INSTITUTO TECNOLOGICO Y DE ESTUDIOS SUPERIORES DE MONTERREY

CAMPUS MONTERREY

E G A D E

ADOPTION OF ENVIRONMENTAL BEHAVIORS AND THE PERCEPTION OF PERSONAL THREATS: AN EMPIRICAL STUDY

DOCTORAL DISSERTATION

CARLOS ROMERO-USCANGA

MONTERREY, N. L. OCTOBER, 1999

ADOPTION OF ENVIRONMENTAL BEHAVIORS AND THE PERCEPTION

OF PERSONAL THREATS: AN EMPIRICAL STUDY

by

Carlos Romero-Uscanga

Dissertation

Presented to the Faculty of the Graduate School of Business

Administration and Leadership of the

Monterrey Institute of Technology University System

in Partial Fulfillment of the Requirements
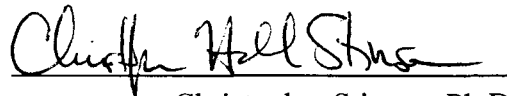
for the Degree of

Doctor of Philosophy

in

Management

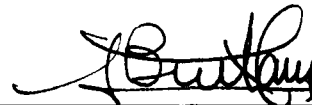Instituto Tecnológico y de Estudios Superiores de Monterrey

October, 1999.

ADOPTION OF ENVIRONMENTAL BEHAVIORS AND THE PERCEPTION

OF PERSONAL THREATS: AN EMPIRICAL STUDY

Approved by
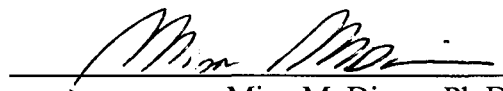**Dissertation Committee:**

_____
Christopher Stinson, Ph.D.
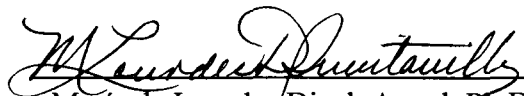Main Advisor
Professor of Environmental Accounting

_____
Alberto Bustani, Ph.D.
Advisor
Professor of Environmental Engineering

_____
Ricardo Flores, Ph.D.
Advisor
Professor of Organizational Behavior

_____
Mina M. Dioun, Ph.D.
Advisor
Environmental Economist

_____
María de Lourdes Dieck Assad, Ph.D.
Director of Doctoral Program

October, 1999

DEDICATION

to

My Parents, Roman Romero and Reyna Uscanga

My siblings, Román, Celia, Paty, Adriana, Carmen and Alicia

My nephews and nices, Fanny, Romancito, Pepito, Chequelín, Ale, Fer and Mimí

My Aunt, Teresa Patraca Barcelata

My Friend, Fernando González Martínez and his Family

My Friend, Jorge Ramírez Vargas

My Friend, José Tamborrell Rivera

My Friend, Arturo Vergara León

My Friend, Sánchez Miranda (R.I.P.)

My Godfather, Don Julio Gutierrez

Dr. Christopher Stinson

Dr. Alberto Bustani, Dr. Ricardo Flores and Dra. Mina Dioun

Dr. Jaime Alonso Gómez and Dra. María de Lourdes Dieck

CONACyT for the scholarship to study the Ph.D.

God

THANK YOU

.

ABSTRACT OF DISSERTATION

GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP,
INSTITUTO TECNOLOGICO Y DE ESTUDIOS SUPERIORES DE
MONTERREY, CAMPUS MONTERREY

Degree: <u>Doctor of Philosophy</u>   Program: <u>Doctoral Program in Management</u>

Name of the Candidate: <u>Carlos Romero-Uscanga</u>

Main Advisor: <u>Christopher Stinson</u>

TITLE: **ADOPTION OF ENVIRONMENTAL BEHAVIORS AND THE**

PERCEPTION OF PERSONAL THREATS: AN EMPIRICAL

STUDY

Objective. The relations between the adoption of environmental behavior and the

perception of personal threat and demographic characteristics are increasingly a topic

of scholarly and management interest. This study seek to clarify the independent

relations among environmental behavior (taking more overall strategic and

environmental actions) and a variety of demographic characteristics (i.e. gender, age),

and other factors like type of personal threat perceived and type of environmental

problem. *Method*. Using a model of environmental behavior that includes a variety of

five demographic characteristics, five types of personal threats and five types of

environmental problems as well as twelve measures of environmental behavior (overall environmental actions). The first part of the study consists of a multivariate analysis of the demographic characteristics of the sample, graduate business students in Monterrey Tech, Monterrey Campus, Mexico. The second part of the study consists of a multivariate analysis of the relations among these variables. *Results*. The model as a whole is strongly significant and several of the independent variables show significant correlation with the adoption of environmental behavior (through overall environmental actions). Gender and education specialization are significant predictors of overall environmental actions. But the most significant predictor is the type of threat. Type of environmental problem affects defining the type of personal threat perceived. Most of demographic characteristics were not significant. *Conclusions*. The results suggest that type of personal threat perceived explain the adoption of environmental behavior; type of environmental problem explains what type of personal threat is perceived.

ABSTRACT OF DISSERTATION

GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP,
INSTITUTO TECNOLOGICO Y DE ESTUDIOS SUPERIORES DE
MONTERREY, CAMPUS MONTERREY

Degree: <u>Doctor of Philosophy</u>   Program: <u>Doctoral Program in Management</u>

Name of the Candidate: <u>Carlos Romero-Uscanga</u>

Main Advisor: <u>Christopher Stinson</u>

TITULO : **ADOPCION DE COMPORTAMIENTOS AMBIENTALISTAS Y**

LA PERCEPCION DE AMENAZAS PERSONALES: UN ESTUDIO

EMPIRICO.

Objetivo. Las relaciones entre la adopción de un comportamiento ambientalista y la

percepción de una amenaza personal y de características demográficas son, cada vez

mas, un tópico de interés entre los académicos y empresas. Este estudio busca

clarificar las relaciones independientes entre comportamiento ambientalista (tomando

acciones estratégicas y ambientales más eficiente) y una variedad de características

demográficas (edad, sexo, etc.), y otros factores como el tipo de amenaza personal

percibida y el tipo de problema ambiental. *Metodología*. Usando un modelo de

comportamiento ambiental que incluye una variedad de cinco características

demográficas, cinco tipos de amenazas personales y cinco tipos de problemas

ambientales, así como doce escalas de medición para el comportamiento

ambientalista (acciones más eficientes). La primera parte del estudio consiste de un

análisis multivariable de las características demográficas de la muestra (estudiantes de

posgrado de la escuela de negocios del Tecnológico de Monterrey en Monterrey,

México). La segunda parte del estudio consiste de un análisis multivariable de las

relaciones entre las variables. *Resultados*. El modelo en su conjunto es fuertemente

significativo y algunas de las variables independientes muestran una correlación

significativa con la adopción de un comportamiento ambientalista (a través de

acciones más eficientes). Sexo y tipo de especialidad en la educación predicen

significativamente la toma de acciones más eficientes. Pero lo más significativo para

predecirlas es el tipo de amenaza. El tipo de problema ambiental define el tipo de

amenaza personal percibida. Las características demográficas en general no son

significativas para predecirlas. *Conclusiones*. Los resultados sugieren que el tipo de

amenaza personal percibida explica la adopción de un comportamiento ambientalista;

el tipo de problema ambiental explica que tipo de amenaza personal es percibido.

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

CHAPTER I. GENERAL VIEW AND PURPOSE OF THE STUDY

The study of environmental problems has recently been increased mainly because many people think various environmental problems are a threat for humanity, a threat that is not always recognized the same by all. What may cause this is the variety of perceptions that people can have about a situation. And these perceptions are oriented by many factors that still are under study. Perception will lead to a specific behavior making people make decisions on their lives. Important for this study are the perceptions on how specific environmental problems are considered as personal threats and its effects on behavior. Firms are considered as major sources of environmental pollution, therefore, it is important to focus on the study of these entities or even better on those managers and decision-makers of the firms. Environmental awareness implies a new environmental behavior in which quantitative demands and confrontation must be replaced by qualitative appreciation and coordination (Ryding, 1992) as shown in table 1.

Environmental Awareness		
Mass Production	⟶	Differentiated production
Expansion	⟶	Consolidation
Specialization	⟶	Generalization
Exploitation	⟶	Reuse, renew, repair
Mass communication	⟶	Selective information
Economy	⟶	Ecology
Money as value	⟶	Meaning as values
Lonelyness	⟶	Cooperation
Privacy	⟶	Openness

TABLE 1

It is understood that there is a need to know more about the psychological factors, which make the executive or others in firms to take environmental and strategic actions. But, there are a few studies that focus on psychological factor and even fewer done in developing countries. It is expected this study to help understand more about this issues in Mexico. This study is about environmental behavior and its sources.

This study is developed under the above-mentioned context. Unfortunately, most of the advancement in the practice and theory in this field has been developed in the US, and, the increasing global interdependence is motivating academics in Mexico to pursue research on this area: Environment and Behavior.

Most of the existing environmental research has focused on the area of technology, nature, economy, marketing and many other scientific and social-economic areas but unfortunately it has not been helped that much to reduce the harmful situation that Humans live. The study of Human Nature is now an area where hopes are focused. In this study, we mention the limited, and some times useless, outcomes that fines, tax increases and law enforcement have had in solving the environmental problems.

It is time now to go back to basics, the study of Human characteristics as a way to understand and predict behaviors towards the environment. The first section of this chapter briefly discusses the global environmental situation and sets the frame

for the study. In this chapter we discuss the main objectives of the study and key

questions.

I.1. OVERVIEW.

Analyzing the global environmental situation, around the World, we find that

there are some places that are more polluted and devastated than others are.

Correspondingly, there are some countries (e.g., the USA or many European

countries) or industries (e.g., DuPont, Ciba-Geigy) that make more effective

environmental-policy decisions, or design and implement more effective

environmental actions or practices (Wescott II, 1995) than do other countries and

industries. This difference could make it looks as if the latter were more conscious

than the former in their concern for the environment.

What causes this difference between countries and/or industries? Some countries are

more economically developed than others and have more resources (money, human

resource, infrastructure, etc.) suggesting that "Environmental protection is a "luxury"

which only wealthy societies can afford" (Wescott II, 1995).

Does this explain *all* differences between the environmental attitudes and

behaviors of citizens of countries like Sweden, Denmark, Canada, and Switzerland

(on the one hand) and the environmental attitudes and behaviors of the citizens of

other countries like Mexico, India, Brazil or some African countries? Is environmental awareness the same for all Mexicans or for all Canadians?

Why is that even though efforts have been made, for instance, in Mexico City, to control air pollution (e.g. the "One Day Without Car" Program), those efforts have been largely ineffective? What is missed in those places where a consciousness or consensus can't be created? Why not take the last step and make more effective environmental-policy decisions? Is it just lack of money or is it something much more complicated that is related directly with the way people perceive the problem, what kind of threats they perceive, or factors such as gender, age, educational level, educational type?

In this study we analyzed how business school graduate students at the ITESM in Monterrey, Mexico, many of whom also work in different companies in Monterrey, Mexico, design solutions to specific environmental problems taking diverse environmental and strategic actions depending on their perceptions of threat of an specific environmental problem.

Undoubtedly, many factors contribute to their solution but two of the most important factors are how they perceive the current situation (i.e., as an opportunity or as a threat) and the extent of personal threat perceived by the decision maker (Baldassare and Katz, 1992).

The second sections of this chapter, explains the need for a study of environmental attitudes and behaviors in Mexico and focus on the relevance of the

5

study and how is improving some research already done. Environmental Management, which implies an agreement with necessary changes in people's lives and business philosophies, based on economic and technological development, to improve the environmental situation (Ryding, 1992), is, as practice and as theory, the field where this study is developed. The third section of this chapter presents a brief analysis of the possible origins of the problem. Facts are presented and questions set to lead to the understanding of the need of this study. The fourth sections of this chapter, sets the bases for firmly support the presence of a problem and search its possible sources and propose the objective of this study, help to solve the environmental problems.

Chapter two is a review of the main concepts used in this study. Their development, different points of view and differences in results through the years in different academic fields. Mainly focused on literature about environmental behavior from a psychological point of view and its application to diverse fields. The analysis of how and why people perceives a situation as a threat and its effects on behavior and attitudes. Important analysis on its application and relevance in business and environmental management. The Mexican situation on these issues is also reviewed.

Chapter three presents the conceptual model proposed in this thesis, its contributions and the testable hypotheses proposed in this study. The analysis of the operationalization of the variables used and the explanation that supports research site selection and data collection strategy.

Chapter four explains sample characteristics, and the statistical analysis and results of the study. Also includes the statistical methods used to evaluate and interpret the different functions, as well as the test of the hypotheses.

Chapter five summarizes the study. First we discuss the results of the study and its implications for theory and practice in this field. Second, we discuss the limitations of the study. And finally, the futures studies that could help to broad the knowledge about environment and behavior are discussed.

I.2. SETTING THE STAGE FOR A STUDY OF ENVIRONMENTAL ATTITUDES & BEHAVIORS IN MEXICO.

The main research question addressed in this thesis is "What are the most significant predictors for the design of overall environmental actions to specific environmental problems?" Overall environmental actions means, for this study, a larger number of "more comprehensive", described like this by Frederickson (1985), strategic actions and, a larger number of environmental actions done "Always" or "Frequently".

The "More Comprehensive Actions" are: teamwork, rely on outsiders to solve the problem, involve many people, many areas of expertise represented, authorize significant expenses and, act. The environmental actions are: recycle, proper waste disposal, support tax payment increase to care environment, support environmental

law enforcement, use of environmentally friendly products and, promote a new and more sever environmental law.

The specific contribution of this study is to determine how perceived personal threats caused by specific environmental problem results in adoption of specific strategic and environmental practices, and to examine the determinants of environmental behaviors in Mexico.

This study is an extension of the study done by Baldassare & Katz in 1992. Where they analyze how personal threat of environmental problems for some residents in the Orange County, CA is a predictor of individual environmental practices.

This study will be relevant for several diverse fields. First, very few studies have examined environmental or ecological behavior (EB) in Developing Countries. Axelrod and Lehman (1993) give a definition of an individual's environmental behavior:

".... actions which contribute towards environmental preservation and/or conservation".

It is expected that also in Mexico, people to behave differently when environmental issues affect their lives. This study will add a new perspective to literature by adding perceived personal threat of a specific environmental problem as an additional component of people's perspective on the relevance and actual impact of the design and implementation of a solution for environmental problems. Second, this is a study in the field of Environmental Management, which not only is a new area but a new area to test organizational theories (Wescott II, 1995). Third,

8

Environmental Management, in the context of sustainable development and industrial

ecology, presents itself as a different framework for organizing human activities

(Allenby and Richards, 1994) and its study. Fourth, literature regarding

environmental management subjects applied in organizational studies is scarce

(Wescott II, 1995). Fifth, Gladwin (1993) concluded that in U.S. scholarship in this

field was weak due in part to the lack of empirical studies and a systematic

comparison of findings across firm size, industries, countries. This is a research in a

developing country. Sixth, this study is seen an extension of the work done by

Baldassare and Katz (1992). Their study was limited by the use of a single item to

measure personal environmental threat. This research uses multiple items, as they

proposed for future research in this area. This study also is focused on specific

environmental problems to examine how perceptions bring about the adoption of

given environmental and strategic actions.

In summary, this study provides new insight into how graduate business

school students behave with respect to environmental management, how they are

influenced by their perceptions as well as by certain demographic characteristics to

design a solution for specific environmental problems through strategic and

environmental actions.

I.3.   BACKGROUND OF THE PROBLEM.

This research is motivated by an appreciated need for estimating the impact of demographic characteristics (e.g., gender, age, educational level, educational type, and, outdoor sports practice), in the design of solutions for specific environmental problems in Mexico.

This study focuses on Human behavior toward the environmental problems. Review the decision-making process, to understand the motivations that lead to certain behaviors, Karp found that an important point is to recognize that when deciding if pursuing self-interest or realizing the collective good, is exactly when conflicts arise (Karp, 1996).

Decisions can be taken based on several factors, some are social norms and some are personal norms and values that each individual has. Schwartz proposes a distinction between social norms and personal norms, the latter are norms that individuals does not merely agree with but follows because its fulfillment is connected with self-expectations (Schwartz, 1977).

Some of the personal norms are more general, like gender. Brody (1984) (cited by Stern et al, 1993) suggests that it may be fruitful to look at gender effects within a model that allows us to asses whether men or women differ in the degree to which they hold belief about the consequences of environmental conditions for self-interest, other human beings, or non-human species or the biosphere, or in the weights they give to egoistic, social-altruistic, and biospheric values. For some social

10

factors, now it is possible to know in some extent which ecological behavior is easier to carry out and which is harder cause by social-cultural constraints (Kaiser et al, 1999). Socialization and social structure can shape individual environmental concern either by affecting value orientation or by altering individuals' attentiveness to information (Stern et. al, 1993).

Based on this, it is easier to recognize that the problem is to know which are the values and norms people has towards environment and then expect certain behavior. But also important is to know how these values and norms were developed and to know if they could be changed and then expect a change in people's behavior. The problem is that current public interest in environmental matters does not have much depth (Krause, 1993), this, complicates the analysis. People may have a completely different perception of what an environmental problem is and its consequences. People create ideas or worldviews according to the information they have received. The problem is that this information could be false, insufficient or get too late to them to create a rational and actual judgment about the problematical environmental situation. Some policy-makers attempt to shape public attitudes by molding problem definitions (Stern et. al, 1993). Then it would be difficult for the people to develop an environmental awareness and have the appropriate behaviors and attitudes.

I.4. PROBLEM STATEMENT.

With respect to management, this study is based on two questions, "How decisions are made in a firm to solve environmental problems?" and, "Who in a firm makes solutions for business-related environmental problems?". When environmental problems are solved with ineffective decision-making processes, many stakeholders are adversely affected in some way. This problem affects many countries and people (UNEP, 1995). This study could help firms to know if the person who develops solutions for business-related environmental problems is an adequate person and to know which are the bases people has to solve these problems.

It is important to recognize that people appear to behave inconsistently, someone who claims to be ecological oriented may behave ecologically in one context and unecologically in another (Oskam et al, 1991; Scott and Willits, 1994). More important that the "what" is the "why" and this study intend to help to find it. It is expected that the factors studied here be an important source of influence to these behaviors.

The main interest to environmental psychologists is human behavior, and then, the cognitive and affective processes that are fundamental to understanding the behavior of both individuals and groups; all behavior occurs within a context that has the potential to affect it; a description of a given context ideally should include all those factors that might in some way affect the behavior of an individual or group in

that context but it is few less than impossible (Clitheroe Jr. et al, 1998). Some steps have to be given before and this study is a further step in the field.

The problem is that it has not been defined completely what cause people have environmental attitudes and behaviors. Finding which are those specific factors that could be used to predict whether a person would design a successful overall environmental solution to specific environmental problems could help to solve the problem. Two basic questions have to be addressed here. First, what kind of perceived personal threat can bring about specific environmental and strategic actions? Second, what makes people to perceive an environmental problem as a personal threat?

The difficulty is that, as is already understood, people do not all value the same things. Sometimes, it seems, they do not even see the same world (Dietz et. al, 1989). So an effort may have to be done for people see at least environmental problems as the same, as what they are, a threat. But how to do it? If it is understood what affects people's perceptions, it may be useful to orient information towards the affection that an environmental problem has on those factors that people recognize as the most important in their lives. This might change their behaviors, attitudes and even their values, norms, and their life style. But, how willing is people to make changes in their life styles? Is a bottom line question on environmental awareness and is expected they be strongly willing if they perceive a personal threat. The problem then is to make they to perceive it.

13

I.5.   OBJECTIVES.

The five objectives of this research are:

1.   Determine if the perception of different personal threats (to family, to nation to religious beliefs, to income or to health) caused by different environmental problems (air pollution, water scarcity, leaks and spills of hazardous materials, water contamination or deforestation) leads people to adopt different specific strategic and environmental actions.

2.   Search which are significant determinants of environmental behaviors (measured by choosing more overall environmental actions) in Mexico, considering demographic characteristics (age, gender, education level, education specialization, and practice of outdoor sports) and types of personal threat perceived (to family, to health, to income, to religious beliefs and to nation).

3.   Define the characteristics of the person who might develop better solutions for environmental problems.

4.   Find which are the types of environmental problems (among air pollution, water scarcity, leaks and spills of hazardous materials, water contamination and deforestation) that provokes people the most to perceive these problems as a personal threat that could impact their family, income, nation, religious beliefs and health.

5.   Define what makes people to perceive any of those environmental problems as a personal threat that could impact their family, nation, religious beliefs, income and health.

A questionnaire will be applied to a group of graduate students of the ITESM (Monterrey Tech) in Monterrey Campus. Five environmental problems are presented. Respondents are asked what kind of environmental and strategic actions they will take in order to design a solution for the specific environmental problems. It is expected that if a strong personal threat is perceived, people will take a different set of actions than when a weak personal thereat is perceived.

CHAPTER II.   LITERATURE REVIEW

The first section of this chapter reviews the academic literature related to

threat and threat perception in the context of environmental management, while in the

second section, the literature related to environmental behavior is discussed. The third

section reviews the process of how a threat is perceived by persons. The fourth

section incorporates the factor of environmental threat that is expected to be a

different context to make decisions for any person compared with their normal

context. A review of some characteristics for Mexicans is included. The fifth section

analyses the relevance of managerial decision-making when facing an environmental

problem. In all sections, it is apparent that different studies have arrived at different

(and often contradictory) conclusions. These unresolved differences provide some of

the motivations for this study. Additionally, the results from these previous studies

will be compared with the results from this study based in Monterrey, Mexico.

II.1   ENVIRONMENTAL MANAGEMENT; THREAT PERCEPTION

Previous research has established that the way an executive interprets a

problematic situation substantially affects subsequent information processing,

decision making and behavior (Cowan, 1990). A person's knowledge is used in

deciding whether a situation is a problem (Pounds, 1969). Context (i.e., the different

characteristics that each person perceives in any situation) is also a factor (Cowan,

1986). The difference between what an individual perceives and what that individual

16

thinks others perceive, gives rise to the individual perception that a problem exist

(Downs, 1967). In this literature, a problem arise when different people in the same

situation will perceive the situation differently (i.e., differences in perceived

timeliness or magnitude of each situation) (Smith, 1988).

This selective reality implies that the amount of attention devoted to solving a

problem will be based on the particular perspective that each person has (Volkema,

1983); this will also affect how each individual acts to solve that problem (Taylor,

1975). Applying this to business, when executives categorize a situation as a

problem, their perceptions of its causes are based on their perceptions (Schwenk &

Thomas, 1983), reformulation (Bass, 1983), their search for solutions (March and

Simon, 1958; Katz & Kahn, 1978), and management's prior performance (Bass,

1983).

Research on problem solving has dichotomized problems as programmed or

nonprogrammed (March and Simon, 1958), structured or unstructured (Simon,

1973), focused on human relations or technical matters (Blake & Mouton, 1964), and

concerning strategic or operating issues (Drucker, 1954).

Jackson and Dutton (1988) analyzed the importance of discerning whether

issues represent threats or opportunities for managers. Issues are interpreted as threats

or opportunities depending on their perceived characteristics. Threats have negative

connotations; opportunities have positive connotations. Thus, a primary issue in

research on problem solving is "How do people perceive a situation?"

The Jungian personality typology is based first, on how people perceive and, second, on how they judge (Ramaprasad & Mitroff, 1984). Perceiving is the process of "becoming aware of things or people or occurrences or ideas (Myers, 1962). Judging is the process of "coming to conclusion about what has been perceived" (Myers, 1962). From the perspective, there are two methods of perceiving sensing and intuiting. Sensing is the commonly recognized way of becoming aware of things using the five senses (e.g. this method of perception is the basis for most academic research). Intuiting is an indirect perception through the unconscious. There also are two forms of judging: feeling and thinking. Feeling is the personal, subjective, process of judging. Thinking is the logical process aimed at impersonal findings (Myers, 1962).

Managers are more sensitive to characteristics associated with threats. This occurs because individuals differently value the avoidance of loss and the actualization of gain (Tversky and Kahneman, 1981). People tend to avoid loss; managers view threats as offering a greater likelihood of loss than of gain. How managers behave is determined by whether they feel they are facing a threat or an opportunity (Jackson and Dutton, 1988). How people react to threats, and which solutions they consider, change with the amount of information they have (Shaw, Sandelands, and Dutton, 1981). However, neither of these studies consider whether the type of personal threat perceived by the decision-maker affects how the decision-maker reacts or what solutions to the perceived problem are considered.

A threat may result in restriction of information processing, such as a narrowing in the field of attention, a simplification in how information is categorized, or a reduction in the number of information sources used (Staw, Sandelands and Dutton, 1981). A threat perception leads power and influence become more concentrated or moved to higher levels of the organizational hierarchy. Staw et al. (1981) concluded that people will tend to give well-learned or dominant responses. Perceptions of threats are hypothesized to changes both the information and control processes, restricting both of them. This thesis examines the hypothesis that perception of threat depends on the perceived extent and type of personal threat. When the perceived threats are environmental problems, this thesis examines the hypothesis that changes occur in the opposite way.

In this thesis, environmental problems are characterized as threats only. In a future study, they could be studied from a perspective that views them as opportunities. This simpler characterization is made here because most people conceive most of their decisions to be about problems (Mintzberg et. al., 1976; Nutt, 1984). The focus of this study then will be to know how people categorize environmental problems.

The evidence from disaster-research studies on the reactions of individuals to threat situations such as tornadoes (Wallace, 1956) or floods (Danzing, Thayer, and Galanter, 1958) is often anecdotal and speculative. Brouillette and Quarantelli's (1971) research on how organizations deal with natural disasters finds that divisions

19

or units of public-work organizations became more autonomous during a threat period. This is, that centralization may change according to whether perceived threats affect an entire organization or a subunit (or, in my view, an individual). In summary, the focus of this study is to examine how people perceive environmental problems, how they categorize them, and how they design solutions for these problems.

II.2. LITERATURE ON ENVIRONMENTAL BEHAVIOR.

Large portions of the organizational behavior literature suggest that organizational outcomes reflect the psychological characteristics of its members or constituents groups (Wescott II, 1995). This suggests that people's perceptions actually could guide organizational outcomes. March and Simon (1958) argue that decision outcomes are largely based on behavioral factors rather than global-optimization processes. This suggest, for example, that if a corporation's environmental manager is inadequately prepared for the actual job responsibilities, a good corporate environmental program may not have any effect on the organization's environmental performance.

Is it possible that some characteristics of the person or the group of persons that are managing the effort affects the probability of achieving a specific level of environmental performance? We know that education, professional training, and organizational function not only filter the quantities and qualities of information a

person receives and perceives, but also influence the mental models that person creates (Wescott II, 1995). This thesis examines the effect of various factors on environmental behaviors when people perceive a personal threat. This thesis also examines what environmental behaviors people adopt once an environmental problem is perceived to be a personal threat.

The social sciences take two very distinct approaches to the study of behavior. One group, mainly social and cognitive psychologists, study behavior as a function of processes internal to the individual; another, mainly economists and applied behavior analysts, advance knowledge by studying behavior as a function of external factors (Guagnano et al, 1995)

It is very important to recognize the difference between behavior and attitude. A person may have an environmental attitude (e.g. he or she thinks air pollution is not good) but may have a seemingly contradictory environmental behavior (e.g. he or she is not willing use a bus instead of using his/her car). How can people maintain such seemingly inconsistencies? One of the most influential contributions to the literature on the causal links between attitudes and behavior is "The Theory of Reasoned Action" (Fishbein and Ajzen, 1975). This is a model for describing the relationship between beliefs, attitudes, intentions and behavior. The underlying theory posits that for behaviors under full volitional control, attitudes are developed from beliefs, behavioral intentions from attitudes, and behavior from behavioral intentions.

But this is not the only theory in literature that attempts to explain behavior.

"The Theory of Planned Behavior" (Ajzen, 1985) considers behavior to be a direct result of behavioral intentions that are, in turn, influenced by three major factors: attitudes towards the environment (i.e., our private attitudes towards performing the behavior in question); the new environmental paradigm (i.e., subjective norms consisting of perceptions of how people who are important to us believe we ought to behave); and attitudes towards ecological behavior (i.e., perceived behavioral control, or our perception of how easy or difficult it is for us to perform a specific behavior). This theory involves at least three components: factual knowledge about the environment, social and moral values regarding environment, and ecological behavior intention. Both, the theory of reasoned action and the theory of planned behavior propose that attitude influences behavior, which is mediated by intention (Kaiser et. al, 1999).

These theories are important in framing any study of environmental behavior. Kals et al (1999) propose that Nature-protective behavior, like reduced energy consumption, is not purely based on rational decisions but is influenced and motivated by emotions (e.g., personal remorse because one has wasted energy and contributed to the detrimental environmental effects of energy production).

Individuals commonly change their behavior but then return to their former ways of behaving. One explanation for this reversal is that concluded that while external factors such as incentives may be effective at initiating behavior, continued participation requires additional "intrinsic motivation" (Katzev & Pardini, 1987-1988

22

cited by Guagnano et al, 1995). However, this perspective does not help us understand coexisting but inconsistent behaviors and attitudes (described above). Although it is widely accepted that knowledge and awareness will lead to behavior change, research to date suggests that the antecedent conditions associated with behavior are both complex and difficult to disentangle. Several have found almost no relationship between behavior, knowledge, and the extent of feeling (affect) towards the protection of the environment (Boerden and Schettino, 1979 cited by Hamid and Cheng, 1995).

Something that is very well known and could help to predict behaviors is that the easier a behavior is to carry out, the less constrains have to be assumed (Kaiser et al, 1999). This sounds logic, but unfortunately is not the case in many situations mainly in those behaviors that are closely observed by society. Also and very important to predict behavior is that past behavior is likely to play a significant role in determining future behavior (Hamid and Cheng, 1995), once an individual have performed a behavior the possibility to have it again increases.

II.3. THREAT PERCEPTION AND ENVIRONMENTAL BEHAVIOR.

Threat perception is one of the most important factors, for this study, to start understanding how and why people have certain environmental behaviors. The extent of environmental awareness may depend on the perceived nature and strength of the threat (Grieshop and Stiles, 1989 cited by Krause, 1993). In other words, if people

can actually experience a threatening situation, their reactions are likely to be more pronounced than if they are told about –but do not experience per se- a threatening situation.

Social structure also has a significant role on how people perceive and behave. Individuals are part of a social structure that substantially influences all psychological variables. Social structure acts in two ways. It shapes early experience and thus an individual's values and general beliefs or worldview (Stern et al, 1995) and these beliefs create certain attitudes and behaviors, which can easily be changed or be inconsistent. The social context might help to create, first, a worldview or perception and, second, a behavior; however, inconsistencies in perception have not been completely explained (Krause, 1993).

There is some information that could help guide to understand this, for instance, it is known that when people calculates rationally, the perception of the costs and benefits of engaging in a certain behavior, this is known as the awareness of consequences (Karp, 1996). This is something that eventually everybody will consciously or unconsciously do. So awareness of consequences is a starting point to study peoples behavior.

Another direction to aim our attention is towards people's values and norms. One can assume that values may guide behavior independent of cost/benefit calculations (Karp, 1996). Values and worldview act as filters for new information or ideas. Information congruent with an individual's values and worldview will be more

24

likely to influence her/his beliefs and attitudes (Stern et al, 1995).

In the same direction but with a different scope is Widegren (1998), who proposes that the essence of a Pro-environmental behavior is some kind of moral and altruistic motivation (Widegren, 1998).

It is clear that the values, worldviews, and norms will guide people to have certain behaviors towards the environment. A big problem for people to realize about the effects on the environment of their own behaviors, is that this effect usually is too marginal to serve as a rational motive for their Pro-environmental behavior (Widegren, 1998).

Even thought it is helpful to predict people's behavior towards the environment through norms, values and, perceptions, also is very important to consider the intention to have that behavior. What helps to create this behavioral intention is known that past behavior and attitude, but not locus of control, predicts behavioral intentions (Hamid and Cheng, 1995). The assumption that past behavior is an important factor to understand current behavior opens a new opportunity for this research because for many threats, until the event has actually been experienced, most people do not take anticipatory action (Burton et al, 1978 cited by Cary, 1993).

But isn't it possible people just behave environmentally friendly because seeks everyone's benefit? The Schwartz model posits that for an individual to act altruistically, she or he must be aware of negative consequences for others of a state

of affairs and ascribe responsibility to individuals like herself or himself who, by their action or inaction, can prevent or create such states (Guagnano et al, 1995).

Once it be possible to explain the dynamics underlying the emergence of a selective perception, once it could be known why event A is considered threatening to some people in a given population and not others, then it might be something significant (Krause, 1993) to understand behaviors. In this study is expected to help to explain how this perception works.

II.4.   THREAT PERCEPTION ON ENVIRONMENTAL PROBLEMS. THE MEXICAN CONTEXT.

When a decision to be made, people rely on processes that have been followed before. It doesn't matter whether it is an individual, a group of persons, or an entity. Process is unique in each case but there are some similar steps in all processes (Lang, Dietrich and White, 1978). Processes start with a stimulus or motive; the very first actions define what will be done throughout the remaining process (Dutton, Fahey & Narayanan, 1983).

When a problem arises and it is time to make a decision, people frequently set process actions intended to be comprehensive and rational. Information is searched widely and analyses are conducted (Mintzberg et al., 1976). When making a decision, the success of that decision depends on many different aspects. Individuals or organizations with a high level of performance have resources that come precisely

from that positive outcome. This presence of resources allow them to make decisions including actions like extensive information search and elaborate analyses (Frederickson, 1985). Different stakeholders influence firms and its management, each one with their own interests. Firms with more proactive profiles do differ from less environmentally committed firms in their perceptions of the relative importance of different stakeholders (Henriques and Sadorsky, 1999). But it was already clear that as Stern (1992) identified a multiplicity of factors influence pro-environmental behavior, with attitudes and values playing the most significant roles. It is one's subjective norms and normative beliefs regarding environment affect the intention to behave ecologically. This relationship decreases if environmental behavior instead of environmental behavior intention is considered (Vining and Ebreo, 1992 cited by Kaiser et al, 1999). It was found that the highest difference is found between environmental behavior intention and environmental behavior.

Environmental protection may be seen as a social dilemma. Collectively, we are better off if the environment is protected, but rational self-interest often dictates environmental exploitation. The role of personal values in influencing pro-environmental behavior is gaining increasing attention relative to other solutions, such as monetary incentives and punitive sanctions. Values have been found to have a positive influence on environmental behavior (Karp, 1996).

Dunlap and Van Liere (1984) research on environmental attitudes has assessed the extent to which individuals concerned with the environment view the

world in ways that differ fundamentally from those who are less concerned with the environment. Cary (1993) proposed that many environmental beliefs appear to have the characteristics of symbolic beliefs. The difficulty of testing environmental knowledge against environmental reality characterizes the often symbolic nature of environmental beliefs and also typifies the perception of environmental risk or hazard.

One of the research done to typify the perception of environmental problem is Baldassare and Katz's (1992). In their study they used only one type of personal threat, i.e., health, to measure how people changed behaviors towards the environment. In our research, different threats are used: to health, to income, to religious belief, to family, and to their nation. In this study will be examined which of these threats is most commonly perceived by Mexican graduate students of the ITESM in Monterrey, Mexico, who also work in Mexican and international firms, and how they react when each one of these threats appear. The reason for including cultural values (religious belief, family and nation) as types of threat, is that these three are very important in the lives of Mexicans as cultural values which affect our perceptions and behaviors (Hernandez & Narro, 1987). In their study, Hernandez and Narro (1987) state that the three most important values for Mexicans are:

1.   La Familia (Family) :

"The basic vital space and point of reference of other realities"

(Hernandez and Narro, 1987).

28

2. La Patria (Nation) :

   "Understood as the big family, as the shared sense, as collective sense"

   (Hernandez and Narro, 1987).

3. La Religion (Religious Believes) :

   "Maybe almost a vital strength of Mexican culture"

   (Hernandez and Narro, 1987).

Beside "La Familia" (Parents, spouse (husband), siblings), it is hard to think of some other reason why Mexicans justify personal sacrifices. The Mexican family is the "creator" of attitudes, beliefs, and values of individuals (Hernandez and Narro, 1987). Sense for "La Patria" (Nation) is very strong in Mexico. It gives a sense of heritage. Religious beliefs are important for Mexicans; Catholic Church is the second national institution (after Education) in which Mexicans trust the most. Almost 3 out of 4 Mexicans consider God as very important in their lives; for Mexicans, Religion is where "Consuelo" (Consolation) and strength can be find and allow them some praying and meditation time (Hernandez and Narro, 1987).

But even this may be valid for Mexicans as a cultural aspect, is important to compare this vision of Mexicans with the idea that instrumental beliefs related to the environment are likely to be more powerful than symbolic beliefs in influencing environmental behavior (Cary, 1993). Because what is valid for some region may not be for another, and even cultural attitudes, costumes, etc. could be changed if a personal threat is perceived. Americans began to pay attention when their own community's air became dangerous to breathe, when their local beaches began to

29

close in the summer because of polluted water, or when they began to face restrictions on home water use because of shortages (Krause, 1993) also when subjected to drought conditions, American residents could respond by expressing attitudes that are more environmentalist (Arcury and Christianson, 1990 cited by Christianson and Arcury, 1992).

This create a sense of community and people starts behaving as that, but this is contrary to the idea that people behaves individually, it is not clear actually, it is not possible to generalize.

Stern et al (1993) propose that if environmental concern were based entirely on self-interest, and individual would favor protecting the environment when and only when doing so would have expected benefits for the individual. A prototypical example is the NIMBY ("not in my back yard") protest, in which individuals become concerned when they perceive that a hazardous industrial process may harm them and their families.

II.5. RELEVANCE OF MANAGERIAL DECISION-MAKING ON THE DESIGN OF A SOLUTION FOR ENVIRONMENTAL PROBLEMS.

According to Geller's approach (Geller, 1995 cited by Allen and Ferrand, 1999), acting on behalf of the environment requires that individuals "actively care" enough to omit other directed (or altruistic) behaviors for environmental protection. This is, individuals must focus beyond themselves and be concerned about others in a

large community before they will act on behalf of the environment. This occurs when an individual's needs for self-esteem, belonging, personal control, self-efficacy, and optimism have been satisfied. These five factors promote a sense of "other directedness" (i.e., concern for others) and are likely to facilitate altruistic concern for the general well being of the community. But the five factors do not directly lead to environmental concern but first stimulate actively caring, which then stimulates environmental concern. Sympathy, the proxy measure of actively caring, mediated the relation between personal control and environmentally friendly behaviors (Allen and Ferrand, 1999).

Making decisions to solve environmental problems is currently an indispensable activity that must be done in companies by managers and in the whole society. It is a different challenge, a different threat. Each day it is more necessary for companies to have conscientious, well informed, and well motivated managers who can make appropriate decisions to solve the environmental problems (Howell, 1991; Covin, 1994). This will allow them to avoid compliance costs, respect environmental regulations and adapt strategy to society's perceptions about environmentally friendly firms.

An adequate motivation to solve problems is an indispensable condition needed to effectively get results (Bargh and Gollwitzer, 1994). Here is proposed that many times, managers do not know the actual scope of environmental problems and, current and future, devastation levels. Often, individuals believe that it is others'

31

(and not our) responsibility to solve the problem —or that the problem will affect others (but not us) (Buchanan, 1996). Often these attitudes arise because it is difficult to have specialized technical information related to the environmental problem (UNEP, 1995).

If managers were made more aware of the direct effects that environmental problems can have on them, they would try to solve it due to its threaten characteristics (Jackson and Dutton, 1988). People who believe an environmental condition have adverse consequences for things they value will be predisposed to take actions (Stern et al, 1993).

So, managers' awareness about what actually is going on and the real direct effects becomes a basic issue to solve the problem. If this basic understanding does not exist, any other effort is unlikely to have a significant effect (Bargh and Gollwitzer, 1994). This could be the reason why many proposed environmental programs (e.g., the Mexico City "Hoy no Circula" Program) have not worked. Alternatively, an adequate strategy may not formulated because this basic awareness doesn't exist. Managers need both internal and external sources of information to make decisions, because they and the organization are part of a system that they affect and are affected by (Wescott II, 1995).

Then, overall environmental actions are an outcome of a series of causally linked external and internal factors. The effect of attitudes and external conditions on

behavior depends on the values of attitudes and external conditions relative to each other rather than the value of either by itself (Guagnano et al, 1995).

But neither environmental laws against behavior harmful to the environment, nor economic incentives for Pro-environmental behavior, can completely eliminate the need for moral norms (Widegren, 1998). Many people believe that current society is depleting nonrenewable energy sources, but they make little change to their behavior consistent with such a belief (Cary, 1993).

Highly attractive external incentives will not be effective in, for instance, promoting enduring changes in recycling because they bring such behavior under the control of external inducements, rather than the individual's own convictions about the value of recycling (Pardini and Katzev, 1983-1984), the problem is that the more dramatic and the more insidious natural hazards, people are generally unable to discern accurately the risk associated with the particular hazard (Barr and Cary, 1984 cited by Cary, 1993).

Because of above, in this study we proposed that how people perceive environmental problems is affected by their awareness of the personal threat that an specific environmental problem could be for them; and for environmental managers this must be addressed by the firm before trying to design the solution to any environmental problem.

To influence behavior, it is first necessary to affect perceptual structures, activating them with the adequate motivation (Carver, Ganellen, Froming and

Chambers 1983). Also the complexity of a strategy is associated with the intensity of information processing and managerial interaction used in its development and implementation (Miller, 1989). The strategy-making process is used both to develop and to implement a strategy. This study may help on the design of environmental strategies for companies and social institutions. This process can be examined in three different dimensions: rationality, assertiveness, and interaction (Miller, 1987). Here it is not attempt to determine which type of process each person follows after they have perceived an environmental problem, but this is an interesting topic for future research.

People can show willingness for changes in life-style but it depends on the perception of how difficult and the consequences that those adjustments were going to be for the individuals involved (Krause, 1993). Collectively, people prefer environmental protection, but few wish to pay the associated costs. Few people make the collectively beneficial choice, "tragedy of the commons" (Hardin, 1968).

CHAPTER III.   RESEARCH DESIGN.

The first section of this chapter presents the model proposed in this study and reviews the potential contributions of this thesis. The second section motivates the 12 hypotheses that are tested in this thesis. The third section of this chapter explains how each variable is defined. Finally, the fourth section describes how the research site selection was made, and how data were collected.

III.1. CONCEPTUAL MODEL AND IT'S CONTRIBUTIONS.

The model constructed for this study is an extended version of the model proposed by Baldassare and Katz (1992). The variables included in current model which were not considered by Baldassare and Katz are:

1. Besides health (used by Baldassare and Katz), here were used: family, income, religious beliefs and nation as factors that could be in threat by an environmental problem.

2. Six strategic actions to be taken to solve environmental problems (Baldassare and Katz did not use any).

3. Six environmental actions to be taken. Baldassare and Katz used four.

4. Five environmental problems. Baldassare and Katz used air and water pollution. |Next figure shows Baldassare and Katz model.

FIGURE 1

36
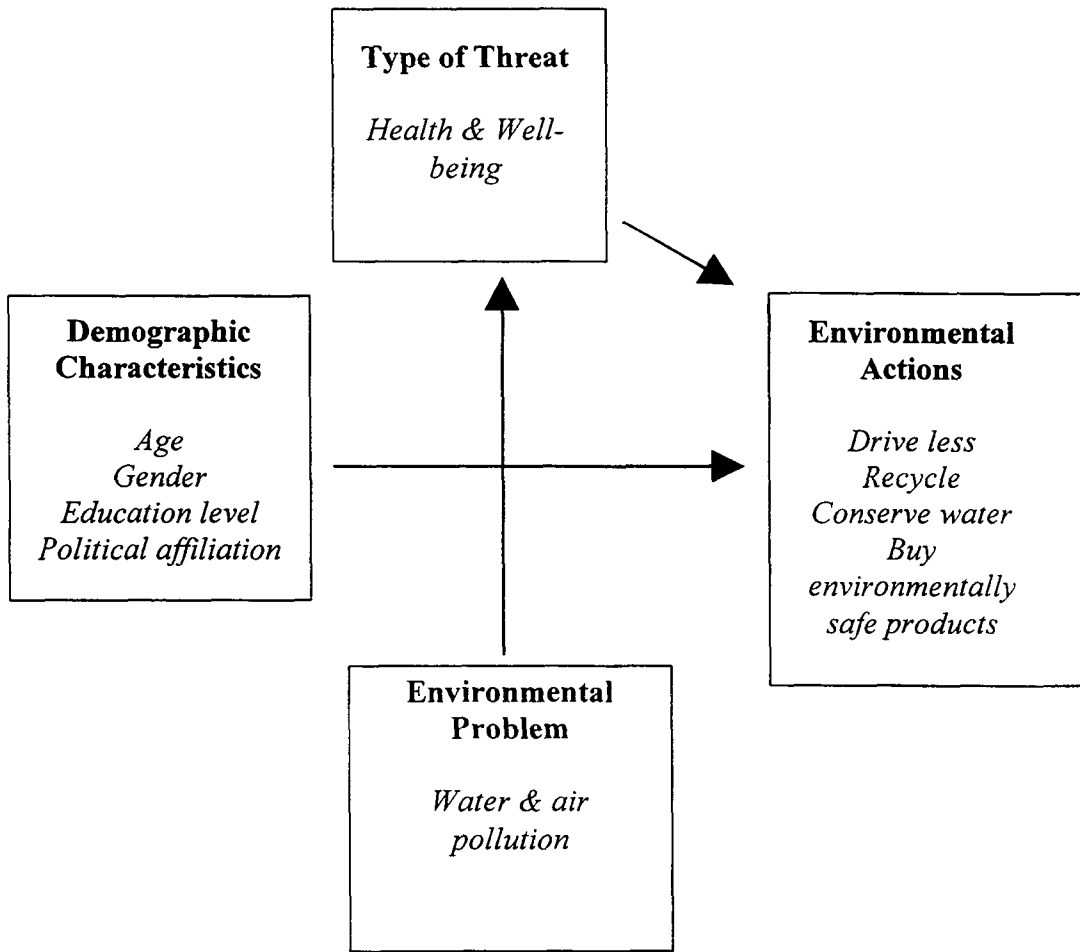
Propositions.

First, demographic characteristics make people to perceive how much the given environmental problems mean a real problem for them. Second, once the environmental problem has been perceived, people define what these problems threaten, this is the type of threat. The type of environmental problem defines then what type of threat it can lead to. It also is assumed that demographic characteristics might affect the type of threat perceived. And finally, once an specific threat has been perceived, the type of threat leads people to take, with certain frequency, the given strategic and environmental actions. This study search to find which type of threat or demographic characteristics has more influence in the frequency of the actions taken, demographic characteristics or type of threat.

The differences with the study of Baldassare and Katz (1992) are:

1. It is expected that demographic characteristics (or some of them) be significant predictors of the perception of the impact of an environmental problem.

2. It is expected that not only the perception of a threat but what type of threat is perceived, leads people to vary the frequency of the actions to take.

3. It is expected that type of problem and demographic characteristics be a predictor of the type of threat to be perceived. In Figure 2 is shown the model for this study.

```
┌─────────────────────┐              ┌──────────────────────────────────────────────────────────┐
│     Perceived       │              │                    Strategic Actions                     │
│   Environmental     │              │                                                          │
│      Threat         │              │           Individual work vs Teamwork                    │
│                     │              │  Solve it with internal people vs Solve it with external people │
│      Family         │              │  Limit the number of people involved vs Involve many people │
│  Religious Beliefs  │              │  Few areas of kowledge represented vs Many areas represented │
│      Nation         │              │     Limit expenses vs Authorize significant expenses     │
│      Health         │              │                    Pray vs Act                           │
│      Income         │              └──────────────────────────────────────────────────────────┘
└─────────────────────┘

┌─────────────────────┐              ┌──────────────────────────────────────────────────────────┐
│   Characteristics   │              │                  Environmental Actions                   │
│                     │              │                                                          │
│       Age           │              │                       Recycle                            │
│      Gender         │              │                 Proper Waste Disposal                    │
│   Education Type    │              │    Support tax increase for environmental protection     │
│   Education Level   │              │       Support Environmental law enforcement              │
│   Outdoor Sports    │              │        Use of environmentally friendly products          │
│                     │              │     Promote a new and more sever environmental law        │
└─────────────────────┘              └──────────────────────────────────────────────────────────┘

              ┌──────────────────────────┐
              │  Environmental Problems  │
              │                          │
              │      Air Pollution       │
              │      Water Sacrcity      │
              │         Leaks            │
              │   Water Contamination    │
              │      Deforestation       │
              └──────────────────────────┘
```

FIGURE 2

38

The main questions to be assumed are:

a) What variables are the most significant predictors of overall environmental actions?

b) Which variables for solving which environmental problem?

It seems the environmental behavior of people is influenced with a wide range of variables which are beyond the individual's control (Hines et al, 1986-1987). Cost of water affects water conservation (Moore et al, 1994); another example is that the number of people in a given household (Gamba and Oskamp, 1994), storage space (Williams, 1991), house ownership (Lansana, 1992), and type of residence (Oskamp et al, 1991) affect recycling behavior. It is important to identify other factors that increase the likelihood that an individual will engage in environmentally conscious behavior (Hamid and Cheng, 1995).

Clitheroe Jr. et al (1998) proposed that a useful model of context begins with one or more "prompts" that initiate a response by an individual or group. The model assumes that prompts are the starting point of an intentional or unintentional psychological and/or behavioral process. The process may be guided by an unstated sense of purpose, or by explicit goals, objectives and timelines as shown in Figure 3.

FIGURE 3

40
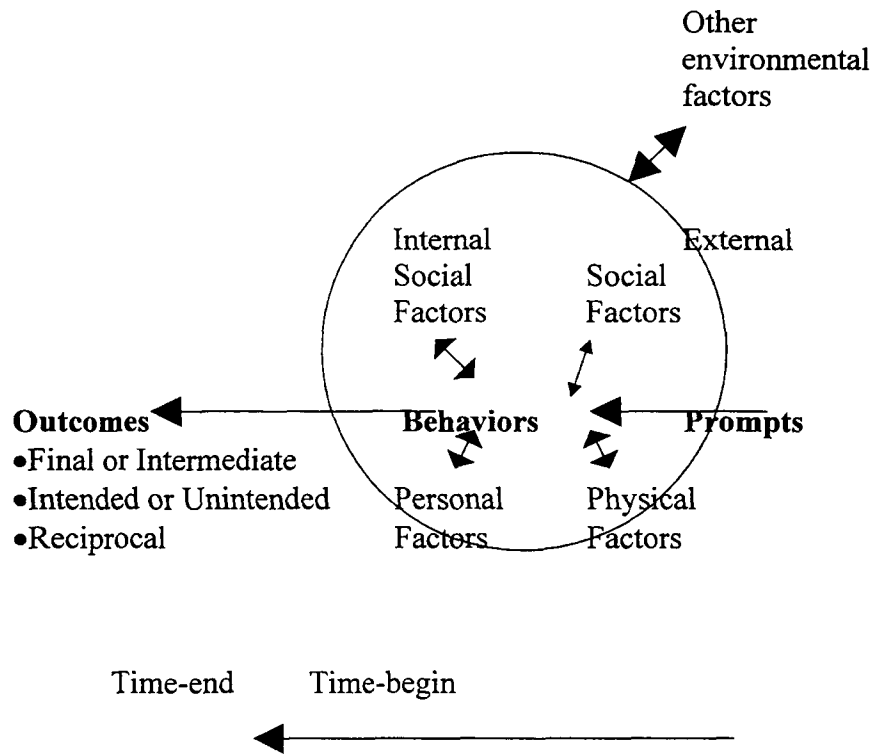
Attitude towards the environment commonly refers to environmental concern (Vining and Ebreo, 1992). Environmental concern is used either as a multiple or a single component approach (Fuhrer, 1995) and covers either environment in general or some particular aspects of environment. All three environmental attitude components –affect knowledge (i.e. cognition) and intention- have been used in parallel to predict ecological behavior (Kaiser et al, 1999). Two types of environmental attitude have been used to predict ecological behavior: (1) attitudes towards the environment, and (2) attitudes toward ecological behavior (Hines et al, 1986-1987).

Several studies found either no relationship between factual environmental knowledge and ecological behaviors (Maloney and Ward, 1973) at best a moderate relationship (Hines et al, 1986/87). When this relationship appears to be stronger, it is knowledge about an ecological behavior rather than factual knowledge about the environment that is related to ecological behavior (Kaiser et al, 1999).

A basic assumption for this study is that, depending on if people perceive the environmental problem as a personal threat or not, the design of a solution and the reactions to change this situation will be different. Van Dijk (1999) explains that environmental uncertainty is not necessarily detrimental to the collective's interest, and very important, that effects of environmental uncertainty depend on the specific type of environmental uncertainty, and the environmental uncertainty may affect choice behavior differently in each dilemmas.

41

It is expected that people would not react towards more overall environmental actions until they perceive a real personal threat even if they are environmentally conscious. Environmental attitude and ecological behavior appear to be at least moderately related (Hines et al, 1986-1987).

Stern et al (1993) consider that motivation to act to be the product of beliefs about consequences for a valued object (awareness of consequences) and the weight or importance of the value orientation towards that object (value weights).

III.2. TESTABLE HYPOTHESES.

The last sections have given the context and explained the model proposed for this study. Even tough many variables have impact on environmental behavior of people; a few of them will be tested in this study.

Hypotheses

Hypothesis 1. "In a normal situation, people usually tend to choose a higher number of less comprehensive strategic actions".

This is, people tend to act in a certain way as a normal routine, preferences like work in teams instead of doing it individually, have been acquired by each person but knowing that certain contexts are better for one behavior that other even tough this don't be their normal preference.

Hypothesis 2. "Strategic Actions taken in a normal case differ from those taken when an environmental problem is perceived".

This means that once a threat has been perceived, the behavior is expected to be changed, what is considered a normal behavior under normal conditions may be modified because of the perception of the presence of an environmental problem.

Hypothesis 3. "Each environmental problem is related with different types of threats depending on how are perceived as affectants of health, family, religious belief, income and nation".

When people has perceived the presence of an environmental problem, each person will define the degree of threat. This degree will depend on what is in threat for them.

Hypothesis 4. "Actions proposed to solve an specific environmental problem differ when a personal threat is perceived. People take different overall environmental actions when family, income, religious beliefs, nation or income are in danger for any type of environmental problem.

When conditions are not normal anymore and a threat is perceive by people, the context change, the actions taken will be more oriented to assure a faster and better solution of the problem thus behavior may change. Once people have decided

that a change in their behavior is necessary, they have to choose what new behavior to take (or not to choose a new one), it may depend on the type of threat perceived by each person. People appreciate thing in different ways thus weight what is most important and tend to orient their best actions to protect it first than other things.

Hypothesis 5. "Actions taken differ depending on age. Younger take a higher number of overall environmental actions than older".

People perceive threats in different ways; many are the factors that may cause this. Age might cause it. Younger and older people may have a different perception of threats, just because the age itself, and then have different behaviors.

Hypothesis 6. "Actions taken differ depending on gender. Female take a higher number of overall environmental actions than Male".

Male and female may have a different perception of threats, just because the gender itself, and then have different behaviors.

Hypothesis 7. "Actions taken will differ depending on Educational level. People with Master degree take a higher number of overall environmental actions than people with Bachelor degree".

Higher or lower educational level may make people to have a different perception of threats, just because the educational level itself, and then have different behavior (or have not).

Hypothesis 8. "Actions taken will differ depending on Educational Type. People that are more "technical" in term of the type of formal education take a higher number of overall environmental actions".

Educational type (humanities, management, sciences, engineering) may make people to have a different perception of threats, just because the educational type itself, and then have different (or not) behaviors.

Hypothesis 9. "Actions taken will differ depending on outdoor sports practice. People who practice outdoor sports take more overall environmental actions".

The outdoor sports practice may make people to have a different perception of threats, just because the practice of outdoor sports (or not) itself, and then have different (or not) behaviors.

It is the goal of this research to show by testing these hypotheses, to understand how and why people behave in certain way but is important to have in mind that simply knowing a person's dominant philosophical outlook will not allow assured prediction of how she or he might act in response to a given ethical situation. One reason is because people does not always conscientiously act in a manner

consistent with their beliefs. They might fail to follow through with what they believe is the right thing to do in a particular situation (Barger, 1993).

III.3. DEFINITION OF THE VARIABLES.

Independent Variables.

The independent variables will be the demographic characteristics: age, gender, education level, education specialization, and outdoor sports practice. Perceived personal threat is also an independent variable. The type of personal threat will provoke strategic and environmental actions to be taken.

Perceived personal threat is defined, as the extent of personal importance (Petty and Caccioppo, 1979) perceived by the decision-maker when solving what he or she perceives as a threat before making the decision. In this study, the personal threat independent variables can be one of the five categories: income, health, nation, religious belief, and family. Income for this study is defined as the amount of money that each person has as outcome for the practice of an specific activity (or activities) during a period of time (Fairchild, 1984).

Health is defined for this study as the normal development of the human biological and psychological functions (Fairchild, 1984).

Nation is defined for this study as the nationality that has achieved the final phase of unification represented by a own political structure and by its settlement in a territory (Fairchild, 1984).

Religious believes is defined in this study as the acceptation as true of one conception about Nature and the character of the Divinity; a set of reciprocate doctrines about responsibilities and obligations between the Divinity and the Humanity and of a set of conduct norms created to guide Life and God's will and to ensure to the believer the approval of his/her conscious and any rewards or freedom of sins, in this world or the other, included in the doctrine of her/his faith (Fairchild, 1984).

Family is defined for this study as the basic social institution. One or more men or women that live with his/her mate in a more or less permanent relation, with recognized rights and obligations (Fairchild, 1984).

Environmental Problems also are used as independent variables. In this study they are calibrated in five different variables, which are: air pollution, water scarcity, leaks and spills of hazardous substances, water contamination and deforestation. The environmental problems were chosen from a list of "Best Management Practices" which are oriented towards risk control (Wescott II, 1995).

Air pollution is defined for this study as the presence in the atmosphere of contaminants with enough time and quantity to be harmful for animals, plants or to interfere in the enjoyment of life and property (Lewis, 1977).

Water scarcity is defined for this study as the lack of water that becomes a severe constraint on food production, economic development, and protection of natural systems (Postel, 1992).

Direct spills (larger volume, one-time, instantaneous event) or leaks (continuous release of small amounts of material over a period of time) are defined for this study (Noyes, 1992) as the emissions from: process vent (from vented process equipment in reaction and separation systems), storage tanks, equipment and piping (that occur due to the escape of process materials through faulty seals in pumps, valves, compressors, flanges and other connectors, agitators, sample connections, and open-end process lines), transfer (that occur when loading and unloading tank trucks, rail cars, and marine vessels), wastewater collection and treatment (that result from the volatilization of organic hazardous air pollutants contained in wastewater, as well as liquids into the ground), and waste storage piles (dust in the mineral processing and inorganic chemical industries), all of them dumped by accident or on purpose.

Water contamination is defined in this study as a change in natural water that may provoke to be used to drink or agriculture. This change is cause by the introduction of organic or inorganic substances (domestic or industrial wastes as sewage and toxic materials, acid rain, temperature changes in water when discharging hot water from power plants, factories and desalination plants (Lewis, 1977).

Deforestation is defined for this study as the permanent elimination of forest or weeds (Lincoln, 1995).

48

Dependent Variables.

In this study the dependent variables are the strategic and the environmental

actions to be taken.

Strategic Actions

Individual work

Team work

Solve it with internal people

Solve it with external people

Limit the number of people involved

Involve many people

Explore only a few areas of knowledge

Explore many areas of knowledge

Limit expenses

Authorize significant expenses

Pray

Act

The degree of variation expected in these dependent variables will flow from

less to more comprehensive strategic actions; they are more comprehensive because

they are attempts to be exhaustive or inclusive (Frederickson, 1985).

The "More Comprehensive Actions" are:

Teamwork

49

Rely on outsiders to solve the problem

Involve many people

Many areas of expertise represented

Authorize significant expenses

Act

Environmental Actions

Recycle

Proper waste disposal

Support tax payment increase for environmental protection

Support environmental law enforcement

Use of environmentally friendly products

Promote a new and more sever environmental law

The degree of variation that is expected to be observe in these dependent

variables will be to flow from less to more comprehensive strategic actions (answers

from "Never" and "Few times" to "Always" and "Frequently").

Research sample.

This study analyzed a group of graduate business students at the ITESM

(Monterrey Tech) in Monterrey Campus as the study sample. The reasons for

choosing this group are as follows.

50

(1)   Easy access to the group lists by name, number, course and field of specialization existed. Consistency of the group (remain the same during the academic period).

(2)   Many of the data that exists in the field has been gathered through groups like these.

(3)   The characteristics of the groups were very similar which reduced the variance.

(4)   All students have received some type of environmental management instruction either by courses at the ITESM or in their work places, reduce the factor of ignorance of the issue.

(5)   A large population was available (more than 1000 students).

(6)   Larger response rate could be expected due to their commitment to the ITESM as students and understanding of the practice of survey application.

With the survey questionnaire, the students were asked to make decisions about which strategic and environmental actions they would take if a particular environmental problem arose. The students were asked to answer the questionnaire based on their personal opinions, not on how they thought I would respond.

Measurement of Variables.

The predictors of a perceived personal threat of environmental problems for this research are demographic variables (age, educational level, educational type, and outdoor sports practice) and the type of environmental problem. And the predictors of overall environmental actions are demographic characteristics and the type of threat perceived. Table 2 explains these predictors for the design of overall environmental actions for the environmental problems used in this study.

Predictors					
Gender	Male	Female			
Age	Less than 25	25-34	35-44	45-54	
Education level	Bachelor	Master			
Education tpe	Science	Engineering	Management	Humanities	
Outdoor sports	Yes	No			
Personal threat	Health	Income	Nation	Family	Religious Beliefs

TABLE 2

In this thesis, several demographic characteristics are evaluated as predictors of environmental behavior. Here I review the existing, but gradually, inconclusive literature about the known effects of these demographic characteristics. Literature presents different results when studying demographic characteristics. Krause (1993) found that perceptions about environmentalism do not vary along demographic lines.

Demographic characteristics

- Age

Age is correlated with negative environmental attitudes (Van Liere and Dunlap, 1980; Scott and Willits, 1994). This suggests that youth are more environmentally oriented, but a recent survey shows that there is no difference in how committed young and old are (Earthview, April 1998).

Christianson and Arcury (1992) found that younger are more concern about the environment and have more positive attitudes towards the environmental movement.

Haldemann and Wister (1993) set that aging is largely defined in terms of decline, restriction and losses; this is why aging individuals and their psychological well being become more dependent on their environment than younger people.

- Gender

Women in developing countries are more environmentally concerned than are men, and this difference is greater for local issues than for global issues (Blocker &

Eckberg, 1989). Prior to this thesis, no research has explored whether these differences exist also in developing countries.

Many studies on gender effects on having a more environmentally conscious behavior can be found in literature. Stern et al (1993) found that women tend to see a world of inherent interconnections, whereas men tend to see a worlds of clearly separate subjects and objects, with events abstracted from their contexts. Women are potentially more environmentalists than men because of a biospheric orientation. This is, have a different and more direct understanding of Nature and our systemic relation with it. Stern et al (1993) explains this saying that if gender differences in value orientation exist with regard to humanistic or biospheric altruism, they are more likely to derive from shared experience than innate differences.

Women do tend to show somewhat more personal concern than do men but they are no more likely to engage in environmental action than are men. Women (and men) of higher social status, with more knowledge, and with greater trust in science are more likely to engage in Proenvironmental action (Blocker and Eckberg, 1997). Also is know that women's nurturance orientation leads them to be concerned about health and safety issues; this is reflected in high levels of environmental concern (Blocker and Eckberg, 1997).

It seems that exist a theoretical justification for expecting gender differences in environmental attitudes and actions but reviews of empirical studies report inconsistent findings on gender and environmentalism (Van Diere and Dunlap, 1980).

55

All this could be explained with the fact that male children are encouraged to adopt a more separatist, controlling role that extends to the objectification and control of the environment and a definition of self as separate from the world (Keller, 1985). Resulting male socialization into a "marketplace mentality" is linked to unecological attitudes that give priority to economic growth, technical mastery of the earth, and exploitation of resources, regardless of environmental destruction (Barbour, 1980).

- Education Level and Education Type

Higher education levels are positively correlated with environmental knowledge (Arcury, 1990) and environmental attitudes (Van Liere and Dunlap, 1980; Arcury, 1990). Education level is also the best predictor for environmental-protection activities (Scott and Willits, 1994). Managers with more technical (e.g., science and engineering) backgrounds control environmental risks better than do managers with less technical background (Hambrick and Mason, 1984). Christianson and Arcury (1992) found that better educated are more concern about the environment and have more positive attitudes towards the environmental movement.

- Outdoor sports practice.

People who practice outdoor sports are more environmentally concerned than those who do not (Greenwire, April 1998). We can expect that outdoor sports activity will be a strong variable to predict an environmental behavior. Finger (1994)

56

demonstrated that experiences with nature are powerful predictors of nature-protective behaviors and showed that environmental experiences are even more important than environmental value orientations. On an empirical level, the few existing data support the hypothesis that direct encounters with nature (e.g. playing or walking outdoors, experiencing nature with all five senses) can promote affinity towards nature and, subsequently, behavior to protect its natural functioning. Emotional affinity towards nature proved to be as important for the prediction of nature-protective willingness and behavioral decisions as interest in nature and indignation about insufficient nature protection (Kals et al, 1999).

In almost all variables exists an extra factor that may affect behavior. De Young (1990) found that, while general attitudes towards recycling are strongly positive among Americans, the main barrier to behavior seems to be inconvenience.

Type of Personal Threat

People may have environmental attitude and could say that would have certain behaviors but many times is because they are not facing the problem closely, in their region or person. Therefore, an imminent threat for them, once it is perceived like that, things change so does behavior. Research has shown that a general/local distinction is important, since people who are not concern about environmental issues in the abstract may be concerned about more local issues (Eckberg and Blocker, 1989). This is confirmed by Cary (1993) who found that beliefs about the seriousness

of the problem in distal locations were more unstable than beliefs about the seriousness of the problem in proximate locations.

One of the issues that are used in this study and that could be perceived in threat by environmental problems is religious beliefs. Some research has been done on the effects that this has on environmental behavior. In Mexico, as mentioned before, people consider religion as extremely important in their lives. It is expected that if people perceive that their religious beliefs are affected by an environmental problem, they be more willing to change their behavior towards a more environmentally conscious behavior. Research through literature shows that considerable discussion has been done recently about the possible relationship between religion and environmental attitudes, much of it centering on Lynn White's argument that Christian beliefs carry an antinature bias (Eckberg and Blocker, 1996). The same research found common religiosity to be utterly unimportant in environmental issues. A problem with stewardship is that it was find non-proenvironmentalism effects of Christian beliefs. Asking, "How important would you say religion is in your life" assessed the subjective significance of religion to respondents (called "Importance"? Responses were scaled in a Likert format from "extremely important"(5) to "not important" (1) (Eckberg and Blocker, 1989). Hand and Van Liere (1984) applied a survey in Washington State and their findings show that Judeo-Christians were generally less likely to be concerned about environmental issues that were non-Judeo-Christians and were more likely to believe that humanity

should dominate nature.

According to Hines et al (1986-1987), some underlying factors such as economic constraints, social pressures, and opportunities can impact the choice of actions and one's attitude. However, these factors were not examined in this study.

As a final point in this literature review, it is important to remember that environmental problems are primarily the result of maladaptive behavior rather than an unavoidable consequence of changes in technology (Maloney and Ward, 1973). This is a fundamental point in solving environmental problems.

III.4. RESEARCH SITE SELECTION, DATA COLLECTION STRATEGY.

Research Site Selection.

This study was applied at the Graduate Business School and Leadership (EGADE) of the ITESM (Monterrey Tech) in Monterrey, Mexico. The School was recently (August 1999) classified as the Number 1 business school by the specialized magazine *America Economia* (same ranking obtained last year). This school is located in Monterrey city ranked as one of the three most important industrial cities in Mexico. This also places the city as one of the cities with more environmental problems, mainly air pollution, deforestation and water scarcity. The ITESM also has several groups that orient their research, programs and activities to environmental issues promoting environmentalism continuously among the ITESM community

59

making this an ideal site to apply an environmental study. At the ITESM exist world

class resources, environmental concern and engagement and environmental education

at all levels. So the absence of these internal factors is not a problem in this case, but

could be in some other cases and could be also a subject for future research. And

finally, proximity to the sample group also was a reason to choose the site, mainly

because of time, money and effort savings.

Data Collection Strategy

The Survey.

Data were obtained by using a survey. A survey was used as the instrument to

measure behaviors in this study for several reasons. This methodology has been used

in many studies of environmental behaviors. This study focuses on attitudes and

behaviors; attitude surveys have been of used commonly to collect information

regarding what people believe about a problem and what possible solutions to the

problem they perceive. This information is provided in most attitude surveys and is

the most popular reason for doing attitude surveys as part of an environmental

management program (Heberlein, 1989). By using an attitude survey here, the results

can be easily compared to the many earlier studies with similar methodology.

Some problems to face to when applying a survey is that in many situations,

when responding to a survey, people use cognitive processes that ignore details and

problem specific information (Stern et al, 1995). It is also important to know that

60

reliance on opinion surveys is seen as fundamental problem in any analysis of environmental awareness (Krause, 1993). This data-gathering technique is susceptible to a variety of unique, and potentially disruptive, problems such as the time of the day, psychological disposition of the respondent, and the individual's definition of the topic along with his or her willingness to discuss (Krause, 1993) This and other influences can significantly affect the quality of survey data. In other word the analysis is often based on weak foundations (Krause, 1993) and is better not to generalize or take results as definite, always further analysis would help to improve the discussion.

The main purpose of the survey is to obtain data to support the proposed hypotheses. Each question will help to test some hypothesis. This relation is as follows:

Question 1 will give data for Hypothesis 1.

Questions 1 and 2 will give data for Hypothesis 2.

Question 3 and 4 will give data for Hypothesis 3.

Questions 5 and 6 will give data for Hypothesis 4

Question 6 will give data for Hypothesis 5 to Hypothesis 9.

Questions on general data will help to test all hypotheses.

The design of the questions is based on some of the existing survey instruments, which were used before to observe and predict environmental behavior (Frederickson, 1985; Cowan, 1990; Baldassare and Katz, 1992; Westcott II, 1995).

Their formats are used in this study and questions were designed with a completely new format. Frederickson (1985) used strategic actions (defined as more or less comprehensive). A 1-5 Likert scale was used in all questions. In questions 1, 2, 5 and 6 the scale values were "Always", "Frequently", "Some times", "Few times" and "Never"; in question 3 values varied from "The most important and first to defend" (5) to "The less important and last to defend" (1) and finally question 4 varies from "Very serious" to "Not serious at all".

Before applying the survey, a pre-test survey was given to 21 ITESM students, and 2 ITESM professors and 7 people no affiliated with the ITESM. The questionnaire was modified after receiving feedback from this pre-test group. These changes are described in Appendix 1.

Due to the characteristics of the issue treated in this experiments, the "social loafing" effect could be a factor in this study (Harkins, 1986) in his study. That is, the environmental problem is a situation that by itself provokes by itself social attraction. If people think that their answers will be evaluated, their answers could be different than if they thought they wouldn't be evaluated. Also, filling out the survey could be affected by whether they are in groups or alone when answering the questions. To minimize these effects, the subjects were informed that the questionnaires were anonymous and confidential, and that they would be alone without supervision when answering the questions taking the questionnaires to their home to answer it.

The survey was anonymous and personally applied to each group, explained each question and clarified each concept. It was not delivered to those students that could not listen the explanation of the questionnaires and the rules to answer it. Students took the questionnaire with them to be answered within 7 days. Then the questionnaire was picked up in each classroom. Telephone number and e-mail address was submitted in case of any question or doubt about the questionnaire and its content. The statistical analysis was calculated using SPSS Version7.5 for Windows. Explanation of the statistics done is shown in appendix 2.

Participants also were told that there was not right or wrong answers and were instructed to specify the answer that best conveys their understanding and recommendations.

Question 1 is oriented to know which are the normal behaviors based on personal working preferences (i.e. when solving a problem if they normally prefer to work in team instead of individually but recognizing that context leads to the best practice for the specific problem). This will help to compare if a behavior change is done when a environmental problem and when a personal threat has been perceived.

Question 2 is similar to question 1 but in this case the presence of an environmental problem as a concept is added. Also environmental actions are included to be selected.

Question 3 is a importance ranking. Here five different factors (health, family, income, religious beliefs and nation) are asked to be ranked from the most important and that would defend first to the less important and would defend the last.

The first three questions are oriented to know how people behave in a "normal" situation. Then, the answers for this questions were used to be compare with their answers once the presence of a personal threat is perceived (questions 5 and 6).

Question 4 would give data on how each specific environmental problems may be perceived as a threat and affectants of the five different factors (health, family, income, religious beliefs and nation) in different degrees.

Question 5 is were by the first time respondents are asked to think on how to design a solution for specific environmental problem. Here the presence of a personal threat is not mentioned yet so the answer is expected not to be biased by the perception of that threat but to solve a problem that could be anywhere.

In Question 6 the presence of a personal threat is obviated, students are expected to design a solution having in mind that the problem to solve is a problem that could, if not solved properly, affect them in a very short period of time, directly to each of the five factors and severely. The question is divided in 5 parenthetic sentences each one representing one of the five factors. Three examples of how their health, family, income, etc could be affected are included to put all of them in the same threat context. It is oriented to know to which factor they give a higher weight

to protect immediately (Nation, Religious Belief, Budget, Health and Family) and their reactions for each environmental problem.

The last part of the questionnaire is oriented to collect data on sample general characteristics; this is gender, age, education level, education type, and outdoor sports practice.

CHAPTER IV.   RESULTS.

This chapter describes the analysis and results of the ten hypotheses. The first section of this chapter describes the sample characteristics. Finally, the second section shows the results of the ten hypotheses. The ten hypotheses explored how people change behaviors measured by the election of strategic and environmental actions once a personal threat cause by environmental problems was perceived.

IV.1. SAMPLE CHARACTERISTICS.

The explanation of the relation of the variables is shown below in the following equations:

Y = Strategic and Environmental Actions

$Y = f(X7)$

$Y = f(X1); Y = f(X2); Y = f(X3); Y = f(X4); Y = f(X5)$

$X7 = f(X6)$

$X7 = f(X1); X7 = f(X2); X7 = f(X3); X7 = f(X4); X7 = f(X5)$

Where:

X1 = Age

X2 = Gender

X3= Educational Level

X4 = Educational Type

X5 = Outdoor sports practice

X6 = Types of Environmental Problem

X7 = Types of Threat

Table 3 shows the relations above mentioned.

Environmental Problems 1	Demographic Characteristics 2	Type of Threat 3	Strategic & Environmental Actions 4

Step 1		Step 2
1 defines 3	THEN	3 defines 4
2 defines 3	THEN	3 defines 4
2 defines 1	THEN	1 defines 3

TABLE 3

68

A group of graduate business students of the EGADE (Graduate School of Business and Leadership) of the ITESM (Monterrey Tech) are the sample used. The size of the sample will be statistically calculated using the formula to set the adequate size depending on the margin of error, level of confidence, z-score and estimate of proportion. The sample size also depended on the availability of students and approval of professors and students to answer the survey. This is, the questionnaire only was applied to those who accept to answer it.

The sample size was chosen to give 95 % confidence that the results had no more than a 5 % margin of error (Bradt and Osteraas, 1993).

The potential population of students was approximately 1020 this meant a set of 87 groups of students were the survey could be applied and 51 professors to contact. At the beginning the survey was thought to be applied at a transnational Mexican firm with plants in Mexico and several countries. After some months of contacting them with a tentative approval to apply the survey in the company, they decided that it was not possible to apply it there. A fast shift was proposed to the Doctoral Committee and was approved the application of the survey to Graduate students of the ITESM that at the end resulted a better option in many ways. The idea was notified to the Director of the MBA of Monterrey Campus at the ITESM and the project was approved immediately. Some groups (executive format) already had finished their courses so finally a group of 44 professors were contacted by email, telephone and personally and was asked their permission to apply the questionnaire in

their groups. The total of the groups were the survey could be applied also was reduced to 78. Groups varied from small (8-7 students) to large groups (50-70 students). After the first approach to the group of professors, 22 (50 %) answered the petition to apply the survey in their groups. Having then the possibility to apply the questionnaire to 30 courses (38 %). During the application of the survey a common situation was to find in some groups some students that already had received (and some answered) the survey so only was delivered to those students that had not received the questionnaire in a prior group. It was decided that the survey would be applied first to those groups were professors approved its application. The first, who answered, the first were it was applied. During four weeks the different groups were visited in their classroom prior visiting schedule with the professor. The explanation of the survey (purpose, concepts explanation, etc.) lasted from 10 to 20 minutes, in some groups the questionnaire was applied at the beginning of the class, in some during the class, in some during the break, in some right after the break and in some at the end of the class. Some professors denied openly since the beginning that the survey to be applied in their class (2 professors). The groups had a week to answer the questionnaire. During second week, those delivered during the first week were picked up and deliver others to new groups. After three weeks of application only a 10-15 % rate of return was achieved. Two strategies were followed: first, students were asked to deliver the questionnaire directly to each professor or at the office of the MBA Director with their school ID number ("Matricula") and indicating in which

70

group and professor the survey was delivered, this increased considerably the return rate; second, to achieve the number of desired sample, it was necessary to contact three more large groups (each one of them with 63, 62 and 51 students each) were professors had not returned an answer to the application request. Even in these groups there were students who already had answered the questionnaire, several had not. So the total of professors contacted was 25 (57 %) and groups were the questionnaire were applied 33 (42 %). The sample was randomly selected from the first 400 students who properly and completely returned the questionnaire. At the end the responding sample was a total of 395 surveys, 11 were not included because incomplete or improper answer of the questions, 5 questionnaires which were complete were not included because they were received later so 384 (59% of the 650 questionnaires applied) were used as data, this means 37 % of the potential population.

Most students of the sample work in different functions at several firms, this heterogeneity is desirable to avoid a focus on idiosyncrasies associated with, for example, a particular functional orientation. As when they confront the same types of problems repeatedly and think about them in unique ways (Cowan, 1990).

Also, in the school all students have "Leadership for Sustainable Development" as a core course so the lack of environmental awareness may not be a factor. This may make people more sensible to environmental problems. These could be a subject for a future research, how does the absence or presence of environmental

71

awareness affect people's perceptions and then the election of practices. Next tables

show statistics for each characteristic:

	N Valid	Median	Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic
Age	384	2 (25-34)	.7444	.5541
Education Level	384	1 (Bachelor)	.3989	.1592
Education Specialization	384	2 (Management)	.7322	5361
Gender	384	1 (Male)	.4927	.2428
Outdoor Sports Practice	384	1 (Yes)	.4957	.2457

TABLE 4

73

Age	Frequency	Percent	Cumulative Percent
Less than 25	118	30.7	30.7
25 to 34	216	56.3	87.0
35 to 44	33	8.6	95.6
45 to 54	17	4.4	100.0
Total	384	100.0	100.0

TABLE 5

Bar Chart

Student's Age
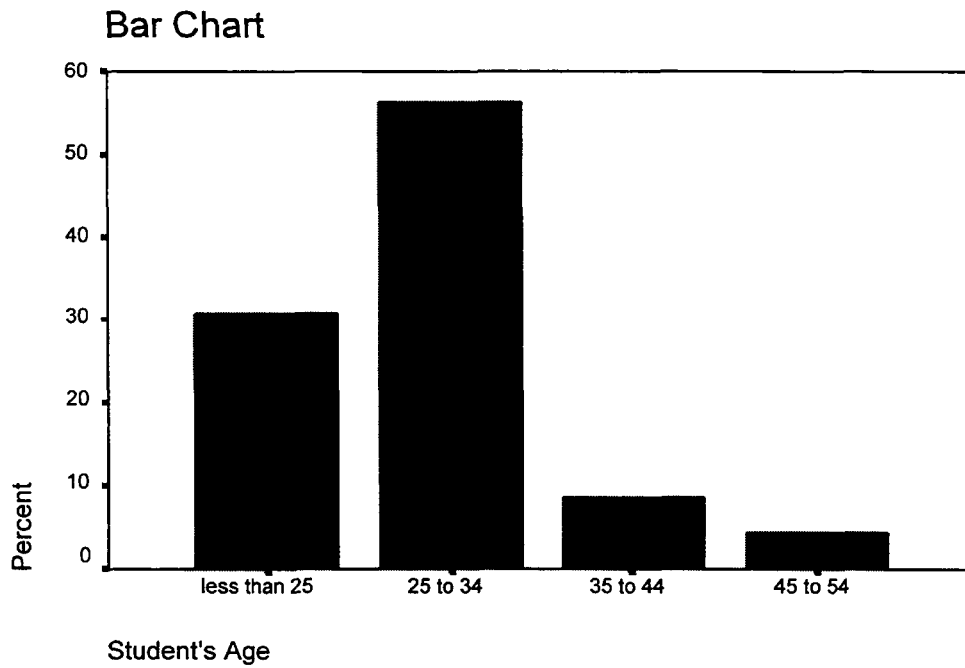
FIGURE 4

Education Level	Frequency	Percent	Cumulative Percent
Bachelor	308	80.2	80.2
Master	76	19.8	100.0
Total	384	100.0	100.0

TABLE 6
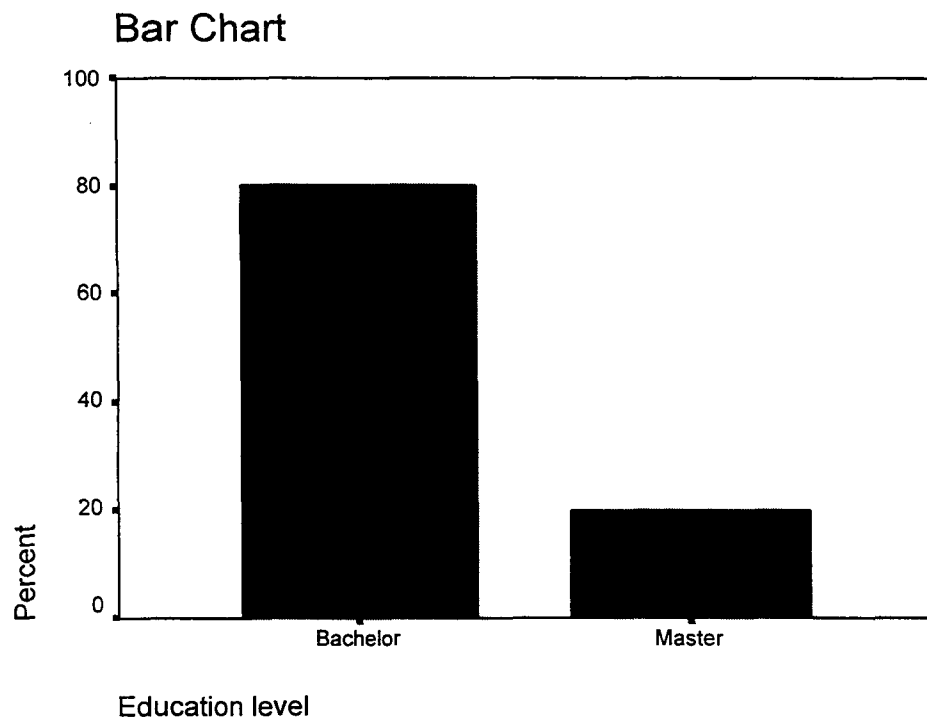
FIGURE 5

Education Specialization	Frequency	Percent	Cumulative Percent
Engineering	124	32.3	32.3
Management	211	54.9	87.2
Humanities	35	9.1	96.4
Sciences	14	3.6	100.0
Total	384	100.0	100.0

... TABLE 7

Bar Chart
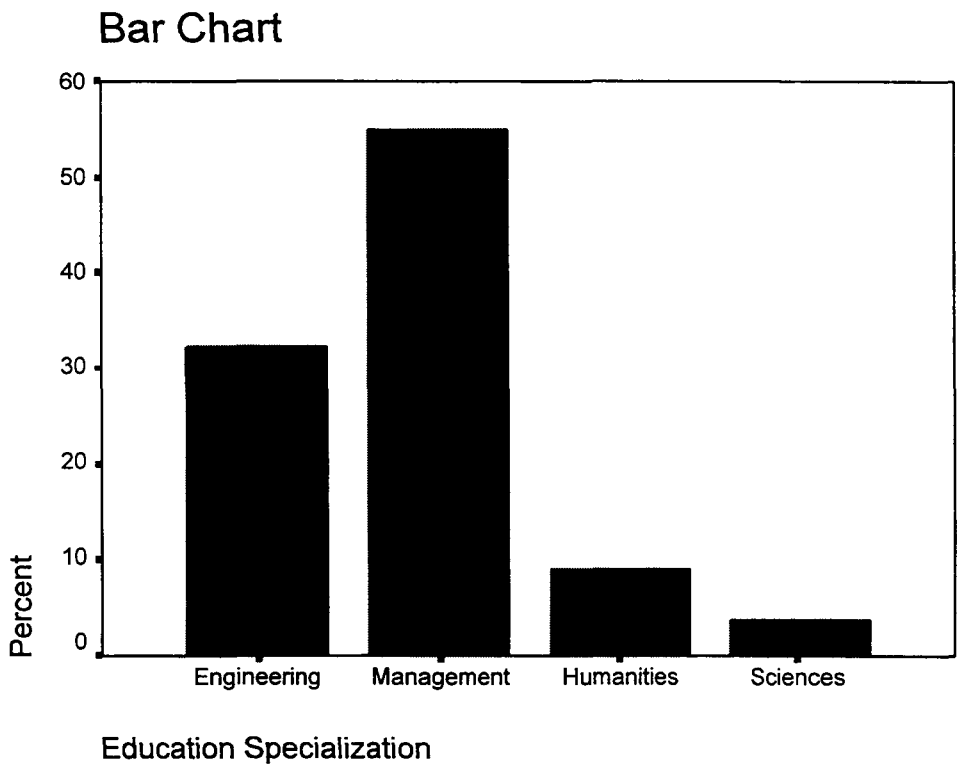
FIGURE 6

Student's Gender			
	Frequency	Percent	Cumulative Percent
Male	226	58.9	58.9
Female	158	41.1	100.0
Total	384	100.0	100.0

TABLE 8

Bar Chart
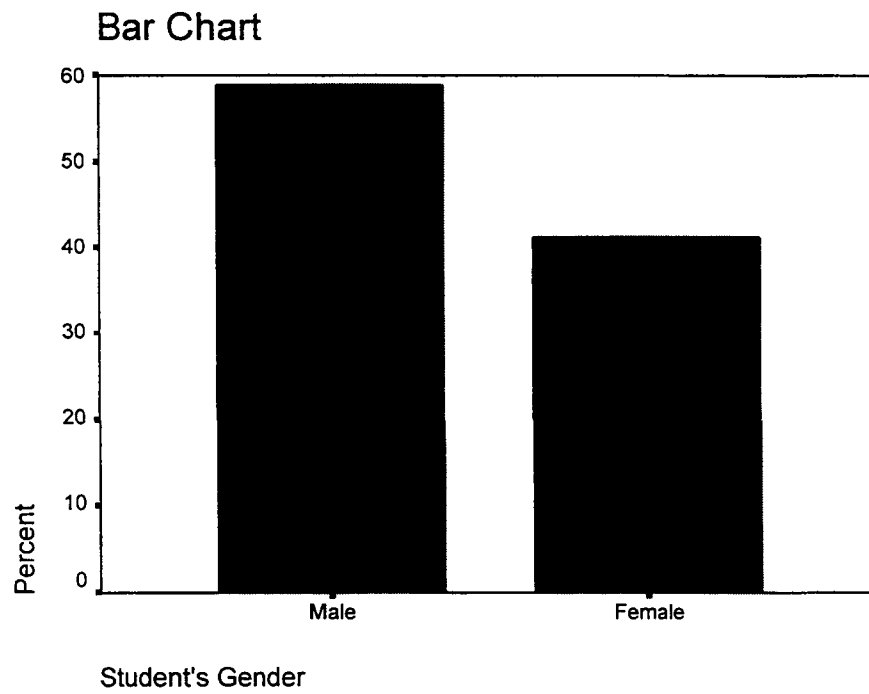
FIGURE 7

Outdoor Sports Practice			
	Frequency	Percent	Cumulative Percent
Yes	219	57.0	57.0
No	165	43.0	100.0
Total	384	100.0	100.0

TABLE 9

Bar Chart

Practice Outdoor Sports
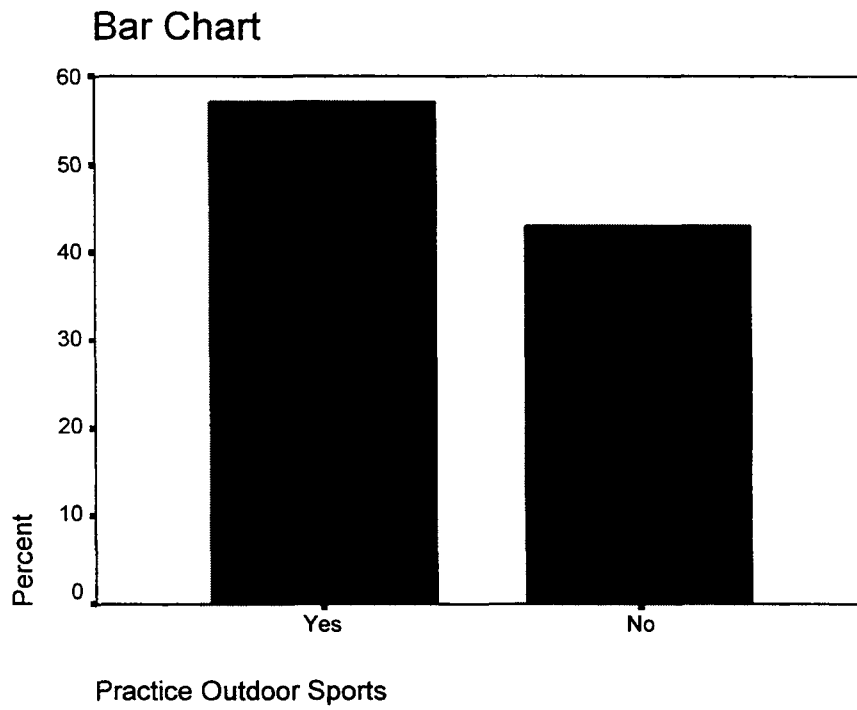
FIGURE 8

Variance statistics for age and education specialization show that the sample is not representative in this issues. Therefore, predictions can be done based only on education level, outdoor sports practice and gender.

IV.2. TEST OF HYPOTHESES.

Each hypothesis is listed which its corresponding null hypothesis. Null hypothesis will be tested and then accepted or rejected.

Hypothesis 1. "In a normal situation, people usually tend to choose a higher number of less comprehensive strategic actions".

Null Hypothesis 1.   "In a normal situation, people usually tend to choose a lower number of less comprehensive strategic actions".

The responses could be:

Less comprehensive responses	More comprehensive responses
Individual work	Teamwork
Rely on outsiders to solve the problem	Rely on insiders
Involve few persons	Involve many persons
Few areas of expertise represented	Many areas
Authorize limited expenses	Authorize significant expenses
Pray	Act

The corresponding null hypothesis is tested by asking whether "Never" and "Few Times" was the most common answers by each respondent whatever be their demographic, organizational and personal characteristicS. Responses of "Never" and "Few Times" as the most common answers are consistent with the null hypothesis and responses of "Always" and "Frequently" as the most common answers are inconsistent with the null hypothesis.

Question 1 provides data for Hypothesis 1 to evaluate their common managerial style.

Summary of crosstab analysis for answers of question 1 are shown in table 10, complete crosstab results are shown in table 11. Crosstab calculations use the following formula:

$r =$ number of rows in table

$c =$ number of columns in table

$f_{ij} =$ frequency in position (row i, column j)

$x_i =$ distinct values of row variable arranged in ascending order, i=1,..,r

$y_j =$ distinct values of row variable arranged in ascending order, j=1,..,c

$$R_i = \sum_{j=1}^{c} f_{ij} \qquad C_j = \sum_{i=1}^{r} f_{ij} \qquad N = \sum_{i=1}^{r}\sum_{j=1}^{c} f_{ij}$$

As shown in table 11, Chi-square analysis shows significance levels close to zero. Lambda values and uncertainty coefficients were calculated, they measure the benefit of predicting a value of one categorical variable when a value of the second

80

variable is known In general lambda values (probability of error) and uncertainty

coefficients (reduction in uncertainty of one factor when the other is known), they go

down by about 15 percent and in several cases are zero. Blank spaces means that

cannot be computed because the asymptotic standard error equals zero (see an

example of this analysis in Appendix 3).

Conditions/ Factors	Normal Conditions (Presence of No Problem) (%)	
	Never	Few Times
Work	6.3	22.7
People	0.0	0.0
Number of People	3.6	1.8
Knowledge areas*	13	32.3
Expenses	6.8	13.3
Action*	32	33.6

TABLE 10

Normal Conditions	Significance Chi-Square	Lambda	Uncertainty Coeff.
AGE			
Work	.000	0.139	.000
People	.000	0.165	.000
# People	.000	.227	.000
Areas	.000	.007	.000
Expenses	.000	.000	.000
Action	.000	.005	.000
EDUCATION LEVEL			
Work	.000		.000
People	.168		.171
# People	.000	.222	.000
Areas	.000	.148	.000
Expenses	.319		.295
Action	.000	.037	.000
EDUCATION TYPE			
Work	.000	.000	.000
People	.000		.000
# People	.000	.058	.000
Areas	.000	.000	.000
Expenses	.000	.011	.000
Action	.000	.000	.000
GENDER			
Work	.000		.000
People	.000	0.119	.000
# People	.000	.360	.000
Areas	.018	.032	.018
Expenses	.000	.679	.000
Action	.000	.018	.000

TABLE 11

OUTDOOR SPORTS

Work	.000	.000	.000
People	.223		.219
# People	.000	.091	.000
Areas	.000	.205	.000
Expenses	.000		.000
Action	.000	.007	.000

TABLE 11

Table 10 show that for all factors except for "Action" and "Knowledge areas" people prefers as their normal behavior less comprehensive strategic actions.

Comparisons of medians show that most common value was "Some times" for three of the factors and "Frequently" for 2 of the factors, the lower values was for "Action" with a median of 2 ("Few times").

Interpretation for the factor "Action" is that the group analyzed is not very concern about "Religion" as is seen below in other analysis and they prefer to act instead of pray knowing that the first is, from a practical point of view, more productive, also could be that both values of the factor are not completely opposite. In the case of "Knowledge areas" could be because feeling unconfident on getting involved in an unknown field or lack of systemic view.

In general, results show that in normal conditions people prefers "Always" or "Frequently" to Work individually rather than in Teamwork. "Always" or "Frequently" to solve problems with insider rather than outsider. "Always" and "Frequently" limit the number of people involved than involve many. "Never" or "Few times" involve many areas of knowledge rather than few. "Always" or "Frequently" limit expenses rather than authorize significant expenses. "Never" or "Few times" pray rather than act.

Based on chi square, lambda, uncertainty coefficients, as well as on frequency (which show that the most common answers were not "Never" and "Few times") results, null hypothesis 1 is rejected and alternative hypothesis 1 is accepted.

Hypothesis 2. "Strategic Actions taken in a normal case differ from those taken when an environmental problem is perceived".

Null Hypothesis 2. "Strategic Actions taken in a normal case do not differ from those taken when an environmental problem is perceived".

The response could be :

Normal situation   Situation with Environ. Problem Perceived

Specific Actions   Same Specific Actions as in Normal Situation

Asking whether the strategic actions were the same chosen in a normal situation than those when each respondent perceived an environmental problem whatever be their demographic, organizational and personal characteristics tests the corresponding null hypothesis.

Response of "Same Answers" is consistent with the null hypothesis and responses of "Different Answers" are inconsistent with the null hypothesis.

Questions 1 and 2 will give data for Hypothesis 2 to evaluate if there is a change between strategic actions taken in a normal situation and when an environmental problem is perceived.

As shown in table 12, Chi-square analysis shows significance levels close to zero. Lambda values and uncertainty coefficients were calculated, they go down by about 10 percent and in several cases are zero.

A crosstab analysis of answers (frequencies) for question 1 and 2 is used to

test Hypothesis 2. Results of both questions are compared and shown in Table 13.

Environmetal Problem	Significance Chi-Square	Lambda	Uncertainty Coeff.
AGE			
Work	.000	0.746	.000
People	.000	.000	.000
# People	.000	.016	.000
Areas	.000	.285	.000
Expenses	.000	.031	.000
Action	.000	.005	.000
EDUCATION LEVEL			
Work	.012		.001
People	.000		.000
# People	.000	.035	.000
Areas	.000		.000
Expenses	.306		.119
Action	.001		.000
EDUCATION TYPE			
Work	.000		.000
People	.000	0.142	.000
# People	.000	.006	.000
Areas	.000	.000	.000
Expenses	.000	.497	.000
Action	.000	.023	.000
GENDER			
Work	.007	.240	.008
People	.000	.000	.000
# People	.013	.137	.013
Areas	.018	.032	.018
Expenses	.000	.281	.000
Action	.000	.046	.000

TABLE 12

OUTDOOR SPORTS

Work	.000	.001	.000
People	.000	.038	.000
# People	.000	.146	.000
Areas	.000	.012	.000
Expenses	.003	.733	.000
Action	.005	.535	.000

TABLE 12

Conditions/ Factors	Normal Conditions (Presence of No Problem) (%)		Normal Conditions (Presence of Env. Problem) (%)	
	Never	Few Times	Never	Few Times
Work	6.3	22.7	37.8	26
People	0.0	0.0	7	9.4
Number of People	3.6	1.8	26	18.8
Knowledge areas	13	32.3	23.2	35.7
Expenses	6.8	13.3	15.1	23.4
Action	32	33.6	36.5	34.6

TABLE 13

Table 13 shows the comparisons of percentage of normal conditions when no environmental problem was specified and when the presence of an environmental problem was specified. Percentages in table represent the amount of "Never" and "Few times" answers in normal conditions, this is, when no type of threat perceived and no type of environmental problem were specified. The second column shows results when the presence of an environmental problem was mentioned in the question and the third column shows results when the presence of an environmental problem was mentioned (but not specified what type of environmental problem).

It is obvious that responses were not the same in both cases, this is inconsistent with the null hypothesis. In all cases answers were more towards more comprehensive actions when the presence of an environmental problem was mentioned in the question.

Based on chi-square, lambda and uncertainty coefficient values, as well as on frequency results, the null hypothesis 2 is rejected and the alternative hypothesis 2 is accepted.

Hypothesis 3. "Each environmental problem is related with different types Of threats depending on how are perceived as affectants of health, family, religious belief, income and nation".

Null Hypothesis 3. "Each environmental problem is not related with different types of threats depending on how are perceived as affectants of health, family, religious belief, income and nation".

91

The response could be :

	AP	WS	L	WC	D
Health	T1				
Family	T1				
Income	T1				
Relig. Beliefs	T1				
Nation	T1				

AP = Air Pollution

WS = Water Scarcity

L = Leaks and Spills

WC = Water Contamination

D = Deforestation

Where T1 is the level of threat perceived for Health for each environmental problem. The level of threat may (or not) vary across the different environmental problems but not across the factors.

Asking whether the different environmental problems affect threat perception to the different factors by each respondent the same way regardless of their demographic, organizational and personal characteristics test the corresponding null hypothesis. Response of "Yes, they do affect threat perception the same way" is

consistent with the null hypothesis and response of "No, they don't affect threat perception the same way" is inconsistent with the null hypothesis.

Question 3 and 4 will give data for Hypothesis 3 to evaluate how different environmental problems affect the threat perception to the different factors. First, a frequency analysis was done to answers of question 3. Results indicate what normally is the most important for respondents; these results are shown in Table 14 and were compared with answers for question 4 to test Hypothesis 3.

Factor	Ranking	%
Family	1st	47.7
Health	2nd	38.8
Income	3rd	46.4
Rel. beliefs	4th	30.5
Nation	5th	39.3

Frequencies of importance

Scale : 5= the first most important and first to defend
4= the second most important and second to defend
3= the third most important and third to defend
2= the fourth most important and fourth to defend
1= the fifth most important and last to defend

TABLE 14

Table 14 explains that 47 % of students ranked Family as the most important thing and first to defend. A lower percentage ranked it as second, third, fourth and fifth. The highest rank that Health received was second with 38.8 % of students, lower percentages ranked it as first, third, fourth and fifth. The highest rank that Income received was third with 46.4 % of students, lower percentages ranked it as first, second, fourth and fifth. The highest rank that Religious Beliefs received was fourth with 30.5 % of students, lower percentages ranked it as first, second, third and fifth. The highest rank that Nation received was fifth with 39.3 % of students, lower percentages ranked it as first, second, third and fourth. Next figures summarized this data.

60 —

50 —

40 —

30 —

20 —

Percent

10 —

0 —

Fifth most important   Third most important   First most important

Fourth most importan   Second most importan

Importance Family

FIGURE 9

FIGURE 10

Fifth most important   Third most important   First most important

Fourth most importan   Second most importan

Importance Income

FIGURE 11

98

Importance Religious Belief
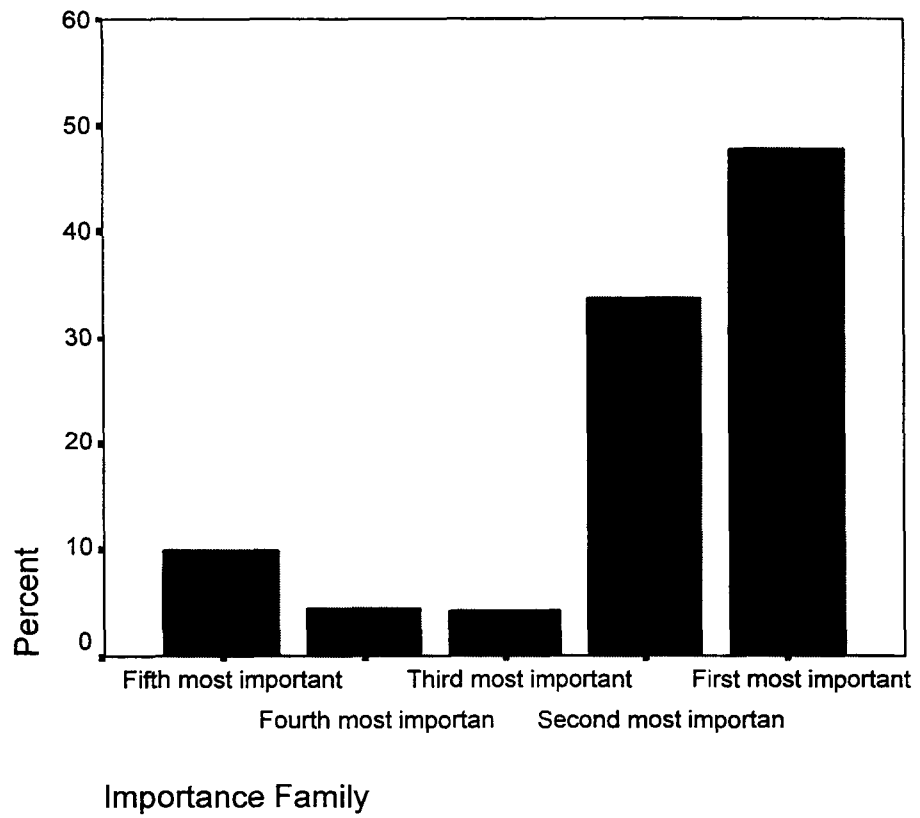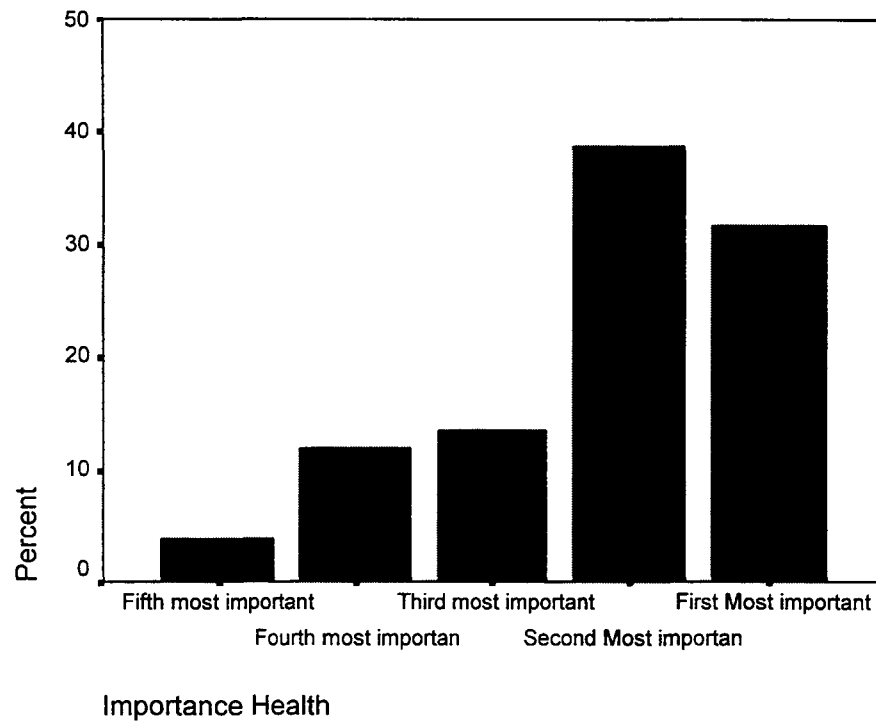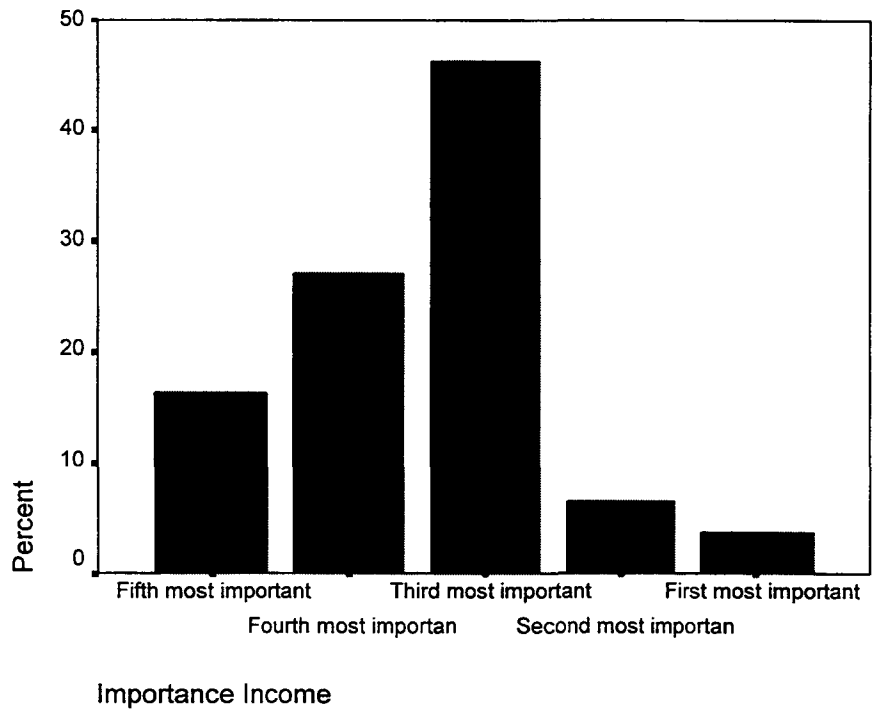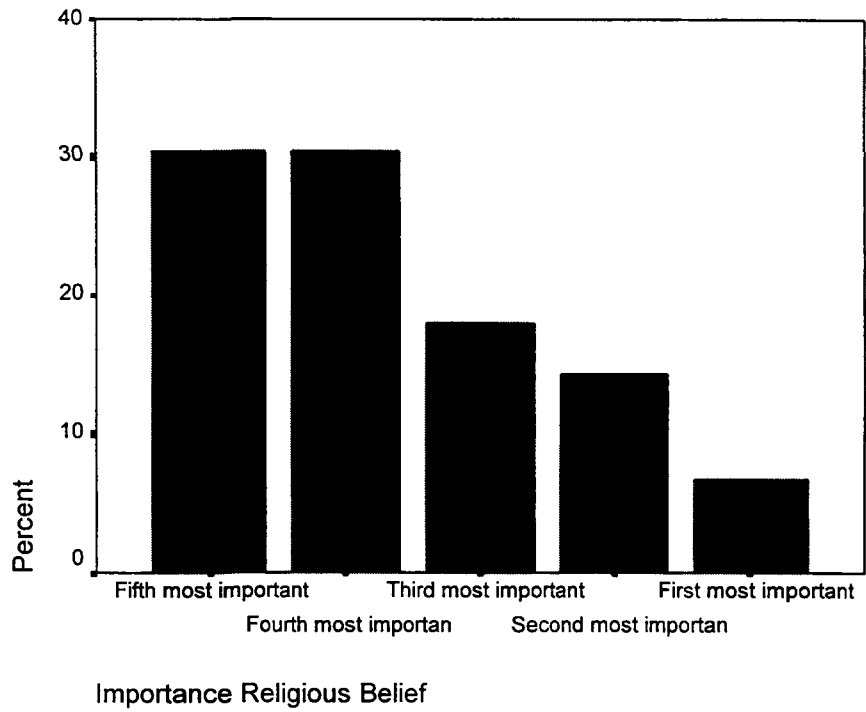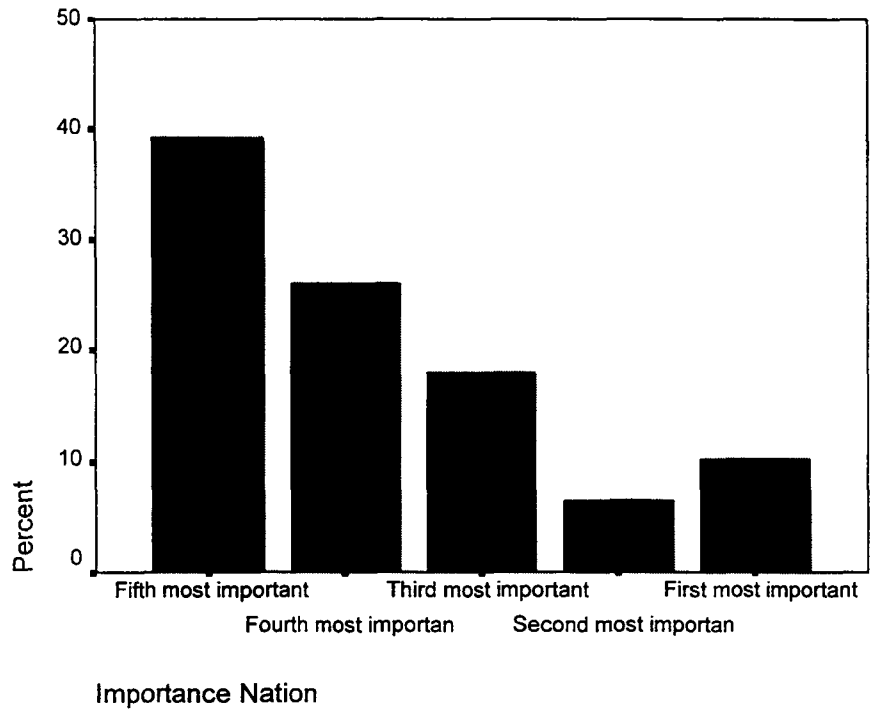
FIGURE 12

FIGURE 13

This ranking contradicts the results of Hernandez and Narro (1987) were was found that for Mexicans the three most important things to defend are Family, Religion and Nation. Family is the only factor that is considered as very important in both, Hernandez and Narro and, in this study.

As shown in tables 15 and 16, Chi-square analysis shows significance levels close to zero. Lambda values and uncertainty coefficients were calculated, in general, they go down by about 25 percent and in several cases are zero. Blank spaces means that cannot be computed because the asymptotic standard error equals zero

Signficance levels	Importance		
Health	Chi-Square		
	Significance	Lambda	Uncertainty Coef.
Age	.000	.044	.000
Education level	.060		.019
Education specialization	.000	.000	.000
Gender	.003	.357	.003
Outdoor sports practice	.000	.003	.000
Religion	Chi-Square		
	Significance	Lambda	Uncertainty Coef.
Age	.000	.001	.000
Education level	.029	.942	.004
Education specialization	.000	.050	.000
Gender	.000	.343	.000
Outdoor sports practice	.000	.153	.000
Family	Chi-Square		
	Significance	Lambda	Uncertainty Coef.
Age	.000	.000	.000
Education level	.000	.317	.000
Education specialization	.000	.040	.000
Gender	.000	.000	.000
Outdoor sports practice	.000	.082	.000
Nation	Chi-Square		
	Significance	Lambda	Uncertainty Coef.
Age	.000	.000	.000
Education level	.000		.000
Education specialization	.000	.000	.000
Gender	.000	.007	.000
Outdoor sports practice	.042	.160	.041
Income	Chi-Square		
	Significance	Lambda	Uncertainty Coef.
Age	.000	.238	.000
Education level	.001		.000
Education specialization	.000	.770	.000
Gender	.000	.003	.000
Outdoor sports practice	.080	.148	.081

TABLE 15

Blank spaces: Cannot be computed because the asymptotic standard error equals zero.

Significance levels   Threat Perception

Health	AP			WS			L		
	Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.
Age	.000	.001	.000	.000	.071	.000	.007	.200	.002
Education level	.035		.017	.000	.004	.000	.000		.000
Education specialization	.005	.435	.001	.000	.002	.000	.000	.059	.000
Gender	.000	.020	.000	.009	.435	.001	.000	.296	.000
Outdoor sports practice	.000	.000	.000	.001	.139	.000	.264	.884	.256

Religion	Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.
Age		.127	.000	.000	.004	.000	.000		.000
Education level	.021		.004	.022		.001	.555		.565
Education specialization	.000	.072	.000	.000	.593	.000	.000	.593	.000
Gender	.000	.002	.000	.000	.000	.000	.000	.000	.000
Outdoor sports practice	.001		.000	.004	.715	.001	.037		.033

Family	Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.
Age	.000	.074	.000	.000	.019	.000	.001	.677	.000
Education level	.001		.000	.000	.130	.000	.102		.012
Education specialization	.000	.226	.000	.000	.001	.000	.000	.072	.000
Gender	.003		.000	.000	.069	.000	.000		.000
Outdoor sports practice	.000	.000	.000	.000	.000	.000	.000	.040	.000

TABLE 16

Nation	Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.
Age	.000	.282	.000	.000		.000	.000	.862	.000
Education level	.000	.224	.000	.000	.908	.000	.000	.365	.000
Education specialization	.000	.122	.000	.000	.593	.000	.000	.104	.000
Gender	.000	.236	.000	.001		.000	.000	.076	.000
Outdoor sports practice	.000	.000	.000	.000	.000	.000	.015	.414	.009

Income	Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.
Age	.000	.000	.000	.000	.082	.000	.000	.001	.000
Education level	.000	.108	.000	.000	.104	.000	.000	.058	.000
Education specialization	.000	.115	.000	.000	.015	.000	.000	.003	.000
Gender	.000	.018	.000	.000	.163	.000	.000	.076	.000
Outdoor sports practice	.000	.026	.000	.004	.095	.003	.000	.018	.000

TABLE 16

WC			D		
Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.
.022		.001	.000	.049	.000
.000	.001	.000	.000	.908	.000
.000	.001	.000	.000	.344	.000
.000		.000	.166		.055
.000	.006	.000	.000	.001	.000

Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.
.000	.004	.000	.003	1	.000
.263		.465	.000		.000
.000	.173	.000	.000	.303	.000
.000	.001	.000	.000	.000	.000
.000	.004	.000	.000		.000

Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.
.001		.001	.000	.111	.000
.030	.317	.015	.000		.000
.003	.014	.001	.000	.084	.000
.000		.000	.000		.000
.003	.004	.000	.043	.317	.017

TABLE 16

Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.
.000	.007	.000	.001		.000
.000	.001	.000	.000	.317	.000
.000	.027	.000	.000	.593	.000
.000	.182	.000	.000		.000
.016		.002	.000	.000	.000

Chi-Square Significance	Lambda	Uncertainty Coef.	Chi-Square Significance	Lambda	Uncertainty Coef.
.000	.020	.000	.000	.000	.000
.000	.206	.000	.000	.500	.000
.000	.010	.000	.000	.004	.000
.000	.006	.000	.000	.013	.000
.000	.000	.000	.000	.028	.000

TABLE 16

To test Hypothesis 3, question 4 responses were also analyzed. A crosstab analysis (frequencies) for question 4 gave results showing which were the most common levels of threat perception for each situation and the percentage of them, results are shown in table 17. This table shows how serious people considered each type of threat (first number in each cell) explained by the scale below the table, and the percentage of people (number in parenthesis) that considered the type of threat as very serious, serious, some serious, little serious or not serious at all. These results were then compared with results of question 3.

Problem/ Factor	A. Pollution	W. Scarcity	Leaks	W. Contamination	Deforestation
Health	5(84.9)	5 (81.3)	5 (79.2)	5 (94.5)	5 (43)
Family	5 (72.1)	5 (79.9)	5 (69.5)	5 (81.8)	5 (55.2)
Income	2;3 (26)	3 (26.3)	4 (25)	2;4 (27)	2 (31.8)
Relig Beliefs	1 (59.6)	1 (56.5)	1 (52.9)	1 (54.4)	1 (55.7)
Nation	5 (49.5)	5(68.5)	5 (62.8)	5 (64.8)	5 (64.3)

Frequencies of Threat Perceptions

Scale : 5= very serious
4= serious
3= some serious
2= little serious
1= not serious at all

TABLE 17

108

In three of five factors threat perception affected the same way across factors. Income and religious beliefs were the only that were modified. So people does not perceive that income and religious beliefs are in threat because of environmental problems.

Comparing results of table 14 and table 17 is observed that Family and Health were, in table 14, ranked as the two most important things to defend. Table 17, shows that people considered that their Family and their Health, are in a very serious threat for all types of environmental problems.

As shown in table 14, Income was ranked as the third most important but it is not perceived that an environmental problem could be a very serious threat for it in table 17, actually it was mostly seen as a "little serious" threat.

In the case of Religious beliefs ranked as the fourth most important in table 14, environmental problems were classified as a "Not serious at all" threat for them in table 17.

Finally, Nation ranked as the last important factor to defend in table 14 was always defined as a factor were environmental problems are a "very serious" threat in table 17.

Table 17 shows that even thought the amount of people (percentages in table) that considered the different types of threat as very serious, serious, some serious, little serious and not serious at all, did vary, the level of threat perception did not vary in most people.

Based on chi-square, lambda and uncertainty coefficient values, as well as on frequency results, the null hypothesis 3 is accepted and the alternative hypothesis 3 is rejected.

Hypothesis 4.. "Actions proposed to solve an specific environmental problem differ when a personal threat is perceived. People take different overall environmental actions when Family, Income, Religious beliefs, Nation or Income are in danger for any type of environmental problem".

Null Hypothesis 4. "Actions proposed to solve an specific environmental problem do not differ when a personal threat is perceived. People do not take different overall environmental actions when Family, Income, Religious beliefs, Nation or Income are in danger for any type of environmental problem".

The responses could be :

Overall environmental actions

Teamwork

Rely on insiders to solve problems

Involve many persons

Many areas of expertise represented

Authorize significant expenses

Act

Recycle (Always or Frequently)

Proper waste disposal (Always or Frequently)

Support tax payment increase for environmental protection (Always or Frequently)

Support environmental law enforcement (Always or Frequently)

Use of environmentally friendly products (Always or Frequently)

Promote a new and more sever environmental law (Always or Frequently)

Asking whether people take the same overall environmental actions for each type of environmental problem regardless of the type of threat perceived tests the corresponding null hypothesis. Response of "Yes, people tend to take the same overall environmental actions for each environmental problem regardless of the type of threat perceived, is consistent with the null hypothesis.

Response of "No, people don't tend to take the same overall environmental actions for each environmental problem regardless of the type of threat perceived, is inconsistent with the null hypothesis.

Question 5 and 6 will give data for Hypothesis 4 to evaluate if they tended to take the same or different overall environmental actions.

As shown in tables 18, 19, 20 (for question 5), 21, 22, 23 (for question 6), Chi-square analysis shows significance levels close to zero. Lambda values and uncertainty coefficients were calculated, in general, values go down by about 25 percent and in several cases are zero. Blank spaces means that cannot be computed because the asymptotic standard error equals zero

111

Significance Chi-Square	Design		AP						WS		
	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.001	0.006	.000	0.004	.000	.007	0.003	.000	0.191	0.026
Work	.000	0.026	.000	0.005	0.002	.000	0.007	.000	0.002	.000
Product	.000	0.016	.000	.000	.000	.000	.000	.000	.000	0.004
New Law	.000	0.022	.000	0.001	.000	.000	0.006	.000	.000	.000
People	.000	0.581	.000	.000	.000	.000	0.114	.000	0.005	.000
# People	.000	.000	.000	.000	.000	.000	.000	.000	.000	0.014
Area	.000	.000	.000	0.25	.000	.000	.000	.000	0.023	.000
Expenses	.000	.000	.000	.000	0.008	.000	.000	0.002	.000	0.055
Action	.000	.000	.000	.000	0.001	.000	0.005	.000	.000	0.008
Recycle	.000	.000	.000	0.036	0.001	.000	0.006	.000	0.12	.000
Storage	.000	.000	.000	.000	0.001	.000	.000	.000	0.015	0.001
Tax	.000	.000	.000	.000	0.059	.000	.000	.000	.000	.000

TABLE 18

	L					WC					D			
A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.000	0.01	.000	0.251	0.158	.000	0.004	.000	.000	.000	0.001	0.006	.000	.000	0.01
.000	0	.000	0.011	0.006	.000	0.596	.000	0.131	.000	.000	0.03	.000	.000	0
.000	0	.000	.000	0.043	.004	0.104	.000	0.002	0.855	.000	0.068	.000	0.584	0.01
.000	0	.000	.000	0.012	.000	0.105	.000	0.035	.000	.000	.000	.000	.000	0
.000	0.01	.000	.000	.000	.000	.000	.000	.000	.000	.000	0.39	.000	.000	0
.000	.000	.000	.000	0.005	.000	.000	.000	0.003	0.001	.000	.000	.000	.000	0
.000	.000	.000	0.007	.000	.000	.000	.000	.000	0.003	.000	.000	.000	.000	0.04
0.011	.000	.000	.000	.000	.000	.000	0.009	.000	0.071	.000	0.002	.000	.000	0.01
.000	0	.000	.000	.000	.000	0.017	0.001	.000	.000	.000	0.006	0.002	0.001	.000
.000	.000	.000	0.028	.000	.000	0.003	.000	.000	.000	0.004	.000	.000	.000	.000
.000	0	.000	.000	0.196	.000	.000	.000	.000	0.081	.000	.000	.000	0.002	.000
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

TABLE 18

Significance Lambda	Design		AP					WS		
	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.004		0.016		0.007			0.001		0.024
Work	.001		0.15	0.152	0.152	0.002			0.01	0.098
Product	0.004		0.004		0.005	0.204	0.014	.000	.000	0.193
New Law	0.317		0.014		0.001	0.004		.000		0.001
People	0.054		0.165	0.036	0.404	0.188		0.396	0.107	0.002
# People	0.038	0.101	0.008	0.133	0.328	0.001	0.101	0.009	0.006	0.535
Area	0.011		0.186	0.821	0.006	0.103		0.007	0.382	0.012
Expenses	0.112	0.464	0.06	.000	0.777	0.222	0.414	0.2	0.001	0.574
Action	0.005		0.057	0.195		0.014		0.074	0.065	0.577
Recycle	0.224	0.01	0.12		0.083	0.269		0.127		.000
Storage	0.05	0.004	0.058	0.004	0.004	0.086		0.065	0.093	0.005
Tax	0.003	.000	.000	.000	.059	.000	0.016	0.025	0.001	0.026

TABLE 19

| L | | | | | WC | | | | | D | | | | |
A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
0.115		0.001		0.101	0.014		0.231	0.014	0.014	0.072		.000	0.008	0.167
0.019			0.069	0.015	.000		0.375	0.276	.000	.000			0.003	0.004
0.002		0.004	.000	0.491			0.004			0.059		.000		0.179
0.073	0.156	0.013	0.033	0.331	0.317		0.014		0.007	0.164	0.058	0.083	0.058	0.328
.000		0.156	0.001	0.063	0.036		0.019	0.186	0.009	0.376				0.362
.000	0.267	0.011	0.336	0.437	0.001	0.101	.000	0.535	0.617	0.006	0.205	.000	0.299	0.601
0.003		0.246	0.674	0.354	0.002		.000	0.096	0.014	.000		0.109	0.196	
0.019	0.414	.000	0.011	0.756	0.043	0.12	0.918	.000	0.745	0.382	0.414	0.21	.000	0.116
0.076		0.001	0.003	0.799	0.054		0.016	0.058	0.458	0.065		0.156	0.058	0.458
0.568		0.016		0.044	.000		0.162	0.051	0.002				0.001	0.001
0.015		.000	0.139		0.177		0.001	0.023		0.274	0.019	0.001	0.642	0.037
0.027	0.056	0.015	0.006	0.002	.000	0.016	0.002	0.006	0.002	0.045	.000	0.032	.000	0.002

TABLE 19

Significance Uncertainty Coefficient	Design		AP						WS	
	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.001	.000	.000	.000	.000	0.001	.000	.000	0.087	0.011
Work	.000	.010	.000	.005	0.001	.000	0.001	.000	0.002	.000
Product	.000	.002	.000	.000	.000	.000	.000	.000	.000	0.001
New Law	.000	.009	.000	.000	.000	.000	0.001	.000	.000	.000
People	.000	.563	.000	.000	.000		0.107	.000	0.005	.000
# People	.000	.000	.000	.000	.000	.000	.000	.000	.000	0.013
Area	.000	.000	.000	.252	.000	.000	.000	.000	0.022	.000
Expenses	.000	.000	.000	.000	0.006	.000	.000	.000	.000	0.052
Action	.000	.000	.000	.000	.000	.000	.000	.000	.000	0.002
Recycle	.000	.000	.000	.033	0.001	.000	0.001	.000	0.106	.000
Storage	.000	.000	.000	.000	.000	.000	0.002	.000	0.015	0.001
Tax	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

TABLE 20

	L					WC					D			
A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.000	0.001	.000	0.221	0.146	.000	.000	.000	.000	.000	.000	.000	.000	.000	0.012
.000	.000	.000	0.012	0.006	.000	0.463	.000	0.137	.000	.000	0.008	.000	.000	0.001
.000		.000	.000	0.012	.000	0.026	.000	0.001	0.853	.000	0.011	.000	0.58	0.01
.000	0.005		.000	0.004	.000	0.048		0.011	.000	.000	0.001	.000	.000	0.001
	.000	.000	.000	.000		.000	.000	.000	.000		0.341		.000	0.003
.000	.000	.000	.000	0.004	.000	.000	.000	0.003	.000	.000	.000	.000	.000	0.003
.000	.000	.000	0.007	.000	.000	.000	.000	.000	0.003	.000	.000	.000	.000	0.029
0.001	.000	.000	.000	.000	.000	.000	.000	.000	0.066	.000	.000	.000	.000	0.008
.000	.000	.000	.000	.000	.000	0.001	.000	.000	.000	.000	.000	0.001	.000	.000
.000	.000	.000	0.018	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
.000	0.001	.000	.000	0.181	.000	.000	.000	.000	0.068	.000	.000	.000	0.001	.000
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

TABLE 20

Significance Chi-Square **Health**	Design EP		AP						WS	
	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.000	.009	.000	.000	.002	.000	.012	.000	.000	.001
Work	.000	.000	.000	.000	.001	.000	.000	.000	.000	.000
Product	.000	.112	.000	.000	.000	.000	.247	.000	.000	.000
New Law	.006	.025	.000	.000	.001	.017	.000	.000	.000	.000
People	.000	.000	.000	.000	.000	.000	.000	.000	.000	.040
# People	.000	.000	.000	.001	.016	.000	.000	.000	.114	.000
Area	.000	.081	.000	.000	.000	.000	.007	.000	.003	.000
Expenses	.000	.000	.000	.250	.001	.000	.000	.000	.787	.005
Action	.000	.098	.000	.000	.000	.000	.164	.000	.000	.001
Recycle	.000	.000	.000	.006	.000	.000	.000	.000	.000	.000
Storage	.000	.000	.000	.069	.000	.000	.001	.000	.000	.000
Tax	.000	.000	.001	.011	.207	.000	.000	.000	.014	.000

Religion

	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.000	.002	.000	.000	.002	.001	.014	.000	.000	.001
Work	.000	.000	.000	.000	.012	.000	.00	.000	.000	.002
Product	.000	.000	.000	.000	.007	.000	.000	.000	.000	.015
New Law	.000	.000	.000	.000	.000	.002	.000	.000	.000	.000
People	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000
# People	.000	.001	.000	.000	.000	.000	.000	.000	.000	.001
Area	.000	.000	.000	.000	.024	.001	.000	.000	.002	.000
Expenses	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Action	.003	.000	.000	.000	.000	.001	.000	.000	.000	.000
Recycle	.000	.000	.000	.002	.000	.000	.001	.000	.000	.000
Storage	.000	.003	.000	.000	.000	.000	.003	.000	.000	.000
Tax	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001

TABLE 21

Family

	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.000	.008	.000	.018	.000	.000	.011	.000	.011	.000
Work	.060	.000	.000	.000	.000	.026	.000	.000	.000	.005
Product		.003	.000	.013	.000	.000	.000	.000	.001	.000
New Law	.207	.006	.000	.009	.000	.116	.005	.000	.000	.000
People	.000	.000	.000	.000	.000	.000	.000	.009	.000	.000
# People	.000	.009	.000	.000	.000	.000	.020	.000	.000	.000
Area	.000	.000	.000	.000	.024	.000	.000	.000	.006	.006
Expenses	.000	.005	.000	.000	.006	.000	.035	.000	.000	.071
Action	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.187	.000	.000	.000	.000	.685	.000
Storage	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Tax	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Nation

	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.002	.000	.000	.000	.001	.000	.000	.000	.002	.000
Work	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000
Product	.000	.086	.000	.000	.000	.002	.032	.000	.000	.004
New Law	.006	.000	.000	.000	.000	.000	.000	.000	.000	.251
People	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000
# People	.000	.000	.000	.002	.000	.000	.000	.000	.000	.000
Area	.000	.001	.000	.000	.000	.000	.036	.000	.644	.000
Expenses	.001	.000	.000	.000	.000	.000	.000	.000	.000	.001
Action	.000	.000	.000	.187	.000	.000	.001	.000	.245	.000
Recycle	.000	.000	.000	.024	.044	.000	.000	.001	.020	.000
Storage	.000	.000	.000	.000	.124	.000	.000	.000	.000	.198
Tax	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

TABLE 21

Income

	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.000	.000	.000	.000	.000	.001	.000	.000	.000	.004
Work	.000	.000	.000	.157	.000	.000	.000	.000	.405	.000
Product	.000	.030	.000	.000	.001	.002	.036	.000	.000	.000
New Law	.000	.047	.000	.000	.000	.002	.013	.000	.000	.000
People	.000	.000	.000	.000	.259	.000	.000	.009	.000	.029
# People	.000	.000	.000	.000	.000	.000	.000	.000	.008	.044
Area	.000	.024	.000	.000	.957	.000	.006	.000	.025	.003
Expenses	.000	.000	.000	.000	.306	.000	.000	.000	.000	.057
Action	.000	.017	.000	.000	.019	.000	.002	.000	.000	.000
Recycle	.000	.000	.000	.000	.000	.000	.001	.000	.003	.001
Storage	.000	.000	.000	.000	.000	.000	.000	.000	.017	.000
Tax	.000	.000	.000	.000	.000	.000	.001	.000	.000	.010

TABLE 21

	L					WC					D				
	A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.065	.000	.017	.000	.000	.000
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.013	.000	.000	.000	.000	.000
	.008	.006	.000	.000	.000	.000	.000	.000	.001	.001	.000	.001	.001	.000	.001
	.078	.068	.000	.002	.000	.006	.007	.000	.000	.000	.003	.000	.000	.000	.000
	.000	.003	.000	.000	.000	.000	.001	.000	.000	.000	.000	.004	.000	.000	.000
	.000	.000	.000	.001	.000	.000	.000	.000	.000	.002	.000	.000	.000	.010	.000
	.000	.005	.000	.007	.000	.000	.108	.000	.000	.000	.000	.004	.000	.617	.000
	.000	.000	.000	.173	.314	.000	.000	.000	.027	.044	.000	.000	.000	.020	.000
	.000	.033	.000	.000	.000	.000	.009	.000	.000	.000	.000	.018	.000	.000	.000
	.000	.024	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	.002	.000	.000	.004	.006	.010	.129	.000	.000	.007	.001	.000	.000	.000	.012
	.000	.000	.000	.133	.006	.000	.000	.000	.001	.000	.000	.000	.000	.016	.133

A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.001	.002	.000	.000	.000	.000	.000	.000	.000	.281	.000	.000	.000	.000	.000
.000	.000	.000	.000	.002	.000	.000	.000	.059	.820	.000	.000	.000	.000	.168
.008	.000	.000	.000	.004	.000	.000	.000	.000	.009	.004	.000	.000	.000	.000
.000	.000	.000	.003	.007	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.001	.006	.000	.000	.001	.050	.000	.000	.000	.000	.001	.000
.000	.000	.000	.000	.047	.000	.000	.000	.000	.011	.000	.000	.000	.000	.003
.000	.008	.000	.000	.000	.000	.001	.000	.000	.000	.000	.001	.000	.002	.000
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
.000	.005	.001	.000	.006	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002
.000	.001	.000	.000	.009	.000	.006	.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.005	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	

TABLE 21

A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.000	.001	.000	.012	.000	.000	.003	.000	.468	.000	.000	.001	.000	.004	.000
.007	.000	.000	.000	.000	.005	.000	.000	.000	.000	.005	.000	.000	.000	.000
.008	.025	.000	.003	.000	.002	.005	.000	.221	.000	.000	.001	.000	.106	.000
.063	.068	.000	.003	.000	.001	.027	.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.005	.000	.000	.000	.001	.000	.000	.000	.000	.000	.001	.000
.000	.001	.000	.000	.000	.000	.001	.000	.000	.006	.000	.110	.000	.000	.043
.000	.001	.000	.758	.000	.000	.000	.000	.000	.261	.000	.000	.000	.762	.384
.000	.046	.000	.000	.025	.000	.047	.000	.000	.000	.000	.035	.000	.000	
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.012	.000	.000
.000	.000	.000	.164	.000	.000	.000	.000	.076	.000	.000	.000	.000	.000	.011
.000	.001	.000	.004	.673	.000	.000	.000	.000	.005	.000	.000	.000	.000	.003
.000	.000	.000	.000	.000	.000	.000	.000	.000	.586	.000	.000	.000	.000	.058

A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.025	.000	.000	.000	.011	.001	.000	.000	.000	.001	.511	.000	.000	.067	.016
.000	.000	.000	.003	.000	.000	.000	.000	.029	.000	.000	.000	.000	.003	.000
.004	.000	.000	.000	.000	.016	.083	.000	.001	.008	.001	.006	.000	.000	.034
.000	.000	.000	.000	.038	.000	.000	.000	.000	.001	.005	.000	.000	.000	.005
.000	.000	.000	.000	.000	.000	.000	.000	.608	.000	.000	.000	.000	.082	.000
.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.018
.000	.001	.000	.230	.058	.000	.003	.000	.000	.002	.000	.000	.000	.000	.000
.002	.000	.000	.000	.026	.000	.000	.000	.000	.001	.000	.000	.000	.000	.046
.000	.000	.000	.006	.000	.000	.000	.000	.101	.000	.000	.018	.012	.000	.081
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.025
.000	.000	.000	.000	.000	.000	.000	.000	.139	.805	.000	.000	.000	.004	.000
.000	.000	.000	.000	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000

TABLE 21

A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.000	.000	.000	.096	.000	.001	.000	.000	.019	.000	.000	.000	.000	.000	.000
.000	.000	.000	.058	.000	.000	.000	.004	.240	.000	.000	.000	.000	.009	.000
.000	.007	.000	.000	.000	.011	.001	.000	.000	.035	.000	.006	.000	.000	.001
.000	.003	.000	.000	.000	.003	.083	.000	.000	.000	.056	.010	.000	.000	.000
.000	.000	.000	.000	.251	.000	.000	.000	.000	.029	.000	.000	.000	.000	.000
.000	.000	.000	.000	.002	.000	.000	.000	.000	.190	.000	.007	.000	.001	.068
.000	.000	.000	.018	.549	.000	.002	.000	.000	.007	.000	.000	.000	.000	.109
.000	.000	.000	.000	.806	.000	.000	.000	.000	.660	.000	.000	.000	.000	.137
.000	.002	.000	.055	.129	.000	.001	.000	.034	.751	.000	.001	.000	.004	.018
.000	.000	.000	.000	.000	.000	.000	.002	.001	.000	.000	.000	.000	.000	.000
.000	.000	.000	.012	.000	.000	.000	.000	.022	.000	.000	.000	.000	.104	.000
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

TABLE 21

Significance Lambda	Design EP		AP					WS		
Health										
	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.010		.040	.676	.008	.200		.000	.014	.000
Work	.548		.004	.001		.208	.354	.000	.000	.594
Product	.256		.000	.002	.000	.072		.014		.061
New Law	.548		.019		.004	.808		.000		.000
People	.057	.763	.019	.000	.023	.002	.763	.220	.013	
# People	.423		.115	.189	.208	.007		.113	.696	.768
Area	.001		.002	.032	.032	.013		.000	.312	.000
Expenses	.108				.005	.144		.181		.701
Action	.001		.405	.067	.001	.000		.256	.093	.793
Recycle	.094	.071		.548	.000	.002		.000		.000
Storage	.000	.796		.796	.000	.000		.014	.000	.003
Tax	.025	.221	.303		.156	.090	.179	.012		.003
Religion										
	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement		.796	.655	.396	.089		.796	.082	.343	.046
Work	.593	.006	.044	.007		.049	.631	.003	.116	.317
Product	.200	.000	.371	.160	.222	.004	.138	.371	.373	.411
New Law	1	.051	.004	.057	.006	.819	.051	.077	.035	.015
People	.001	.453	.053	.515	.307	.026	.060	.189	.458	.368
# People	.357		.284	.000	.099			.284	.003	.023
Area	.048	.007	.003	.064	.000	1	.224	.000	.600	.115
Expenses	.025	.020	.000	.187	.331	.015	.020	.004	.381	.271
Action			.131	.083	.166			.070	.033	.050
Recycle	.473	.639	.593	.943	.003	.131		.507	.414	.000
Storage	.007		.045	.222	.001	.131		.371	.663	.041
Tax	.451	.010	.375	.000	.037	.362	.000	.007	.007	.060

TABLE 22

Family

	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.014			.014	.000	.082		.125	.014	.000
Work			.000		.004			.000	.164	.057
Product	.020		.058	.014	.001	.217			.072	.000
New Law	.284				.000			.296		.000
People	.317		.857	.133	.001	.593			.628	.000
# People	.011		.066	.298	.017	.011		.011	.579	.255
Area	.027		.002	.156	.345	.021		.489	.156	.354
Expenses	.001		.000	.698	.030	.038		.011	.795	.409
Action	.022		.577	.000		.156		.577	.090	
Recycle	.010	.160	.180	.160	.000	.012		.104		.027
Storage	.050	.138	.066	.069	.005	1	.101	.043	.005	.009
Tax	.015	.181	.449	.110	.009	.026	.032	.019	.021	.009

Nation

	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.004		.024		.288	.033	.886	.024		.024
Work	.001	.014	.002	.857	.124	.011	.010	.317		.008
Product	.000		.024	.004	.000	.004	.317	.024		.024
New Law			.004		.000	.335			0.544	.125
People	.586			0.203	.058	.120		.529		.000
# People	.342	.004	.004	0.913	.508	.082	.107	.004		.442
Area	.032		.115	0.057	.096	.015		.035		.259
Expenses			.014	0.22	.649	.593			0.488	.574
Action	.398		.000			.006		.008		.189
Recycle	.057	.012	.796		.200	.057	.062	.796		.601
Storage	.007	.002	1	0.405		.274	.029		0	.593
Tax	.101	.668	1	0.224	.179	.317		.414		.068

TABLE 22

Income

	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.014	.593	.317	.058	.000			.024		.024
Work	.244	.000	.317		.161	.893		.004		.166
Product	.000		.000		.000			.008	.014	.000
New Law	1		.330	.002	.000					.000
People	.001		.169	.003	.262	.131		.002	.007	.277
# People	.041	.898	.003	.505	.008	.006		.010		.069
Area	.003		.003	.003		.130		.004		.069
Expenses	.299	.345		.126		.237	.058		.133	.879
Action	.655		.004	.000	.655	.094		.039	.015	.122
Recycle	.002	.004	.104	.001	.000	.057		.018		.122
Storage	.038	.004	.014	.058	.005	.484	.889	.006	.014	.000
Tax	.057	.002	.127	.326	.002	.078	.148	.274	.074	.054

TABLE 22

L					WC					D				
A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.207	.593	.014	.014	.002	.217	.405	.004	.008	.058	.127		.296	.641	.000
	.014	.019	.000	.411	.134	.354	.866	.000		1	.104		.205	.617
.000		.317	.317	.018	.005	.577	.005		.177	.062		1	.004	.004
	.637	.101		.001	.414		.101		.000	.593	.317	.317		.001
.000	.763	.083	.312	.010	.050	.763	.247	.010	.403	.000	.763	.070	.001	.322
.138	.571	.285	.087	.726	.662		.053	.074	.787		.891	.004	.251	.058
.000		.000	.014	.008	.017		.004	.007	.094	.227		.000		.036
.108					.108					.207	.018		.072	.029
.016		.593	.002	.005	.000		.284	.003	.323	.001		.405	.056	.005
.000		.579	.051	.000	.002	.724	.579	.844	.000	.034		.156	.607	.000
.527		.156		.159	.125		.014	.008	.002	.695	.125		.000	.107
.055	.221	.012		.006	.055	.564	.012	.686	.047	.024	.646	.040	.777	.248

A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.200	.796	.085	.469	.000		.796	.266	.373	.414	.139	.796	.049	.338	.001
		.231	.121	.208	.094	.011	.032	.670		.393	.062	.059	.283	.816
.014	.881	.437	.198	.190		.000	.666	.238	.193	1	.262	.371	.072	.027
.274	.051	.191	.604	.059	.238	.051	.058	.006	.013	.160	.051	.032	.034	.001
.021	.453	.130	.701	.332	.006	.060	.018		.219	.010	.060	.173		.268
.376		.593	.326	.476	.248		.405	.001	.353	.284		.354	.122	.023
.001		.330	.120	.011	.142	.224	.019	.042	.014	.100	.224	.002	.235	.013
.008	.330	.001	.041	.689	.000	.354	.001	.007	.264	.000	.435	.001	.002	.494
		.593	.078	.515		.068	.354	.093	.456		.455		.000	.095
.131		.122	.243	.055	.131	.139	.529	.000	.007	.639			.347	.004
.131		.133	.209	.034	.018		.371	.008	.000	.007	.540		.014	.004
.131	.002	.026	.003	.002	.446	.000	.143	.000	.014	.131	.000	.026	.013	.011

TABLE 22

A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.038		.617	.008	.000	.224		.317	.317	.004	.139			.058	.000
		.006	.224	.016			.000	.098	.000			.000	.324	.001
.330		.085	.008	.000	.266		.256	.317	.001	.038				.000
.432		.317	.156	.000	.008		.014	.008	.000	.000	.008	.014	.781	.000
.811		.777	.519	.001	.169			.110	.002	.169			.327	.001
.004		.082	.643	.175	.004		.010		.137	.004		.409	.371	.662
.003		.019		.152	.085		.479	.392	.903	.009		.084		.868
.038		.038		.162	.038		.003	.444	.015	.593		.005		.068
.156		.577	.000		.049		.353	.000		.004		.577	.022	
.023	.002	.018		.000	.006	.000	.028	.179	.001	.005	.047	.002	.076	.028
.009		.000	.808		.748	.101	.203	.009	.051	.5	.101	.001	.002	.060
.031	.059	.000	.263	.075	.101	.032	.001	.479	.479	.028	.032	.000	.158	.248

A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.449					.004		.024	.014	.024	1		.014	.317	.156
.001	.182	.879		0	.002	.010	.031		.000	.001	.000	.317		.000
.796		.330		0.058		.317	.024		.024			.014	.317	.024
.072		.082		0.082	.048		.001		.001	.781		.001		.004
.014		.144	0.908	0	.303				.000	.093		.516		.000
.835	.013	.024		0.14	.156	.000	.271	0.53	.590	.105	.198	.002	0.066	
.015		.211	0.909	0.159	.448		.469		.055	.266		.036	0.013	.007
		.014		0.274			.001	0.78	.274			.058	0.778	.274
.303		.001	0.22		.012		.015	0.92	.258	.036		.004	0.007	
.057		.796		0.007	.131	.362		0.85	.819	.057	.000			.220
.027	.391	.001			.131	.000	1			.082	.044	1		.288
.085		.125	0.862	0.137	.032	.668		0.7	.001	.134	.801		0.653	.001

TABLE 22

A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.432	.593	.014		.033			.101		.000			.024		.005
	.027	.160		.017	.785		.564		.021	.065	.369	.396	.208	.150
.004		.014	.670	.038			.014	.317	.181	.414		.001	.014	.010
.317				.000			.014	.008	.000				.014	.000
.004		.004		.392	.005	.696	.004	.111	.095	.001		.004	.001	.034
.016		.139	.348	.067	.085	1	.002	.039	.626	.008		.045	.296	.377
.256	.579	.000	.439	.874	.138		.000	.330	.539	.056	.579	.000	.078	.399
.354	.345		.317		.350	.345		.072		.164	.345		.628	
.050		.039	.577	.546	.069		.019	.652		.262		.000	.014	.355
.034	.768	.205	.237	.000	.000	.768	.884	.781	.000	.034	.004	.014	.004	.001
.274	.144	.004		.000	.031	.010	.004		.000	.186	.240	.148		.000
.057	.148		.188	.001	.057	.148	.274	.127	.002	.034	.024	.274	.097	.001

TABLE 22

Significance   Design EP   **AP**   **WS**

Uncertainty Coefficient

Health

	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.002	.001	.000	.000	.001	.000	.008	.000	.000	.000
Work	.000	.000	.000	.000	.000	.000	.000	.188	.000	.000
Product	.000	.037	.000	.000	.000	.000	.081	.000	.000	.000
New Law	.000	.002	.000	.000	.000	.003	.000	.000	.000	.000
People	.000	.000	.000	.000	.000	.000	.000	.000	.000	.037
# People	.000	.000	.000	.001	.015	.000	.000	.000	.114	.000
Area	.000	.011	.000	.000	.000	.000	.000	.000	.003	.000
Expenses	.000	.000	.000	.000	.001	.000	.000	.000	.783	.004
Action	.000	.032	.000	.000	.000	.000	.054	.000	.000	.000
Recycle	.000	.000	.000	.004	.000	.000	.000	.000	.000	.000
Storage	.000	.000	.000	.059	.000	.000	.000	.000	.000	.000
Tax	.000	.000	.000	.009	.211	.000	.000	.000	.009	.000

Religion

	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.000	.004	.000	.000	.001	.000	.018	.000	.000	.001
Work	.000	.000	.000	.000	.007	.000	.000	.000	.000	.001
Product	.000	.000	.000	.000	.006	.000	.000	.371	.000	.004
New Law	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
People	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001
Area	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000
Expenses	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Action	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000
Storage	.000	.002	.000	.000	.000	.000	.008	.000	.000	.000
Tax	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

TABLE 23

Family

	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.000	.001	.000	.007	.000	.000	.001	.000	.004	.000
Work	.009	.000	.000	.000	.000	.003	.000	.000	.000	.004
Product	.000	.000	.000	.004	.000	.000	.000	.000	.000	.000
New Law	.093	.000	.000	.006	.000	.005	.000	.000	.000	.000
People	.000		.000	.000	.000	.000	.000	.000	.000	.000
# People	.000	.003	.000	.000	.000	.000	.005	.000	.000	.000
Area	.000	.000	.000	.000	.023	.000	.000	.000	.006	.005
Expenses	.000	.000	.000	.000	.006	.000	.002	.000	.000	.072
Action	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.193	.000	.000	.000	.000	.678	.000
Storage	.000	.000		.000	.000	.000	.000	.000	.000	.000
Tax	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Nation

	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000
Work	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Product	.000	.020	.000	.000	.000	.000	.018	.000	.000	.000
New Law	.000	.000	.000	.000	.000	.000	.000	.000	.000	.254
People	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Area	.000	.000	.000	.000	.000	.000	.006	.000	.633	.000
Expenses	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Action	.000	.000	.000	.187	.000	.000	.000	.000	.220	.000
Recycle	.000	.000	.000	.018	.041	.000	.000	.000	.015	.000
Storage	.000	.000	.000	.000	.094	.000	.000	.000	.000	.190
Tax	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

TABLE 23

Income

	A	EL	ES	G	S	A	EL	ES	G	S
Enforcement	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001
Work	.000	.000	.000	.148	.000	.000	.000	.000	.399	.000
Product	.000	.002	.000	.000	.000	.000	.004	.000	.000	.000
New Law	.000	047.00	.000	.000	.000	.000	.004	.000	.000	.000
People	.000	.000	.000	.000	.263	.000	.000	.000	.000	.030
# People	.000	.000	.000	.000	.000	.000	.000	.000	.006	.045
Area	.000	.020	.000	.000	.957	.000	.000	.000	.024	.002
Expenses	.000	.000	.000	.000	.305	.000	.000	.000	.000	.053
Action	.000	.001	.000	.025	.003	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000
Storage	.000	.000	.000	.000	.000	.000	.000	.000	.007	.000
Tax	.000	.000	.000	.000	.000	.000	.000	.000	.000	.010

TABLE 23

	L					WC					D			

A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.000	.000	.000	.000	.000	.000	.000	.000	.000	.055	.000	.009	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000	.000	.010	.000	.000	.000	.000	.000
.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.029	.000
.003	.000	.000	.000	.000	.000	.002	.001	.000	.000	.000	.000	.000	.000	.000
.000	.002	.000	.000	.000	.000	.002	.000	.000	.000	.000	.006	.000	.000	.000
.000	.000	.000	.001	.000	.000	.000	.000	.000	.002	.000	.000	.000	.010	.000
.000	.001	.000	.007	.000	.000	.018	.000	.000	.000	.000	.000	.000	.619	.000
.000	.000	.000	.031	.281	.000	.000	.000	.024	.040	.000	.000	.000	.017	.000
.000	.008	.000	.000	.000	.000	.001	.000	.000	.000	.000	.004	.000	.000	.000
.000	.007	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
.001	.000	.000	.000	.004	.004	.044	.000	.000	.002	.000	.000	.000	.000	.011
.000	.000	.000	.124	.005	.000	.000	.000	.001	.000	.000	.000	.000	.014	.136

A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.000	.002	.000	.000	.000	.000	.000	.000	.000	.284	.000	.002	.000	.000	.000
.000	.000	.000	.000	.001	.000	.000	.000	.045	.817	.000	.000	.000	.000	.157
.000	.000	.000	.000	.001	.000	.000	.000	.000	.009	.000	.000	.000	.000	.000
.008	.000	.000	.000	.007	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.005	.000	.000	.000	.047	.000	.000	.000	.000	.001	.000
.000	.000	.000	.000	.045	.000	.000	.000	.000	.009	.130	.000	.000	.000	.003
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000
.000	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
.000	.003	.000	.000	.001	.000	.001	.000	.001	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.009	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.006	.000	.000	.000
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

TABLE 23

A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.000	.000	.000	.004	.000	.000	.000	.000	.411	.000	.000	.000	.000	.001	.000
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
.001	.001	.000	.000	.000	.001	.000	.000	.184	.000	.000	.000	.000	.029	.000
.008	.007	.000	.001	.000	.000	.004	.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.004	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000
.000	.000	.000	.000	.000	.000	.000	.000	.000	.006	.000	.021	.000	.000	.040
.000	.000	.000	.758	.000	.000	.000	.000	.000	.258	.000	.000	.000	.762	.382
.000	.003	.000	.000	.026	.000	.003	.000	.000	.000	.000	.003	.000	.000	.003
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.138	.000	.000	.000	.000	.074	.000	.000	.000	.000	.000	.011
.000	.001	.000	.003	.665	.000	.000	.000	.000	.004	.000	.000	.000	.000	.001
.000	.000	.000	.000	.000	.000	.000	.000	.000	.590	.000	.000	.000	.000	.059

A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.005	.000	.000	.000	.001	.000	.000	.000	.016	.000	.158	.000	.000	.026	.006
.000	.000	.000	.000	.000	.000	.000	.000	.010	.000	.000	.000	.000	.000	.000
.000	.000	.000	.000	.000	.000	.080	.000	.000	.003	.000	.009	.000	.000	.013
.000	.000	.000	.000	.034	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002
.000	.000	.000	.000	.000	.000	.000	.000	.598	.000	.000	.000	.000	.068	.000
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.015
.000	.000	.000	.225	.058	.000	.000	.000	.000	.002	.000	.000	.000	.000	.000
.000	.000	.000	.000	.010	.000	.000	.000	.000	.000	.000	.000	.000	.000	.040
.000	.000	.000	.006	.000	.000	.000	.000	.080	.000	.000	.004	.000	.000	.068
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.021
.000	.000	.000	.000	.000	.000	.000	.000	.127	.805	.000	.000	.000	.002	.000
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

TABLE 23

A	EL	ES	G	S	A	EL	ES	G	S	A	EL	ES	G	S
.000	.000	.000	.070	.000	.000	.000	.000	.016	.000	.000	.000	.000	.000	.000
.000	.000	.000	.055	.000	.000	.000	.000	.238	.000	.000	.000	.000	.008	.000
.000	.000	.000	.000	.000	.001	.000	.000	.000	.014	.000	.000	.000	.000	.000
.000	.001	.000	.000	.000	.000	.022	.000	.000	.000	.003	.002	.000	.000	.000
.000	.000	.000	.000	.255	.000	.000	.000	.000	.029	.000	.000	.000	.000	.000
.000	.000	.000	.000	.002	.000	.000	.000	.000	.191	.000	.000	.000	.001	.067
.000	.000	.000	.016	.546	.000	.000	.000	.000	.006	.000	.000	.000	.000	.035
.000	.000	.000	.000	.805	.000	.000	.000	.000	.660	.000	.000	.000	.000	.125
.000	.000	.000	.056	.115	.000	.000	.000	.034	.752	.000	.000	.000	.002	.007
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
.000	.000	.000	.008	.000	.000	.000	.005	.000	.000	.000	.000	.000	.027	.000
.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

TABLE 23

Cross tabulation analysis (frequencies) shows that effectively people tended, most of the time, to take different overall environmental actions but not always. First, it was measure, by a cross tabulation analysis of answers for question 5, which actions people would do to design a solution for an environmental problem that was not directly affecting them. The second part was to measure, by a cross tabulation analysis of answers for the six parenthetic sentences of question 6, how these actions changed once an environmental problem directly affecting people was perceived. The environmental problem could affect five different factors. The analysis done was to see in how many of the responses for each factor in question 6 was a change towards a more overall environmental action compared with the responses of question 5. As expected, in each factor environmental & strategic actions taken changed. The factor that changed more dramatically was "Family", here was found the higher number of changes towards overall environmental actions with only 8 of 300 cases were a higher number of changes towards an overall environmental actions was not taken once a personal threat was perceived. Next was "Nation" with 8 cases, "Health" with 15 cases, "Income" with 28 cases and "Religion" with 38 cases.

Across each environmental problem, results show that in "Air Pollution" was found the higher number of changes towards overall environmental actions with only 15 of 300 cases were a higher number of overall environmental actions was not taken once a personal threat was perceived. Next was "Water Scarcity" with 16 cases, "Leaks" with 17 cases, "Deforestation" with 24 and "Water contamination" with 25.

136

Based on chi-square, lambda and uncertainty coefficient values, as well as on frequency results, the null hypothesis 4 is rejected and the alternative hypothesis 4 is accepted.

Hypothesis 5. "Actions taken differ depending on age. Younger take a higher number of overall environmental actions than older".

Null Hypothesis 5. "Actions taken do not differ depending on age. Younger do not take a higher number of overall environmental actions than older".

The response could be :

<u>Overall environmental actions</u>

Teamwork

Rely on insiders to solve problems

Involve many persons

Many areas of expertise represented

Authorize significant expenses

Act

Recycle (Always or Frequently)

Proper waste disposal (Always or Frequently)

Support tax payment increase for environmental protection (Always or Frequently)

Support environmental law enforcement (Always or Frequently)

Use of environmentally friendly products (Always or Frequently)

Promote a new and more sever environmental law (Always or Frequently)

Asking whether Younger had "Always" and "Frequently" as the most common answers for strategic actions and "Never" and "Few times" for environmental actions tests the corresponding null hypothesis.

Responses of more "Always" and "Frequently" for strategic actions and responses of "Never" and "Few times" for environmental actions are consistent with the null hypothesis and responses of "Never" and "Few times" for strategic actions and "Always" and "Frequently" for environmental actions are inconsistent with the null hypothesis.

Question 6 will give data for Hypothesis 5 to evaluate if they tended to take more or less overall environmental actions.

In this study "Younger" are those who are less than 25, 25-34 and "Older" those who are 35-44 and 45-54 (no students were 55 or more). Younger were 334 students and older were 50

Regression analysis was done to obtain correlation between age and actions taken for the different types of threat and types of environmental problems, results are shown in table 24.

Correlation analysis was done to predict people's behavior. For this study, the level p<.01 was used to determine statistically significance. Correlation of .20 is

138

considered significant, correlation of .30 is considered more important and correlation of .40 or more are considered very important.

A Pearson correlation (using cross-tabulation) for overall environmental actions including the six demographic variables, types of threat and types of environmental problem was done. As shown in table 25, Chi-square analysis shows significance levels close to zero. Lambda values and uncertainty coefficients were calculated, in general, these values go down by about 25 percent and in several cases are zero. Blank spaces means that cannot be computed because the asymptotic standard error equals zero

Correlations   **AP**   **WS**

Health

	A	EL	ES	G	HL	S	A	EL	ES	G	HL	S
Enforcement				0.27								
Work						-0.20			0.23			
Product												
New Law			0.24							0.20		-0.23
People								-0.21				
# People			0.34						0.29		0.25	
Area			0.25						0.23		0.21	
Expenses	-0.22						-0.28					
Action				0.25	0.25	-0.21				0.23		
Recycle						-0.29	-0.26			0.23		
Storage						-0.21						
Tax	-0.29	-0.27					-0.24	-0.24				

Religion

	A	EL	ES	G	HL	S	A	EL	ES	G	HL	S
Enforcement				0.25						0.25	0.23	
Work					0.26						0.22	
Product			-0.24	0.29					-0.26	0.30		
New Law				0.21					-0.20	0.21		
People		-0.24						-0.21				
# People												
Area						0.22		-0.21				0.20
Expenses	0.21		-0.21									-0.20
Action												
Recycle		-0.20								0.24		
Storage				0.29						0.30		
Tax								-0.28				

TABLE 24   * p<.001

Family

	A	EL	ES	G	HL	S	A	EL	ES	G	HL	S
Enforcement												
Work				-0.27								
Product	0.20					-0.24	0.25					-0.32
New Law			-0.21			-0.27						
People		-0.28				0.24		-0.31				
# People				-0.21						-0.25		
Area			0.24						0.24		0.22	
Expenses				-0.25						-0.23		
Action					0.20	-0.26						-0.21
Recycle						-0.21						
Storage		-0.26										
Tax		-0.23					-0.22	-0.20	0.23			

Nation

	A	EL	ES	G	HL	S	A	EL	ES	G	HL	S
Enforcement			-0.21	0.24					-0.21			
Work									0.24			
Product				0.20					-0.23	0.28		
New Law				0.23					-0.28	0.34		
People			0.25						0.29			
# People			0.26						0.27			
Area			0.25		0.20				0.30		0.21	
Expenses				-0.33						-0.27		
Action					0.20	-0.25						
Recycle	-0.26	-0.39					-0.23					
Storage	-0.29	-0.47						-0.35			-0.26	
Tax		-0.20						-0.21				

TABLE 24   * p<.001

141

Income

	A	EL	ES	G	HL	S	A	EL	ES	G	HL	S
Enforcement												
Work												
Product				0.22								
New Law			-0.23			-0.27			-0.21			-0.25
People				-0.29							-0.28	
# People				-0.23								
Area			0.28				-0.24		0.33			
Expenses				-0.23						-0.23		
Action			0.20					-0.20	0.22			
Recycle		-0.23					-0.28		0.23			
Storage	-0.33	-0.20					-0.21					
Tax		-0.30				-0.20						

TABLE 24   * p<.001

	L						WC						D					
	A	EL	ES	G	HL	S	A	EL	ES	G	HL	S	A	EL	ES	G	HL	S
										0.21						0.23		
									0.20						0.21			
															0.20			
			0.23						0.35	0.26					0.38	0.22		
			0.27		0.21											0.22		
	-0.23						-0.26						-0.29					
				0.26					0.27	0.21	-0.22					0.23	0.23	-0.21
					-0.30				0.25					-0.31	-0.27	0.21		
	-0.24	-0.26							-0.24					-0.30	-0.20			

(page number)

	L						WC						D					
	A	EL	ES	G	HL	S	A	EL	ES	G	HL	S	A	EL	ES	G	HL	S
			0.23	0.22						0.26						0.29		
			-0.24						-0.23	0.20							0.26	
			-0.28	0.24					-0.23	0.24					-0.26	0.22		
									-0.23		-0.20				-0.22			
		-0.22											-0.21					
						0.20					0.24					0.20		0.24
	0.21	-0.22																
				0.32	0.23					0.32				-0.24		0.20		
				0.31	0.24		-0.21		0.24	0.24						0.21		
			-0.29						-0.24						-0.26			

TABLE 24   * p<.001

A	EL	ES	G	HL	S	A	EL	ES	G	HL	S	A	EL	ES	G	HL	S
								-0.20		-0.25	-0.22					-0.24	
			-0.31														
						0.21						0.26					
		-0.29			-0.23			-0.33			-0.41			-0.28	0.22		-0.41
	-0.30						-0.28				0.22		-0.26				0.26
			-0.22														
		0.21		0.27		0.24								0.21			
		-0.21							-0.24					-0.20			
		0.20		-0.22					0.21		-0.22						-0.20
			-0.25								-0.22			-0.26			
						-0.33								-0.27	-0.20		
-0.22	-0.22					-0.28	-0.24					-0.27	-0.21	0.20			

A	EL	ES	G	HL	S	A	EL	ES	G	HL	S	A	EL	ES	G	HL	S
		-0.25		-0.22				-0.25						-0.31			
														0.20			
		-0.27						-0.28	0.20					-0.29			
		-0.38	0.26					-0.39	0.24					-0.41	0.22		
		0.31						0.23									
			-0.21						0.26	-0.20					0.26	-0.20	
		0.25		0.21										0.24			
			-0.23							-0.24						-0.27	
				0.20	-0.24						-0.20						
-0.26						-0.21						-0.36	-0.33				
-0.41	-0.32		0.25			-0.37	-0.44					-0.23	-0.38			-0.22	
		-0.22		-0.21						-0.20							

TABLE 24   * p<.001

A	EL	ES	G	HL	S	A	EL	ES	G	HL	S	A	EL	ES	G	HL	S
			0.21														
		-0.22	0.21					-0.28				-0.28		-0.24	0.22		-0.21
	-0.20			-0.27						-0.25					-0.20	-0.25	
		0.33						0.34						0.27		0.25	
			-0.236*							-0.28							
		0.23					-0.20	0.23					-0.20	0.25			
-0.21												-0.20	-0.23				
-0.27						-0.20											
	-0.21																

TABLE 24   * p<.001

Significance Design EP   Significance
Chi-Square   Lambda

Health

Age

	AP	WS	L	WC	D		AP	WS	L	WC	D
Enforcement	.000	.000	.000	.000	.000	Enforcement	.010	.200	.207	.217	.127
Work	.000	.000	.000	.000	.000	Work	.548	.208		.134	1
Product	.000	.000	.008	.000	.000	Product	.256	.072	.000	.005	.062
New Law	.006	.017	.078	.006	.003	New Law	.548	.808		.414	.593
People	.000	.000	.000	.000	.000	People	.057	.002	.000	.050	.000
# People	.000	.000	.000	.000	.000	# People	.423	.007	.138	.662	
Area	.000	.000	.000	.000	.000	Area	.001	.013	.000	.017	.227
Expenses	.000	.000	.000	.000	.000	Expenses	.108	.144	.108	.108	.018
Action	.000	.000	.000	.000	.000	Action	.001	.000	.016	.000	.001
Recycle	.000	.000	.000	.000	.000	Recycle	.094	.002	.000	.002	.034
Storage	.000	.000	.002	.010	.001	Storage	.000	.000	.527	.125	.695
Tax	.000	.000	.000	.000	.000	Tax	.025	.090	.055	.055	.024

Religion

	AP	WS	L	WC	D		AP	WS	L	WC	D
Enforcement	.000	.001	.001	.000	.000	Enforcement			.200		.139
Work	.000	.000	.000	.000	.000	Work	.593	.049		.094	.393
Product	.000	.000	.008	.000	.004	Product	.200	.004	.014		1
New Law	.000	.002	.000	.000	.000	New Law	1	.819	.274	.238	.160
People	.000	.000	.000	.000	.000	People	.001	.026	.021	.006	.010
# People	.000	.000	.000	.000	.000	# People	.357		.376	.248	.284
Area	.000	.001	.000	.000	.000	Area	.048	1	.001	.142	.100
Expenses	.000	.000	.000	.000	.000	Expenses	.025	.015	.008	.000	.000
Action	.003	.001	.000	.000	.000	Action					.456
Recycle	.000	.000	.000	.000	.000	Recycle	.473	.131	.131	.131	.007
Storage	.000	.000	.000	.000	.000	Storage	.007	.131	.131	.018	.007
Tax	.000	.000	.000	.000	.000	Tax	.451	.362	.131	.446	.131

TABLE 25

Family

Enforcement	.000	.000	.000	.000	.000	Enforcement	.014	.082	.038	.224	.139
Work	.060	.026	.007	.005	.005	Work					
Product		.000	.008	.002	.000	Product	.020	.217	.330	.266	.038
New Law	.207	.116	.063	.001	.000	New Law	.284		.432	.008	.000
People	.000	.000	.000	.000	.000	People	.317	.593	.811	.169	.169
# People	.000	.000	.000	.000	.000	# People	.011	.011	.004	.004	.004
Area	.000	.000	.000	.000	.000	Area	.027	.021	.003	.085	.009
Expenses	.000	.000	.000	.000	.000	Expenses	.001	.038	.038	.038	.593
Action	.000	.000	.000	.000	.000	Action	.022	.156	.156	.049	.004
Recycle	.000	.000	.000	.000	.000	Recycle	.010	.012	.023	.006	.005
Storage	.000	.000	.000	.000	.000	Storage	.050	1	.009	.748	.5
Tax	.000	.000	.000	.000	.000	Tax	.015	.026	.031	.101	.028

Nation

Enforcement	.002	.000	.025	.001	.511	Enforcement	.004	.033	.449	.004	1
Work	.000	.000	.000	.000	.000	Work	.001	.011	.001	.002	.001
Product	.000	.002	.004	.016	.001	Product	.000	.004	.796		
New Law	.006	.000	.000	.000	.005	New Law		.335	.072	.048	.781
People	.000	.000	.000	.000	.000	People	.586	.120	.014	.303	.093
# People	.000	.000	.000	.000	.000	# People	.342	.082	.835	.156	.105
Area	.000	.000	.000	.000	.000	Area	.032	.015	.015	.448	.266
Expenses	.001	.000	.002	.000	.000	Expenses		.593			
Action	.000	.000	.000	.000	.000	Action	.398	.006	.303	.012	.036
Recycle	.000	.000	.000	.000	.000	Recycle	.057	.057	.057	.131	.057
Storage	.000	.000	.000	.000	.000	Storage	.007	.274	.027	.131	.082
Tax	.000	.000	.000	.000	.000	Tax	.101	.317	.085	.032	.134

TABLE 25

Income

Enforcement	.000	.001	.000	.001	.000	Enforcement	.014		.432		
Work	.000	.000	.000	.000	.000	Work	.244	.893		.785	.065
Product	.000	.002	.000	.011	.000	Product	.000		.004		.414
New Law	.000	.002	.000	.003	.056	New Law	1		.317		
People	.000	.000	.000	.000	.000	People	.001	.131	.004	.005	.001
# People	.000	.000	.000	.000	.000	# People	.041	.006	.016	.085	.008
Area	.000	.000	.000	.000	.000	Area	.003	.130	.256	.138	.056
Expenses	.000	.000	.000	.000	.000	Expenses	.299	.237	.354	.350	.164
Action	.000	.000	.000	.000	.000	Action	.655	.094	.050	.069	.262
Recycle	.000	.000	.000	.000	.000	Recycle	.002	.057	.034	.000	.034
Storage	.000	.000	.000	.000	.000	Storage	.038	.484	.274	.031	.186
Tax	.000	.000	.000	.000	.000	Tax	.057	.078	.057	.057	.034

TABLE 25

Significance
Uncertainty Coefficient

	AP	WS	L	WC	D
Enforcement	.002	.000	.000	.000	.000
Work	.000	.000	.000	.000	.000
Product	.000	.000	.000	.000	.000
New Law	.000	.003	.003	.000	.000
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.000
Area	.000	.000	.000	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.001	.004	.000
Tax	.000	.000	.000	.000	.000

Enforcement	.000	.000	.000	.000	.000
Work	.000	.000	.000	.000	.000
Product	.000	.000	.000	.000	.000
New Law	.000	.000	.008	.000	.000
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.000
Area	.000	.000	.000	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.000	.000	.000
Tax	.000	.000	.000	.000	.000

TABLE 25

Enforcement	.000	.000	.000	.000	.000
Work	.009	.003	.000	.000	.000
Product	.000	.000	.001	.001	.000
New Law	.093	.005	.008	.000	.000
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.000
Area	.000	.000	.000	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.000	.000	.000
Tax	.000	.000	.000	.000	.000

Enforcement	.000	.000	.005	.000	.158
Work	.000	.000	.000	.000	.000
Product	.000	.000	.000	.000	.000
New Law	.000	.000	.000	.000	.000
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.000
Area	.000	.000	.000	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.000	.000	.000
Tax	.000	.000	.000	.000	.000

TABLE 25

Enforcement	.000	.000	.000	.000	.000
Work	.000	.000	.000	.000	.000
Product	.000	.000	.000	.001	.000
New Law	.000	.000	.000	.000	.003
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.000
Area	.000	.000	.000	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.000	.000	.000
Tax	.000	.000	.000	.000	.000

TABLE 25

Cross tabulation analysis (frequencies) shows that younger must of time took more overall environmental actions but not always. Analysis through each environmental problem shows that for income, air pollution and water scarcity were where younger mostly took a higher number of overall environmental actions compared with older through each factor. Only in 4 of 12 factors younger did not take a higher number of overall environmental actions compared with older. In both, water contamination and deforestation, in 5 of 12 factors where younger did not take a higher number of overall environmental actions, and finally in leaks were 7 of 12. Results for health, family, nation and religious beliefs are also shown in table 26 and figures 14 and 15.

Based on chi-square, lambda and uncertainty coefficient values, as well as on frequency results, the null hypothesis 5 is rejected and the alternative hypothesis 5 is accepted.

AGE	AP	WS	L	WC	D
Health	4	4	7	5	5
Income	4	4	7	5	5
Rel. Beliefs	7	6	6	7	8
Family	5	4	4	5	5
Nation	4	4	4	5	6

Factors where younger did NOT take a higher number of overall environmental actions
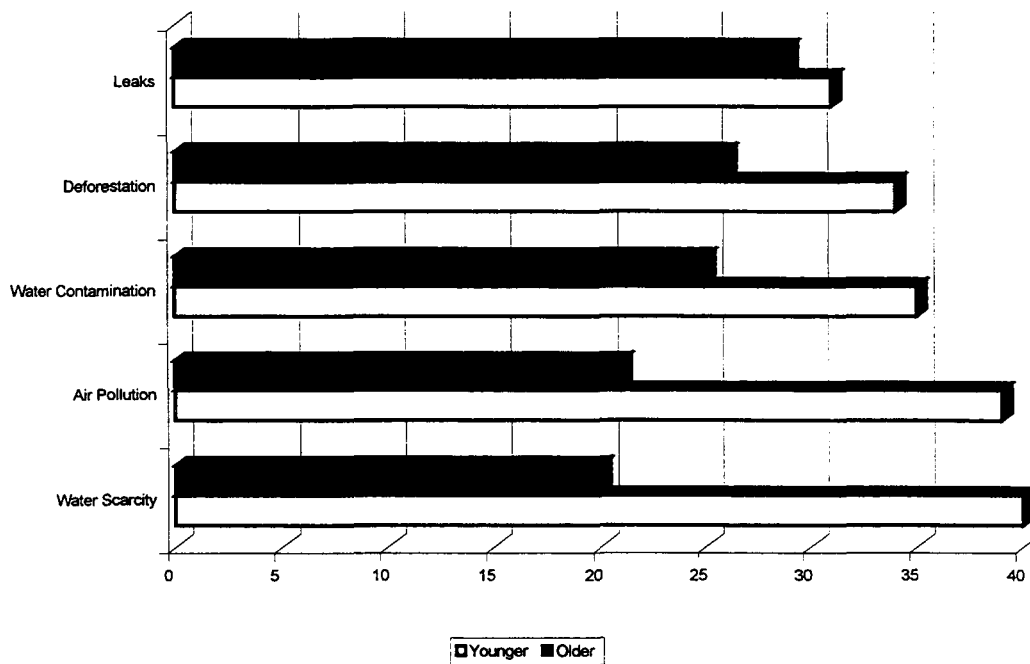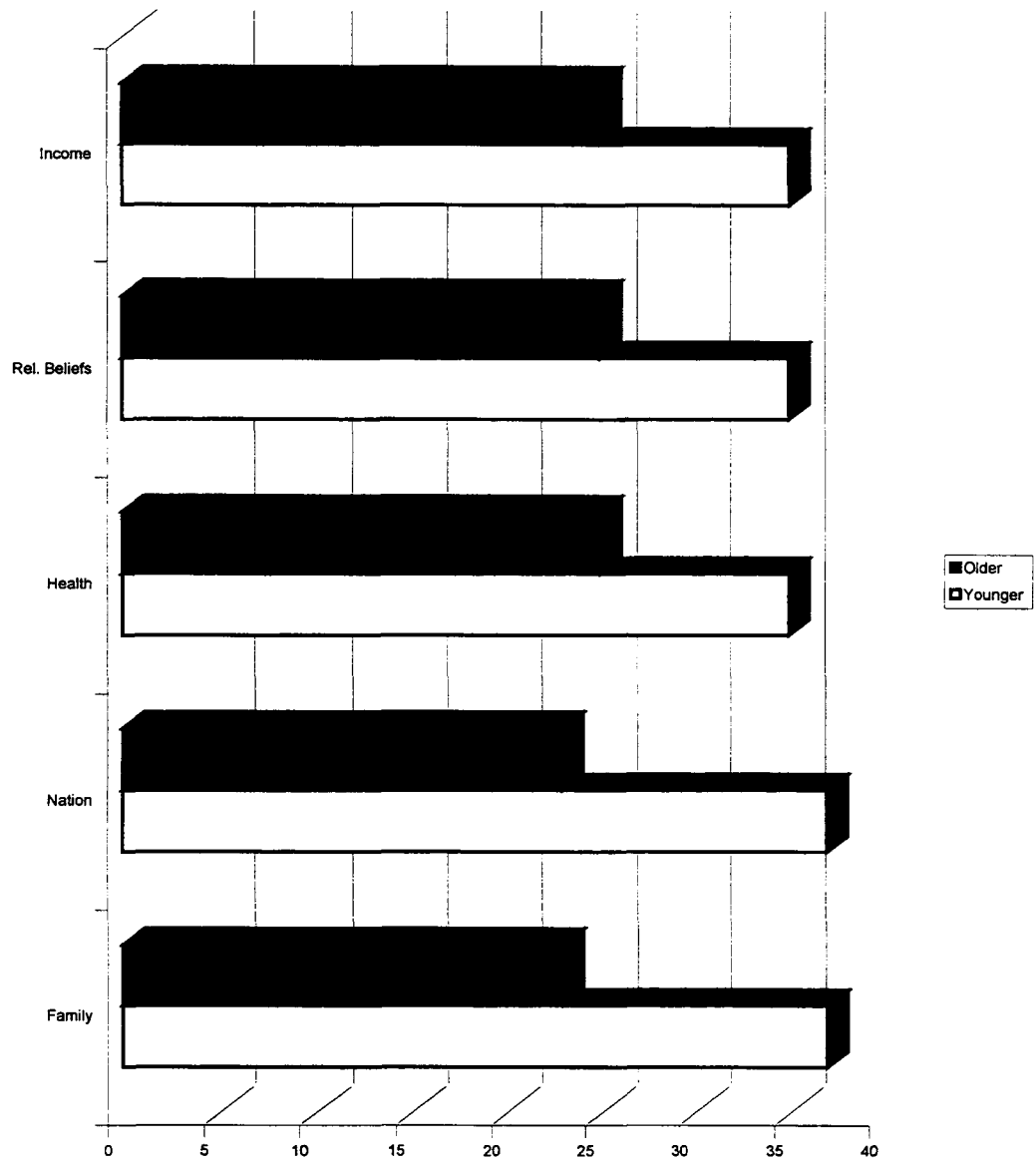
TABLE 26

FIGURE 14

153

FIGURE 15

154

Hypothesis 6. "Actions taken will differ depending on gender. Female will tend to take a higher number of overall environmental actions than Male".

Null Hypothesis 6. "Actions taken will differ depending on gender. Female will not tend to take a higher number of overall environmental actions than Male".

The response could be :

<u>Overall environmental actions</u>

Teamwork

Rely on insiders to solve problems

Involve many persons

Many areas of expertise represented

Authorize significant expenses

Act

Recycle (Always or Frequently)

Proper waste disposal (Always or Frequently)

Support tax payment increase for environmental protection (Always or Frequently)

Support environmental law enforcement (Always or Frequently)

Use of environmentally friendly products (Always or Frequently)

Promote a new and more sever environmental law (Always or Frequently)

Asking whether Female had "Always" and "Frequently" as the most common answers for strategic actions and "Never" and "Few times" for environmental actions tests the corresponding null hypothesis.

Responses of more "Always" and "Frequently" for strategic actions and responses of "Never" and "Few times" for environmental actions are consistent with the null hypothesis and responses of "Never" and "Few times" for strategic actions and "Always" and "Frequently" for environmental actions by female are inconsistent with the null hypothesis.

Question 6 will give data for Hypothesis 6 to evaluate if they tended to take more or less overall environmental actions.

Regression analysis was done to obtain correlation between gender and actions taken for the different types of threat and types of environmental problems, results are shown in table 24. As shown in table 27, Chi-square analysis shows significance levels close to zero. Lambda values and uncertainty coefficients were calculated, in general, these values go down by about 25 percent and in several cases are zero. Blank spaces means that cannot be computed because the asymptotic standard error equals zero

Significance Chi-Square	Design EP					Significance Lambda					
Health	AP	WS	L	WC	D		AP	WS	L	WC	D
Education level											
Enforcement	.009	.012	.000	.000	.017	Enforcement			.593	.405	
Work	.000	.000	.000	.000	.000	Work		.354	.014	.354	.104
Product	.112	.247	.006	.000	.001	Product				.577	
New Law	.025	.000	.068	.007	.000	New Law			.637		.317
People	.000	.000	.003	.001	.004	People	.763	.763	.763	.763	.763
# People	.000	.000	.000	.000	.000	# People			.571		.891
Area	.081	.007	.005	.108	.004	Area					
Expenses	.000	.000	.000	.000	.000	Expenses					
Action	.098	.164	.033	.009	.018	Action					
Recycle	.000	.000	.024	.000	.000	Recycle	.071			.724	
Storage	.000	.001	.000	.129	.000	Storage	.796				.125
Tax	.000	.000	.000	.000	.000	Tax	.221	.179	.221	.564	.646
Religion											
Enforcement	.002	.014	.002	.000	.000	Enforcement	.796	.796	.796	.796	.796
Work	.000	.00	.000	.000	.000	Work	.006	.631		.011	.062
Product	.000	.000	.000	.000	.000	Product	.000	.138	.881	.000	.262
New Law	.000	.000	.000	.000	.000	New Law	.051	.051	.051	.051	.051
People	.000	.000	.000	.000	.000	People	.453	.060	.453	.060	.060
# People	.001	.000	.000	.000	.000	# People					
Area	.000	.000	.008	.001	.001	Area	.007	.224		.224	.224
Expenses	.000	.000	.000	.000	.000	Expenses	.020	.020	.330	.354	.435
Action	.000	.000	.005	.000	.000	Action					
Recycle	.000	.001	.001	.006	.000	Recycle	.639				.639
Storage	.003	.003	.000	.000	.005	Storage					
Tax	.000	.000	.000	.000	.000	Tax	.010	.000	.002	.000	.000

TABLE 27

Family

Enforcement	.008	.011	.001	.003	.001	Enforcement					
Work	.000	.000	.000	.000	.000	Work					
Product	.003	.000	.025	.005	.001	Product					
New Law	.006	.005	.068	.027	.000	New Law					.008
People	.000	.000	.000	.000	.000	People					
# People	.009	.020	.001	.001	.110	# People					
Area	.000	.000	.001	.000	.000	Area					
Expenses	.005	.035	.046	.047	.035	Expenses					
Action	.000	.000	.000	.000	.000	Action					
Recycle	.000	.000	.000	.000	.000	Recycle	.160		.002	.000	.047
Storage	.000	.000	.001	.000	.000	Storage	.138	.101		.101	.101
Tax	.000	.000	.000	.000	.000	Tax	.181	.032	.059	.032	.032

Nation

Enforcement	.000	.000	.000	.000	.000	Enforcement		.886			
Work	.000	.000	.000	.000	.000	Work	.014	.010	.182	.010	.000
Product	.086	.032	.000	.083	.006	Product		.317		.317	
New Law	.000	.000	.000	.000	.000	New Law					
People	.000	.000	.000	.000	.000	People					
# People	.000	.000	.001	.000	.000	# People	.004	.107	.013	.000	.198
Area	.001	.036	.001	.003	.000	Area					
Expenses	.000	.000	.000	.000	.000	Expenses					
Action	.000	.001	.000	.000	.018	Action					
Recycle	.000	.000	.000	.000	.000	Recycle	.012	.062		.362	.000
Storage	.000	.000	.000	.000	.000	Storage	.002	.029	.391	.000	.044
Tax	.000	.000	.000	.000	.000	Tax	.668			.668	.801

TABLE 27

Income

Enforcement	.000	.000	.000	.000	.000	Enforcement	.593		.593		
Work	.000	.000	.000	.000	.000	Work	.000		.027		.369
Product	.030	.036	.007	.001	.006	Product					
New Law	.047	.013	.003	.083	.010	New Law					
People	.000	.000	.000	.000	.000	People				.696	
# People	.000	.000	.000	.000	.007	# People	.898			1	
Area	.024	.006	.000	.002	.000	Area			.579		.579
Expenses	.000	.000	.000	.000	.000	Expenses	.345	.058	.345	.345	.345
Action	.017	.002	.002	.001	.001	Action					
Recycle	.000	.001	.000	.000	.000	Recycle	.004		.768	.768	.004
Storage	.000	.000	.000	.000	.000	Storage	.004	.889	.144	.010	.240
Tax	.000	.001	.000	.000	.000	Tax	.002	.148	.148	.148	.024

159

TABLE 27

Significance
Uncertainty Coefficient

	AP	WS	L	WC	D
Enforcement	.001	.008	.000	.000	.009
Work	.000	.000	.000	.000	.000
Product	.037	.081	.001	.000	.001
New Law	.002	.000	.000	.002	.000
People	.000	.000	.002	.002	.006
# People	.000	.000	.000	.000	.000
Area	.011	.000	.001	.018	.000
Expenses	.000	.000	.000	.000	.000
Action	.032	.054	.008	.001	.004
Recycle	.000	.000	.007	.000	.000
Storage	.000	.000	.000	.044	.000
Tax	.000	.000	.000	.000	.000

	AP	WS	L	WC	D
Enforcement	.004	.018	.002	.000	.002
Work	.000	.000	.000	.000	.000
Product	.000	.000	.000	.000	.000
New Law	.000	.000	.000	.000	.000
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.130
Area	.000	.000	.000	.000	.000
Expenses	.000	.000	.001	.000	.000
Action	.000	.000	.003	.001	.000
Recycle	.000	.000	.000	.001	.000
Storage	.002	.008	.000	.000	.006
Tax	.000	.000	.000	.000	.000

TABLE 27

Enforcement	.001	.001	.000	.000	.000
Work	.000	.000	.000	.000	.000
Product	.000	.000	.001	.000	.000
New Law	.000	.000	.007	.004	.000
People		.000	.000	.000	.000
# People	.003	.005	.000	.000	.021
Area	.000	.000	.000	.000	.000
Expenses	.000	.002	.003	.003	.003
Action	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.001	.000	.000
Tax	.000	.000	.000	.000	.000

Enforcement	.000	.000	.000	.000	.000
Work	.000	.000	.000	.000	.000
Product	.020	.018	.000	.080	.009
New Law	.000	.000	.000	.000	.000
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.000
Area	.000	.006	.000	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.000	.000	.000	.000	.004
Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.000	.000	.000
Tax	.000	.000	.000	.000	.000

TABLE 27

Enforcement	.000	.000	.000	.000	.000
Work	.000	.000	.000	.000	.000
Product	.002	.004	.000	.000	.000
New Law	.047.008	.004	.001	.022	.002
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.000
Area	.020	.000	.000	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.001	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.000	.000	.000
Tax	.000	.000	.000	.000	.000

TABLE 27

Cross tabulation analysis (frequencies) shows that effectively female, most of the time, took a higher number of overall environmental actions but not always. In this study were 226 male and 158 female. Analysis through each environmental problem shows that for income, air pollution was where female mostly took a higher number of overall environmental actions compared with male through each factor. Only in 1 of 12 factors female did not take a higher number of overall environmental actions compared with male; in water contamination in 2 of 12 factors female did not take a higher number of overall environmental actions, and finally in water scarcity, leaks and deforestation, in 3 of 12 factors female did not take a higher number of overall environmental actions. Results for health, family, nation and religious beliefs are also shown in table 28 and figures 16 and 17.

Based on chi-square, lambda and uncertainty coefficient values, as well as on frequency results, the null hypothesis 6 is rejected and the alternative hypothesis 6 is accepted.

GENDER	AP	WC	L	WIC	D
Health	6	5	3	4	5
Income	1	3	3	2	3
Rel. Beliefs	3	5	2	5	4
Family	6	5	4	4	5
Nation	1	2	2	1	1

Factors where female did NOT take a higher number of overall environmental actions

TABLE 28
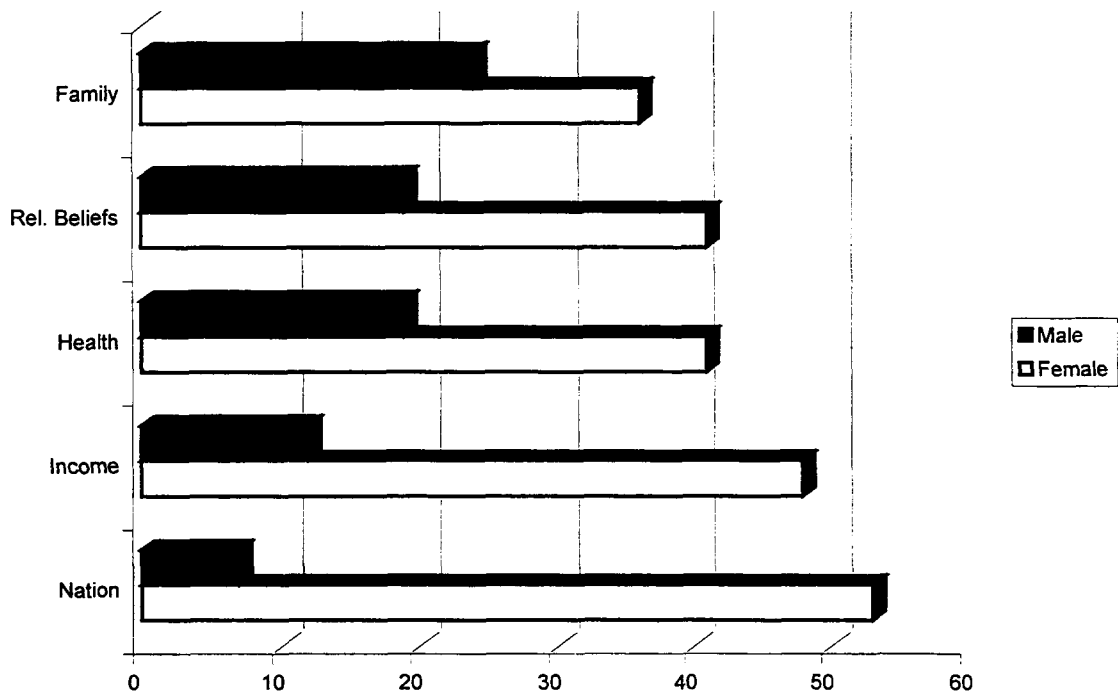
FIGURE 16
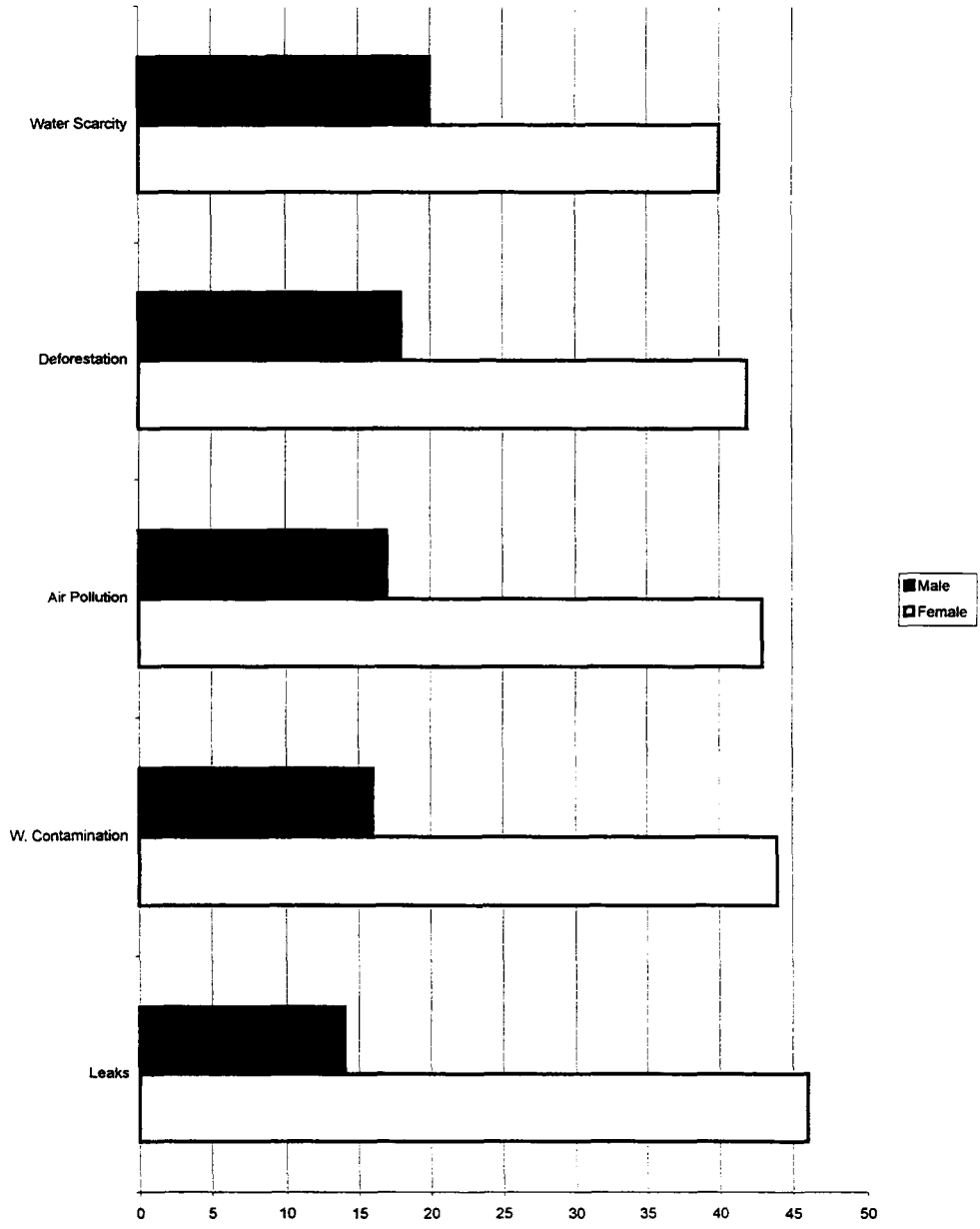
164

FIGURE 17

165

Hypothesis 7. "Actions taken will differ depending on Education level. People with higher academic degrees will tend to take a higher number of overall environmental actions".

Null Hypothesis 7. "Actions taken will differ depending on Education level. People with higher academic degrees will not tend to take a higher number of overall environmental actions".

The response could be :

Overall environmental actions

Teamwork

Rely on insiders to solve problems

Involve many persons

Many areas of expertise represented

Authorize significant expenses

Act

Recycle (Always or Frequently)

Proper waste disposal (Always or Frequently)

Support tax payment increase for environmental protection (Always or Frequently)

Support environmental law enforcement (Always or Frequently)

Use of environmentally friendly products (Always or Frequently)

Promote a new and more sever environmental law (Always or Frequently)

166

Asking whether people with higher academic degrees had "Always" and "Frequently" as the most common answers for strategic actions and "Never" and "Few times" for environmental actions tests the corresponding null hypothesis.

Responses of more "Always" and "Frequently" for strategic actions and responses of "Never" and "Few times" for environmental actions are consistent with the null hypothesis and responses of "Never" and "Few times" for strategic actions and "Always" and "Frequently" for environmental actions by people with higher academic degrees are inconsistent with the null hypothesis.

Question 6 will give data for Hypothesis 7 to evaluate if they tended to take more or less overall environmental actions.

Regression analysis was done to obtain correlation between education level and actions taken for the different types of threat and types of environmental problems, results are shown in table 24. As shown in table 29, Chi-square analysis shows significance levels close to zero. Lambda values and uncertainty coefficients were calculated, in general, these values go down by about 25 percent and in several cases are zero. Blank spaces means that cannot be computed because the asymptotic standard error equals zero

Significance Chi-Square	Design EP					Significance Lambda					
Health	AP	WS	L	WC	D		AP	WS	L	WC	D
Education specialization											
Enforcement	.000	.000	.000	.000	.000	Enforcement	.040	.000	.014	.004	.296
Work	.000	.000	.000	.000	.000	Work	.004	.000	.019	.866	
Product	.000	.000	.000	.000	.001	Product	.000	.014	.317	.005	1
New Law	.000	.000	.000	.000	.000	New Law	.019	.000	.101	.101	.317
People	.000	.000	.000	.000	.000	People	.019	.220	.083	.247	.070
# People	.000	.000	.000	.000	.000	# People	.115	.113	.285	.053	.004
Area	.000	.000	.000	.000	.000	Area	.002	.000	.000	.004	.000
Expenses	.000	.000	.000	.000	.000	Expenses		.181			.072
Action	.000	.000	.000	.000	.000	Action	.405	.256	.593	.284	.405
Recycle	.000	.000	.000	.000	.000	Recycle		.000	.579	.579	.156
Storage	.000	.000	.000	.000	.000	Storage		.014	.156	.014	
Tax	.001	.000	.000	.000	.000	Tax	.303	.012	.012	.012	.040
Religion											
Enforcement	.000	.000	.000	.000	.000	Enforcement	.655	.082	.085	.266	.049
Work	.000	.000	.000	.000	.000	Work	.044	.003	.231	.032	.059
Product	.000	.000	.000	.000	.000	Product	.371	.371	.437	.666	.371
New Law	.000	.000	.000	.000	.000	New Law	.004	.077	.191	.058	.032
People	.000	.000	.000	.001	.000	People	.053	.189	.130	.018	.173
# People	.000	.000	.000	.000	.000	# People	.284	.284	.593	.405	.354
Area	.000	.000	.000	.000	.000	Area	.003	.000	.330	.019	.002
Expenses	.000	.000	.000	.000	.000	Expenses	.000	.004	.001	.001	.001
Action	.000	.000	.001	.000	.000	Action	.131	.070	.593	.068	.455
Recycle	.000	.000	.000	.000	.000	Recycle	.593	.507	.122	.139	
Storage	.000	.000	.000	.000	.000	Storage	.045	.371	.133	.371	.540
Tax	.000	.000	.000	.000	.000	Tax	.375	.007	.026	.143	.026

TABLE 29

Family

Enforcement	.000	.000	.000	.000	.000	Enforcement		.125	.617	.317	
Work	.000	.000	.000	.000	.000	Work	.000	.000	.006	.000	.000
Product	.000	.000	.000	.000	.000	Product	.058		.085	.256	
New Law	.000	.000	.000	.000	.000	New Law		.296	.317	.014	.014
People	.000	.009	.000	.001	.000	People	.857		.777		
# People	.000	.000	.000	.000	.000	# People	.066	.011	.082	.010	.409
Area	.000	.000	.000	.000	.000	Area	.002	.489	.019	.479	.084
Expenses	.000	.000	.000	.000	.000	Expenses	.000	.011	.038	.003	.005
Action	.000	.000	.000	.000	.012	Action	.577	.577	.577	.353	.577
Recycle	.000	.000	.000	.000	.000	Recycle	.180	.104	.018	.028	.002
Storage	.000	.000	.000	.000	.000	Storage	.066	.043	.000	.203	.001
Tax	.000	.000	.000	.000	.000	Tax	.449	.019	.000	.001	.000

Nation

Enforcement	.000	.000	.000	.000	.000	Enforcement	.024	.024		.024	.014
Work	.000	.000	.000	.000	.000	Work	.002	.317	.879	.031	.317
Product	.000	.000	.000	.000	.000	Product	.024	.024	.330	.024	.014
New Law	.000	.000	.000	.000	.000	New Law	.004		.082	.001	.001
People	.000	.000	.000	.000	.000	People		.529	.144		.516
# People	.000	.000	.000	.000	.000	# People	.004	.004	.024	.271	.002
Area	.000	.000	.000	.000	.000	Area	.115	.035	.211	.469	.036
Expenses	.000	.000	.000	.000	.000	Expenses	.014		.014	.001	.058
Action	.000	.000	.000	.000	.012	Action	.000	.008	.001	.015	.004
Recycle	.000	.001	.000	.000	.000	Recycle	.796	.796	.796		
Storage	.000	.000	.000	.000	.000	Storage	1		.001	1	1
Tax	.000	.000	.000	.001	.000	Tax	1	.414	.125		

TABLE 29

Income

Enforcement	.000	.000	.000	.000	.000	Enforcement	.317	.024	.014	.101	.024
Work	.000	.000	.000	.004	.000	Work	.317	.004	.160	.564	.396
Product	.000	.000	.000	.000	.000	Product	.000	.008	.014	.014	.001
New Law	.000	.000	.000	.000	.000	New Law	.330			.014	
People	.000	.009	.000	.000	.000	People	.169	.002	.004	.004	.004
# People	.000	.000	.000	.000	.000	# People	.003	.010	.139	.002	.045
Area	.000	.000	.000	.000	.000	Area	.003	.004	.000	.000	.000
Expenses	.000	.000	.000	.000	.000	Expenses					
Action	.000	.000	.000	.000	.000	Action	.004	.039	.039	.019	.000
Recycle	.000	.000	.000	.002	.000	Recycle	.104	.018	.205	.884	.014
Storage	.000	.000	.000	.000	.000	Storage	.014	.006	.004	.004	.148
Tax	.000	.000	.000	.000	.000	Tax	.127	.274		.274	.274

TABLE 29

Significance
Uncertainty Coefficient

	AP	WS	L	WC	D
Enforcement	.000	.000	.000	.000	.000
Work	.000	.188	.000	.000	.000
Product	.000	.000	.000	.000	.001
New Law	.000	.000	.000	.001	.000
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.000
Area	.000	.000	.000	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.000	.000	.000
Tax	.000	.000	.000	.000	.000
Enforcement	.000	.000	.000	.000	.000
Work	.000	.000	.000	.000	.000
Product	.000	.371	.000	.000	.000
New Law	.000	.000	.000	.000	.000
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.000
Area	.000	.000	.000	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.000	.000	.000
Tax	.000	.000	.000	.000	.000

TABLE 29

Enforcement	.000	.000	.000	.000	.000
Work	.000	.000	.000	.000	.000
Product	.000	.000	.000	.000	.000
New Law	.000	.000	.000	.000	.000
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.000
Area	.000	.000	.000	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.000
Storage		.000	.000	.000	.000
Tax	.000	.000	.000	.000	.000

Enforcement	.000	.000	.000	.000	.000
Work	.000	.000	.000	.000	.000
Product	.000	.000	.000	.000	.000
New Law	.000	.000	.000	.000	.000
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.000
Area	.000	.000	.000	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.000	.000	.000
Tax	.000	.000	.000	.000	.000

TABLE 29

Enforcement	.000	.000	.000	.000	.000
Work	.000	.000	.000	.000	.000
Product	.000	.000	.000	.000	.000
New Law	.000	.000	.000	.000	.000
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.000
Area	.000	.000	.000	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.000	.000	.000
Tax	.000	.000	.000	.000	.000

TABLE 29

Cross tabulation analysis (frequencies) shows that effectively people with Master degrees, most of the time, took a higher number of overall environmental actions but not always compared with people with Bachelor degree. In this study were 308 with bachelor degree and 76 with master degree. Analysis through each environmental problem shows that for income, leaks and water contamination, were the problems where people with higher academic degrees mostly took a higher number of overall environmental actions compared with bachelor through each factor. Only in 3 of 12 factors people with higher academic degrees did not take a higher number of overall environmental actions compared with bachelors in both environmental problems; in water scarcity and deforestation in 4 of 12 factors people with higher academic degrees did not take a higher number of overall environmental actions, and finally in air pollution in 6 of 12 factors people with higher academic degrees did not take a higher number of overall environmental actions. Results for health, family, nation and religious beliefs are also shown in table 30 and figures 18 and 19.

Based on chi-square, lambda and uncertainty coefficient values, as well as on frequency results, the null hypothesis 7 is rejected and the alternative hypothesis 7 is accepted.

174

ED LEVEL	AP	WS	L	WC	D
Health	3	3	3	3	5
Income	6	4	3	3	4
Rel. Beliefs	8	7	8	8	9
Family	4	4	4	5	6
Nation	7	7	7	7	7

Factors were people with higher academic degree did NOT take a higher number of overall environmental actions.

TABLE 30
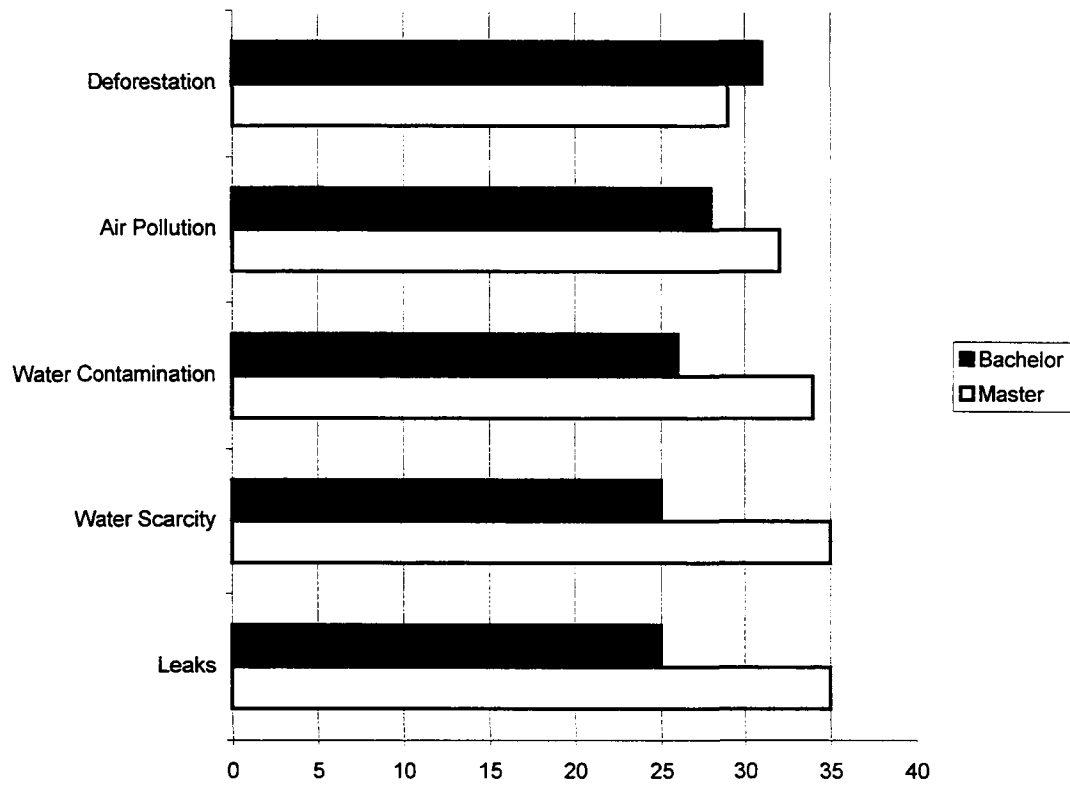
FIGURE 18
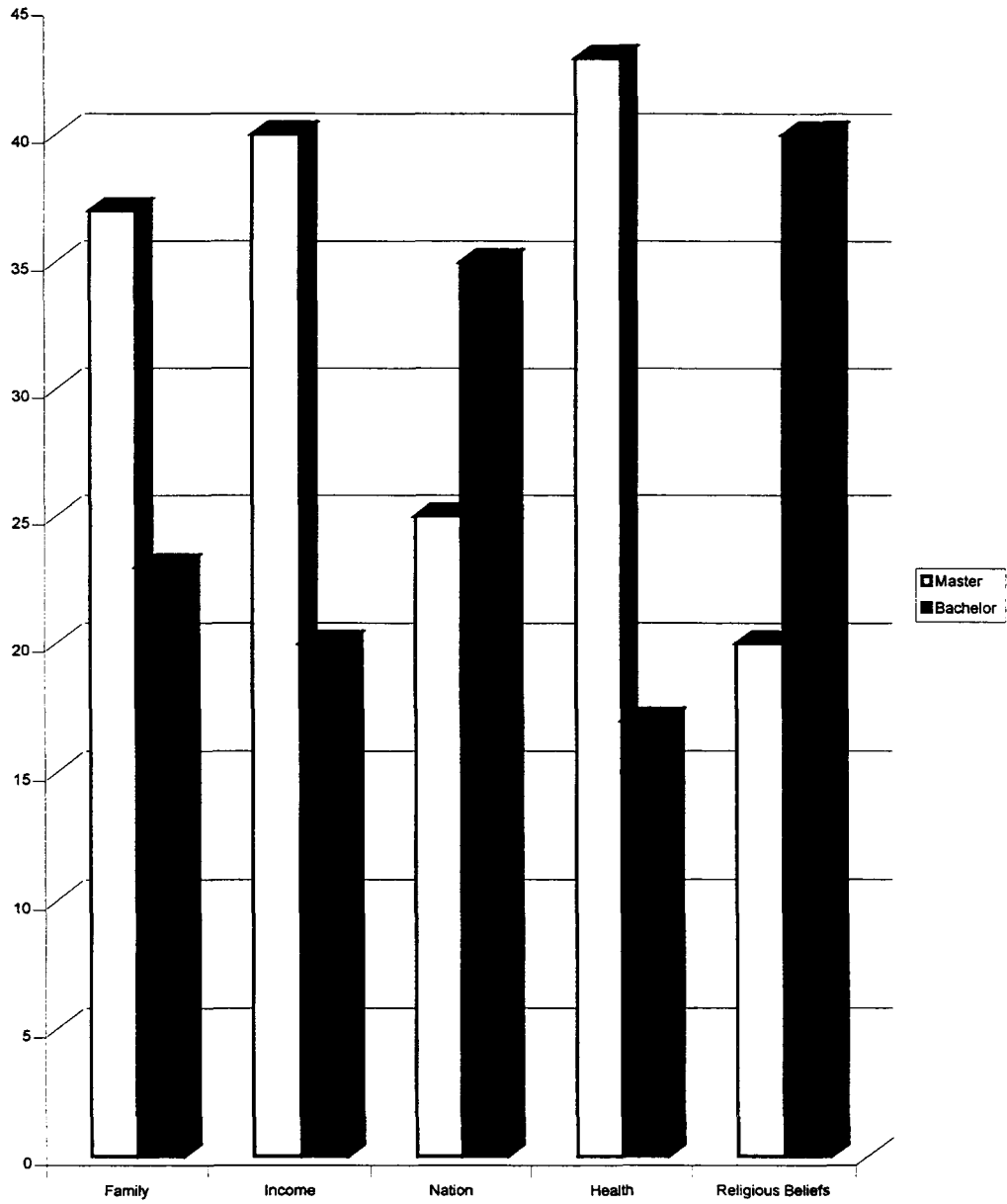
FIGURE 19

176

Hypothesis 8. "Actions taken will differ depending on Educational Type. People that are more "technical" in term of the type of formal education will tend to take a higher number of overall environmental actions".

Null Hypothesis 8. "Actions taken will differ depending on Educational Type. People that are more "technical" in terms of the type of formal education will not tend to take a higher number of overall environmental actions".

The response could be :

Overall environmental actions

Teamwork

Rely on insiders to solve problems

Involve many persons

Many areas of expertise represented

Authorize significant expenses

Act

Recycle (Always or Frequently)

Proper waste disposal (Always or Frequently)

Support tax payment increase for environmental protection (Always or Frequently)

Support environmental law enforcement (Always or Frequently)

Use of environmentally friendly products (Always or Frequently)

Promote a new and more sever environmental law (Always or Frequently)

The corresponding null hypothesis is tested by asking whether people that are more "technical" in terms of the type of formal education had "Always" and "Frequently" as the most common answers for strategic actions and "Never" and "Few times" for environmental actions.

Responses of more "Always" and "Frequently" for strategic actions and responses of "Never" and "Few times" for environmental actions are consistent with the null hypothesis and responses of "Never" and "Few times" for strategic actions and "Always" and "Frequently" for environmental actions by people that are more "technical" in terms of the type of formal education are inconsistent with the null hypothesis. From the most "Technical" to the less "Technical", the classification of the fields for this study is : The most "Technical", Engineering, followed by Sciences, Management and Humanities.

Question 6 will give data for Hypothesis 8 to evaluate if they tended to take more or less overall environmental actions.

Regression analysis was done to obtain correlation between education type and actions taken for the different types of threat and types of environmental problems, results are shown in table 24. As shown in table 31, Chi-square analysis shows significance levels close to zero. Lambda values and uncertainty coefficients were calculated, in general, these values go down by about 25 percent and in several cases are zero. Blank spaces means that cannot be computed because the asymptotic standard error equals zero

Significance Chi-Square	Design EP					Significance Lambda					
Health	AP	WS	L	WC	D		AP	WS	L	WC	D
Gender											
Enforcement	.000	.000	.000	.000	.000	Enforcement	.676	.014	.014	.008	.641
Work	.000	.000	.000	.000	.000	Work	.001	.000	.000	.000	.205
Product	.000	.000	.000	.001	.000	Product	.002		.317		.004
New Law	.000	.000	.002	.000	.000	New Law					
People	.000	.000	.000	.000	.000	People	.000	.013	.312	.010	.001
# People	.001	.114	.001	.000	.010	# People	.189	.696	.087	.074	.251
Area	.000	.003	.007	.000	.617	Area	.032	.312	.014	.007	
Expenses	.250	.787	.173	.027	.020	Expenses					
Action	.000	.000	.000	.000	.000	Action	.067	.093	.002	.003	.056
Recycle	.006	.000	.000	.000	.000	Recycle	.548		.051	.844	.607
Storage	.069	.000	.004	.000	.000	Storage	.796	.000		.008	.000
Tax	.011	.014	.133	.001	.016	Tax				.686	.777
Religion											
Enforcement	.000	.000	.000	.000	.000	Enforcement	.396	.343	.469	.373	.338
Work	.000	.000	.000	.059	.000	Work	.007	.116	.121	.670	.283
Product	.000	.000	.000	.000	.000	Product	.160	.373	.198	.238	.072
New Law	.000	.000	.003	.000	.000	New Law	.057	.035	.604	.006	.034
People	.000	.001	.001	.050	.001	People	.515	.458	.701		
# People	.000	.000	.000	.000	.000	# People	.000	.003	.326	.001	.122
Area	.000	.002	.000	.000	.002	Area	.064	.600	.120	.042	.235
Expenses	.000	.000	.000	.000	.000	Expenses	.187	.381	.041	.007	.002
Action	.000	.000	.000	.000	.000	Action	.083	.033	.078	.354	.000
Recycle	.002	.000	.000	.000	.000	Recycle	.943	.414	.243	.529	.347
Storage	.000	.000	.000	.000	.000	Storage	.222	.663	.209	.008	.014
Tax	.000	.000	.000	.000	.000	Tax	.000	.007	.003	.000	.013

TABLE 31

Family

Enforcement	.018	.011	.012	.468	.004	Enforcement	.014	.014	.008	.317	.058
Work	.000	.000	.000	.000	.000	Work		.164	.224	.098	.324
Product	.013	.001	.003	.221	.106	Product	.014	.072	.008	.317	
New Law	.009	.000	.003	.000	.000	New Law			.156	.008	.781
People	.000	.000	.005	.000	.001	People	.133	.628	.519	.110	.327
# People	.000	.000	.000	.000	.000	# People	.298	.579	.643		.371
Area	.000	.006	.758	.000	.762	Area	.156	.156		.392	
Expenses	.000	.000	.000	.000	.000	Expenses	.698	.795		.444	
Action	.000	.000	.000	.000	.000	Action	.000	.090	.000	.000	.022
Recycle	.187	.685	.164	.076	.000	Recycle	.160			.179	.076
Storage	.000	.000	.004	.000	.000	Storage	.069	.005	.808	.009	.002
Tax	.000	.000	.000	.000	.000	Tax	.110	.021	.263	.479	.158

Nation

Enforcement	.000	.002	.000	.000	.067	Enforcement				.014	.317
Work	.001	.000	.003	.029	.003	Work	.857				
Product	.000	.000	.000	.001	.000	Product	.004				.317
New Law	.000	.000	.000	.000	.000	New Law		0.544			
People	.000	.001	.000	.608	.082	People	0.203		0.908		
# People	.002	.000	.000	.000	.000	# People	0.913			0.527	0.066
Area	.000	.644	.230	.000	.000	Area	0.057		0.909		0.013
Expenses	.000	.000	.000	.000	.000	Expenses	0.22	0.488		0.778	0.778
Action	.187	.245	.006	.101	.000	Action			0.22	0.918	0.007
Recycle	.024	.020	.000	.000	.000	Recycle				0.847	
Storage	.000	.000	.000	.139	.004	Storage	0.405	0			
Tax	.000	.000	.000	.000	.000	Tax	0.224		0.862	0.701	0.653

TABLE 31

Income

Enforcement	.000	.000	.096	.019	.000	Enforcement	.058			
Work	.157	.405	.058	.240	.009	Work					.208
Product	.000	.000	.000	.000	.000	Product		.014	.670	.317	.014
New Law	.000	.000	.000	.000	.000	New Law	.002			.008	.014
People	.000	.000	.000	.000	.000	People	.003	.007		.111	.001
# People	.000	.008	.000	.000	.001	# People	.505		.348	.039	.296
Area	.000	.025	.018	.000	.000	Area	.003		.439	.330	.078
Expenses	.000	.000	.000	.000	.000	Expenses	.126	.133	.317	.072	.628
Action	.000	.000	.055	.034	.004	Action	.000	.015	.577	.652	.014
Recycle	.000	.003	.000	.001	.000	Recycle	.001		.237	.781	.004
Storage	.000	.017	.012	.022	.104	Storage	.058	.014			
Tax	.000	.000	.000	.000	.000	Tax	.326	.074	.188	.127	.097

TABLE 31

Significance
Uncertainty Coefficient

	AP	WS	L	WC	D
Enforcement	.000	.000	.000	.000	.000
Work	.000	.000	.000	.000	.000
Product	.000	.000	.000	.000	.029
New Law	.000	.000	.000	.000	.000
People	.000	.000	.000	.000	.000
# People	.001	.114	.001	.000	.010
Area	.000	.003	.007	.000	.619
Expenses	.000	.783	.031	.024	.017
Action	.000	.000	.000	.000	.000
Recycle	.004	.000	.000	.000	.000
Storage	.059	.000	.000	.000	.000
Tax	.009	.009	.124	.001	.014
Enforcement	.000	.000	.000	.000	.000
Work	.000	.000	.000	.045	.000
Product	.000	.000	.000	.000	.000
New Law	.000	.000	.000	.000	.000
People	.000	.000	.000	.047	.001
# People	.000	.000	.000	.000	.000
Area	.000	.001	.000	.000	.001
Expenses	.000	.000	.000	.000	.000
Action	.000	.000	.000	.001	.000
Recycle	.001	.000	.000	.000	.000
Storage	.000	.000	.000	.000	.000
Tax	.000	.000	.000	.000	.000

TABLE 31

Enforcement	.007	.004	.004	.411	.001
Work	.000	.000	.000	.000	.000
Product	.004	.000	.000	.184	.029
New Law	.006	.000	.001	.000	.000
People	.000	.000	.004	.000	.001
# People	.000	.000	.000	.000	.000
Area	.000	.006	.758	.000	.762
Expenses	.000	.000	.000	.000	.000
Action	.000	.000	.000	.000	.000
Recycle	.193	.678	.138	.074	.000
Storage	.000	.000	.003	.000	.000
Tax	.000	.000	.000	.000	.000

Enforcement	.000	.001	.000	.016	.026
Work	.000	.000	.000	.010	.000
Product	.000	.000	.000	.000	.000
New Law	.000	.000	.000	.000	.000
People	.000	.000	.000	.598	.068
# People	.000	.000	.000	.000	.000
Area	.000	.633	.225	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.187	.220	.006	.080	.000
Recycle	.018	.015	.000	.000	.000
Storage	.000	.000	.000	.127	.002
Tax	.000	.000	.000	.000	.000

TABLE 31

Enforcement	.000	.000	.070	.016	.000
Work	.148	.399	.055	.238	.008
Product	.000	.000	.000	.000	.000
New Law	.000	.000	.000	.000	.000
People	.000	.000	.000	.000	.000
# People	.000	.006	.000	.000	.001
Area	.000	.024	.016	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.025	.000	.056	.034	.002
Recycle	.000	.001	.000	.000	.000
Storage	.000	.007	.008	.005	.027
Tax	.000	.000	.000	.000	.000

TABLE 31

Cross tabulation analysis (frequencies) shows that people that are more "technical" in terms of the type of formal education (engineering and sciences), most of the time, did not take a higher number of overall environmental actions. In this study were 138 with more "technical" formation and 246 with more "social sciences" (management and humanities) formation.

Analysis through each environmental problem shows that for income, air pollution, water scarcity, water contamination and deforestation were the problems where people that are more "technical" in terms of the type of formal education mostly took a higher number of overall environmental actions compared with people that are more "social sciences" in terms of the type of formal education through each factor. In 8 of 12 factors people that are more "technical" in terms of the type of formal education did not take a higher number of overall environmental actions compared with people that are more "social sciences" in terms of the type of formal education; in leaks in 9 of 12 factors people that are more "technical" in terms of the type of formal education did not take a higher number of overall environmental actions. Results for health, family, nation and religious beliefs are also shown in table 32 and figures 20 and 21.

Based on chi-square, lambda and uncertainty coefficient values, as well as on frequency results, the null hypothesis 8 is rejected and the alternative hypothesis 8 is accepted.

ED SPEC	AP	WS	L	WC	D
Health	4	6	4	4	3
Income	8	8	9	8	8
Rel. Beliefs	8	6	9	9	8
Family	7	6	6	4	4
Nation	1	4	2	4	3

TABLE 32

Factors were people that are more "technical" in term of the type of formal education did NOT take a higher number of overall environmental actions.

FIGURE 20

186
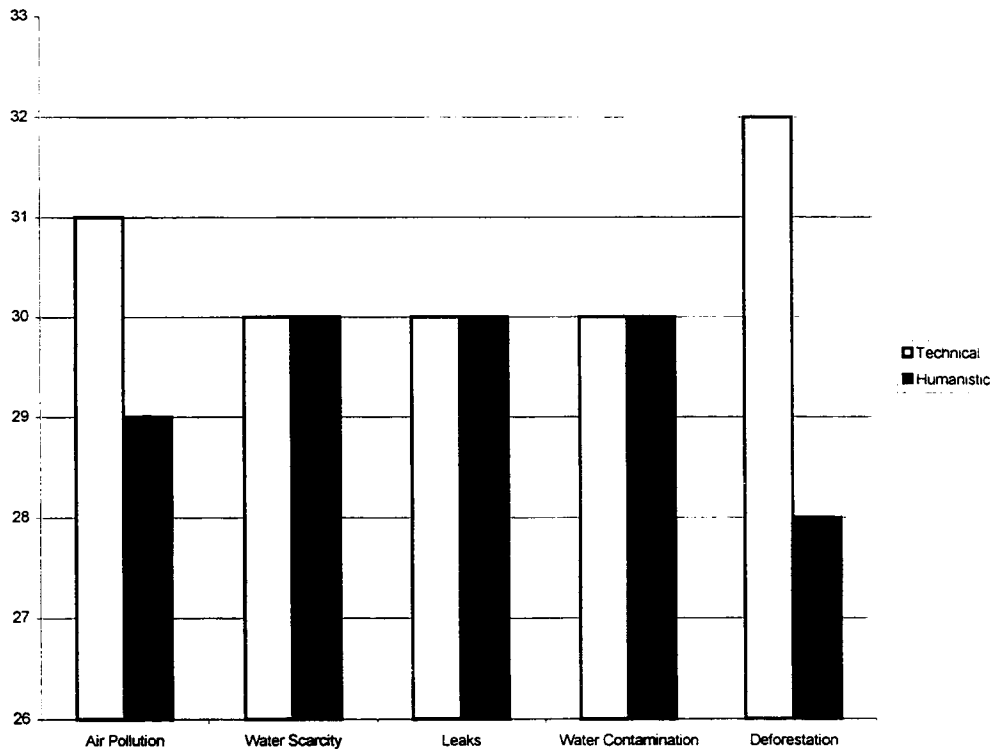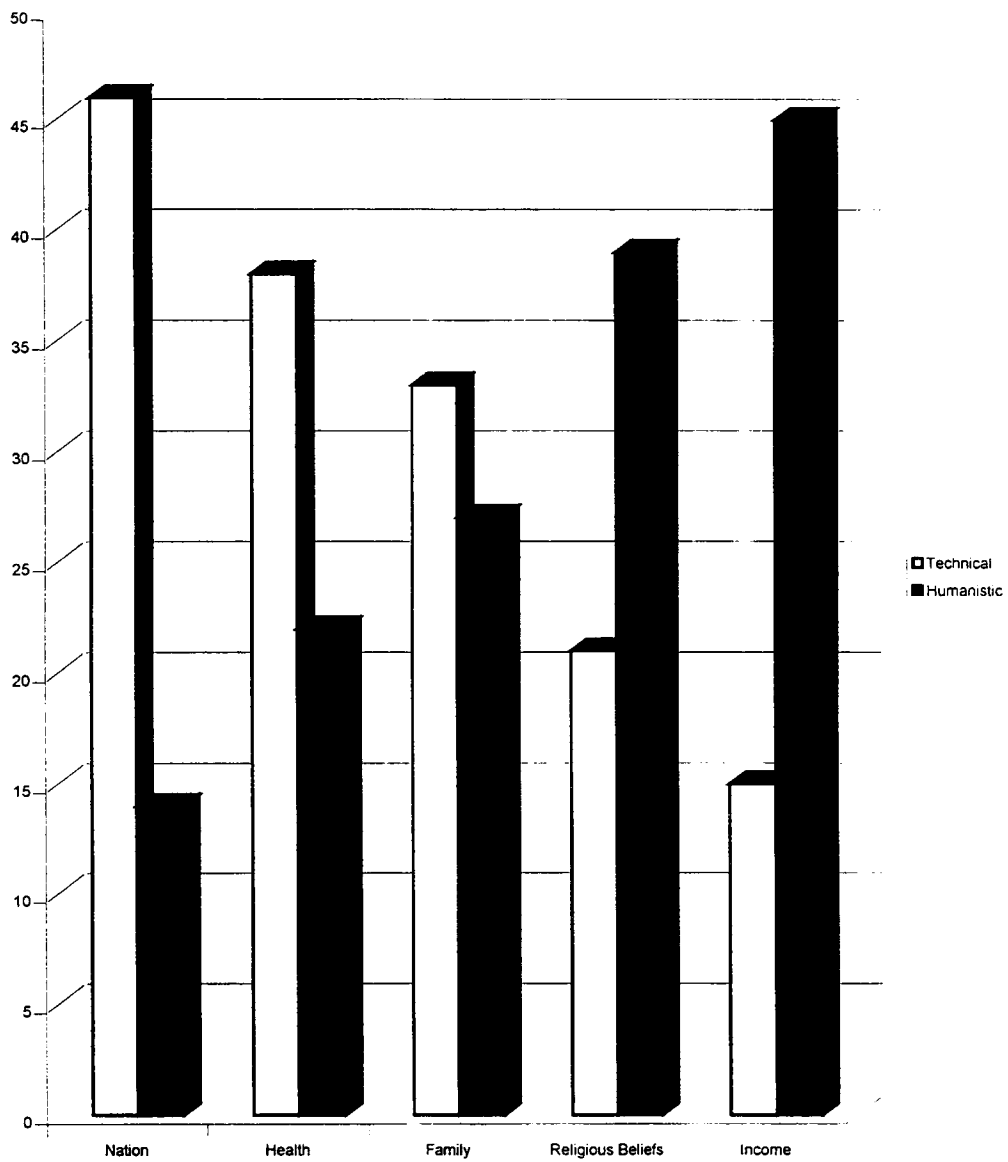
FIGURE 21

Hypothesis 9. "Actions taken will differ depending on practice of outdoor sports. People who practice outdoor sports will tend to take more overall environmental actions".

Null Hypothesis 9. "Actions taken will differ depending on practice of outdoor sports. People who practice outdoor sports will not tend to take more overall environmental actions".

The response could be :

<u>Overall environmental actions</u>

Teamwork

Rely on insiders to solve problems

Involve many persons

Many areas of expertise represented

Authorize significant expenses

Act

Recycle (Always or Frequently)

Proper waste disposal (Always or Frequently)

Support tax payment increase for environmental protection (Always or Frequently)

Support environmental law enforcement (Always or Frequently)

Use of environmentally friendly products (Always or Frequently)

Promote a new and more sever environmental law (Always or Frequently)

The corresponding null hypothesis is tested by asking whether people who practice outdoor sports had "Always" and "Frequently" as the most common answers for strategic actions and "Never" and "Few times" for environmental actions.

Responses of more "Always" and "Frequently" for strategic actions and responses of "Never" and "Few times" for environmental actions are consistent with the null hypothesis and responses of "Never" and "Few times" for strategic actions and "Always" and "Frequently" for environmental actions by people that practice outdoor sports are inconsistent with the null hypothesis.

Question 6 will give data for H9 to evaluate if they tended to take more or less overall environmental actions.

Regression analysis was done to obtain correlation between education type and actions taken for the different types of threat and types of environmental problems, results are shown in table 24. As shown in table 33, Chi-square analysis shows significance levels close to zero. Lambda values and uncertainty coefficients were calculated, in general, these values go down by about 25 percent and in several cases are zero. Blank spaces means that cannot be computed because the asymptotic standard error equals zero

Significance Design EP   Significance
Chi-Square   Lambda

Health	AP	WS	L	WC	D		AP	WS	L	WC	D
Enforcement	.002	.001	.000	.065	.000	Enforcement	.008	.000	.002	.058	.000
Work	.001	.000	.000	.013	.000	Work		.594	.411		.617
Product	.000	.000	.000	.001	.001	Product	.000	.061	.018	.177	.004
New Law	.001	.000	.000	.000	.000	New Law	.004	.000	.001	.000	.001
People	.000	.040	.000	.000	.000	People	.023		.010	.403	.322
# People	.016	.000	.000	.002	.000	# People	.208	.768	.726	.787	.058
Area	.000	.000	.000	.000	.000	Area	.032	.000	.008	.094	.036
Expenses	.001	.005	.314	.044	.000	Expenses	.005	.701		.207	.029
Action	.000	.001	.000	.000	.000	Action	.001	.793	.005	.323	.005
Recycle	.000	.000	.000	.000	.000	Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.006	.007	.012	Storage	.000	.003	.159	.002	.107
Tax	.207	.000	.006	.000	.133	Tax	.156	.003	.006	.047	.248

Religion											
Enforcement	.002	.001	.000	.281	.000	Enforcement	.089	.046	.000	.414	.001
Work	.012	.002	.002	.820	.168	Work		.317	.208		.816
Product	.007	.015	.004	.009	.000	Product	.222	.411	.190	.193	.027
New Law	.000	.000	.007	.000	.000	New Law	.006	.015	.059	.013	.001
People	.000	.000	.006	.000	.000	People	.307	.368	.332	.219	.268
# People	.000	.001	.047	.011	.003	# People	.099	.023	.476	.353	.023
Area	.024	.000	.000	.000	.000	Area	.000	.115	.011	.014	.013
Expenses	.000	.000	.000	.000	.000	Expenses	.331	.271	.689	.264	.494
Action	.000	.000	.006	.000	.002	Action	.166	.050	.515	.093	.095
Recycle	.000	.000	.009	.000	.000	Recycle	.003	.000	.055	.000	.004
Storage	.000	.000	.001	.000	.000	Storage	.001	.041	.034	.000	.004
Tax	.000	.001	.000	.000		Tax	.037	.060	.002	.014	.011

TABLE 33

Family

Enforcement	.000	.000	.000	.000	.000	Enforcement	.000	.000	.000	.004	.000
Work	.000	.005	.000	.000	.000	Work	.004	.057	.016	.000	.001
Product	.000	.000	.000	.000	.000	Product	.001	.000	.000	.001	.000
New Law	.000	.000	.000	.000	.000	New Law	.000	.000	.000	.000	.000
People	.000	.000	.000	.000	.000	People	.001	.000	.001	.002	.001
# People	.000	.000	.000	.006	.043	# People	.017	.255	.175	.137	.662
Area	.024	.006	.000	.261	.384	Area	.345	.354	.152	.903	.868
Expenses	.006	.071	.025	.000		Expenses	.030	.409	.162	.015	.068
Action	.000	.000	.000	.000	.000	Action					
Recycle	.000	.000	.000	.000	.011	Recycle	.000	.027	.000	.001	.028
Storage	.000	.000	.673	.005	.003	Storage	.005	.009		.051	.060
Tax	.000	.000	.000	.586	.058	Tax	.009	.009	.075	.479	.248

Nation

Enforcement	.001	.000	.011	.001	.016	Enforcement	.288	.024		.024	.156
Work	.000	.000	.000	.000	.000	Work	.124	.008	0	.000	.000
Product	.000	.004	.000	.008	.034	Product	.000	.024	0.058	.024	.024
New Law	.000	.251	.038	.001	.005	New Law	.000	.125	0.082	.001	.004
People	.000	.000	.000	.000	.000	People	.058	.000	0	.000	.000
# People	.000	.000	.000	.000	.018	# People	.508	.442	0.14	.590	
Area	.000	.000	.058	.002	.000	Area	.096	.259	0.159	.055	.007
Expenses	.000	.001	.026	.001	.046	Expenses	.649	.574	0.274	.274	.274
Action	.000	.000	.000	.000	.081	Action		.189		.258	
Recycle	.044	.000	.000	.000	.025	Recycle	.200	.601	0.007	.819	.220
Storage	.124	.198	.000	.805	.000	Storage		.593			.288
Tax	.000	.000	.000	.000	.000	Tax	.179	.068	0.137	.001	.001

TABLE 33

Income

Enforcement	.000	.004	.000	.000	.000	Enforcement	.000	.024	.033	.000	.005
Work	.000	.000	.000	.000	.000	Work	.161	.166	.017	.021	.150
Product	.001	.000	.000	.035	.001	Product	.000	.000	.038	.181	.010
New Law	.000	.000	.000	.000	.000	New Law	.000	.000	.000	.000	.000
People	.259	.029	.251	.029	.000	People	.262	.277	.392	.095	.034
# People	.000	.044	.002	.190	.068	# People	.008	.069	.067	.626	.377
Area	.957	.003	.549	.007	.109	Area		.069	.874	.539	.399
Expenses	.306	.057	.806	.660	.137	Expenses		.879			
Action	.019	.000	.129	.751	.018	Action	.655	.122	.546		.355
Recycle	.000	.001	.000	.000	.000	Recycle	.000	.122	.000	.000	.001
Storage	.000	.000	.000	.000	.000	Storage	.005	.000	.000	.000	.000
Tax	.000	.010	.000	.000	.000	Tax	.002	.054	.001	.002	.001

TABLE 33

Significance
Uncertainty Coefficient

	AP	WS	L	WC	D
Enforcement	.001	.000	.000	.055	.000
Work	.000	.000	.000	.010	.000
Product	.000	.000	.000	.000	.000
New Law	.000	.000	.000	.000	.000
People	.000	.037	.000	.000	.000
# People	.015	.000	.000	.002	.000
Area	.000	.000	.000	.000	.000
Expenses	.001	.004	.281	.040	.000
Action	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.004	.002	.011
Tax	.211	.000	.005	.000	.136

	AP	WS	L	WC	D
Enforcement	.001	.001	.000	.284	.000
Work	.007	.001	.001	.817	.157
Product	.006	.004	.001	.009	.000
New Law	.000	.000	.007	.000	.000
People	.000	.000	.005	.000	.000
# People	.000	.001	.045	.009	.003
Area	.000	.000	.000	.000	.000
Expenses	.000	.000	.000	.000	.000
Action	.000	.000	.001	.000	.000
Recycle	.000	.000	.009	.000	.000
Storage	.000	.000	.001	.000	.000
Tax	.000	.000	.000	.000	.000

TABLE 33

Enforcement	.000	.000	.000	.000	.000
Work	.000	.004	.000	.000	.000
Product	.000	.000	.000	.000	.000
New Law	.000	.000	.000	.000	.000
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.006	.040
Area	.023	.005	.000	.258	.382
Expenses	.006	.072	.026	.000	.003
Action	.000	.000	.000	.000	.000
Recycle	.000	.000	.000	.000	.011
Storage	.000	.000	.665	.004	.001
Tax	.000	.000	.000	.590	.059

Enforcement	.000	.000	.001	.000	.006
Work	.000	.000	.000	.000	.000
Product	.000	.000	.000	.003	.013
New Law	.000	.254	.034	.000	.002
People	.000	.000	.000	.000	.000
# People	.000	.000	.000	.000	.015
Area	.000	.000	.058	.002	.000
Expenses	.000	.000	.010	.000	.040
Action	.000	.000	.000	.000	.068
Recycle	.041	.000	.000	.000	.021
Storage	.094	.190	.000	.805	.000
Tax	.000	.000	.000	.000	.000

TABLE 33

Enforcement	.000	.001	.000	.000	.000
Work	.000	.000	.000	.000	.000
Product	.000	.000	.000	.014	.000
New Law	.000	.000	.000	.000	.000
People	.263	.030	.255	.029	.000
# People	.000	.045	.002	.191	.067
Area	.957	.002	.546	.006	.035
Expenses	.305	.053	.805	.660	.125
Action	.003	.000	.115	.752	.007
Recycle	.000	.000	.000	.000	.000
Storage	.000	.000	.000	.000	.000
Tax	.000	.010	.000	.000	.000

TABLE 33

Cross tabulation analysis (frequencies) shows that effectively people who practice outdoor sports, most of the time, took more overall environmental actions but not always than those who do practice outdoor sport.

In this study were 219 who practice outdoor sports and 165 who don't. Analysis through each environmental problem shows that for income, leaks and water contamination were the problems where people who practice outdoor sports mostly took a higher number of overall environmental actions compared with those who don't practice outdoor sports through each factor. In both problems only in 1 of 12 factors people who practice outdoor sports did not take a higher number of overall environmental actions compared with those who don't; for water scarcity and deforestation in 2 of 12 factors people who practice outdoor sports did not take a higher number of overall environmental actions, and finally for air pollution, in 3 of 12 factors people who practice outdoor sports did not take a higher number of overall environmental actions. Results for health, family, nation and religious beliefs are also shown in table 34 and figures 22 and 23.

Based on chi-square, lambda and uncertainty coefficient values, as well as on frequency results, the null hypothesis 9 is rejected and the alternative hypothesis 9 is accepted.

SPORTS	AP	WS	L	WC	D
Health	6	3	5	5	4
Income	3	2	1	1	2
Rel. Beliefs	6	3	6	4	5
Family	4	6	4	3	2
Nation	7	9	8	6	7

Factors were people that practice outdoor sports did NOT take a higher number of overall environmental actions.

TABLE 34
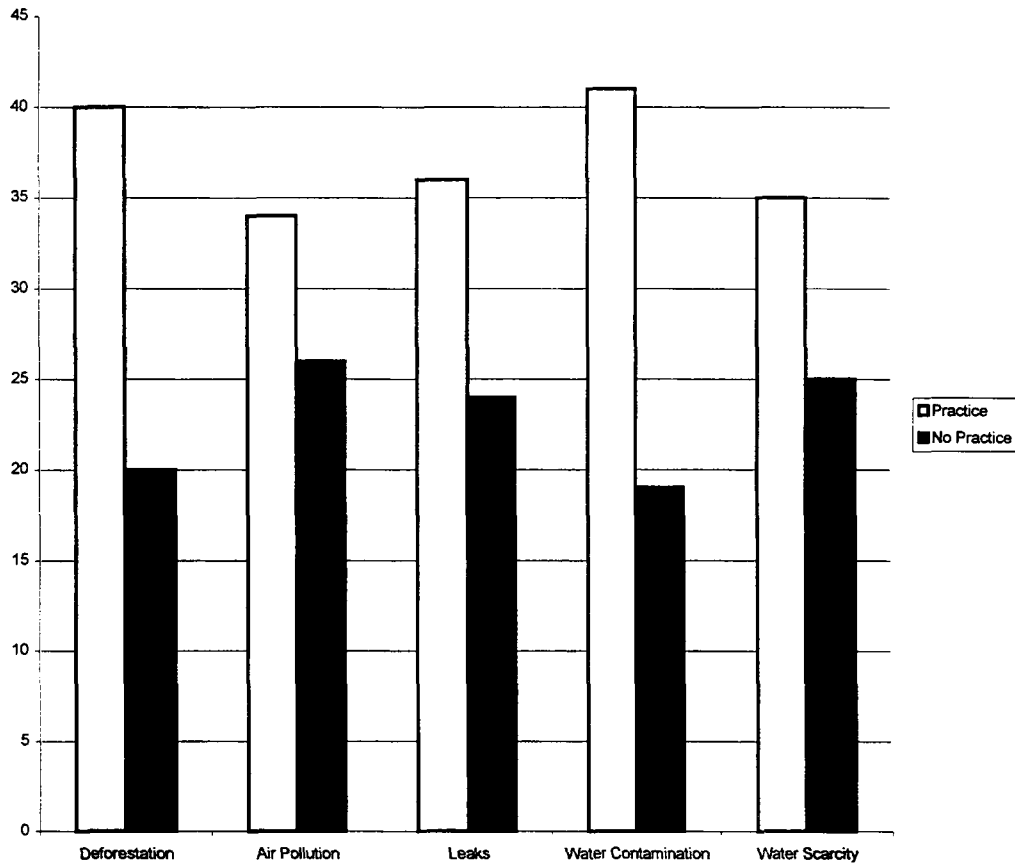
FIGURE 22

FIGURE 23

198
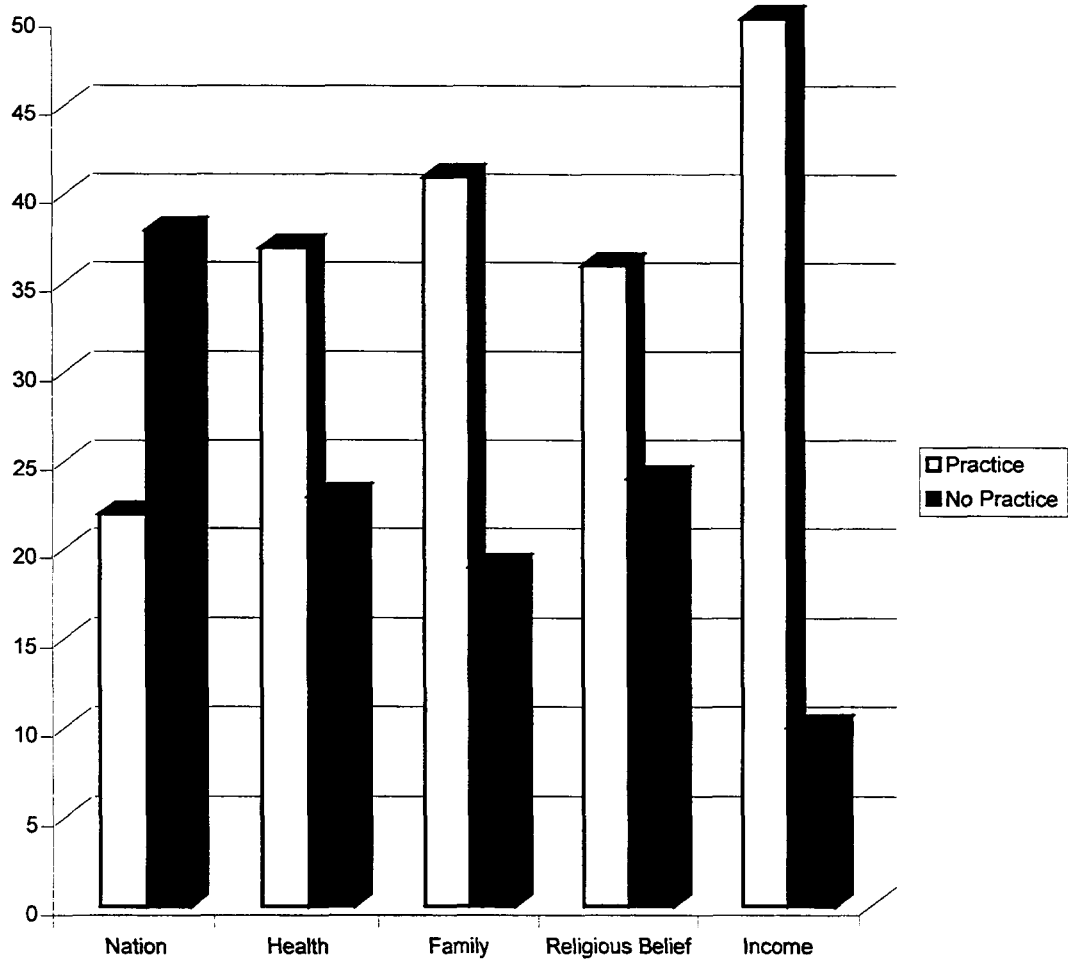
Summary.

Results show that people in their normal behavior tends to take actions that are not more comprehensive. But when an environmental problem is perceived their behaviors changed drastically. The only one where there was not such a big change is in religious beliefs.

People also has its values on their family, health, religious beliefs, nation and income but the perception of what is most important also changes when one of these factors is facing a threat. Family is the only one that remained without change as the most important.

For age, results through the five environmental problems and the five types of threat show that younger took more overall environmental actions.

Younger took the most overall environmental actions when family was in threat and the less when income was in threat. On the other hand, older took the most overall environmental actions when income, religious belief and health were on threat and the less when family and nation were in threat. Younger took the most overall environmental actions for water scarcity and the less for leaks, but age is the less significant predictor of overall environmental action among the demographic characteristics.

For age, the threat which had a higher number of significant correlation was family and the lower was religious beliefs.

199

For age, the environmental problem which had the higher number of significant correlation with threat perception was water scarcity and the lower were air pollution, leaks and water contamination.

For gender, results through the five environmental problems and the five types of threat show that female took more overall environmental actions.

Female took the most overall environmental actions when nation was in threat and the less when family was in threat. Female took the most overall environmental actions for leaks and the less for water scarcity.

For gender, the threat which had a higher number of significant correlation was religious beliefs and the lower was income.

For gender, the environmental problem that had the higher number of significant correlation with threat perception was air pollution and the lower was water scarcity. Gender was the most significant predictor of overall environmental actions among the demographic characteristics.

For education level, results through the five environmental problems and the five types of threat show that people with Master degree only did not take more overall environmental actions for deforestation and for nation and religious beliefs.

People with Master degree took the most overall environmental actions when health was in threat and the less when religious beliefs were in threat.

People with Master degree levels took the most overall environmental actions for leaks and the less for deforestation.

For education level, the threat which had a higher number of significant correlation was family and the lower was health.

For education level, the environmental problem that had the higher number of significant correlation with threat perception was deforestation and the lower was water contamination. Education level was the third most significant predictor of overall environmental actions among the demographic characteristics.

For educational specialization or type, results through the five environmental problems and the five types of threat show that people with a more technical orientation in their education did not take more overall environmental actions for water contamination, leaks and water scarcity (took the same than people with a more humanistic orientation in their education) and for income and religious beliefs.

People with a more technical orientation in their education took the most overall environmental actions when nation was on threat and less when income was in threat.

People with a more technical orientation in their education took the most overall environmental actions for deforestation and the less for water scarcity, water contamination and leaks.

For education specialization, the threat which had a higher number of significant correlation with threat perception was nation and the lower was health.

For education specialization, the environmental problem that had the higher number of significant correlation was water scarcity and the lower was air pollution. Education specialization was the second most significant predictor of overall environmental actions among the demographic characteristics.

For outdoor sports practice, results through the five environmental problems and the five types of threat show that people who practice outdoor sports took more overall environmental actions.

People who practice outdoor sports took the most overall environmental actions when income was in threat and the less when nation was in threat.

People who practice outdoor sports took the most overall environmental actions for water contamination and the less for air pollution.

For practice of outdoor sports, the threat which had a higher number of significant correlation was family and the lower was nation.

For outdoor sports practice, the environmental problem that had the higher number of significant correlation with threat perception was air pollution and the lower were water scarcity, leaks and deforestation. Outdoor sports practice was the fourth most significant predictor of overall environmental actions among the demographic characteristics.

Results show that for the last 6 hypotheses people took different actions depending on the type of environmental problem, the type of threat, demographic characteristics and the different types of actions. So it is clear that not only demographic characteristics, but type of environmental problem, type of threat and the action to perform will affect people's behavior.

Results can be analyzed in different ways. For demographic characteristics, gender was the most significant predictor of overall environmental actions, followed by education specialization, education level practice of outdoor sports and age. For types of environmental problem, deforestation was the most significant predictor of threats, followed by air pollution, water scarcity, leaks and water contamination. For types of threat, nation was the most significant predictor of overall environmental actions, followed by family, religious beliefs, health and income. In general it can be said that types of threat were the most significant predictors of overall environmental actions, followed by demographic characteristics.

Summarizing, the most significant predictors of overall environmental actions are the types of threat, for demographic characteristics only gender and education specialization are significant.

Further statistical analysis will be done in future research to these types of threats as predictors of overall environmental actions for specific environmental threat and to the environmental actions taken for the types of threats and the types of environmental problems.

CHAPTER V. DISCUSSION, IMPLICATIONS, LIMITATIONS AND FUTURE RESEARCH.

V.1. DISCUSSION.

The purpose of this study was to find how people behave when a personal threat was perceived and to analyze what factors affect the perception of threat, and, ultimately, the behavioral response to that perceived threat.

The results presented in this thesis are preliminary but suggestive. Further empirical work is needed to see if these results generalize to more diverse and representative populations. Further methodological work is needed to improve the measurement and estimation of value orientation.

This study finds support for the hypothesis that people take more environmental actions when a personal threat is perceived than when no personal threat is perceived.

Interestingly, the type of environmental problem is an important factor in predicting what kind of threat people will perceive, but not in predicting what specific actions will be taken. This shows that once people perceived an issue as a problem that threatened them personally, air pollution motivated people more than any other environmental problem did to undertake appropriate counteractions. The other environmental problems that induced action-taking behavior are, from most to least influential, water scarcity, leaks, deforestation, and water contamination. However,

205

these latter issues generally did not change a person's propensity to take action in a statistically significant manner. Further analysis of the relative impact of each of these environmental issues can be a focus of future research.

"Family" is the most significant factor affecting perception of a threat for environmental problems once the environmental problem was perceived as a threat. The next most important were nation, health, income, and religious beliefs; however, most of the effects of these latter factors were not statistically significant. The statistically significant correlation are as follows; for the factors that affected whether air pollution is perceived as a personal threat are, nation (biggest effect), family, health, and income (all with a lower effect) and, finally, religious beliefs (least effect). For the factors that affected whether water scarcity is perceived as a personal threat are, nation (biggest effect), health, religious beliefs and family (all with a lower effect) and, finally, income (least effect). For the factors that affected whether leaks is perceived as a personal threat are, nation (biggest effect), religious beliefs, family, and income (all with a lower effect) and, finally, health (least effect).

For the factors that affected whether water contamination is perceived as a personal threat are, family (biggest effect), nation, religious beliefs and health (all with a lower effect) and, finally, income (least effect).

206

For the factors that affected whether deforestation is perceived as a personal threat are, family (biggest effect), health, nation, and religious beliefs (all with a lower effect) and, finally, income (least effect).

This study found that the types of threat are more significant predictors for the design of an overall environmental solution to specific environmental problems than are demographic characteristics like gender and education specialization; this is consistent with Baldassare and Katz's (1992) conclusion. The type of problem affects threat perception.

The specific factors that predict whether a successful overall environmental solution to specific environmental problems could be designed by a person were obtained from a Pearson's correlation (using cross-tabulation) including the six demographic variables, types of threat and types of environmental problem. Results shows that gender is the most significant demographic characteristic that predicted overall environmental actions; education level and practice of outdoor sports are also significant. Deforestation is the environmental problem that most significantly predicts threat perception; air pollution, water scarcity, leaks, and water contamination are also significant. Threat to nation is the most significant predictor of overall environmental actions; threats to family, religious beliefs, health, and income are also significant. In general, the types of threat are the most significant predictors of whether or not environmental actions were undertaken; some demographic characteristics also had predictive power.

207

Next discussion is based on the objectives established at the beginning of this report.

1. It was found that the perception of different personal threats (to family, to nation, to religious beliefs, to income or to health) caused by different environmental problems (air pollution, water scarcity, leaks and spills of hazardous materials, water contamination or deforestation) leads people to adopt different specific strategic and environmental actions.

2. Results show that gender, education level and outdoor sports practices (among demographic characteristics) and nation, family and religious beliefs (among types of personal threat perceived) are significant determinants of environmental behaviors (measured by choosing more overall environmental actions) for MBA students of the ITESM in Monterrey, Mexico.

3. The characteristics of the person who might develop better solutions for the specific environmental problems are as shown in table 35.

	AP	WS	L	WC	D
Health	Practice of sports				Gender
R. beliefs	Gender	Gender	Gender	Gender	Gender
Family	Practice of sports		Gender	Practice of sports	Educ.Level
Nation	Educ. Special. Gender	Educ. Special.	Educ. Special Gender	Educ. Special. Gender	Educ. Special.
Income	Gender	Educ. Special.			

TABLE 35

4. The types of environmental problems (among air pollution, water scarcity, leaks and spills of hazardous materials, water contamination and deforestation) that provokes people the most to perceive these problems as a personal threat that could impact their family, income, nation, religious beliefs and health are shown in table 36.

TYPES OF ENVIRONMENTAL PROBLEM	TYPES OF THREAT
Air Pollution	1. Nation 2. Family 3. Health 4. Income 5. Religious beliefs
Water scarcity	1. Nation 2. Health 3. Religious beliefs 4. Family 5. Income
Leaks	1. Nation 2. Religious beliefs 3. Family 4. Income 5. Health
Water contamination	1. Family 2. Nation 3. Religious beliefs 4. Health 5. Income
Deforestation	1. Family 2. Health 3. Nation 4. Religious beliefs 5. Income

TABLE 36

211

5. Results show that what makes people to perceive any of those environmental problems as a personal threat that could impact their family, nation, religious beliefs, income and health is first, the type of threat perceived; second, the types of problem and; third, demographic characteristics as gender, education level and outdoor sports practice. It is believe in this study that the type of action to perform is also an important factor but further studies have to be done to support this proposition.

V.2. IMPLICATIONS FOR THEORY AND PRACTICE.

The results of this thesis suggest that environmental awareness is an attribute that requires a much closer look than it has been given in both theory and practice. Environmental awareness is not a simple "yes" or "no" variable. It is not enough just to talk but to act about being environmentally friendly. Future research will have to consider now if people are actually or not in a personal threat and, if possible, when applying a survey about environmental attitudes to complement it with observation data. Also will be important to identify what environmental problem is provoking people to feel a threat. Finally, it will be important to identify what is what people perceive is in threat.

212

One practical result from this study is basic guidance on how others can use environmental survey results as a predictor of behavior.

These findings suggest some potential ways to change environmental performance. Specifically, this research shows that demographic characteristics, type of threat, type of environmental problem, and actions to perform affect individual behavior. These factors should be considered in the selection of the individuals who make the decisions to design and implement the solutions for environmental problems.

The basic findings of this research will be interesting to both researchers and administrators of public policy. Hopefully, these results will help organizations and government agencies (especially in rapidly developing countries like Mexico) when they design and implement environmental programs as part of their corporate strategy.

This study contributes to fulfill the lack of research in the field of environmental management as reported in several studies like Wescott II (1995). This study also contributes, in the context of sustainable development and industrial ecology, to be a different framework for organizing human activities (Allenby and Richards, 1994) and its study. This study also is a contribution to the literature regarding environmental management subjects applied in organizational studies, which is reported as scarce (Wescott II, 1995). Another contribution is as an

empirical study, which can be used as a systematic comparison of findings across organizations and countries as proposed by Gladwin (1993).

In summary, this study provides new insight into how graduate business school students who are also executives, directors or managers in Mexican firms behave with respect to environmental management, how they are influenced by their perceptions as well as by certain demographic and organizational factors to design a solution for specific environmental problems through strategic and environmental actions.

V.3. LIMITATIONS.

Some limitations of this study should be recognized. First, the survey was limited to a group of students with certain characteristics that are not common in the majority of Mexican population but in some business people. Thus, we can not generalize our results to all Mexicans.

Second, people can change their threat perceptions over time. The present study does not shed light on changes on environmental practices over time.

Third, this study was limited to Monterrey and, so, is not a national sample. It would be inappropriate to draw conclusions about the country's environmental consciousness even for other groups with characteristics similar to the group surveyed here.

Fourth, although a high proportion of our sample could be considered as environmentalists, that label has little to do with how much they know about environmental problems, or how much they are willing to alter their behavior in order to deal with environmental problems.

Fifth, for this study only five environmental problems were used. More should be included in future research. Also these five environmental problems are analyzed as isolated factors; in real life they appear as a combined set of problems. Further studies could examine how different combinations of these problems affect people's perceptions.

Sixth, the study was applied only in a successful world-class Mexican school.

Seventh, as mentioned before, one of the objectives of this study was to analyze how people react to some of the environmental problems in the area of Monterrey, Mexico. A limitation of this study is that there is not a support literature focused on environmental behavior in developing countries. So much of the objective is to gather information for further and future research.

Eighth, the use of questionnaire as the instrument for this study. It is known that although the validity of questionnaire responses is often problematic and objective measures of actual behavior is preferred, such data are very hard to collect. And when available, it is by necessity only for very few specific types of behavior (Stern et al, 1995).

V.4. FUTURE RESEARCH.

Beside the obvious studies in other groups with different demographic characteristics and types of social groups. Future research could include:

i. Studying how decisions or solutions are proposed in groups (i.e., not only by individuals).

ii. Discovering which type of process each person follows once they have perceived the existence of a environmental problem that is not done in current study.

iii. To analyze people's behaviors when implementing a solution and not only when designing a solution as in current study.

iv. How individual concern is shaped by macro factors, such as social movements and political-economic forces.

v. Determining the effect of the presence or absence of environmental concern and engagement and environmental education. These internal factors are present at the ITESM, but could be absent in other settings.

APPENDIX 1

There was a question 7 which pretended to know which were the three most important determinants for people to consider for each environmental problem a personal threat for each one of the factors to be affected (health, income, family, religious beliefs and nation). These determinants would be the endpoint to start changing attitudes and behaviors towards an environmental problem because of the perception of an immediate, strong and personal effect on each one of the factors to be affected.

Also was eliminated "Job Security" as environmental problem to be studied, many disagree in considering it as an environmental problem. Also the format of the questionnaire was changed to a more easy and faster to respond and a more friendly format was designed. No open-ended questions were included. Like remarking some paragraphs and keywords, standardization of scales also was done. General data also was placed at the end of the questionnaire and space for answering also was amplified. Definitions of the different concepts used were also included to standardize understanding of them. Also the categories for age, hierarchy level and education type were changed to more realistic and easier scales. Wording was also changed to a language that could be easily understood by the students, technical word were avoided as possible.

APPENDIX 2

<u>Summary of statistics</u>

Cross tabulation is the plotting of two categorical variables in the form of a matrix so that the values of one variable define the rows and the values of the other define the columns, with the cells containing the frequency of cases with a given value for each of the two items and from which a chi-square can be computed to asses the statistical significance of the relationship.

Chi-square is the value, usually obtained from cross-tabulation of two items in survey research that can be compared with the values of the chi-square distribution to obtain a probability for assessing statistical significance.

Numerical Descriptive Statistics, are statistics such as average variance, used to suppress the detail in data files and to condense and summarize the data to make facts more visible, as well as to indicate the degree to which the sample data are likely to represent the entire population.

Frequency distribution is the number of cases that contain each of the scale values for a particular survey item or variable.

Median: A measure of central tendency not sensitive to outlying values. The value above and below which half the cases fall, the 50th percentile. If there is an even number of cases, the median is the average of the two middle cases when they are sorted in ascending or descending order.

220

Correlation: is the measure of linear association between two variables. Values of the correlation coefficient range from -1 to 1. The sign of the coefficient indicates the direction of the relationship, and its absolute value indicates the strength, with larger absolute values indicating stronger relationships.

APPENDIX 3

Crosstabs

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Student's Age * Normal Conditions Work	384	100.0%	0	.0%	384	100.0%
Student's Age * Normal Conditions People	384	100.0%	0	.0%	384	100.0%
Student's Age * Normal Conditions Number People	384	100.0%	0	.0%	384	100.0%
Student's Age * Normal Conditions Knowledge Areas	384	100.0%	0	.0%	384	100.0%
Student's Age * Normal Conditions Expenses	384	100.0%	0	.0%	384	100.0%
Student's Age * Normal Conditions Action	384	100.0%	0	.0%	384	100.0%
Education level * Normal Conditions Work	384	100.0%	0	.0%	384	100.0%
Education level * Normal Conditions People	384	100.0%	0	.0%	384	100.0%
Education level * Normal Conditions Number People	384	100.0%	0	.0%	384	100.0%

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Education level * Normal Conditions Knowledge Areas	384	100.0%	0	.0%	384	100.0%
Education level * Normal Conditions Expenses	384	100.0%	0	.0%	384	100.0%
Education level * Normal Conditions Action	384	100.0%	0	.0%	384	100.0%
Education Specialization * Normal Conditions Work	384	100.0%	0	.0%	384	100.0%
Education Specialization * Normal Conditions People	384	100.0%	0	.0%	384	100.0%
Education Specialization * Normal Conditions Number People	384	100.0%	0	.0%	384	100.0%
Education Specialization * Normal Conditions Knowledge Areas	384	100.0%	0	.0%	384	100.0%
Education Specialization * Normal Conditions Expenses	384	100.0%	0	.0%	384	100.0%
Education Specialization * Normal Conditions Action	384	100.0%	0	.0%	384	100.0%

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Student's Gender * Normal Conditions Work	384	100.0%	0	.0%	384	100.0%
Student's Gender * Normal Conditions People	384	100.0%	0	.0%	384	100.0%
Student's Gender * Normal Conditions Number People	384	100.0%	0	.0%	384	100.0%
Student's Gender * Normal Conditions Knowledge Areas	384	100.0%	0	.0%	384	100.0%
Student's Gender * Normal Conditions Expenses	384	100.0%	0	.0%	384	100.0%
Student's Gender * Normal Conditions Action	384	100.0%	0	.0%	384	100.0%
Practice Outdoor Sports * Normal Conditions Work	384	100.0%	0	.0%	384	100.0%
Practice Outdoor Sports * Normal Conditions People	384	100.0%	0	.0%	384	100.0%

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Practice Outdoor Sports * Normal Conditions Number People	384	100.0%	0	.0%	384	100.0%
Practice Outdoor Sports * Normal Conditions Knowledge Areas	384	100.0%	0	.0%	384	100.0%
Practice Outdoor Sports * Normal Conditions Expenses	384	100.0%	0	.0%	384	100.0%
Practice Outdoor Sports * Normal Conditions Action	384	100.0%	0	.0%	384	100.0%

Student's Age * Normal Conditions Work

Crosstab

Count

		Normal Conditions Work			
		Never	Few Times	Some Times	Frequently
Student's Age	less than 25		9	57	36
	25 to 34	16	75	58	47
	35 to 44	8	2	17	6
	45 to 54		1	14	2
Total		24	87	146	91

Crosstab

Count

		Normal Conditions Always	Total
Student's Age	less than 25	16	118
	25 to 34	20	216
	35 to 44		33
	45 to 54		17
Total		36	384

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	89.489[a]	12	.000
Likelihood Ratio	98.010	12	.000
Linear-by-Linear Association	18.490	1	.000
N of Valid Cases	384		

a. 6 cells (30.0%) have expected count less than 5. The minimum expected count is 1.06.

227

Directional Measures

			Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.042	.028	1.478	.139
		Student's Age Dependent	.000	.000	.[c]	.[c]
		Normal Conditions Work Dependent	.071	.047	1.478	.139
	Goodman and Kruskal tau	Student's Age Dependent	.105	.019		.000[d]
		Normal Conditions Work Dependent	.065	.013		.000[d]
	Uncertainty Coefficient	Symmetric	.103	.016	6.079	.000[e]
		Student's Age Dependent	.123	.019	6.079	.000[e]
		Normal Conditions Work Dependent	.089	.014	6.079	.000[e]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Cannot be computed because the asymptotic standard error equals zero.

d. Based on chi-square approximation

e. Likelihood ratio chi-square probability.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.220	.037	-4.402	.000[c]
Ordinal by Ordinal	Spearman Correlation	-.252	.041	-5.080	.000[c]
N of Valid Cases		384			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Student's Age * Normal Conditions People

Crosstab

Count

		Normal Conditions People			
		Some Times	Frequently	Always	Total
Student's Age	less than 25	45	44	29	118
	25 to 34	37	120	59	216
	35 to 44	8	12	13	33
	45 to 54	3		14	17
Total		93	176	115	384

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	47.203[a]	6	.000
Likelihood Ratio	48.934	6	.000
Linear-by-Linear Association	18.408	1	.000
N of Valid Cases	384		

a. 1 cells (8.3%) have expected count less than 5. The minimum expected count is 4.12.

Directional Measures

			Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.064	.045	1.389	.165
		Student's Age Dependent	.048	.053	.884	.377
		Normal Conditions People Dependent	.077	.052	1.418	.156
	Goodman and Kruskal tau	Student's Age Dependent	.046	.017		.000[c]
		Normal Conditions People Dependent	.064	.015		.000[c]
	Uncertainty Coefficient	Symmetric	.061	.015	4.058	.000[d]
		Student's Age Dependent	.062	.015	4.058	.000[d]
		Normal Conditions People Dependent	.060	.015	4.058	.000[d]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on chi-square approximation

d. Likelihood ratio chi-square probability.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.219	.055	4.392	.000[c]
Ordinal by Ordinal	Spearman Correlation	.204	.054	4.071	.000[c]
N of Valid Cases		384			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Student's Age * Normal Conditions Number People

Crosstab

Count

		Normal Conditions Number People			
		Never	Few Times	Some Times	Frequently
Student's Age	less than 25			46	35
	25 to 34	6	4	46	98
	35 to 44		2	5	15
	45 to 54	8	1		
Total		14	7	97	148

Crosstab

Count

		Normal Conditions Always	Total
Student's Age	less than 25	37	118
	25 to 34	62	216
	35 to 44	11	33
	45 to 54	8	17
Total		118	384

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	130.382[a]	12	.000
Likelihood Ratio	84.273	12	.000
Linear-by-Linear Association	4.337	1	.037
N of Valid Cases	384		

a. 8 cells (40.0%) have expected count less than 5. The minimum expected count is .31.

231

Directional Measures

			Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.052	.042	1.209	.227
		Student's Age Dependent	.012	.061	.194	.846
		Normal Conditions Number People Dependent	.081	.038	2.025	.043
	Goodman and Kruskal tau	Student's Age Dependent	.059	.017		.000[c]
		Normal Conditions Number People Dependent	.048	.011		.000[c]
	Uncertainty Coefficient	Symmetric	.095	.018	5.002	.000[d]
		Student's Age Dependent	.106	.020	5.002	.000[d]
		Normal Conditions Number People Dependent	.086	.016	5.002	.000[d]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on chi-square approximation

d. Likelihood ratio chi-square probability.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.106	.073	-2.092	.037[c]
Ordinal by Ordinal	Spearman Correlation	.023	.056	.459	.647[c]
N of Valid Cases		384			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Student's Age * Normal Conditions Knowledge Areas

Crosstab

Count

		Normal Conditions Knowledge Areas			
		Never	Few Times	Some Times	Frequently
Student's Age	less than 25	17	39	20	20
	25 to 34	26	72	45	73
	35 to 44	7	12	8	6
	45 to 54		1	14	2
Total		50	124	87	101

Crosstab

Count

		Normal Conditions Always	Total
Student's Age	less than 25	22	118
	25 to 34		216
	35 to 44		33
	45 to 54		17
Total		22	384

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	97.297[a]	12	.000
Likelihood Ratio	93.371	12	.000
Linear-by-Linear Association	1.380	1	.240
N of Valid Cases	384		

a. 6 cells (30.0%) have expected count less than 5. The minimum expected count is .97.

233

Directional Measures

			Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.084	.030	2.694	.007
		Student's Age Dependent	.131	.026	4.831	.000
		Normal Conditions Knowledge Areas Dependent	.054	.047	1.109	.268
	Goodman and Kruskal tau	Student's Age Dependent	.108	.012		.000[c]
		Normal Conditions Knowledge Areas Dependent	.048	.011		.000[c]
	Uncertainty Coefficient	Symmetric	.097	.016	5.745	.000[d]
		Student's Age Dependent	.117	.020	5.745	.000[d]
		Normal Conditions Knowledge Areas Dependent	.082	.014	5.745	.000[d]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on chi-square approximation

d. Likelihood ratio chi-square probability.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.060	.047	-1.175	.241[c]
Ordinal by Ordinal	Spearman Correlation	-.056	.052	-1.097	.274[c]
N of Valid Cases		384			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Student's Age * Normal Conditions Expenses

Crosstab

Count

		Normal Conditions Expenses			
		Never	Few Times	Some Times	Frequently
Student's Age	less than 25		15	44	38
	25 to 34	26	20	112	52
	35 to 44		9	1	23
	45 to 54		7	2	
Total		26	51	159	113

Crosstab

Count

		Normal Conditions Always	Total
Student's Age	less than 25	21	118
	25 to 34	6	216
	35 to 44		33
	45 to 54	8	17
Total		35	384

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	133.963[a]	12	.000
Likelihood Ratio	139.620	12	.000
Linear-by-Linear Association	2.309	1	.129
N of Valid Cases	384		

a. 6 cells (30.0%) have expected count less than 5. The minimum expected count is 1.15.

235

Directional Measures

			Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.109	.018	5.737	.000
		Student's Age Dependent	.089	.030	2.919	.004
		Normal Conditions Expenses Dependent	.124	.024	4.953	.000
	Goodman and Kruskal tau	Student's Age Dependent	.123	.019		.000[c]
		Normal Conditions Expenses Dependent	.090	.013		.000[c]
	Uncertainty Coefficient	Symmetric	.150	.019	7.473	.000[d]
		Student's Age Dependent	.176	.021	7.473	.000[d]
		Normal Conditions Expenses Dependent	.130	.017	7.473	.000[d]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on chi-square approximation

d. Likelihood ratio chi-square probability.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.078	.059	-1.522	.129[c]
Ordinal by Ordinal	Spearman Correlation	-.115	.057	-2.271	.024[c]
N of Valid Cases		384			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Student's Age * Normal Conditions Action

Crosstab

Count

		Normal Conditions Action			
		Never	Some Times	Few Times	Frequently
Student's Age	less than 25	24	29	53	6
	25 to 34	72	77	45	22
	35 to 44	13	20		
	45 to 54	14	3		
Total		123	129	98	28

Crosstab

Count

		Normal Conditions Always	Total
Student's Age	less than 25	6	118
	25 to 34		216
	35 to 44		33
	45 to 54		17
Total		6	384

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	83.182[a]	12	.000
Likelihood Ratio	92.703	12	.000
Linear-by-Linear Association	41.430	1	.000
N of Valid Cases	384		

a. 7 cells (35.0%) have expected count less than 5. The minimum expected count is .27.

Directional Measures

			Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.116	.039	2.816	.005
		Student's Age Dependent	.083	.058	1.376	.169
		Normal Conditions Action Dependent	.137	.036	3.576	.000
	Goodman and Kruskal tau	Student's Age Dependent	.081	.018		.000[c]
		Normal Conditions Action Dependent	.069	.014		.000[c]
	Uncertainty Coefficient	Symmetric	.102	.015	6.296	.000[d]
		Student's Age Dependent	.117	.017	6.296	.000[d]
		Normal Conditions Action Dependent	.090	.014	6.296	.000[d]

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on chi-square approximation

d. Likelihood ratio chi-square probability.

Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	-.329	.038	-6.807	.000[c]
Ordinal by Ordinal	Spearman Correlation	-.319	.045	-6.576	.000[c]
N of Valid Cases		384			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Education level * Normal Conditions Work

APPENDIX 4

Environmental Problems Perception Questionnaire

Objective

The main objective of this study is to identify which factors lead people make one or another decision on how to design a solution to specific environmental problems.

Instructions

- Read carefully each question and when answering be as honest as possible.
- There are no correct or incorrect answers. This is, your answers won't be grade right or wrong.
- Do not answer what you think I would like to know but what you really think about.
- There are no tricky questions.
- When answering the questionnaire have in mind that we only are talking about the design of a solution and not its implementation. This means please to consider when designing a solution that you have available all human, material and economic resources required for the solution.
- This questionnaire is anonymous and your answers are strictly confidential. Answers will be used only for the objective above mentioned.

Your honesty, seriousness and respect are important to answer this questionnaire, if so, you can help to find an alternative to support the solution of environmental problems.

<u>**THANK YOU VERY MUCH FOR YOU HELP!!**</u>

ITESM
Instituto Tecnológico y de Estudios
Superiores de Monterrey, Campus Monterrey
Eugenio Garza Sada 2501 Sur, Col. Tecnológico
Monterrey, N.L. México, Edificio CETEC 4to Piso EGADE
Tel (8) 358-2000 Ext. 6094
e-mail: cromero@campus.mty.itesm.mx

Questionnaire

Normal Decision Conditions

1. First indicate sections you **normally** prefer to carry out when making decisions **to solve any problem**. Also indicate frequency of these decisions.

Scale
5) Always 4) Frequently 3) Sometimes 2) Seldom 1) Never

Preferred presently
5 4 3 2 1

Individual work vs Group work
Solve problems with inside people vs outsiders
Limit the number of people involved vs Involving many people
A few knowledge areas represented vs Many areas
Limit expenses vs Give authorization for significant expenses
Pray vs Acting

2. First indicate sections you **normally prefer** to carry out when making decisions **to solve any environmental problem**. Also indicate frequency of these decisions.

Scale
5) Always 4) Frequently 3) Sometimes 2) Seldom 1) Never.

Preferred presently
5 4 3 2 1

Individual work vs Group work
Solve problems with inside people vs outsiders
Limit the number of people involved vs Involving many people
A few knowledge areas represented vs Many areas
Limit expenses vs Authorize significant expenses
Pray vs Acting
Recycle
Properly waste storage
Support taxes increase focused on a safe environment care
Support environmental laws compliance
Use environmental safe products
Promote a new and more vigorous environmental law

3. People perceive different types of threats. However, there are certain events that are perceived as personal threats. These may affect certain aspects of our lives, that we as people appreciate (i.e. pollution affecting our health). If you would perceive a threat over certain personal aspects (as listed below:)

Number the following options in accordance with the degree of importance they have to stand up for them.

Scale
5 = The most important and what you would defend in first place.
1 = The least important and what you would defend in last place

a) Your health   ( )
b) Your religious beliefs ( )
c) Your Nation   ( )
d) Your family   ( )
e) Your economic income   ( )

241

Decisions Conditions when facing an Environmental Problem

4. Environmental problems when considered as a threat, may affect us as per our own perception, in different aspects, (Health, Family, Economic income, Religious Beliefs, etc.). However, each one of the environmental problems can affect us in a different manner **Please circle the threat degree you perceive from each one of the environmental problems listed for the different aspects indicated.** That is to say, 'how do you feel air pollution affects your health, family, Nation, and so on with each of the environmental problems included.

Scale
5) Very serious, 4) Serious 3) Somewhat serious 2) Not very serious, 1) Not at all serious

Degree of threats of the following:	Health	Religious Beliefs	Nation	Family	Economic Income
1) Air pollution	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
2) Water scarcity	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
3) Dangerous products leaks and spills.	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
4) Water contamination	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
5) Deforestation	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1

5. Imagine that you have been assigned to help design a solution to solve different environmental problems. In this stage only consider the solution design. Analyze each one of the following environmental problems. Indicate your preferences for each one of the actions listed and the frequency you propose to apply them as part of the solution design to each of the environmental problems.

Scale
5) Always 4) Frequently 3) Sometimes 2) Seldom 1) Never

	Air pollution	Water scarcity	Leaks and spills of dangerous products	Water pollution	Deforestation
	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Individual work vs Group work					
Solve problems with inside people vs outsiders					
Limit the number of people involved vs Involving many people					
A few knowledge areas represented vs Many areas					
Limit expenses vs Authorize significant expenses					
Pray vs Acting					
Recycle					
Properly waste storage					
Support taxes increase focused on a safe environment care					
Support environmental laws compliance					
Use environmental safe products					
Promote a new and more vigorous environmental law					

Decision Conditions when facing an Specific Environmental Problem

6. Imagine that you have been assigned to help design a solution to solve different environmental problems. Imagine that at the precise moment you are designing the solution, you realize that the environmental problem involved means an immediate serious risk for your health. Analyze each one of the following environmental problems. Indicate your preference for each of the actions listed and the frequency you would propose to act on them as part of the solution design of each specific environmental problem.

A) CONTEXT UNDER WHICH YOUR HEALTH CAN BE SERIOUSLY THREATEN DUE TO AN ENVIRONMENTAL PROBLEM.

1. Assume that the damage to the ozone in the atmosphere, due to the use of CFC (Chlorofluorocarbon), such as Freon, and other refrigerants has reached a point that you have developed a skin cancer because of the exposure to the sun ultraviolet rays, not filtered by the ozone in the atmosphere.
2. Suppose that the drinking and daily usage water received in your house or work is so contaminated that it is no longer safe to drink it. Having bad odor, taste and pollution, and that it is also dangerous to use it for daily cleaning endangering your skin.
3. Imagine that the air at the place where you live or work, has been identified as polluted and dangerous for the human body with dust, human wastes, metals, etc. mixed.

Scale
5) Always 4) Frequently 3) Sometimes 2) Seldom 1) Never

a) If your health is in danger:

	Air Pollution	Water Scarcity	Dangerous products leaks and spills	Water contamination	Deforestation
	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Individual work vs Group work					
Solve problems with inside people vs outsiders					
Limit the number of people involved vs Involving many people					
A few knowledge areas represented vs Many areas					
Limit expenses vs Authorize significant expenses					
Pray vs Acting					
Recycle					
Properly waste storage					
Support taxes increase focused on a safe environment care					
Support environmental laws compliance					
Use environmental safe products					
Promote a new and more vigorous environmental law					

B) CONTEXT OF HOW YOUR RELIGIOUS BELIEF CAN BE SERIOUSLY THREATEN DUE TO AN ENVIRONMENTAL PROBLEM

1. Imagine that you live in a place near to a river and that this river is considered a holy place' (like the Ganges River in India or the water spring of the Fatima Virgin in Portugal, among others). Imagine that the water starts contaminating to a degree that it is forbidden to take a bath in it, swim or drink it and even worse, all previous religious ritual which took place in the river or spring, is suspended modifying thereby this ancient belief.
2. Imagine that in your religion there exist a sacred hill or a mountain such as the Tepeyac where it is believed that the Virgin of Guadalupe appeared before Juan Diego). Suppose that this sacred place suffers deforestation, is full of garbage, endures droughts, etc., to a degree that entrance to the hill or nearby area is prohibited, preventing therefore, any ancestral ritual in the place.
3. Imagine that there is a cathedral, such as the old Mexico City Cathedral, whose structure, facade and inner parts have been so air polluted and have endured soil damage water due to water extraction, and that these factors provoke the fall down and forever loss of the cathedral.

Scale
5) Always 4) Frequently 3) Sometimes 2) Seldom 1) Never

b) If your religious beliefs are in danger:

	Air Pollution	Water scarcity	Dangerous products leaks and spills	Water contamination	Deforestation
	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Individual work vs Group work					
Solve problems with inside people vs outsiders					
Limit the number of people involved vs Involving many people					
A few knowledge areas represented vs Many areas					
Limit expenses vs Authorize significant expenses					
Pray vs Acting					
Recycle					
Properly waste storage					
Support taxes increase focused on a safe environment care					
Support environmental laws compliance					
Use environmental safe products					
Promote a new and more vigorous environmental law					

C) CONTEXTS UNDER WHICH YOUR FAMILY CAN BE SERIOUSLY THREATEN DUE TO AN ENVIRONMENTAL PROBLEM

1. Imagine that you and your family live in a community where air, soil and water contamination is so serious that newborn babies are affected. Also adults of the community suffer diverse threatens to their human body structure (such as the case of Matamoros, Tamaulipas, Mexico, where hydrocefalia is present). And you have detected some chow the existence of that enormous risk for your family if the conditions remain as they are.

2. Imagine that you live in a community with water scarcity. This serious problem affects your family, provoking strong dehydration, mainly affecting the children. With the consequent infectious illness for lack of clean water to drink and clean. Houses also accumulate undesirable wastes for the lack of cleaning water giving way to plagues and other sickness.

3. Imagine that you are a nature lover and enjoy it with your family. You want your children to learn to observe the plants, animals and living creatures of the country. Besides this is an opportunity for family integration and living together. Imagine that due to deforestation, accumulated waste and water scarcity, these places are no longer available, making it impossible to visit.

Scale
5) Always 4) Frequently 3) Sometimes 2) Seldom 1) Never

c) If your family is in danger:

	Air pollution 5 4 3 2 1	Water scarcity 5 4 3 2 1	Dangerous products leaks and spills 5 4 3 2 1	Water Contamination 5 4 3 2 1	Deforestation 5 4 3 2 1
Individual work vs Group work					
Solve problems with inside people vs outsiders					
Limit the number of people involved vs Involving many people					
A few knowledge areas represented vs Many areas					
Limit expenses vs Authorize significant expenses					
Pray vs Acting					
Recycle					
Properly waste storage					
Support taxes increase focused on a safe environment care					
Support environmental laws compliance					
Use environmental safe products					
Promote a new and more vigorous environmental law					

D) CONTEXTS OF HOW YOUR NATION CAN BE SERIOUSLY THREATEN DUE TO SOME ENVIRONMENTAL PROBLEM

1. Imagine that in Mexico at Laguna Verde Plant, Veracruz, there would be an accident such as the one suffered in Russia at Chernobyl Plant, affecting not only Russia but the neighbor countries.

2. Imagine that in Mexico there would be a possibility that the toxic gas emission kill millions of people further affecting extensive agricultural areas, flora, fauna, rivers, etc. (like the accident at Bophal, India.)

3. Imagine that the enormous quantity of waste generated in Mexico, would be out of control and its confining would be impossible in such a way that underground disposal would no longer be possible as a solution as the previous residues have already caused an irreversible soil damage which will take years to overcome. Affecting also the agricultural areas and underground water supplies in the country.

Scale
5) Always 4) Frequently 3) Sometimes 2) Seldom 1) Never

d) If your Nation is in danger:

	Air pollution 5 4 3 2 1	Water scarcity 5 4 3 2 1	Dangerous products leaks and spills 5 4 3 2 1	Water contamination 5 4 3 2 1	Deforestation 5 4 3 2 1
Individual work vs Group work					
Solve problems with inside people vs outsiders					
Limit the number of people involved vs Involving many people					
A few knowledge areas represented vs Many areas					
Limit expenses vs Authorize significant expenses					
Pray vs Acting					
Recycle					
Properly waste storage					
Support taxes increase focused on a safe environment care					
Support environmental laws compliance					
Use environmental safe products					
Promote a new and more vigorous environmental					

E) CONTEXT UNDER WHICH YOUR ECONOMIC INCOME CAN BE SERIOUSLY THREATEN DUE TO SOME ENVIRONMENTAL PROBLEM I.

1. Imagine that the scarcity of water (due to droughts or contamination) and food (due to soil desertification), have reached the point in which to bring these services from far away places, to your location have caused an increment of 100% on what you usually paid for them. This situation will directly affect your cashflow amount reducing your economic income significatively.

2. Imagine that the environmental problems are presently affecting you so much that you are starting to get a constant medical check up and even medical attention, with the consequent money disbursements.

3. Imagine that the effects of the environmental problems are affecting people and the general environment and that a significant part of the cost of this situation must be covered by the Government. Therefore provoking a considerable increment in taxes required to cover these expenses. Taxes which you will have to pay and which will affect your budget.

Scale
5) Always 4) Frequently 3) Sometimes 2) Seldom 1) Never

e) If your Income is in danger:

	Air Pollution	Water scarcity	Dangerous products leaks and spills	Water contamination	Deforestation
	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
Individual work vs Group work					
Solve problems with inside people vs outsiders					
Limit the number of people involved vs Involving many people					
A few knowledge areas represented vs Many areas					
Limit expenses vs Authorize significant expenses					
Pray vs Acting					
Recycle					
Properly waste storage					
Support taxes increase focused on a safe environment care					
Support environmental laws compliance					
Use environmental safe products					
Promote a new and more vigorous environmental law					

245

Demographic Data

Please select one option in each group as applied

1. Gender
    Male
    Female

2. Age
    Less than 25 years
    25 a 34
    35 a 44
    45 a 54
    55 years or more

3. Studies (Last degree obtained)
    Professional degree
    Master degree

4. Academic Area
    Engineering
    Business Administration
    Social Science
    Sciences

5. Position in the company
    Manager
    Director
    Executive

6. Indicate if you practice some sport or outdoor activity at least twice a week.

    Yes
    No

7. Birth place

8. City or community where you have lived most of your life (years?)

9. Trajectory development
(Positions in the present firm or before)

DEFINITION OF CONCEPTS USED IN THE SURVEY

Air pollution.

The presence in the atmosphere of contaminants with enough time and quantity to be harmful for animals, plants or to interfere in the enjoyment of life and property (Lewis, 1977).

Deforestation.

The permanent elimination of forest or weeds (Lincoln, 1995).

Family.

The basic social institution. One or more men or women that live with his/her mate in a more or less permanent relation, with recognized rights and obligations (Fairchild, 1984).

Health.

The normal development of the human biological and psychological functions (Fairchild, 1984).

Income.

The amount of money that each person has as outcome for the practice of an specific activity (or activities) during a period of time (Fairchild, 1984).

Nation.

The nationality that has achieved the final phase of unification represented by a own political structure and by its settlement in a territory (Fairchild, 1984).

Religious believes.

The acceptation as true of one conception about Nature and the character of the Divinity; a set of reciprocate doctrines about responsibilities and obligations between the Divinity and the Humanity and of a set of conduct norms created to guide Life and God's will and to ensure to the believer the approval of his/her conscious and any rewards or freedom of sins, in this world or the other, included in the doctrine of her/his faith (Fairchild, 1984).

Spills (larger volume, one-time, instantaneous event) or **leaks** (continuous release of small amounts of material over a period of time).

The emissions from: process vent (from vented process equipment in reaction and separation systems), storage tanks, equipment and piping (that occur due to the scape of process materials through faulty seals in pumps, valves, compressors, flanges and other connectors, agitators, sample connections, and open-end process lines)), transfer (that occur when loading and unloading tank trucks, rail cars, and marine vessels), wastewater collection and treatment (that result from the volatilization of organic hazardous air pollutants contained in wastewater, as well as liquids into the ground), and waste storage piles (dust in the mineral processing and inorganic chemical industries), all of them dumped by accident or on purpose (Noyes, 1992).

Water contamination.

A change in natural water that may provoke to be used to drink or agriculture. This change is cause by the introduction of organic or inorganic substances (domestic or industrial wastes as sewage and toxic materials, acid rain, temperature changes in water when discharging hot water from power plants, factories and desalination plants (Lewis, 1977).

Water scarcity.

The lack of water that becomes a severe constraint on food production, economic development, and protection of natural systems (Postel, 1992).

248

GLOSSARY

Air pollution.

The presence in the atmosphere of contaminants with enough time and quantity to be harmful for animals, plants or to interfere in the enjoyment of life and property (Lewis, 1977).

Biospheric orientation.

Have a different and more direct understanding of Nature and our systemic relation with it.

Deforestation.

The permanent elimination of forest or weeds (Lincoln, 1995).

Environmental awareness.

New environmental behavior in which quantitative demands and confrontation must be replaced by qualitative appreciation and coordination (Ryding, 1992).

Environmental behavior.

Actions which contribute towards environmental preservation and/or conservation Axelrod and Lehman (1993).

Environmental management.

Changes in people´s lives and business philosophies, based on economic and technological development, to improve the environmental situation (Ryding, 1992).

Family.

The basic social institution. One or more men or women that live with his/her mate in a more or less permanent relation, with recognized rights and obligations (Fairchild, 1984).

Health.

The normal development of the human biological and psychological functions (Fairchild, 1984).

Income.

The amount of money that each person has as outcome for the practice of an specific activity (or activities) during a period of time (Fairchild, 1984).

More comprehensive actions.

They are more comprehensive because they are attempts to be exhaustive or inclusive (Frederickson, 1985).

250

Nation.

The nationality that has achieved the final phase of unification represented by a own political structure and by its settlement in a territory (Fairchild, 1984).

Perceived personal threat.

The extent of personal importance perceived by the decision maker when solving what he or she perceives as a threat before making the decision (Petty and Caccioppo, 1979).

Religious believes.

The acceptation as true of one conception about Nature and the character of the Divinity; a set of reciprocate doctrines about responsibilities and obligations between the Divinity and the Humanity and of a set of conduct norms created to guide Life and God's will and to ensure to the believer the approval of his/her conscious and any rewards or freedom of sins, in this world or the other, included in the doctrine of her/his faith (Fairchild, 1984).

251

Spills (larger volume, one-time, instantaneous event) or **leaks** (continuous release of small amounts of material over a period of time).

The emissions from: process vent (from vented process equipment in reaction and separation systems), storage tanks, equipment and piping (that occur due to the scape of process materials through faulty seals in pumps, valves, compressors, flanges and other connectors, agitators, sample connections, and open-end process lines)), transfer (that occur when loading and unloading tank trucks, rail cars, and marine vessels), wastewater collection and treatment (that result from the volatilization of organic hazardous air pollutants contained in wastewater, as well as liquids into the ground), and waste storage piles (dust in the mineral processing and inorganic chemical industries), all of them dumped by accident or on purpose (Noyes, 1992).

Water contamination.

A change in natural water that may provoke to be used to drink or agriculture. This change is cause by the introduction of organic or inorganic substances (domestic or industrial wastes as sewage and toxic materials, acid rain, temperature changes in water when discharging hot water from power plants, factories and desalination plants (Lewis, 1977).

Water scarcity.

The lack of water that becomes a severe constraint on food production,

economic development, and protection of natural systems (Postel, 1992).

REFERENCES.

Ajzen, I. "From intentions to actions: A theory of the planned behavior" In J. Kuhl & J. Beckman (Eds.), Action-control from cognition to behavior, Heidelberg, Springer, 1985.

Allen, J. and Ferrand, J. "Environmental Locus of Control, Sympathy, and Proenvironmental Behavior : A Test of Geller's Actively Caring Hypothesis" Environment and Behavior Vol.31, No.3, May 1999, pp. 338-353.

Allenby, R. and Richards, J. (Eds.). "The Greening of Industrial Ecosystems" National Academy Press, 1994.

Ansoff, L. "Corporate Strategy" New York, McGraw-Hill, 1965.

Arcury, A. "Environmental Attitude and Environmental Knowledge" Human Organization, Vol. 49, No.4, 1990, pp. 300-304.

Arcury, A. and Christianson, E. "Environmental Worldview in Response to Environmental problems: Kentucky 1984 and 1988 Compared" Environment and Behavior Vol. 22, pp. 387-407.

Axelrod, J. and Lehman, R. "Responding to environmental concern : what factors guide individual action?" Journal of Environmental Psychology Vol. 13, 1993, pp. 149-159.

Baldassare, M. and Katz, Ch. "The Personal Threat of Environmental Problems as a Predictor of Environmental Practices" Environment and Behavior Vol. 24, No. 5, 1992, pp. 602-616.

Barbour, I. "Technology, Environment and Human Values" New York, Praeger, 1980.

Barger, N. "A metaethical analysis of computer ethics" University of Notre Dame. The Brookings Institution, Washington D.C. April, 1993.

Bargh, J. and Gollwitzer, P. "Environmental Control of Goal-Directed Action: Automatic and Strategic Contingencies between Situations and Behavior. Integrative Views of Motivation, Cognition and Emotion" Vol. 41 of the Nebraska Symposium on Motivation, University of Nebraska Press, 1994, pp. 89-115.

Barr, N. and Cary, J. "Farmer's perceptions of soil salting: Appraisal of an insidious hazard" Parksville: University of Melbourne, School of Agriculture and Forestry, 1984.

Bass, B. "Organizational Decision Making" Homewood, Ill, Richard D. Irwin, 1983.

Blake, R. and Mouton, J. "The managerial grid" Houston, Gulf, 1964.

Blocker, T. and Eckberg, D. "Environmental Issues as Women's Issues: General Concerns and Local Hazards" Social Science Quarterly Vol. 70, No. 3 1989, pp. 586-593.

Blocker, T. and Eckberg, D. "Gender and Environmentalism : Results from the 1993 General Social Survey" Social Science Quarterly Vol.78, No.4, December 1997 , pp. 841-858.

Borden R. and Schettino, A. "Determinants of environmentally responsible behavior" Journal of Environmental Education Vol. 10, No. 4, 1979, pp. 35-37.

Bradt, J. And Osteraas D. "Designing Statistically Reliable Samples" National Productivity Review , Summer 1993, pp. 417-424.

Brody, J. "Sex differences in support for nuclear power" Social Forces Vol. 63, 1984, pp. 209-228.

Buchanan, A. "Perfecting imperfect duties collective action to create moral obligations" Business Ethics Quarterly Vol. 6, No.1, 1996, pp. 27-39.

Burton, I., Kates, W. and White, F. "The environment as hazard" New York, Oxford University Press, 1978.

Bustani, A and Mackay, P.W. "Nafta and the Environment" Chapter: "NAFTA: Environmental Needs and Infrastructure in Mexico", Kluwer Law International, 1995.

Cambridge Reports/Research International "The Green Revolution and the Changing American Consumer", Cambridge, MA, 1990.

Carver, C., Ganellen, R., Froming, W., & Chambers, W. "Modeling: An Analysis in terms of category accessibility" Journal of Experimental Social Psychology, Vol.19, 1983, pp. 403-421.

255

Cary, J. "The Nature of Symbolic Beliefs and Environmental Behavior in a Rural Setting" <u>Environment and Behavior</u> Vol.25, No.5, September 1993, pp. 555-576.

Christianson, E. and Arcury, T. "Regional Diversity in Environmental Attitudes, Knowledge, and Policy : The Kentucky River Authority" <u>Human Organization</u> Vol.51, No.2, Summer 1992 , pp. 99-108.

Clitheroe Jr., H., Stokols, D. and Zmuidzinas, M. "Conceptualizing the Context of Environment and Behavior" <u>Journal of Environmental Psychology</u> Vol.18, 1998 , pp. 103-112.

Covin, T. "Perceptions of Family-Owned Firms: The impact of gender and educational level" <u>Journal of Small Business Management</u> Vol. 32, No.3, July 1994, pp. 29.

Cowan, D. "Developing a process model of problem recognition" <u>Academy of Management Review</u> Vol.11, 1986, pp. 763-776.

Cowan, D. "Developing a Classification Structure of Organizational Problems: An empirical Investigation" <u>Academy of Management Journal</u> Vol. 33, No.2, 1990, pp. 366-390.

Danzig, E., Thayer, P., and Lila P. "The Effects of a Threatening Rumor on a Disaster Stricken Community. Disaster Study # 10" Washington, D.C. National Academy of Sciences. National Research Council, 1958.

De Young, R. "Recycling as appropriate behavior : A review of survey data from selected recycling education programs in Michigan" <u>Resources, Conservation and Recycling</u> Vol. 3, 1990, pp. 1-13.

Dietz, T., Stern, C. and Rycroft, W. "Definitions of the conflict and the legitimization of resources : The case of environmental risk" <u>Sociological Forum</u> Vol. 4, 1989, pp. 47-70.

Dunlap, E. and Van Liere, D. "Commitment to the dominant social paradigm and concern for environmental quality : An empirical examination" <u>Social Science Quarterly</u> Vol. 65, 1984, pp. 1013-1028.

Dutton, E.J. and Jackson, E.S. "Categorizing strategic issues: Links to organizational action" <u>Academy of Management Review</u> Vol.12, No.1, 1987, pp. 76-90.

Downs, A. "Inside Bureaucracy" Boston: Little, Brown, 1967.

Drucker, P. "The practice of management" New York : Harper & Brothers, 1954

Dutton, J., Fahey, L. and Narayanan, V. "Toward understanding strategic issue diagnosis" Strategic Management Journal   Vol. 4, No. 4 , 1983, pp. 307-324.

Earthview. "April 1998 Nationwide Poll" Greenwire April 22, 1998

Eckberg, D. and Blocker, T. "Varieties of Religious Involvement and Environmental Concerns : Testing the Lynn White Thesis" Journal for the Scientific Study of Religion   Vol. 28, No.4, 1989 , pp. 509-517.

Eckberg, D. and Blocker, T. "Christianity, Environmentalism, and the Theoretical Problem of Fundamentalism" Journal for the Scientific Study of Religion   Vol. 35, No.4, 1996 , pp. 343-355.

Eisenhardt, M. and Zbaracki, J. "Strategic Decision Making" Strategic Management Journal, Vol. 13 , 1992, pp. 17-37.

Fairchild, H. "Diccionario de Sociologia" Mexico, D.F. Fondo de Cultura Economica, 1984.

Finger, M. "From knowledge to action? Exploring the relationship between environmental experiences, learning, and behavior" Journal of Social Sciences Vol. 50, 1994, pp. 141-160.

Fishbein, M. and Ajzen, I. "Belief, attitude, intention and behavior" Reading, MA, Addison-Wesley, 1975.

Frederickson, J. "Effects of Decision Motive and Organizational Performance Level on Strategic Decision Processes" Academy of Management Journal Vol. 28, No. 4, 1985, pp. 821-843.

Fuhrer, U "Sozialpsychologisch fundierter Theorierahmen für eine Umweltbewusstseins-forschung (Socialpsychological framework for research an environmental concern)" Psychologische Rundschau No. 46, 1995, pp. 93-103.

Gamba, J. and Oskamp, S. " Factors influencing community residents' participation in commingled curbside recycling programs" Environment and Behavior Vol. 26, 1994, pp. 587-612.

Geller, S. "Actively caring for the environment : An integration of behaviorism and humanism" Environment and Behavior Vol. 27, No. 4, 1995, pp. 184-195.

257

Gladwin, T. "The Meaning of Greening: A Plea for Organizational Theory., Environmental Strategies for Industry: International Perspectives on Research Needs and Policy Implications" Washington, D.C., Island Press, 1993.

Grieshop, I. and Stiles, C. "Risk and home-pesticide users" Environment and Behavior Vol. 21, 1989, pp. 699-716.

Guagnano, G., Stern, P. and Dietz, T. "Influences on Attitude-Behavior Relationships : A Natural Experiment with Curbside Recycling" Environment and Behavior Vol.27, No.5, September 1995, pp. 699-718.

Haldemann, V. and Wister, A. "Environment and Aging" Journal of Canadian Studies Vol.28, No.1, Spring 1993 , pp. 30-44.

Hambrick, D. and Mason, P. "Upper Echelons: The Organization as a Reflection of its Top Managers" Academy of Management Review Vol. 9, No. 2, 1984, pp. 193-206.

Hamid, P. and Cheng, S. "Predicting Antipollution Behavior : The Role of Molar Behavioral Intentions, Past Behavior, and Locus of Control" Environment and Behavior Vol.27, No.5, September 1995, pp. 679-698.

Hand, C. and Van Liere, K. "Religion, mastery-over-nature, and environmental concern" Social Forces Vol.63 pp. 555-570.

Hardin, G. "The Tragedy of the Commons" Science Vol. 162, 1968, pp. 1243-1248.

Heberlein, T. "Attitudes and Environmental Management" Journal of Social Issues Vol.45, No.1, January 1989, pp. 37-57.

Henriques, I. and Sadorsky, P. "The Relationship Between Environmental Commitment and Managerial Perceptions of Stakeholders Importance" Academy of Management Journal Vol. 42, No. 1, 1999, pp. 87-99.

Hernandez Medina, A & Narro Rodriguez, L. "Como somos los Mexicanos" Mexico, D.F., Centro de Estudios Educativos CREA, 1987.

Hines, M., Hungerford, R. and Tomera, M. "Analysis and synthesis of research on responsible environmental behavior : a meta-analysis" Journal of Environmental Education Vol. 18, 1986-1987, pp. 1-8.

Howell, D. "Trends in the Growth and Distribution of Skills in the U.S. Workplace, 1960-1985" Industrial & Labor Relations Review Vol. 44, No. 3, April 1991, pp. 486-502.

Jackson, E. and Dutton, E. "Discerning Threats and Opportunities" Administrative Science Quarterly Vol. 33, No. 3, 1988, pp. 370-387.

Kaiser, F., Wölfing, S. and Fuhrer, U. "Environmental Attitude and Ecological Behavior" Journal of Environmental Psychology Vol.19, 1999 , pp. 1-19.

Kals, E., Schumacher, D. and Montada, L. "Emotional Affinity Towards Nature as a Motivational Basis to Protect" Environment and Behavior Vol.31, No.2, March 1999, pp. 178-202.

Karp, D. "Values and Their Effect on Pro-Environmental Behavior" Environment and Behavior Vol. 28, No.1, January 1996, pp. 111-133.

Katz, D. and Kahn, R. "The social psychology of organizations" New York: John Wiley and Sons. 1978.

Katz, R. "The Effects of Group Longevity on Project Communication and Performance" Administrative Science Quarterly Vol. 27, No. 1, 1982, pp. 81-104.

Katzev, R. and Pardini, A. "The comparative effectiveness of reward and commitment approaches in motivating community recycling" Journal of Environmental Systems Vol. 17, 1987-1988, pp. 93-113.

Keller, E. " "Reflections on Gender and Sciences" New Haven, Conn. , Yale University Press, 1985

Krause, D. "Environmental Consciousness" Environment and Behavior Vol.25, No.1, January 1993, pp. 126-142.

Lang, J., Dittrich, J. and White, S. "Managerial Problem Solving Models: A Review and a Proposal" Academy of Management Review Vol. 3, No. 4 , 1978, pp. 854-866.

Lansana, M. "Distinguishing potential recyclers from nonrecyclers . a basis for developing recycle strategies" Journal of Environmental Education Vol. 23, 1992, pp. 16-23.

Lewis, W. "Ecology Field Glossary A naturalist's vocabulary" London, England Greenwood Press, 1977.

259

Lincoln, J. "Diccionario de Ecología, evolución y taxonomía" México, D.F. Fondo de Cultura Económica, 1995.

Lutz, A., Simpson-Housley, P. and De Man, A. "Wilderness : Rural and Urban Attitudes and Perceptions" Environment and Behavior Vol.31, No.2, March 1999, pp. 259-266.

Maloney, P. and Ward, P. "Ecology, : Let's hear it from the people" American Psychologist Vol. 28, 1973, pp. 583-586

March, J. and Simon, H. "Organizations" New York : John Wiley and Sons, 1958.

Mintzberg, H., Raisinghani, D., and Theoret, A. (1976) "The Structure of "Unstructured" Decision Processes" Administrative Science Quarterly Vol. 21, 1976, pp. 246-275.

Mintzberg, H. "Patterns in Strategy Formation" Management Science Vol. 24, No.9, 1978, pp. 934-948.

Miller, D. "Strategy Making and Structure: Analysis and Implications for Performance" Academy of Management Journal Vol. 30, No. 1, 1987, pp. 7-32.

Miller, D. "Matching Strategies and Strategy Making: Process, Content, and Performance" Human Relations Vol. 42, No. 3, 1989, pp. 241-260.

Moore, S., Murphy, M. and Watson, R. "A longitudinal study of domestic water conservation behavior" Population and environment : A Journal of Interdisciplinary Studies Vol. 16, 1994, pp. 175-189.

Myers, I. "The Myers-Briggs Type Indicator" Palo Alto, Calif. : Consulting Psychologists Press, 1962.

Noyes, R. "Handbook of Leak, Spill and Accidental Release. Prevention Techniques" New Jersey : Noyes Publications, 1992.

Nutt, P. "Types of Organizational Decision Processes" Administrative Science Quarterly Vol. 29, No. 3, 1984, pp. 414-450.

Oskamp, S., Harrington, J., Edwards, C., Sherwood, L., Okuda, M. and Swanson, C. "Factors influencing household recycling behavior" Environment and Behavior Vol.23, 1991, pp. 494-519.

Pardini, U. and Katzev, D. "The effect of strength of commitment on newspaper recycling" Journal of Environmental Sciences Vol. 13, No. 3, 1983-1984, pp. 245-254.

Petty, R. and Caccioppo, J. "Issue involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses" Journal of Personality and Social Psychology Vol. 37, 1979, pp. 1915-1926.

Postel, S. "Last Oasis. Facing water scarcity" New York : W.W. Norton & Company, 1992.

Pounds, W. "The Process of Problem Finding" Industrial Management Review Vol.11, Fall 1969, pp. 1-19.

Ramaprasad, A. and Mitroff, I. "On formulating strategic problems" Academy of Management Review Vol. 9, No. 4, 1984, pp. 597-605.

Ryding, S. "Environmental Management Handbook" Florida : Lewis Publishers, 1992.

Schwartz, H. "Normative influences on altruism", New York, Academic Press, 1977.

Schwenk, C. and Thomas, H. "Formulating the mess: The role of decision aids in problem formulation" Omega Vol. 11, 1983, pp. 239-252.

Scott, D and Willits F. "Environmental Attitudes and Behavior: A Pennsylvania Survey" Environment and Behavior Vol. 26, No. 2, 1994, pp. 239-260.

Simon, H.A, "The structure of ill-structured problems" Artificial Intelligence Vol. 4, 1973, pp. 181-201.

Smith, G. "Towards a heuristic theory of problem structuring" Management Science Vol. 34, No. 12, 1988, pp. 1489-1506.

Staw, B., Sandelands E. and Dutton J. "Threat-Rigidity Effects in Organizational Behavior: A Multilevel Analysis" Administrative Science Quarterly Vol. 26, No. 4, 1981, pp. 501-524.

Stern, P. "Psychological dimensions of global environmental change" Annual Review of Psychology Vol. 43, 1992, pp. 269-302.

Stern, P., Dietz, T. and Guagnano, G. "The New Ecological Paradigm in Social-Psychological Context" Environment and Behavior Vol.27, No.6, November 1995, pp. 723-743.

Stern, P., Dietz, T. and Kalof, L. "Value Orientations, Gender, and Environmental Concern" Environment and Behavior Vol.25, No.3, May 1993, pp. 322-348.

Taylor, R. "Perception of problem constrains" Management Sciences Vol. 22, 1975, pp. 2-29.

Tibor, T and Feldman, Y "Implementing ISO 14000" Illinois, U.S.A.: Irwin, 1997.

Tversky , A., & Kahneman, D. "The Framing of Decisions and the Psychology of Choice" Science Vol. 30, No. 30 , 1981, pp. 453-458.

UNEP (United Nations Environment Program). "Taking Actions. An Environmental Guide for you and your Community" UNEP, 1995.

Van Dijk, E. et al. "What Information Do We Use in Social Dilemmas? Environmental Uncertainty and the Employment of Coordination Rules" Journal of Experimental Social Psychology Vol.35, 1999 , pp. 109-135.

Van Liere, K. and Dunlap R. "Environmental Concern : Does it make a difference how it's measured? Environment and Behavior Vol. 15, No.13, 1981, pp. 651-676.

Vining, J. and Ebreo, A. "Predicting recycling behavior from global and specific environmental attitudes and changes in recycling opportunities" Journal of Applied Social Psychology Vol. 22, 1992, pp. 1580-1607.

Volkema, R. "Problem formulation in planning and design" Management Science Vol. 29, 1983, pp. 639-652.

Wallace, A. "Tornado in Worcester: An Exploratory Study of Individual and Community Behavior in an Extreme Situation. Disaster Study # 3" Washington, D.C. National Academy of Sciences. National Research Council, 1956.

Wescott II, W. "The Influence of Organizational Factors on the Effectiveness of Environmental Management" A Ph.D. Dissertation in Engineering and Public Policy. Carnegie Mellon University. Pittsburgh, PA., May, 1995.

Widegren, O. "The New Environmental Paradigm and Personal Norms" Environment and Behavior Vol. 30, No.1, January 1998,, pp. 75-100.

262

Williams, E. "College students and recycling : their attitudes and behaviors" <u>Journal of College Student Development</u> Vol. 32, 1991, pp. 86-88.