

REVISITING CONSUMER ENVIRONMENTAL RESPONSIBILITY: A FIVE NATION CROSS-CULTURAL ANALYSIS AND COMPARISON OF CONSUMER ECOLOGICAL OPINIONS AND BEHAVIORS

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ABSTRACT

Cross-cultural marketing of consumer products and services has become an integral part of the mainstream strategic thinking of multinational consumer products firms. These firms must increasingly address ecological concerns of the individuals comprising the various global market segments where these products will be marketed. Green Marketing has thus become a hot topic for both producers and consumers across cultures. This study investigates how consumers across cultures feel about the environment, whether it makes sense to stress green marketing to consumers in other cultures if they are not environmentally sensitive, and whether there are rudimentary differences in ecological attitudes based on cultural origins. The paper compares consumer attitudes toward the environment to determine whether major differences do exist among cultures. Sample data of 459 consumers was gathered from five countries (Azerbaijan, Italy, Spain, the United States and Venezuela) and was analyzed. Factor analysis was performed to indicate dimensions of environmental responsibility. ANOVA was used to see if differences exist between cultures with regard to the various dimensions. Environmental responsibility is characterized by awareness of environmental problems, knowledge of remedial alternatives best suited to alleviate those problems, skills needed to pursue those actions, and a possession of a genuine desire to act.

KEYWORDS: Environmental responsibility, cross-cultural marketing, green marketing.

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INTRODUCTION

Much has happened since the early days of the environmental movement when environmentalism was primarily confined to a relatively small number of environmental activists, many of whom had emerged from the alternate-lifestyles-movements most people think of when they reflect on the social upheaval occurring in the U.S. and Western Europe during the latter half of the 1960's. From its somewhat outside the mainstream beginnings, the "green movement" may finally be trending toward majority status in many economically privileged and predominately Westernized societies, with environmentalism perhaps on the verge of becoming a major consumer orientation even among the elite living in those societies (Webb, Mohr, & Harris 2008; Rosenthal & Revkin 2007; Holusha 2000; Shabekoff 1983). While ecological activist groups appear successful in targeting their message to consumers in Western cultures on the dangers facing the planet's fragile eco-systems, the message does not appear to be gaining traction in less economically developed regions of the world. The earth's rain forests and remaining wildlife habitat are still disappearing at an alarming rate, and rapidly developing economies such as Indonesia, China and India are now successfully competing with the West for vital energy resources, apparently without regard to their own worsening air quality (World Wildlife Fund 2008; Stanford University 2006).

Whether a shift in societal consumer attitudes toward environmental issues is real or imagined, the environmental movement itself has certainly had its fair share of enthusiastic Western political, media, and celebrity cheerleaders---adding their voice in support of a “less is more” consumer mentality. The surprise at this point is that anyone would have the temerity to disagree with a conventional wisdom that so highly associates consumption with ecological crisis. Manmade greenhouse emissions, for example, are thought to be the cause of global warming. Since the root cause of most ecological issues apparently begins with man’s insatiable demand for the earth’s resources, it would follow that the growing awareness of environmental problems would be linked to the recognition that human activities play a significant role in the degradation of the environment (Fernandez-Manzanal, Rodriguez-Barreiro, & Carrasquer 2007).

Critics of the “man is responsible” position indicate that opposing arguments are routinely ignored by the media and other influential supporters in both science and government. As a result, much of the other side of the argument legitimate scientific debate being blacklisted in favor of ideologically based opinion. Because there is less openness of debate, needlessly alarming the public and promoting marginal public policy decisions (Fund 2008; Johnson 2008). Despite opponents’ claims regarding the apparent lack of support from media and government, scientific contrarians have managed to get their message out to a growing group of skeptics and financial supporters (PBS/Lomborg 2007).

No matter which direction the science leads, the U.S. public already appears more engaged in environment issues than at any time in recent memory. Based on the number of European nations signing on to international ecological treaties, political leaders there appear even more engaged than politicians in the U.S. (Revkin 2005; National Center for Policy Analysis 2002). Further, at a time when citizens across the globe could justifiably be focusing their attention on global terrorism, uncertainty in the energy markets, or rising inflation and the possibility a global economic meltdown, environmental issues apparently remain high on the list of concerns to the average citizen (Butler 2006). Whether that ecological concern has the same broad appeal in rapidly expanding and/or less developed national economies, however, needs more investigation. Based on reports of the air quality in India and China, emphasis in those cultures appears to be on economic expansion, not clean air and greenhouse emissions. Recent evidence also indicates that the Amazon rain forest is being cleared at a more rapid rate than previously assumed, primarily by cattle ranchers and corn and soybean farmers eager to capitalize on the growing demand for beef, and, ironically, increased ethanol production (Platt 2007; Butler 2008).

PURPOSE OF THE STUDY

The purpose of the current study is to investigate consumer related ecological attitudes across various national cultures to determine if a new ecologically based consumption mentality is emerging, not just in traditional Western societies, but across a spectrum of cultures. The study should be of interest and have practical value to both national and global marketers since knowledge of emerging consumer attitudes is considered essential in developing marketing campaigns designed around products that have appeal to local consumers. Additionally, since the consumer’s ecological attitude is considered part of an overall framework of consumer orientations that ultimately affect buyer decision making, any evidence of a shift toward more ecologically responsible consumption should be documented and verified.

From a theoretical standpoint, any information that provides additional knowledge on the formation of consumer attitudes helps advance marketers’ overall understanding of the factors affecting the consumer buying decision process. Since ecological social responsibility and the consumer’s ecological attitude are both considered part of the rubric of concerns previously mentioned as belonging to the marketing discipline, it is important to understand how these attitudes are formed. For example, are they predominately rooted in cultural and national identity factors, or, do they result from other external artifacts such as global environmental marketing and educational campaigns? Finally, since consumer

environmental attitudes appear more fluid than stable, descriptive information on the current state of consumer ecological orientation might assist in the development of more robust theoretical models explaining the presence of ecologically responsible consumers across cultures.

LITERATURE REVIEW

Signs of an intellectual, if not ideologically driven divide appear to be growing in the scientific community vis-à-vis public policy decisions affecting the world's ecology. One of the more contentious debates involves global warming, not so much whether it exists, but why it exists. Those who ascribe to a position implicating man as the cause of global warming have long advocated energy conservation and the use of alternative energy sources as a way to reduce greenhouse emissions. Under this scenario, man's dependence on fossil fuels results in the release of excessive amounts of CO₂ which then envelops the earth's atmosphere and raises surface temperatures. In addition to contributing to the rise in sea levels and global temperatures, these emissions are also said to disrupt the earth's weather patterns (i.e., more severe hurricanes, etc.). Under the manmade global warming paradigm, solutions tend to include reductions in fossil fuel based energy usage and conservation of natural resources. Since much of the world's economy is based on energy derived either from coal or petroleum, reductions in either of these fossil fuels would imply a correspondent reduction in lifestyle activities and product usage that accompanies lifestyle (Webb, et. al. 2008).

The big question is whether consumers are willing to make such a sacrifice, especially in the U.S. where consumption is expected and encouraged. Measurement of ecological attitudes, even among true believers, poses something of a dilemma since respondents often overstate both their intentions and their behaviors. Nonetheless, individuals who profess to live an eco-oriented lifestyle are expected to demonstrate their respective attitudes and behaviors by actively participating in eco-oriented activities such as recycling and actually using less energy. Theoretically, at least, the truly eco-oriented consumer should both talk the talk and walk the walk.

Individuals who reject man's influence on the earth's ecology would be expected to fall at the other end of the eco-orientation continuum. Rather than conservation and cutbacks, the admittedly less-than-concerned individual would likely support naturally occurring phenomenon such as increased solar activity to explain the change in global temperatures in recent years---perhaps gleefully noting the current winter as being one of the coldest on record (Johnson 2008). Since a majority of the world's consumption takes place in the West, the populations most likely to exhibit reluctance to change would also be members of advanced Western economies. Not only do western consumers have the most to sacrifice, but they have readier access to published information contradicting arguments urging conservation.

Ironically, while the respondents from advanced Western economies, particularly in the U.S. should demonstrate the largest percentage of eco-oriented citizens, it is quite possible that the same cultural dynamics inherent in one group would encourage anti-environmentalism in the other. Based on its more pro-development, market based history of reliance on technological solutions, Western and particularly U.S. based respondents could just as easily reject conservation and cutbacks as a solution to the world's environmental problems. Even more ironic, the latter might even categorize themselves as environmentalists but would no doubt score low on traditional eco-attitude and behavioral scales.

Using a sort of eco-based cognitive vigilance, consumers at the other end of the eco-orientation spectrum may be as motivated toward awareness and knowledge of environmental issues as their more conventional environmentalist counterparts. Rather than supporting draconian cutbacks in lifestyle, however, the second type individual would look first to free market and technology based solutions to solve environmental problems. Hence, some portion of the sample is likely to be both aware and

knowledgeable, but unwilling to act based on traditional behavioral measures such as recycling and energy conservation (Stone, et. al. 1995).

The final individual may be the type who is either ignorant of the issues, or is too impoverished to be concerned with anything but survival. While members of advanced economic societies appear quite concerned over deforestation and loss of wildlife habitat--the areas most in need of conservation practices are often the ones least able (or willing) to implement the sort of conservation practices that would insure long term economic and environmental stability (Johnson 2008; Butler 2007). Because the sample is composed of a variety of national cultures with varying degrees of economic stability and access to ecological information, what constitutes eco-oriented consumption and ecological concern is likely to vary significantly. Individuals with no sense of control over their external situation would thus believe personal efforts to save the environment to be rather fruitless. Prior to testing of hypotheses, it is believed that the respondents from less developed economies (two of the five national cultures included the sample) will demonstrate less eco-oriented attitudes and behaviors simply because they live under poorer economic conditions.

In closing, the authors have noted the contentious nature of the ecological debate for the purpose of placing the various issues into a global framework. While studies have indicated that most Western societies rank ecological issues high on their list of concerns, there is less evidence to suggest the same levels exist outside Western society. Hence, is “eco-mania” primarily a Western phenomenon confined to economically advanced populations, or, have consumers across cultures truly begun to engage in ecologically friendly consumer patterns of behavior?

ENVIRONMENTAL RESPONSIBILITY, THE CONSTRUCT

Environmental Responsibility has previously been defined as a “state in which a person expresses an intention to take action directed toward remediation of environmental problems, acting not as an individual concerned with her/her own economic interests, but through a citizen consumer concept of societal-environmental well being” (Stone, Barnes & Montgomery 1995). The authors hypothesized that environmental responsibility would consist of five dimensions including: 1) an attitude expressing concern for the environment; 2) awareness and knowledge of environmental issues; 3) behaviors that ecologically responsible consumers might engage in; 4) a willingness to act; and 5) a positive locus of control with an inherent ability and skill level necessary to act upon environmental problems. The findings of their study substantiated these hypotheses.

Previous research indicates that attitude toward the environment is a part of environmental concern (Dunlap, Van Liere, Mertig, & Jones 2000; Kaiser, Woelfing & Fuhrer 1999; Thomson & Barton 1994; Newhouse 1990) with many environmentalists holding the view that man should live in harmony with nature and that limits should be placed on economic growth. It is generally thought that ecological problems are the result of societal values, attitudes and beliefs advocating and encouraging growth, irrespective of environmental costs (Schultz 2001; Thomson & Barton 1994). Thus, attitude toward ecological issues should be considered a vital part of environmental concern.

The level of environmental knowledge a citizen possesses is an important part of environmental responsibility. Although some research is in disagreement with the relationship between environmental knowledge and environmental behaviors (Shean & Shei 1995), most research indicates knowledge of environmental issues to be an important part of environmental responsibility (Smith-Sebasto 1995; Schann & Holzer 1990; Roth & Perez 1989; Hines, Hungerford, & Tomera 1986). Indeed, some research indicates that increased knowledge of the environment produces a more positive attitude toward the environment or can change behavior directly (Hungerford & York, 1990, Arcury, 1990). It is commonly thought that environmental responsibility implies a behavioral component. Hence, the adoption of eco-

friendly behaviors such as recycling, consumerism (e.g., avoidance of certain products, change in purchase behaviors, etc.), political actions (e.g., writing letters to elected officials and voting for candidates based on their environmental records), and educational programs (e.g., becoming more learned in hopes of solving problems (Dunlap & Scarce 1991) are demonstrable acts indicating environmental responsibility. A growing minority of citizens now considers themselves to be environmental activists. Thus, one's ecological behavior should be considered an important component of environmental responsibility.

Another important component of environmental responsibility is willingness to act. A willingness to act has been identified as closely related to locus of control (Hungerford & Yolk 1990; Hines, et. al., 1986). Individuals with a high internal locus of control feel more strongly and are more willing to act to do something to save the environment (Hwang, Kim & Jeng 2000). There is a positive relationship between environmental concern and environmentally responsible intentions to act (McGuire 1992). Some consumers, however, may be willing to act, but not willing to make personal sacrifices (Krause 1993).

Lastly, consumers must have the ability to act. Placed in a practical perspective, eco-oriented consumers should possess the skills necessary to help solve environmental problems, whether that entails the ability to make others aware of the health or esthetic issues related to pollution, the ability to organize consumer boycotts, engage in eco-oriented litigation, or simply understanding the importance of joining conservation groups and other ecologically based organizations such as Greenpeace. Thus, consumers who have the ability to act must be able to logically reason and engage in decision processes to solve environmental problems (Tonn, English & Travis 2000).

A BRIEF PROFILE OF THE COUNTRIES INVESTIGATED

Azerbaijan

The Republic of Azerbaijan was part of the Soviet Union until it won its independence in 1991 (Aliprandini 2006). Azerbaijan is considered one of the most important spots in the world for oil exploration and development. Industry is dominated by the energy sector, contributing almost 70% of the total value of all the country's industrial production (Shelton 2003). The country is rich in oil and natural gas reserves and in September 1994, a 30 year contract was signed between the State Oil Company of Azerbaijan and 13 large national and multinational oil companies, among them Amoco, BP, and Exxon (Horton 1997). Western oil companies have since been able to tap into deepwater oilfields untouched by the Soviet exploitation. While the country is obviously rich in terms of its natural resources, the wealth generated from its oil reserves has not trickled down to the average citizen (O'Lear 2001). Unemployment, for example, ranges from 15% to 20% and per capita income is quite low (e.g., estimated at \$3,862 to \$6,476 annually) (Aliprandini 2006). 50% of the population lives in poverty even though the country exports nearly \$4 billion worth of oil, gas, and chemicals annually.

From an environmental standpoint, Azerbaijan faces serious ecological challenges and diverse threats such as air, water and soil pollution, accumulation of human, industrial and radioactive wastes, deforestation, coastal erosion, and increased incidence of environmentally related diseases (Shelton 2003; Robinson 2008). Soil pollution has occurred throughout the region due to contamination by DDT and other toxic defoliants used in the production of cotton during the Soviet era. The Caspian petroleum and petrochemicals industry has traditionally contributed to the air and water pollution problems experienced by the population in that area. The average Azeri lives in overcrowded, dirty, polluted conditions (Oyster 2000). Years of Soviet oil exploration have left the once beautiful capital of Baku in a dire state of ecological deterioration. Although several environmental organizations exist in Azerbaijan, few funds have been allocated to begin the critical cleanup and prevention programs needed to alleviate some of the severe pollution issues there. Over-fishing, primarily by poachers, is threatening the survival of Caspian

sturgeon stocks, the source of most of the world's supply of caviar. The Convention on International Trade in Endangered Species (CITES) has listed as threatened all sturgeon species, including all commercial Caspian varieties. CITES imposed a ban on most Caspian caviar in January 2006, but the ban was lifted in January 2007

The country's Apsheron Peninsula, including the cities of Baku and Sumqait, and the Caspian Sea is considered to be one of the most ecologically devastated areas in the world, having severe soil, air, and water pollution problems (Shelton 2003, Aliprandini 2006). Today, an estimated 200 oil waste lakes exist in the area. Sumqait's heavy industries have led to a staggering degree of environmental degradation. Today, the Apsheron peninsula is a barren wasteland with almost no visible vegetation. The moonlike landscape outside Baku is a sober reminder of the devastating impact unfettered human activity can have on the environmental quality of a region.

The average Azeri is extremely aware of the environmental problems that are faced within the country. O'Lear & Gray (2006) noted, for example, that 50% of Azeri's were both aware and concerned about problems such as pollution and forest depletion. They also felt that government agencies weren't doing enough to correct the situation. However, when asked to rank environmental concerns in relation to other societal problems, the majority of Azeris placed it 9th on a list of 10 items (O'Lear & Gray 2006). From the above discussion the following hypotheses have been developed:

H₁: The Azerbaijan sub-sample will demonstrate the lowest levels of environmental concern of any of the cultures investigated in the study.

H₂: The Azerbaijan sub-sample will have lower levels of faith in the ability of the government, business and industry in general to correct environmental problems that other cultures in the study.

Venezuela

The Republic of Venezuela, located in the northernmost part of South America, has suffered great environmental degradation in recent years. The extraction of oil, food processing, textile industries and heavy steel and aluminum industries have created heavily to local and national pollution (Gonzalez & Nagel 1996). Environmental issues of note include sewage pollution spilling into Lago de Valencia, located to the west of Caracas; the oil and urban pollution of Lake Maracaibo, located in northwestern Zulia State; deforestation; soil degradation; and urban and industrial pollution, especially along the Caribbean coast. Lake Maracaibo is commonly referred to as the most polluted lake in South America (Ceaser 2003). Current concerns also include irresponsible mining operations that endanger the rain-forest ecosystem and indigenous peoples of that region, and gold extraction activities in the Guyana zone that have resulted in significant mercury pollution. In addition to pollution issues, Venezuela currently has the third highest deforestation rate in South America.

Venezuela remains highly dependent on its oil revenues which account for roughly 90% of the country's export earnings, more than 50% of the federal budget revenues, and around 30% of GDP. Petroleum exports have made Venezuela the third largest economy in South America (Ceaser 2003). Emboldened by his December 2006 reelection, President Hugo Chavez nationalized firms in the petroleum, communications, and electricity sectors in 2007, further eroding what remained of an already dwindling foreign influence on the economy. Although voters recently rejected proposed constitutional changes that would have given him additional authority (December 2007), Chavez's power has not been significantly diminished. Following the example set by his ideological hero, Fidel Castro, Chavez's ultimate goal appears to be one of consolidating and centralizing his control over the economy and implementing his own version of "21st Century Socialism."

As with Azerbaijan, per capita income in Venezuela is low (estimated to range from \$5,800 to \$6,250). While nearly 40% of the country lives in poverty, Venezuelan oil revenues allows the country to maintain the highest per capita income in South America. Despite or perhaps because of the country's economic dependence on oil as the chief source of economic revenues, the Venezuelan people themselves express a great deal of concern for the environment. In a recently published study, Venezuelans were among the top four countries in the world in terms of voicing their concern for the environment (Ho 2007). While it is often assumed that citizens living in less advanced national economies tend to be less ecologically concerned than citizens from more advanced national economies, the above example suggests otherwise. One of the reasons advanced as to why this perception exists is because (as is the case of the Venezuelan people) the citizens themselves have less, if any, input as to the actions of their governments. In essence, it is simply easier for citizens living in most advanced economies to participate in consumer protests because there is little or no political retribution meted out to those who do participate. Indeed, Western activists, far from being politically persecuted are often held out as heroes by an adoring Western media. This is not the case in Venezuela at the moment. Brazil, for example, has only recently been able to establish an organized ecological movement that enjoys support at the highest level of government. On the other hand, some research indicates that native Venezuelans are not sincere supporters of the ban on mining and logging activities in the Venezuelan Amazon (Huber 2001). It appears that Venezuelans are not particularly interested in conservation of natural resources as there is a low acceptance of the protected areas by the native population, even though this would benefit eco-tourism in the region. (Huber 2001). From the above discussion the following hypotheses have been developed:

H₃: The Venezuelan sub-sample will demonstrate overall lower levels of environmental concern than most of the cultures investigated in the study.

H₄: The Venezuelan sub-sample will demonstrate lower levels of eco-oriented attitudes and behaviors than most other cultures with regard to conservation of natural resource

Italy

Italy has a population of 57 million concentrated on a relatively small land area. High population densities have lead to strong environmental pressures to solve problems with pollution, inadequate waste disposal, and land erosion. Per capita income is estimated to be around \$27,700. Primary environmental concerns for Italy include air pollution from industrial emissions such as sulfur dioxide; coastal and inland rivers polluted from industrial and agricultural effluents; acid rain damaging lakes, and inadequate industrial waste treatment and disposal facilities. In the 1990's Italy had the world's 10th highest level of industrial carbon dioxide emissions. Business managers and professionals in Italy tend to view reduction of waste as a higher priority than other environmental factors such as increasing energy efficiency or developing green (environmentally friendly) products. In addition to pollution, Italy continues to face a long-term threat from flooding and erosion. The island city of Venice, one of the world's most beautiful and unusual cities, is routinely threatened by floodwaters and unfortunately, continues to sink.

One of the most severe problems in recent years has been garbage collection and disposal. Between 1975 and 1995, almost 26 million tons of garbage had basically been allowed to build up along the highways and cityscapes of Italy, forcing the government to become more proactive in tackling this huge, garbage related environmental problem. In 1997, a law was finally passed requiring everyone in Italy to recycle so as to decrease the abuse of waste facilities. Italy is now considered the world leader in recycling dangerous wastes. The Italian government is also a strong proponent of solar energy use. Italy is now fourth among European nations in the use of solar energy (Aguila, et. al. 2008). Based on our research, the private sector (i.e., business and industry) appears to routinely fail when it comes to proactively addressing the country's ecological problems. Hence, it is the Italian government that usually has to step

up if the problems persist---and then, only after the problem threatens to become a national health issue. From the above discussion, the following hypotheses have been developed:

H₅: The Italian sub-sample will demonstrate less faith in individual ability to solve ecological problems than will the U.S. and Spanish samples (i.e., lower locus of control).

H₆: The Italian sub-sample will demonstrate less individual willingness to act to solve environmental problems than either the U.S. or Spanish sub-samples.

Spain

Spain appears to take a very proactive approach when it comes to the environment, instituting measures such as those designed to protect wetlands and the wild bird population. Various Mediterranean and National Park locations (e.g., La Gomera in the Pyrenees) have been designated as marine life protection areas. In addition to its in-country ecological efforts, Spain has taken an active role in defense of the global environment, signing on to numerous UN sanctioned agreements and protocols related to the global environment and protection of the earth's natural resources. Further, the Spanish government has signed global treaties relating to atmospheric contamination, protection of the ozone layer, the treatment of refuse and dangerous dumps, issues related to whale hunting, climatic changes, the protection of endangered species, and the protection of tropical forests.

Per capita income for the country of 40 million is relatively high compared to some of the other cultures in the study (estimated to be around \$23,300). Spaniards, as shown in recent studies, are very aware of environmental problems such as desertification and misuse of natural resources (Mangus et. al. 1997). The country's eco-tourism industry has benefited dramatically during the last decade, with Spain now ranking as the number two destination for foreigners searching for environmentally oriented tourist destinations (Webb-Hicks 2008). A growing number of eco-tourists increasingly opt for organized tours incorporating environmental awareness as part of their reason for visiting Spain. Nonetheless, Spain had been referred to as the least environmentally sustainable tourist destination in the world (Ham 2008).

As with most countries, Spain is not without its environmental problems. Of the developed countries included in the study, Spain exhibits the most alarming warning signs for potential environmental disaster. It is estimated, for example, that 1/3 of Spain will be a desert within fifty years and virtually all of the remaining glaciers located in the Spanish Pyrenees will be gone within 20 years (Ham 2008). As a result of centuries of unplanned cuttings once extensive forests are now limited to just the Pyrenees and the northern most Asturias-Galicia areas. Fire eliminates another 700,000 to 1,000,000 hectares of forestland each year. As in many parts of South America, government reforestation schemes often meet with difficulties where sheep and goats have freely grazed over large areas for centuries. Despite the setbacks it initially faced, however, the Spanish government began taking dramatic steps in the 1980's to replant many of the deforested areas, planting an average of 92,000 hectares (227,000 acres) annually since that time. Nonetheless, erosion still affects 18% of the total land mass of Spain. The removal of agricultural subsidies has increased crop production to the point where increased soil erosion, water usage, and pesticide contaminations have resulted in 20% of Spain turning into a desert (Pohl 2001).

In addition to deforestation, air pollution is major problem. In 1995, industrial carbon dioxide emissions totaled 223.2 million metric tons (a per capita level of 5.72 metric tons), ranking Spain as the 20th worst country in terms of carbon dioxide emissions. Spain is easily Europe's worst environmental offender and produces 53% more greenhouse gases than it did 15 years ago (Ham 2008). Industrial and agricultural sources contribute to the nation's water pollution problems---which are considered severe by Western standards. Spain is also vulnerable to oil pollution from tankers traveling the shipping routes near the nation's Atlantic and Mediterranean shorelines, with oil tanker spills along its coastlines and beaches

remaining a constant problem. Spain's cities produce about 13.8 million tons of solid waste per year. Due to its severe problems with pollution and deforestation, the following hypotheses have been developed:

H₇: The Spanish sub-sample will exhibit higher knowledge and awareness of environmental problems than either the U.S. or Italian samples.

H₈: The Spanish sub-sample will exhibit lower levels of eco-oriented behavior than either the U.S. or Italian samples.

The United States

The U.S. is one of the world's leading economies with per capita income at \$46,000. One of the negative consequences associated with being the world's most prolific consumers is that American families generate much higher levels of waste than the typical family in other areas of the world. The U.S., for example, produces 23% of the world's carbon dioxide emissions (Stephen 2003). Water pollution from the runoff of pesticides and fertilizers is also a major problem for many of the United States' natural waterways. Limited natural fresh water resources in much of the western part of the country require careful management to avoid desertification. More than 125 million Americans suffer from intermittent unhealthy air, while 270,000 miles of rivers and streams are too polluted for fishing or swimming (Stephen 2003). The EPA has found that 34% of the coastal waters of the U.S. have such serious ecological problems that they cannot sustain or support aquatic life or basic human activities such as fishing. The Gulf of Mexico and the Great Lakes are among the worst (Horowitz 2002).

The United States consumes nearly 25 percent of the world's energy, although it has only 5 percent of the world's population. Americans consume more oil per capita than the citizens of any other country in the world, and thus are often indicted as inflicting more harm on the planet than the citizens of any other country. Garbage is also a major problem as each American produces about five pounds of trash each day, up from about three pounds in 1960 and five times the rate in developing countries. Each American uses three times the water as the world average. Not surprisingly, surveys of American citizens indicate a generally pessimistic view over the state of the environment. In a recent survey, 55% of Americans said they expected the world's natural environment to be in worse shape in 10 years, and 60% felt the environment was in poor or very poor shape and would not improve (USA Today 2006). Based on the brief discussion above, the following hypotheses have been developed:

H₉: The U.S. sub-sample will exhibit a relatively high degree of environmental awareness compared to the other national samples used in the study.

H₁₀: The U.S. sub-sample will be less willing to act vis-à-vis sacrificing consumption for the environment than any of the other national sub-samples studied.

METHODOLOGY

Data Collection

A total of 459 surveys were administered to university students from five national cultures using a survey adapted from the Eco-Scale measurement instrument originally developed for the first study conducted in 1995. See Table 1 below for a demographic profile of the sample. All the data was gathered during a period of time from 2003-2007. The data from Azerbaijan, Spain and Italy was gathered in 2003, the Venezuelan data was collected in 2006 and the U.S. data was collected in 2007. College students are an important segment of society and have been leading crusaders in the modern environmental movement (Thapa 2001). On campus environmentalism can largely be attributed to student activists who have led

the way on campuses worldwide for environmental responsibility. This point is particularly noteworthy in countries outside the U.S. where college educations are less common and where college students are generally considered to be among the elite in their respective cultures. Other research has recently found that there is indeed a certain level of concern and worry that exists among college students regarding environmental problems (Fernandez-Manzanal, Rodriguez-Barreiro, & Carrasquer 2007).

Consequently, two of the samples collected outside the United States were obtained with the help of college student volunteers and professors living in the those countries (i.e., Spain and Italy) in 2006. Two of the samples were collected by the researchers themselves while teaching in these countries in 2003 (i.e., Azerbaijan and Venezuela) using student volunteers to back translate the items into the native language of that country. Bilingual individuals fluent in English and the native language of the sample were used in the translation process, with a second similarly equipped control group used to verify the results.

Focus groups were used to ascertain the relevance of items from the original scale, creating the need to update and revise some of the items used in the original scale. Because this was a cross-cultural study, the authors brought no preconceived ideas as to what the specific ecological issues might be in each country, or, for that matter, how well the ideas proposed in many of the original items would relate outside a U.S. based audience. As a result, the items used in the original scale measurement were primarily adapted based on wording considerations and not theoretical or actual observations of the ecological behaviors of the populations used in the sample. The remaining student samples were collected from two U.S. colleges, one located in the South and one along the Atlantic Coast in 2007.

Table 1: Demographic Profile of Sample

Demographic	Category	Percent of Sample
Gender	Male	54%
	Female	46%
Age	16-19	11%
	20-23	36%
	24-27	21%
	28-31	28%
	32 & over	23%
	Azerbaijan	7.6%
Country (live)	Italy	8.5%
	Spain	33%
	United States	33%
	Venezuela	18%
	Caucasian	33%
Ethnicity	African American	25%
	Hispanic	38%
	Other	4%

The sample was 54% male and 46% female. The mean age of the sample was 23, and the largest group of students (36%) were between the ages of 20-23. 33% of the sample was from Spain, 33% from the U.S. and another 18% was Venezuela. The majority the sample was Caucasian (33%), African-American (25%), and Hispanic (38%).

It should also be noted that a second study was conducted using a survey instrument developed concurrently with the survey instrument used in this study. The second set of items included additional statements emphasizing topical issues related to global warming and pollution, deforestation and the destruction of wild life habitat, and the impact of economic development on the ecological environment. While the results of that study are not included in the current research effort, a subsequent follow-up/validation study is underway to compare the findings. As indicated previously, the student samples should not be considered typical of the populations found in each of the countries studied. Indeed, a college education is still somewhat rare in many parts of the world, and so college students from poorer countries might be viewed as quite atypical of the population in those cultures. Nonetheless, given the

opportunity to tap into the opinions of even elite members of society offers at least some insight as to the overall level of ecological concern displayed by members of that society.

ANALYSIS AND FINDINGS

Reliability Analysis

The ECOSCALE instrument used had a validated reliability of .929 when first developed in 1995. The 31-item scale used in this study was administered to 459 respondents from five countries, resulting in an initial reliability of .718. During the analysis phase, 14 items were reverse coded in order to insure consistent reliability (i.e., that all items would be consistent with statements that an “environmentally responsible” person would agree with). The recoded items were items 1, 3, 5, 6, 7, 9, 13, 14, 16, 18, 22, 28, 29 and 30. See Appendix A for a copy of the survey instrument.

Several of the items had item to total correlation of less than .20 and were considered too low to be included in the final scale assessment and were therefore deleted from the initial 31-item scale. Removing these items improved the overall scale reliability to .73 (as measured by Cronbach’s Alpha). The scale used in the final data analysis included 29 items since further reductions failed to improve the scale’s reliability. The items that were deleted from the scale were item 2 and item 24 with item to total correlations of .042 and .031. See Appendix A for a copy of the survey instrument and details of these items.

Principal Components Factor Analysis

Principal components factor analysis was used to determine and confirm the number and dimensions of “Individual Environmental Responsibility.” Factor analysis has been cited as a “useful technique for reducing a large number of indicators to a more manageable set” (Gerbing & Anderson 1988). Factor analysis also assists in determining the number of latent variables underlying a set of items and thus, helps form coherent subsets that are independent from one another (Tabachnick & Fidell 1989).

Results of Factor Analysis

The results of the principal components factor analysis using a Varimax rotation yielded 11 factors with eigenvalues higher than 1.00 that explained 62% of the variance. The Kaiser Meyer Olkin Measure of Sampling Adequacy was .672 while the Barlett Test of Sphericity was significant at less than .000. Both tests indicate that factor analysis was appropriate for use with this data set (Noursis 1990). Two items did not load higher than .400 on any factor and were removed from the scale. These were items 26 and 27. See Appendix A for a copy of the survey instrument and wording of these items.

Additionally items 7, 13, 19, 25, 26, 28 and 29 were removed from the scale due to split loadings, low factor loadings, and not loading on any factor higher than .40. See Appendix A for a copy of the survey instrument and the wording of these items. The factor analysis was rerun yielding 7 factors having eigenvalues greater than 1. These 7 factors explained 55.64% of the variance. See Table 2 for a summary of factor analysis.

The first factor explained 10.934% of the variance and was named “*Locus of Ecological Control*.” An individual agreeing with these five statements obviously feels helpless when confronting environmental problems and thus has little or no personal control over environmental issues. These individuals are no doubt concerned about the destruction of the world’s ecosystem. This factor included questions regarding the environmental impact of individual contributions to environmental degradation and their apparent

feelings of adequacy or inadequacy to stop others from harming the environment. Factor loadings ranged from .497 to .721.

The second factor explained 9.577% of the variance and was labeled: “*Individual Eco-Activity.*” This factor was composed of four items, and included activities such as reporting the harmful actions of others, encouraging others to be environmentally responsible and doing things to improve the environment. Factor loadings ranged from .549 to .742.

The third factor explained 8.044% of the variance and was labeled: “*Willingness to Participate in Environmental Group Activity.*” Individuals signifying agreement with these statements would most likely be members of ecological organizations or community activist groups involved in activities designed to save the environment. Factor loadings ranged from .777 to .867.

The fourth factor explains 7.305% of the variance and was labeled: “*Attitude toward Economic Development.*” The statements measure a consumer’s attitude toward economic development and industrial involvement in reducing ecological problems. Factor loadings ranged from .642 to .738. Table 4 shows the items comprising “Attitude toward Economic development” with respect to environmental pollution.

The fifth factor explains 6.732% of the variance and was labeled: “*Individual Ecological Value System.*” These statements appear to measure the values and belief system of individuals regarding their own (and others’) activities vis-à-vis the environment. Individual activities included relate to conservation, energy use, and actions to prevent global warming. Factor loadings ranged from .494 to .768.

The sixth factor explains 6.64% of the variance. This factor was labeled: “*Man’s Impact.*” The two items relate to man’s impact on the environment and the subsequent environmental damage caused by industrial accidents and man’s use of the earth’s resources. Factor loadings ranged from .549 to .727.

The seventh factor explained 6.40% of the variance and was labeled: “*Personal Sacrifice.*” This one item factor relates to a willingness to sacrifice personal convenience for the environment. The factor loading was .667.

Table 2: Summary of Factor Analysis

Factors	Factor Loadings
Factor 1 “Locus of Ecological Control (10.934% of variance explained)	
3. The growth of the world’s population is not one of the major factors contributing to destruction of the earth’s ecosystem.	.608
16. I personally think that the average citizen is powerless to stop environmental pollution.	.721
17. I think my own involvement in environmental activities today will help save the planet for future generations.	.529
22. The earth is so large geographically that people have little impact on the overall ecological conditions of the planet.	.673
30. It is of no use to concern myself with environmental issues because there is simply nothing I can do to fight environmental problems anyway.	.497
Factor 2 “Individual Eco-Activity” (9.577% of variance explained)	
20. I personally, on a routine basis, do things that help the environment (such as recycling, purchasing environmentally friendly products, have my engine emissions checked, etc.)	.549
21. I personally encourage people around me to be more environmentally conscious (such as telling	.727

Factors	Factor Loadings
them not to litter, to conserve energy, to refrain from open burning of garbage, etc.)	
23. People who litter should receive heavy fines and then be forced to clean up their own mess.	.553
31. I would describe myself as someone who is environmentally responsible.	.742
Factor 3 “Willingness to Participate in Environmental Group Activity (8.044% of variance explained)	
11. I am currently involved with (either through membership or active participation) an environmental group or organization dedicated to protecting the environment (e.g. Greenpeace, etc.)	.777
12. I have participated in consumer boycotts and activist campaigns aimed at organizations that I believe are anti-environment	.867
Factor 4 “Attitude toward Economic Development” (7.305% of variance explained)	
4. Product packaging (such as Styrofoam cartons, plastic shrink wrapping, etc) is one source of pollution that could be greatly reduced if manufacturers acted more environmentally responsible	.642
8. This country needs more restrictions on land development (i.e., there should be limits to the amount of farm and forest land in this country that can be used to construct new housing and factories, etc.)	.738
Factor 5 “Individual Ecological Value System” (6.732% of variance explained)	
10. We should limit the use of indoor sporting venues (such as swimming pools and tennis courts) during the winter so that we could save energy	.494
14. I am not offended when I see people wearing clothes made from the fur or skin of exotic animals	.769
15. I believe that we should all be concerned about ozone depletion because the ozone layer helps screen out harmful ultra violet rays.	.497
Factor 6 “Man’s Impact on the Environment” (6.64% of variance explained)	
1. Man made environmental accidents usually result in only short-term damage to the environment.	.549
9. Sportsmen (such as hunters and sports fishermen) should not be subject to game limit restrictions (i.e., such as the number of animals/birds they can kill or the number of fish they can catch)	.727
Factor 7 “Personal Sacrifice” (6.40% of the variance explained)	
18. I believe that if I owned a car , I would use it to commute to work everyday rather than be inconvenienced with public transit	.683

There were seven factors which explained 62% of the variance. These factors were locus of control, Individual eco-activity, group activity, attitude toward economic development, individual value systems, attitude toward man’s impact, and personal sacrifice. Factor loadings ranged from .497 to .867.

DISCUSSION OF ANOVA FINDINGS

ANOVA is an appropriate statistical technique for comparing three or more means (Hair & Anderson 1987). ANOVA was used to compare each culture (e.g., Azerbaijan, Italy, Spain, Venezuela and the U.S.) on each of the seven dimensions of environmental responsibility in order to assess whether differences exist between cultures.

ANOVA was run on the first dimension, Locus of Ecological Control, with results indicating the existence of very strong and significant differences between and among cultures with regard to feelings of control/helplessness ($F = 40.663$, $P = \text{less than } .001$). Both the Venezuela (mean 3.9317) and U.S. samples (mean 3.7232) exhibited significantly stronger mean scores on this factor than the other three national cultures. Respondents from the Venezuelan and U.S. apparently believe that individuals can make a difference and do have influence over environmental decisions while respondents from the other three cultures apparently feel less influential. Respondents from Spain (mean 2.9187) and Italy (mean 2.8769)

for example, had relatively low mean scores on this factor while respondents from Azerbaijan (mean 3.47) indicated a surprisingly high level of locus of control in comparison

ANOVA was run on the second dimension of environmental responsibility, Individual Eco-Activity, with results indicating significant differences between and among cultures regarding the amount of action taken by individuals to alleviate ecological problems ($F = 4.566$, $P = \text{less than } .001$). The interesting finding here is that citizens of Azerbaijan (mean 3.8286) and Venezuela (mean 3.5732) were the most willing to take action while citizens of the U.S. (mean 3.3154), Spain (3.2817), and Italy (3.33) were the least likely to take action to alleviate ecological problems.

ANOVA was run on the third dimension of environmental responsibility, “Willingness to Participate in Environmental Group Activity” with respect to each of the five national cultures. The results indicate that differences do exist with respect to group membership in environmental organizations by culture ($F = 5.116$, $P = \text{less than } .001$). Spain (mean 2.1667) and Italy (mean 2.1923) were the cultures with the highest mean scores on this factor while respondents from Venezuela (mean 1.9207), Azerbaijan (mean 1.5909) and the U.S. (mean 1.7222) were apparently less willing to participate in environmental group activity.

Results of ANOVA run on the fourth dimension of environmental responsibility, “Attitude toward economic development” once again indicate that attitudes differ sharply among cultures ($F = 8.783$, $P = \text{less than } .001$) with respect to what business, government and industry can do to protect the environment. Respondents from Spain (mean 3.7567), Venezuela (mean 3.5983) and the U.S. (mean 3.6732) demonstrated a more positive outlook attitude toward the ability of government, business and industry to protect the environment than respondents from either Italy (mean 3.1026) or Azerbaijan (3.0429).

Results from ANOVA on the fifth dimension of environmental responsibility, “Individual Ecological Value System, indicate that attitudes differ marginally among cultures ($F = 2.352$, $P = .053$). Venezuela (mean 3.1911) had the highest level of individual ecological value systems. Azerbaijan (mean 3.0784), Italy (mean 3.0085), Spain (mean 2.9378) and the U.S. (mean 2.9249) had moderately lower individual ecological value systems. Interestingly, the U.S. sample had the lowest scores on this factor which included items that appear to relate to individual conservation measures.

Results of ANOVA run on the sixth dimension of environmental responsibility, “Man’s impact on the environment” indicated that this was the only factor where no significant differences appear between cultures. Thus, the majority of cultures are apparently in agreement that man is responsible for the earth’s environmental problems ($F = 1.636$, $P = .164$). Spain (mean 3.9533), Venezuela (mean 3.8963), Azerbaijan (mean 3.9429), and the U. S. (mean 3.9013) respondent samples each had fairly high mean scores on this factor compared to that of the sample from Italy (mean 3.5385).

The final ANOVA compared scores on the seventh dimension of environmental responsibility, “Personal Sacrifice.” Results indicate that significant differences exist between cultures as to the amount of comfort individuals are willing to sacrifice in order to save the environment ($F = 3.57$, $P = \text{less than } .05$). Respondents from Spain (mean 2.8267) are apparently the most willing to sacrifice personal convenience followed by Italy (mean 2.6410), Venezuela (mean 2.6341), the U.S. (mean 2.3268), and Azerbaijan (mean 2.1714). While admittedly a single item measurement, there may be no better indicator of an individual’s willingness to sacrifice for the environment than a person who is willing to give up the convenience of a personal automobile for public transportation. Across the board, the mean scores appeared low on this factor. Table 3 summarizes the ANOVA results.

Table 3: ANOVA Results

Factor #	Name of factor or Dimension	F Value	Sig.
1	Locus of Ecological Control	40.063	.0001***
2	Individual Eco-Activity	4.556	.001***
3	Willingness to Participate in Environmental Group Activity	5.116	.001***
4	Attitude toward Economic Development	8.783	.001***
5	Individual Ecological Value System	2.352	.053
6	Man's Impact on the Environment	1.636	.164
7	Personal Sacrifice	3.570	.007**

* = $P < .05$, ** = $P < .01$, *** = $P < .001$. Significant differences exist between cultures with regard to locus of ecological control, individual eco-activity, willingness to participate in environmental group activity, attitude toward economic development and level of personal sacrifice. Marginal differences exist with regard to individual ecological value systems. No differences exist between cultures with regard to man's impact on the environment.

COUNTRY RANKINGS- DISCUSSION OF FINDINGS

A summary of rankings for each factor is shown below. Final rankings were computed for each country by averaging the rankings for each country on each factor..

Table 4: Rankings on Factors 1-7 for Each Country

Country/Rank	F1	F2	F3	F4	F5	F6	F7	Aver
Azerbaijan	3	1	4	5	2	3	5	3.2
Italy	5	5	2	4	3	5	2	3.7
Spain	4	4	1	1	4	1	1	3.1
U.S.	2	3	5	3	5	4	4	3.7
Venezuela	1	2	3	2	1	2	3	2

The results indicate that Venezuela, followed by Spain and Azerbaijan are the most environmentally responsible countries with the U.S. and Italy tied at the bottom. They would be the least environmentally responsible countries

Azerbaijan Sample

Hypothesis 1, which stated Azeris would demonstrate the lowest levels of environmental concern of any culture, was not supported. While respondents from the Azerbaijan sample ranked lowest on factor 4 (attitude that business and government can solve ecological problems) and factor 7 (willingness to engage in personal sacrifice to save the environment), they ranked highest on factor 2 (individual eco-activity) and factor 5 (individual ecological value systems). Azeris were on the bottom of the list in thinking that government or business would do something to save the environment and they were the culture that was least likely to engage in personal sacrifice. However, they were the most likely culture to take some form of personal individual action to save the environment and were more likely to practice conservation of energy as evidenced by having higher ecological value systems. This suggests that Azeris cannot be considered as having the lowest levels of environmental concern. Since the construct (environmental responsibility) has 7 factors it would be difficult to suggest that the Azerbaijan sample is the least eco-oriented of the five samples, especially since the country's mean ranking (3.2) is higher than both the U.S. (3.7) and Italy (3.7) samples.

Hypothesis 2, which stated that the Azerbaijan sub-sample would have lower levels of faith that government, business or industry would solve environmental problems, was supported. Azeris were the least confident of all cultures in thinking that government would do anything to save the environment. The mean on factor 4 "attitudes for economic development" was 3.04 for the Azeri sub-sample, and this was the lowest mean for all cultures.

Venezuelan Sample

Hypothesis 3, which stated that the Venezuelan sub-sample would have lower levels of environmental concern than other cultures, was not supported. Based on the results, the Venezuelan sample ranked 1st or 2nd on five of the seven factors and no worse than third on any of the factor rankings.

Venezuelans had the highest levels of any culture with regard to locus of environmental control (factor 1). They feel very strongly as citizens that they can do something on an individual basis to save the environment and they were among the top cultures in willingness to take action to save the environment (factor 2). They felt very strongly that government, business and industry can make a difference when it comes to saving the environment (factor 4). Venezuelans had the highest level of ecological value systems and were more likely to practice conservation than other cultures (factor 5). Surprisingly, the Venezuelan sample appears to be the most eco-oriented of all the national cultures studied.

Hypothesis 4, which stated that Venezuelans would demonstrate lower levels of eco-oriented attitudes and behaviors than other cultures in regard to conservation of natural resources, was not supported. The Venezuelan sub-sample ranked highest on factor 5 (individual ecological value systems) which includes items that appear to relate to energy conservation and conservation of natural resources. And of the seven factors related to attitudes and behaviors, the Venezuelan sample was either the highest or among the highest of the groups studied.

Italy Sample

Hypothesis 5, which stated that the Italian sub-sample would demonstrate less faith in an individual's ability to solve ecological problems than would the U.S. and Spanish samples, was partially supported, although the behavior of the Italian and Spanish samples appears to be very closely related. Italy ranked last on factors 1 (locus of ecological control) and factor 2 (individual eco-activity). On factor 3 (willing to participate in environmental group activity), Italy did rank second behind Spain, with the U.S. sample ranking last in terms of eco-involvement. Italians were more likely to feel as citizens that there was little they could do to save the environment.

Hypothesis 6, which stated that the Italian sub-sample will demonstrate less individual willingness to act to solve environmental problems than either the U.S. or Spanish sub-samples, was only partially supported. As with the previous hypothesis, the Italian and Spanish samples tend to mirror one another on factors 2 (individual eco-activity), factor 3 (willingness to participate in environmental group activity), and factor 7 (personal sacrifice) which are the factors appearing to be most aligned with individual willingness to act. On factor 2 (individual eco-activity) with regard to recycling, the Italian sample ranked last of the five national cultures studied, closely followed by the Spanish sample. The US sample score was in the middle of the five countries on factor 2 (2nd). On factors 3 (group activity) and factor 7 (personal sacrifice), however, both Italy and Spain scored the highest of the nations sampled and the U.S. sample was next to last. Italians had the moderately higher levels of conservation of energy (factor 5), highest levels of personal sacrifice (factor 7) and were more likely to be members of an environmental group (factor 3). Yet, Italians had the lowest level of locus of ecological control (factor 1) and attitude toward economic development (factor 4). Thus, Italians were less likely to feel they could do anything on an individual basis to save the environment and did not have much faith that government or industry would help to correct the situation either.

Spanish Sample

Hypothesis 7, which stated that the Spanish sub-sample would exhibit higher knowledge and awareness of environmental problems than either the U.S. or Italian samples, was only partially supported. The factors most related to this hypothesis appear to be factors 4 (attitude toward economic development),

factor 5 (individual value systems), and factor 6 (man's impact on the environment). The Spanish sample ranked first on factors 4 (attitude toward economic development) and factor 6 (man's impact on the environment) and next to last on factor 5 (individual value systems) which appears attitudinally rather than awareness or knowledge based. Overall, the Spanish sample appears aware of the environmental issues facing their country.

Hypothesis 8, which stated that the Spanish sub-sample would exhibit lower levels of eco-oriented behavior than either the U.S. or Italian samples, was not supported. The Spanish sample ranked 1st on factors 3 (group activity), factor 4 (attitude toward government), factor 6 (man's impact), and factor 7 (personal sacrifice) and next to last on factors 1 (ecological locus of control), factor 2 (individual eco-activity), and factor 5 (individual value systems). Clearly, the Spanish sample ranks higher on most dimensions of environmental responsibility than both the Italian and U.S. samples. Spain's citizens were more likely to be members of environmental groups than other cultures, were more willing to engage in personal sacrifice, and were more likely to have strong faith that government and industry could solve environmental problems. However, Spaniards as a whole did not feel there was much that the individual citizen could do to solve environmental problems. They were less likely to engage in personal actions to save the environment, and less likely to practice conservation than other cultures.

The U.S. Sample

Hypothesis 9, which stated that the U.S. sub-sample would exhibit a high degree of environmental awareness compared to other cultures, was not supported. Clearly the U.S. sample has opinions not in keeping with what one would expect from individuals who are concerned about environmental issues. The U.S. sample came in last among all the nations studied in terms of its overall rankings on the factors investigated, but had the second highest relative mean score on factor 1, individual locus of ecological control (one's ability to make a difference). The U.S. sample, for example were the least concerned with depletion of natural resources, were very unlikely to belong to an environmental group, were the least likely to conserve energy and the least likely group to take some form of personal action to save the environment. Due to the more individualistic nature of U.S. society, it not surprising that the U.S. respondents felt more empowered than most of the other country respondents. What may be interpreted from the results is that the sample of U.S. respondents believes they could make a difference, but they apparently don't feel the problem is severe enough to take action to correct.

Hypothesis 10, which stated that the U.S. sub-sample would be less willing to engage in personal sacrifice (to save the environment) than other cultures, was supported. The last factor (personal sacrifice) relates sacrificing the convenience of a personally owned vehicle for public transportation, something the U.S. sample is clearly not willing to do. U.S. citizens were the least concerned with depletion of natural resources, the least likely group to conserve energy, and had the lowest levels of personal sacrifice.

CONCLUSIONS

Sharp differences exist between cultures with respect to environmental responsibility. Our findings indicate, completely contrary to our initial expectations, the cultures with the lowest levels of economic development scored higher on factors related to individual ecological concern than the individuals from more economically advanced nations. The findings are surprising from a number of perspectives. First, both Azerbaijan and Venezuela scored the highest on the measures presented, and yet, both countries have decidedly higher levels of pollution and ecological damage, and neither is known for demonstrating the sort of cultural and individual initiative necessary to take the proper steps to control environmental damage. Neither, for example, has the regulatory equivalent of an EPA to enforce environmental standards, and the government of Venezuela with its Marxist economic leanings, appears the virtual antithesis of an environmentally concerned national culture. The per capita income for the average

Venezuelan is quite low and the country's economy is almost completely based on petroleum exports. Ironically, the one national culture expected to score the lowest across the board, was Azerbaijan. With its history of ecological damage, particularly under the former Soviet Republic, its very low per capita income, its economic reliance on petroleum exporting, and its relative backwardness in terms of information and communication, Azerbaijan was expected to fair quite poorly.

Somewhat disappointingly, the U.S. sample appears to be the least concerned over ecological issues, ranking with Italy in last place among the national cultures studied. The two respondent countries demonstrating the highest levels of ecological concern were those of Spain and Venezuela, both Hispanic cultures and neither especially recognized as being overly fanatical when it comes to preservation of the environment. The Italians, like the U.S. respondents, appeared relatively unconcerned over environmental issues based on results from the measurement instrument used in the study. While it was anticipated that the U.S. sample would score lower than many of the other country populations studied on conservation and sacrifice, what was not expected was the apparent lack of concern, or apathy, demonstrated by the U.S. sample. One possible explanation is that the U.S. economy is highly regulated, with EPA standards for air and water quality among the highest in the world. Perhaps as a result of the success these tough standards have had in cleaning up the environment, most Americans really don't see the dramatic effects of rampant pollution that citizens of poorer countries are exposed to on a daily basis. What is encouraging from the results is that the U.S. sample appears to demonstrate a high level of individual ability to act. What is discouraging is that the sample apparently doesn't appear motivated to act. Again, this may be the result of the less visible nature of the problem since most of America's water and air quality is highly monitored and the average citizens obviously believes that the problems are being taken care of by an efficient government watchdog agency.

As stated, poorer countries lack the government based resources to implement the sort of environmental standards enjoyed by most Americans, and hence, the only solution to the problem of ecological damage will be individual action. From that sense, the results may be more encouraging than discouraging, especially since the stereotype of populations from third world type economies often suggests one of a subsistence oriented mindset, apathetic to the environmental destruction taking place around them. Unfortunately, because this was primarily a college student sample, we may be seeing the results of only a small, atypical segment of the populations studied. The fact that the educated and more elite members of those societies appears aware of the problem and somewhat motivated, is at least some small step in the right direction.

While the study was modeled after the research completed in the Stone, et. al. (1995) study using many of the original scale items, an effort was made to revalidate and confirm the scales used in the original measurement instrument. Because the current study included four additional national cultures not originally used in the first study, the authors used judgment calls and best estimates when formulating the hypotheses. Admittedly, some of the cultures used in the study may not have been familiar with many of concepts readily familiar to a U.S. based audience. As a result, the item loadings did not correspond to the original factors on a one-to-one basis.

In closing, because the authors were attempting to assess a rather difficult construct across varied cultures with different social and economic dimensions, the attempt may initially appear less successful than previously hoped. The authors have, however, begun to access the results from a second set of scale items administered to the same set of respondents, and hopefully, the end result will be convergence along factors, with added test reliability and an improvement in construct validity. The authors ultimately believe that while still in the infancy stage, the current research exercise has been useful in helping add new insight into what it means to be eco-oriented on an individual global perspective.

APPENDIX

Appendix A: Copy of Survey instrument (ECO-SCALE)

The following series of questions have been developed in an effort to help us assess an individual’s relative level of *environmental responsibility*. Please read each question carefully and then circle the response that best describes how you feel about the issue being addressed. Please complete *all* responses. If you have doubts about a particular statement, or if you have no opinion either way about the issue being raised by a particular question, then please so indicate by circling the neutral response (3). All question items are based upon a 5-point scale depicted as follows:

1=strongly disagree; 2=somewhat disagree; 3=neutral or no response; 4 somewhat agree; 5=strongly agree
I believe that:

Man made environmental accidents usually result in only short-term damage to the environment.

1. Advanced economies share most of the blame for worldwide environmental damage because they produce more industrial waste than less-developed economies.
2. The growth of the world’s population *is not* one of the major factors contributing to destruction of the earth’s ecosystem.
3. Product packaging (such as Styrofoam cartons, plastic shrink wrapping, etc.) is one source of pollution that could be greatly reduced if manufacturers acted more environmentally responsible.
4. Economic growth considerations should take priority over ecological considerations.
5. The earth’s natural resources are virtually infinite and therefore should be used to the fullest extent to increase the human standard of living.
6. The amount of energy I consume personally has little impact on the environment.
7. This country needs more restrictions on land development (i.e., there should be limits to the amount of farm and forest land in this country that can be used to construct new housing and factories, etc.).
8. Sportsman (such as hunters and sports fisherman) should *not* be subject to game limit restrictions (i.e., such as the number of animals/birds they can kill or the number of fish they can catch).
9. We should limit the use of indoor sporting venues (such as swimming pools and tennis courts) during the winter months so that we could save a lot of energy.

I personally:

10. Am currently involved with (either through membership or active participation) an environmental group or organization dedicated to protecting the environment (e.g., Greenpeace, etc.).
11. Have participated in consumer boycotts and activist campaigns aimed at organizations that I believe are anti-environment.
12. Often toss my litter onto the street or out of the window of a moving vehicle
13. Am *not* offended when I see people wearing clothes made from the fur or skin of exotic animals.
14. Believe that we should all be concerned about ozone depletion because the ozone layer helps screen out harmful ultra-violet rays.
15. Think the average citizen is powerless to stop environmental pollution.
16. Think that my own involvement in environmental activities today will help save the planet for future generations.
17. Believe that if I owned a car, I would use it to commute to work everyday rather than be inconvenienced with public transit.

1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5

- 18. Know that if I saw someone doing something that I felt was harmful to the environment, then I would immediately report that individual to the authorities.
- 19. On a routine basis, do things that help the environment (such as recycling, purchasing environmentally friendly products, have my engine emissions checked, etc.).
- 20. Encourage people around me to be more environmentally conscious (such as telling them not to litter, to conserve energy, to refrain from open burning of garbage, etc.).

Generally speaking:

- 21. The earth is so large geographically that people have little impact on the overall ecological conditions of the planet.
- 22. People who litter should receive heavy fines and then be forced to clean up their own mess.
- 23. My country has a government agency or government sponsored watchdog group that helps protect the nation's ecological climate.
- 24. With the possible exception of gasoline, I try to avoid purchasing products (to include food products) that I know will have a negative impact on the ecology.
- 25. One of the primary considerations for me when choosing a political candidate to vote for is the individual candidate's stand on environmental issues.
- 26. I regularly do things such as cut up the plastic rings on six-packs of soft drinks, or recycle aluminum cans and paper products (newspapers, etc.).
- 27. Everyone should know that ivory, the substance often used to make piano keys and jewelry, is a soft white stone that is mined from deep within the earth.
- 28. Acid rain only affects those countries with lots of heavy industry.
- 29. It is of no use for me to concern myself with environmental issues because there is simply nothing I can do to help fight environmental problems anyway.
- 30. I would describe myself being someone who is environmentally responsible.

1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
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1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5

Demographics Section - Circle the response that fits your category

Sex: Male Female

Race:
 Caucasian/White
 African decent/Black
 Hispanic White
 Hispanic Non-White
 Oriental decent/decent
 Arabic/Middle Eastern decent
 Other (please specify) _____

Age _____

Education level _____

Nationality/Country of birth _____

Country where you presently live _____

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