change is high in relevance will demonstrate greater intentions to follow the recommended behavior presented in ads with fear appeals than the recommendations in ads with happy appeals.

The scores on the two seven-point semantic differential items asking about participants' intention to follow the recommendations shown in the ads were summed and averaged to create an index for behavioral intention. The participants were asked (1) How probable is it that you will perform environment-friendly activities in the near future? (2) How probable is it that you will perform environment-friendly activities every time? The reliability of this index was found to be acceptable (alpha = .877).

A t-test was performed to analyze the treatment effect of type of emotional appeals on intention to follow the recommendations presented among participants who saw global climate change as highly relevant. There was no significant difference in behavioral intention

between participants who had seen an advertisement with a fear appeal (M = 5.62, SD = 1.17) and a happy appeal (M = 5.66, SD = .95). Thus, H3 was not supported.

Table 14. Results of a t-test for behavioral intention of participants with high level of relevance

Types of appeal	N	Mean	Std. Deviation	Std. Error
Fear	21	5.6190	1.17159	.25566
Happy	32	5.6563	.94560	.16716

	t	df	Sig (2-tailed)	Mean Difference	Std. Error Difference	95% CI of the difference	
						Lower	Upper
Equal variances assumed	.127	51	.899	.03720	.29210	-.54920	.62361
Equal variances not assumed	.122	36.456	.904	.03720	.30546	-.58203	.65643

No significant difference also was found in terms of intention to follow the prescribed practices among participants in the low relevance condition who saw the advertisement with a fear appeal (M = 3.62, SD = 1.44) and those who saw the ad with a happy appeal (M = 3.67, SD = 1.47). Table 15 shows the results of the t-test aimed to determine the difference by type of appeal in the behavioral intentions of those who saw global climate change as low in relevance.

Table 15. Results of a t-test for behavioral intention for subjects with low level of relevance

Types of appeal	N	Mean	Std. Deviation	Std. Error
Fear	33	3.6212	1.44714	.25192
Happy	20	3.6750	1.47144	.32902

	t	df	Sig (2-tailed)	Mean Difference	Std. Error Difference	95% CI of the difference	
						Lower	Upper
Equal variances assumed	.130	51	.897	.05379	4.1267	-.77468	.88225
Equal variances not assumed	.130	39.704	.897	.05379	.41439	-.78392	.89149

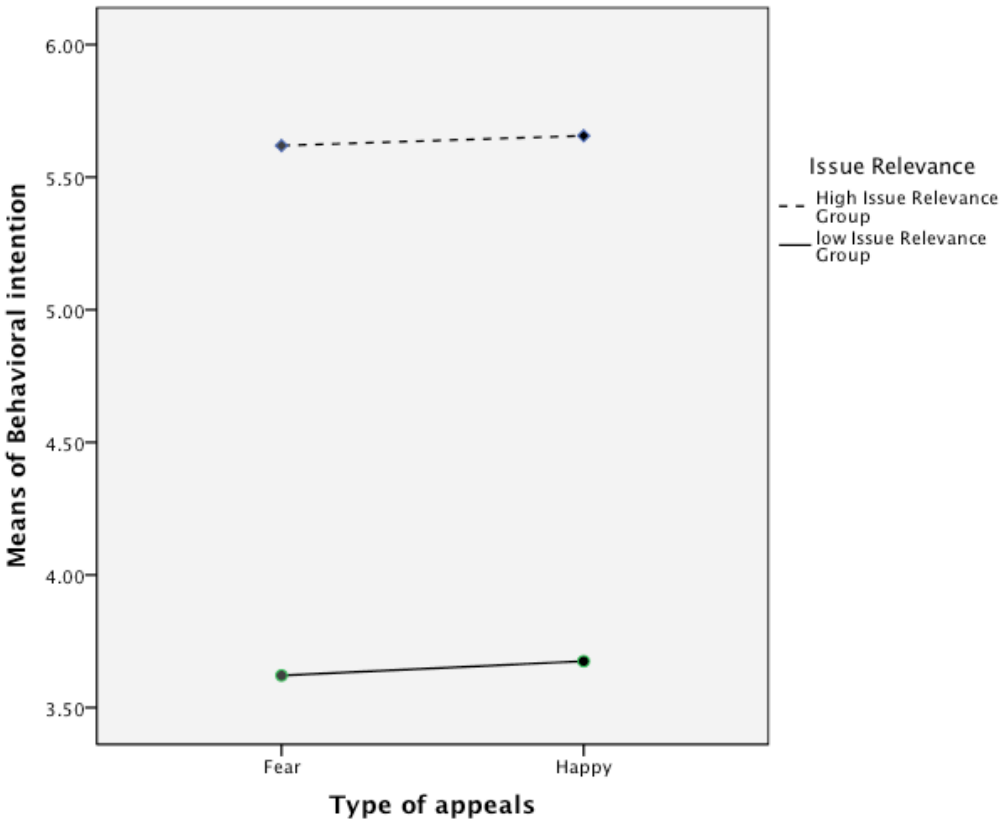
An ANOVA was conducted to determine the interaction effect between level of issue relevance and type of emotional appeals on intention to the follow ads' suggested pro-environmental behaviors. No significant interaction effect was found. That is, the effects of emotional appeals did not vary with level of issue relevance. Nevertheless, a statistically significant main effect of level of relevance was found. Table 16 shows the interaction and main effects of level of issue relevance and type of emotional appeals on behavioral intention using ANOVA.

Table 16. Results of an ANOVA for intention to follow the recommendation levels of relevance

Issue Relevance	Appeals	Mean	Std. Deviation	N
High	Fear	5.6190	1.17159	21
	Happy	5.6563	0.94560	32
	Total	5.6415	1.03020	53
Low	Fear	3.6212	1.44714	33
	Happy	3.6750	1.47144	20
	Total	3.6415	1.44241	53
Total	Fear	4.3981	1.65797	54
	Happy	4.8942	1.51572	52
	Total	4.6415	1.60172	106

Source	Type III sum of Square	df	Mean Square	F	Sig.
Issue Relevance	99.472	1	99.472	62.123	.000
Appeal	0.052	1	0.052	0.032	.857
Issue * Appeal	0.002	1	0.002	0.001	.974
Error	163.324	102	1.601		
Total	2553.00	106			

Figure 5. Interaction effect of level of issue relevance and emotion appeals on intention to follow the behaviors recommended in the ads



A t-test was conducted to determine the effect size of level of issue relevance on behavioral intention. Participants who saw global climate change as highly relevant demonstrated significantly greater intention to follow the recommended behaviors (M = 5.64, SD = 1.03) than those for whom issue relevance was low (M = 3.64, SD = 1.03), t = -8.214, p

< .001, 95%CI [-2.48, -1.52]. Table 17 shows the results of a t-test and the effect size of issue relevance on participants' intention to follow the behaviors suggested in the ads.

Table 17. Results of a t-test for the main effect of issue relevance on intention to follow the recommended behaviors

Issue Relevance	N	Mean	Std. Deviation	Std. Error
High	53	5.6415	1.03020	.14151
Low	53	3.6415	1.44241	.19813

	T	Df	Sig (2-tailed)	Mean Difference	Std. Error Difference	95% CI of the difference	
						Lower	Upper
Equal variances assumed	-8.214	104	.000	-2.000	.24348	-2.48282	-1.51718
Equal variances not assumed	-8.214	94.097	.000	-2.000	.24348	-2.48342	-1.51658

Summary of the findings

In summary, the effects of emotional appeals on the participants' attitude toward the advertisement, attitude toward the issue, and intention to follow environmentally friendly practices were not detected in either high or low issue relevance groups. Thus, the three hypotheses were not supported.

However, the results indicate that the level of issue relevance did have an impact on participants' attitude toward the advertisement, attitude toward global climate change, and intention to follow the behaviors suggested in the advertisement. That is, those who found global climate change highly relevant had a significantly more positive attitude toward the advertisement, toward global climate change, and greater intention to perform behavioral practices than those who found the issue low in relevance.

Although the findings were not significant, the results suggest that in general, participants tended to have a positive attitude toward the global warming advertisement with a fear appeal. Nevertheless, they were more likely to be persuaded by the ad that exhibited a happy appeal. The findings show that a happy appeal elicited more positive attitude toward the issue and more positive behavioral intentions.

CHAPTER 5

Discussion and Conclusions

Summary of the Study

This study was designed to investigate the interaction and the main effects between two types of emotional appeals (fear versus happy appeals) presented in print advertisements and two levels of issue relevance (high and low) on people's attitude toward an ad about global climate change, attitude toward global climate change as an issue, and intention to follow recommended earth-friendly behaviors.

The analyses were guided by the axioms of the protection motivation theory, the limited capacity model of motivated media message processing, and the elaboration likelihood model (ELM). The first two theories posit that fear appeals typically require more cognitive resources to process because they not only prompt individuals to assess the threat and evaluate their ability to protect themselves against the threat (Rogers, 1975); fear appeals also activate individuals' automatic system of allocating cognitive resources to process information (Lang, 2000). Those who see an issue as highly relevant are likely to pay more attention to an incoming message, have greater ability to process the message, and show more willingness to spend cognitive resources to expound on the message (Cacioppo & Petty, 1979). These characteristics are necessary to process fear appeals. Thus, individuals with high issue relevance were expected to respond more to fear appeals or find ads with fear appeals more persuasive. Consequently, these individuals tend to have more positive attitudes toward the advertisement and toward the issue of global warming. These positive attitudes will lead to greater intention to adopt environment-friendly behaviors. A research question was asked for individuals with low level of relevance.

Level of issue relevance was the first variable measured. Participants' scores on a series of semantic differential items that aim to measure the degree of relevance they attach to the issue of global climate change were summed and averaged. Then, groups of high, moderate, and low level of relevance were established.

Participants whose scores fell between the 66.67 and 33.33 percentiles were left out of the study, while those in high and low issue relevance groups were randomly assigned to one of the two advertisement versions. After seeing the advertisement, participants were asked to indicate their attitude toward the advertisement they had just seen, their attitude toward global climate change, and their tendency to follow behaviors recommended in the advertisement.

The results showed that the use of fear and happy appeals did not result in significantly different attitudes toward the advertisement, attitude toward global warming, and intention to follow the suggested behaviors for participants in both the high and low relevance groups. Thus, the three hypotheses were not supported.

The answers to the research question involving the low issue relevant participants were inconclusive. However, a significant effect of level of relevance was detected. Those in the high relevance group reported more positive attitude toward the advertisement, attitude toward global climate change, and behavioral intention than those in the low relevance group.

The current study did not find a statistically significant interaction effect between emotional appeals and level of relevance on attitude toward the advertisement, attitude toward global climate change, and behavioral intention. The treatment effect of types of

emotional appeal also did not reveal significant results. Therefore, the three hypotheses were not supported.

The findings of non-significant differences may be due to two reasons. First, in this study, a real PSA was used to show fear appeal while a manipulated ad was used to exhibit the happy appeal. It could be that the fear appeal ad presented fear stronger than the happy appeal ad displayed happiness. After all, the negative dominance theory suggests that messages with a negative valence tend to overpower people's information processing systems (Covello et al., 2001).

Participants reported no significant difference in attitude toward the ad when it was presented with a fear appeal (M = 3.98) than a happy appeal (M = 3.87). The results also revealed no statistical difference between the ad with a fear appeal (M = 4.97) and a happy appeal (M = 5.54) in terms of the resulting attitude toward the climate change issue. There was also no significant difference in behavioral intention between participants who had seen an ad with fear appeal (M = 4.40) and those who had seen an ad with a happy appeal (M = 4.89).

However, a significant main effect of issue relevance was detected. Participants who saw the issue as highly relevant reported a more positive attitude toward the advertisement (M = 4.22) than those who attached low relevance on the topic (M = 3.62). Members of the high issue relevance group also demonstrated more positive attitude toward the global climate change (M = 6.28) than their low relevant counterparts (M = 4.22). Moreover, those in the high relevance group had greater intention to perform environment-friendly activities (M = 5.64) than those who were in the group who found the issue low in relevance (M = 3.64). These results were in accordance with the ELM prediction that when issue relevance is

high, people are likely to (1) pay more attention to the message, (2) have the ability to process the message (Celsi & Olson, 1998), and (3) are more willing to spend cognitive resources to elaborate on the message (Roser & Thompson, 1995). Thus, individuals for whom the issue has high relevance elaborated on the message more carefully, resulting in more positive attitudes and greater intention to follow behavioral recommendations (Petty & Cacioppo, 1986; Roser, 1990).

An interesting finding was the main effect of emotional appeals. Although the results were not conclusive, the findings indicate that, in general, participants tend to develop more positive attitudes toward global warming when the ad displayed a happy (M = 5.54) rather than a fear appeal (M = 4.97). They also demonstrated greater behavioral intention when the ad exhibited a happy appeal (M = 4.89) rather than a fear appeal (M = 4.40). This finding was in line with other studies that found fear as more likely to activate an aversive system (Leshner et al, 2010) that brings about an avoidance reaction (Nabi, 2002). A fear appeal can deplete individuals' cognitive resources during message processing (Lang, 2006). Because of this, some (especially high involved people), tend to shift their attention away from fearful information (Lang, 2006). Not being able to process and understand the message can cause people to have a less favorable attitude toward the issue presented in the message. Because a happy appeal does not deplete people's cognitive resources during message processing, people tend to pay more attention to happy appeals.

Implications of the Findings

The current study investigated the interaction effect and main effects of type of emotional appeals and level of relevance on individuals' attitudes and behavioral intention. The results contribute to communication theory and communication practice. On the

theoretical side, the results offered insights into the mechanisms underlying the influence of fear and happy appeals on varying degrees of relevance accorded to the climate change issue. Thus, the findings can contribute to the further development of persuasion theory. In addition, this study provided knowledge about the deployment of happy appeals in social marketing that few studies had examined. On the practical side, by understanding how emotions and issue relevance influence persuasion, advertising agencies can take advantage of different appeals to target individuals who attach differential levels of relevance to an issue to enhance awareness and to persuade them to engage in their campaign activities.

Limitations of the Study

There are four limitations that need to be acknowledged regarding this study. First, because of the scarcity of ads that deploy happy appeals, the current study utilized a real PSA with a fear appeal but used a manipulated ad that displayed a happy appeal. This may have affected the way audiences perceived happiness in the constructed ad. Even though participants perceived fear (M=2.81) and happy (M = 3.70) appeals differently, perceptions of happiness were more on the neutral slots within the seven-point scales. Higher degree assessments of the happy stimuli may have produced different results. Second, this study did not concern about the level of fear arousal that might affect the persuasiveness of the messages. Keller and Block in 1996 found that when the level of fear is low, there is little elaboration on the message, while high level of fear triggers too much consideration of the message resulting in message denial. Third, the participants were categorized into high and low issue relevance groups by dividing them into three groups and leaving out people in the middle group. This procedure undoubtedly reduced the study's sample size and produced unequal distribution across cells. Fourth, the method of randomization applied in this study

brought about unequal members in each cell of the 2x2 factorial design. These limitations may have weakened the impact of the independent variables.

Suggestions for Future Study

The current study explored the interaction as well as the main effects of emotional appeals presented in global climate change advertisements and the level of relevance people assign to the topic on attitude toward the advertisement, attitude toward global climate change, and intention to perform the activities recommended. To advance the literature in this area, future studies could experiment with different stimuli formats. The ads presented in the present study were limited to the print posters. Future studies could test audience reactions using only professionally produced PSAs or manipulated ads to ensure the presence of equivalent stimuli. More arresting presentations may elicit stronger emotional responses. Moreover, the level of fear arousal should be tested in order to ensure that fear stimulus arouses moderate level of fear, which is the most effective level in persuasion (Keller & Block, 1996).

The next round of experiments should strive for more participants to be able to detect the impact of type of appeals. Other scholars may also examine other emotional appeals to identify which is most persuasive and convincing.

Conclusions

The current study explored the interaction and main effects of emotional appeals (fear vs. happiness) and the level of issue relevance (low and high) on individuals' attitude toward the advertisement, attitude toward global climate change as an issue, and their intention to follow the recommendations outlined in the ad to protect the planet. Although the interaction between the two factors were not significant, the results indicate that level of relevance

played an important role in shaping people's attitudes and behavior. The findings also suggest that audiences tended to develop more positive attitudes toward global climate change and greater intention to practice environmental-friendly activities when the ad was presented with a happy appeal instead of a fear appeal. To confirm these findings, tests of other advertising formats for the same topic are warranted.

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APPENDIX A:

Questionnaire Before Exposure to the Advertisements

The purpose of this study is to measure people's level of interest and involvement in global climate change. Please check where you position yourself on a series of descriptive scales according to how **you** perceive the global warming issue. If you feel that your answer is **very closely related** to one end of the scale, you should place a check mark as follows:

Unimportant ____:____:____:____:____:____:_√__ Important

If you feel that your answer is **quite closely related** to one end of the scale, you should place a check mark as follows:

Appealing ____:____:____:____:_√___:____:__ Unappealing

If you feel your answer is **only slightly related** to one end of the scale, you should place a check mark as follows:

Interested ____:____:__√___:____:____:____:___ Uninterested

Be sure to respond to every scale. Please do not put more than one check mark on a single scale. Make a separate and independent judgment for each item. Work at a fairly high speed. Do not worry about or ponder over individual items; these items ask for your first impressions or your immediate feelings. On the other hand, please do not be careless because we want your true impressions.

Global warming is:

Important to me ____:____:____:____:____:____:____ Unimportant to me

Of no concern to me ____:____:____:____:____:____:____ Of high concern to me

Irrelevant to me ____:____:____:____:____:____:____ Relevant to me

Means a lot to me	____:____:____:____:____:____:____	Means nothing to me
Valuable	____:____:____:____:____:____:____	Worthless
Trivial	____:____:____:____:____:____:____	Fundamental
Matters to me	____:____:____:____:____:____:____	Doesn't matter to me
Uninteresting to me	____:____:____:____:____:____:____	Highly interesting to me
Very significant to me	____:____:____:____:____:____:____	Insignificant to me
Vital	____:____:____:____:____:____:____	Superfluous
Boring	____:____:____:____:____:____:____	Compelling
Essential	____:____:____:____:____:____:____	Non-essential

APPENDIX B:

The Experimental Stimuli

Advertisement with a Fear Appeal

The following is a public service announcement (PSA) we are currently developing for a communication campaign. Please take as much time as you need to evaluate this PSA. When you are finished with it, please answer the questions that follow.

Advertisement with a Happy Appeal

The following is a public service announcement (PSA) we are currently developing for a communication campaign. Please take as much time as you need to go over this PSA. When you are finished, please answer the questions that follow.

APPENDIX C:

Questionnaire After Exposure to the Advertisement

A. Please circle the number that best describes your evaluation of the global warming PSA you just saw:

Poorly done	1	2	3	4	5	6	7	Well done
Not informative	1	2	3	4	5	6	7	Highly informative
Not useful	1	2	3	4	5	6	7	Very useful
Not convincing	1	2	3	4	5	6	7	Very Convincing

B. Using the following range of responses, please select where you position yourself on a series of descriptive scales that ask about how **you** think about the **climate change issue.** *(Please circle only one.)*

Global climate change is:

Real	1	2	3	4	5	6	7	Not real
Harmful	1	2	3	4	5	6	7	Not harmful
Dangerous to current generation	1	2	3	4	5	6	7	Not dangerous to current generation
Dangerous to future generation	1	2	3	4	5	6	7	Not dangerous to future generation

C. Using the following range of responses, please indicate your agreement with the following items. *(Please circle only one.)*

a. How probable is it that you will perform environment-friendly activities in the near future?

Not probable at all	1	2	3	4	5	6	7	Very highly probable

b. How probable is it that you will perform environment-friendly activities every time?

Not at all probable	1	2	3	4	5	6	7	Very highly probable

D. What was your age on your last birthday? _____ years

E. Please indicate your gender Male Female

F. Which one of the following represents your race? *(Please circle only one.)*

White

Black or African American

Asian

Native Hawaiian or other Pacific Islander

American Indian or Alaskan native

Hispanic non-white or multiracial

I do not wish to disclose

Thank you for your participation!

APPENDIX D:

Code Book

Question No.	Variable Name	Variable label	Values	Missing Value
1	Appeal	Type of appeals	1= Fear 2= Happy	99
Part I: Level of interest in and involvement with global climate change				
2	Importnt	Importance attached to global climate change	1= Unimportant 7= Important	99
3	Concern	Concern about global climate change	1= Of no concern to me 7= Of concern to me	99
4	Relevant	Perceived relevance of global climate change	1= Irrelevant 7= Relevant	99
5	Means	What global climate change means	1= Means nothing to me 7= Means a lot to me	99
6	Valuable	Value attached to global climate change	1= Worthless 7= Valuable	99
7	Fundamen	Knowledge about the fundamentals of global climate change	1= Trivial 7= Fundamental	99
8	Matters	Personal opinion about global climate change	1= Doesn't matter to me 7= Matters a lot to me	99
9	Interest	Perceived interest in global climate change	1= Uninterested 7= Interested	99
10	Signific	Perceived significance or relevance of global climate	1= Insignificant 7= Significant	99

		change		
11	Vital	Perceived strength of global climate change	1= Superfluous 7= Vital	99
12	Boring	Degree of being bored with global climate change	1= Boring 7= Interesting	99
13	Essent	Perception of essential data about global climate change	1= Nonessential 7= Essential	99
Part II: Emotional reactions to the ad				
14	Fearful	Degree of fear felt after exposure to ad	1= Fearful 7= Not fearful	99
15	Happy	Degree of happiness felt after exposure to ad	1= Unhappy 7= Happy	99
16	Aroused	Degree of arousal felt after exposure to ad	1= Emotionally calm 7= Emotionally aroused	99
17	Stimulat	Degree of stimulation felt after exposure to ad	1= Very still 7= Stimulated	99
Part III: Attitude toward the ads				
18	Done	Rating of how ad was done	1= Poorly done 7= Very well done	99
19	Inform	Rating of ad's informative content	1= Not informative 7= Informative	99
20	Useful	Rating of of ad's usefulness or utlity	1= Not useful 7= Useful	99
21	Convince	Rating of the extent to which ad is convincing	1= Not convincing 7= Convincing	99
Part IV: Attitude toward global climate change				
22	Real	Global climate change is real	1= Not real 7= Real	99

23	Harm	Global climate change is harmful	1= Not harmful 7= Harmful	99
24	Curgen	Global climate change is dangerous to the current generation	1= Not dangerous to current generation 7= Dangerous to current generation	99
25	Futgen	Global climate change is dangerous to future generations	1= Not dangerous to future generation 7= Dangerous to future generation	99
Part V: Behavioral intentions				
26	Perform	Will perform environment-friendly activities in the near future	1= Not probable 7= Probable	99
27	Activity	Will perform environment-friendly activities every time	1= Not probable 7= Probable	99
Part VI: Demographic data				
28	Age	Age on last birthday		999
29	Gender	Gender	1=Male 2=Female	9
30	Race	Race	1= White 2= Black or African American 3= Asian 4= Native Hawaiian or other Pacific Islander 5= American	9

			Indian or Alaskan native 6= Hispanic non-white or multiracial 7= Do not wish to disclose	

APPENDIX E:

Approval from the Institutional Review Board

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Resear
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4566
FAX 515 294-4267

Date: 1/31/2011

To: Supathida Kulpavaropas
101 Hamilton

CC: Dr. Sela Sar
201 Hamilton Hall

From: Office for Responsible Research

Title: The Influence of Level of Issue Relevance and Emotional Appeals in Public Service Ads on Attitudes and Behavioral Intentions toward Global Climate Change

IRB Num: 10-590

Submission Type: New **Exemption Date:** 1/31/2011

The project referenced above has undergone review by the Institutional Review Board (IRB) and has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b). The IRB determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**
- **You must carry out the research as proposed in the IRB application**, including obtaining and documenting informed consent if you have stated in your application that you will do so or if required by the IRB.
- **Any modification of this research should be submitted to the IRB on a Continuing Review and/or Modification form, prior to making any changes**, to determine if the project still meets the federal criteria for exemption. If it is determined that exemption is no longer warranted, then an IRB proposal will need to be submitted and approved before proceeding with data collection.

Please be sure to **use only the approved study materials** in your research, including the **recruitment materials and informed consent documents that have the IRB approval stamp**.

Please note that you must submit all research involving human participants for review by the IRB. **Only the IRB may make the determination of exemption**, even if you conduct a study in the future that is exactly like this study.