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Pro-environmental Behavior in Egypt: Is there a Role for Islamic Environmental Ethics?

Gillian Rice

ABSTRACT. Egypt, a less affluent, predominantly Muslim country, suffers from numerous forms of environmental pollution, some severe. This study investigates pro-environmental behaviors of citizens in Cairo, Egypt's largest metropolis, and studies the relationship between pro-environmental behavior and demographic variables, beliefs, values, and religiosity. Analysis shows that three types of pro-environmental behavior are present: Public Sphere, Private Sphere, and Activist Behavior, with the latter occurring less frequently. Importantly, the study identifies an ecocentric value among respondents which is correlated with Public Sphere Behavior. It also confirms earlier research that characterized Egyptians' perceptions of the environment as being set in the context of health and cleanliness. Religious teachings and religiosity are shown to be associated with pro-environmental behavior, thus lending support to the presence of an Islamic environmental ethic.

KEY WORDS: Egypt, environmental behavior, environmental ethics, Islam, individual values

Introduction

Environmental protection is one of three closely-linked dimensions of the World Commission on Environment and Development definition of sustainable development, which are economic growth, social equity and environmental protection (White, 2001). How a society operationalizes environmental protection, the dimension of interest in this study, depends partly upon citizens' ethical and moral values, and partly upon infrastructural elements such as political and social systems that might hinder or promote pro-environmental actions (Kilbourne and Beckman, 1998).

In affluent developed nations, the rise in environmental concern at both the government and business levels occurred because environmental risks were perceived by the public and this led to popular demand for corrective and preventive action. In Egypt, the country of focus for this study, and in other less affluent nations, the expression of environmental concern and pro-environmental behaviors has been somewhat different. The impetus for environmentally responsible behavior emanated in many cases from the government and from non-governmental organizations (NGOs) rather than from the public at large, or from entrepreneurs who viewed themselves as "green evangelists." Furthermore, according to Gomaa (1997), in Egypt, the primary reason environmental protection acquired a position on the government's policy agenda was because foreign donors were willing to provide financial support for environmentally sound projects. Yet a wide gap exists between the rhetoric of declared governmental environment policies in Egypt and the actual policies implemented; the approach appears passive, dedicated to temporary solutions and not focused on the roots of Egypt's environmental crisis (Hamed, 2005).

Egypt, a country of approximately 71 million inhabitants, has a Gross Domestic Product per capita (purchasing power parity method) of $3,755.00

Gillian Rice is an Associate Professor of Marketing at Thunderbird, The Garvin School of International Management. She was previously a Senior Fulbright Scholar at the University of Bahrain. Her current research deals with the relationship between values, organizational context, and employee creativity (in Egypt and Thailand), foreign consumer resistance to American-based brands, and Islamic business ethics as they relate to leadership.

(Countrywatch.com, 2005). Inglehart's postmaterialism thesis implies that the inhabitants of such poorer countries are less likely to demonstrate environmental concern and pro-environmental behaviors (Inglehart, 1995). Findings related to this hypothesis are fragmented and inconsistent, however (Stern et al., 1995). Brechin and Kempton (1994) show, using analyses of public opinion polls conducted by the George H. Gallup International Institute and Louis Harris, that environmental concern among citizens from developing countries is very high. Material satisfaction is clearly not always necessary for environmental problems to be taken seriously (Gardner and Stern, 1996). The Pan-African Green Belt movement, led by Wangari Maathai, winner of the 2004 Nobel Peace Prize, is merely one illustration in support of this view. Chinese consumers have a low commitment to "green" purchases, but they have a strong emotional attachment to ecological issues (Chan and Lau, 2004). The analysis by Brechin and Kempton (1994) reveals that although citizens in less affluent countries cannot pay much to improve the environment, they are much more willing to volunteer time to improve it than are their wealthier counterparts in developed countries.

Stern (2000) called for further investigation of environmental beliefs and actions in developing countries. The purpose of this study is to investigate pro-environmental behavior of citizens in Cairo. Egypt's largest metropolis has over 15 million inhabitants who suffer from severe air pollution as well as water pollution and waste disposal problems. In particular, the research seeks to identify the relationship between pro-environmental behavior and demographic variables, beliefs, values, and religiosity. The emphasis in the study is on behavior because progress toward solving environmental problems is likely to depend on environmentally beneficial behaviors more so than on environmental consciousness (Pickett et al., 1993). An important research question is whether an environmental ethic based in religion is present, and whether this could be used to further pro-environmental behaviors in Egypt, a country inhabited predominantly by Muslims. According to Folz et al. (2003), no understanding of the environment is adequate without a grasp of the religious life that permeates the human societies which inhabit the natural environment.

This paper is organized as follows. First, a literature review details previous work on the correlates of pro-environmental behaviors, and evaluates the presence of an environmental ethic in Islam. A number of hypotheses are developed. Next, the study's methodology is outlined and the results of the Egyptian research are presented. The paper concludes with a discussion of the findings and implications for policymakers and researchers.

Literature review

Little research has been undertaken in developing countries about citizens' attitudes towards and behavior concerning the environment. Most research has been conducted in the United States and Western Europe and the results might not be transferable across countries. The existing body of literature focuses on correlates of environmental concern and pro-environmental behaviors. These correlates include socio-demographic variables, self-efficacy perceptions, and individual values.

Socio-demographic factors

Early research focused on personal background factors (age, income, education, and so on) that predispose individuals to environmental concern (for example, Van Liere and Dunlap, 1980). Demographics provide only a limited explanation of environmental behavior, however (Granzin and Olson, 1991), and there are members of all demographic categories who are willing to participate in environmental activities (Diamantopoulos et al., 2003). While research suggests that environmental concern is a factor in consumer decision making, for example, the associations between socio-demographic characteristics and environmental measures are complex. Diamantopoulos et al. (2003) show that socio-demographic variables can, to some degree, be used to profile UK consumers in terms of environmental knowledge and attitudes, but the variables are of limited use where *behavioral* aspects of the environmental consciousness components are

concerned. The authors explained this result as a function of the measures of environmental consciousness. Most research in this area has been conducted in the United States where environmental consciousness is becoming a socially accepted norm.

Diamantopoulos et al. (2003) provide a comprehensive review of the literature concerning socio-demographics in profiling green consumers and conclude that: (1) females are more environmentally concerned and participate in more pro-environment behaviors; (2) married people are more likely to participate in pro-environment behaviors; (3) there is a negative correlation between age and pro-environment attitudes; (4) larger families have more positive pro-environment attitudes; and (5) there is a positive correlation between education and all the components of the environmental domain (knowledge, attitudes, and behavior). To test whether these characteristics are also associated with pro-environmental behaviors of Egyptians, the following hypothesis is tested:

H1: Individuals who report that they more frequently participate in pro-environmental behavior are more likely to be female, married, younger, more educated, and to have larger families.

Self-efficacy

There are additional reasons for the findings of Diamantopoulos et al. (2003) that socio-demographic variables provide weak explanations of environmental behavior. Several studies have pointed to the importance of other variables, especially the notion of control, self-efficacy, or ''perceived consumer effectiveness'' (PCE) of environmentally concerned behavior.'' The stronger is a person's self-efficacy, the more active are that person's efforts to engage in particular behaviors (Bandura, 2000). The degree to which individuals feel their efforts make a difference affects their performance of individually-oriented behaviors such as recycling (Ellen et al., 1991; Pieters, 1991). According to Kaplan (2000), helplessness could be the pivotal issue in the context of environmentally responsible behavior because people would be expected to avoid contexts that they consider conducive to helplessness. Allen and Ferrand (1999), who found that ''personal control'' was an important predictor of environmentally friendly behavior, also noted that people, who feel helpless, in that their behavior would not make a difference, are less likely to participate in pro-environmental behaviors.

Often, there is a lack of appropriate infrastructure or of cultural support to enable people to engage in pro-environment behaviors. For example, research on norm activation (Schwartz, 1977) suggests that there is a moral imperative or a sense of obligation or responsibility to engage in pro-environmental behaviors (Dietz and Stern, 1995; Thogersen and Grunert-Beckmann, 1997). Personal norms are feelings of personal obligation tied to the self-concept such that conformity to a personal norm or self-expectation results in enhanced self-esteem or security (Schwartz, 1977). Variables that influence whether personal norms translate into behavior are (1) the awareness of the consequences that action or inaction will have and (2) the ascription of the responsibility for those consequences (Hopper and Nielsen, 1991). Norm-based actions flow from values, when things important to those values are under threat, and when actions are believed to alleviate the threat (Stern et al., 1999). Regarding what threats might be more salient, Kempton et al.'s (1995) anthropological study of the U.S. cultural model of the environment revealed the U.S. metaphor for environmental protection is nature. Thus, in the United States, threats to the nonhuman species and the biosphere may be relatively more important. In Egypt, however, Hopkins et al. (2001) found the Egyptian metaphor for the environment to be ''health and cleanliness.'' Egyptians, then, might be more concerned with threats to the health of themselves and their families. Similarly, a study in Latin America revealed that local environmentalists were focused on urban quality of life issues such as sewage treatment, pollution control, and public health, in contrast to international environmentalists who were principally concerned with biological and habitat conservation (Christen et al., 1998).

Granzin and Olson (1991) highlight the ''bystander effect'' which means that a ''helping behavior'' such as a pro-environmental action is less

likely to occur when an individual recognizes other potential "helpers." Berger and Corbin (1992) construed this concept as "faith in others." For example, a government is a potential bystander that people might feel is morally responsible to act on behalf of the citizens to protect the environment. If individuals are environmentally concerned, but are convinced that only business or the government can provide effective solutions, they might not engage in much pro-environmental behavior. A person's having a greater sense of individual responsibility should be positively related to pro-environmental attitudes.

Therefore, the following is hypothesized:

H2: Self-reported pro-environmental behavior will be more frequent for individuals who

(a) believe they are less helpless with respect to the environment;
(b) believe they have more personal responsibility with respect to caring for the environment; and
(c) believe more strongly that there are negative consequences of environmental problems for their families or children.

Values

Research in the fields of anthropology, ecology, sociology and psychology points to the importance of constructing models of environmental behavior based on values. For example, the stream of research investigating altruism and "helping" behavior with environmental behavior (Granzin and Olson, 1991; Hopper and Nielsen, 1991; Taylor and Todd, 1995) implies that environmental concerns are a subset of morally tinged human concerns, rooted in universal values (Stern et al., 1995). Understanding the role of values can help both public and private sector organizations more successfully communicate environmental protection messages, and encourage pro-environmental actions and therefore contribute to improving the quality of life. Gardner and Stern (1996) argue that people's values are likely to be especially strong determinants of pro-environmental actions because people often react to environmental conditions or problems on the basis of very limited knowledge or experience. This is particularly the case in Egypt, where knowledge about environmental issues is meager (United Nations, 2002), although recently, environmental issues have come to the forefront of public discussion.

Extant theories relate to the postmaterialist values of quality-of-life and self-expression in affluent developed countries, religious values, and general theories of values. Stern's (2000) model, for example, does not include socio-demographic variables, but builds upon the self-efficacy concept and Schwartz's value structure (1999) to build a "Value-Belief-Norm Theory" of environmental behavior.

Values, as defined by Schwartz (1999), are conceptions of the desirable that guide the way people choose actions and evaluate others and guide the way that people explain and justify their actions and evaluations. Values also represent responses to the universal requirements of the functioning of societies. Schwartz (2004) lists three universal requirements: (1) the needs of individuals as biological organisms, (2) the requisites of coordinated societal interaction, and (3) the survival and welfare needs of groups. Schwartz's value structure theory (1994), includes ten motivationally distinct types of values derived from the three universal requirements. These value types are Self-Direction (independent thought and action), Stimulation (excitement in life), Hedonism (pleasure for oneself), Achievement (personal success), Power (social status and control over people), Security (safety), Conformity (restraint of actions that might violate norms), Tradition (respect for culture's customs), Benevolence (preserving the welfare of one's in-group), and Universalism (appreciation for the welfare of all people and nature). See Table I for fuller definitions of these value types. A central feature of Schwartz's theory is the hypothesized structure of values which describes value types in a circle (see Figure 1), with compatible value types in close proximity and competing value types on opposing sides of the circle. Tradition and Conformity are located on the same circle segment because they share a single motivational goal: subordination of the self in favor of socially imposed elements (Ros et al., 1999). Also shown on Figure 1 are four higher-order value domains, two of which are in

TABLE I

Value types in Schwartz's value structure theory

Value type	Defining goal	Value items[a]
Self-Direction	Independent thought and action – choosing, creating, exploring	*Creativity*, Freedom, *Choosing Own Goals*, *Curious*, *Independent*
Stimulation	Excitement, novelty, challenge in life	*A Varied Life*, *An Exciting Life*, *Daring*
Hedonism	Pleasure or sensuous gratification for oneself	*Pleasure, Enjoying Life, Self-Indulgent*
Achievement	Personal success though demonstrating competence according to social standards	*Ambitious*, *Successful*, *Capable*, Influential
Power	Social status and prestige, control or dominance over people and resources	*Authority*, *Wealth*, *Social Power*
Security	Safety, harmony, and stability of society, of relationships and of self	*Social Order, Family Security, National Security, Clean, Reciprocation of Favors*, Healthy
Conformity	Restraint of actions, inclinations and impulses likely to upset or harm others and violate social expectations or norms	*Obedient*, *Self-Discipline*, *Politeness*, *Honoring Parents and Elders*
Tradition	Respect, commitment, and acceptance of the customs and ideas that one's culture or religion provides	*Respect for Tradition, Humble, Devout, Accepting my Portion in Life*, Moderate
Benevolence	Preserving and enhancing the welfare of those with whom one is in frequent contact (''in-group'')	*Helpful, Honest, Forgiving, Responsible, Loyal*, True Friendship, Mature Love
Universalism	Understanding, appreciation, tolerance and protection for the welfare of *all* people and for nature	*Broadminded, Social Justice, Equality, World at Peace, World of Beauty, Unity with Nature, Protecting the Environment, Wisdom*

[a]Italicized value items are those included in the indices of the value types. See the Results section for details.

opposition to the remaining two. Self-Enhancement is in opposition to Self-Transcendence and Openness to Change opposes Conservation. (Note that ''Conservation,'' the label given by Schwartz to the Conformity, Security and Tradition values, is not the same as the term, conservation, commonly used in connection with environmentalism. Schwartz's higher order value, Conservation, refers to conserving traditions and conforming to the norms of society). Schwartz's theory has been tested in 210 samples collected between 1988 and 2002 from 67 countries (Schwartz, 2004). He reports that, on average, the data strongly support every aspect of the theory, but specific samples exhibit variation around this average.

A review of the literature suggests particular value types should be related to pro-environment behavior. Stern et al. (1995) and Stern and Dietz (1994) attempted to detect an ''ecocentric'' value orientation in a U.S. study, but their data failed to confirm a coherent ecocentric orientation distinct from a ''homocentric'' (termed ''social-altruistic'') orientation. Ecocentric values are more likely to appear in the domain of values labeled ''Self-Transcendent,'' whereas egocentric values are to be found in the ''Openness to Change'' and ''Self-Enhancement'' areas. In studies conducted by Stern et al. (1993, 1995) and Stern and Dietz (1994), self-transcendent values were strongly predictive of people's self-reported willingness to take politically significant actions such as boycotting the products of a company that pollutes, signing a petition for tougher environmental laws, and refusing to invest in or work for a polluting company. Self-enhancement (or egocentric) values

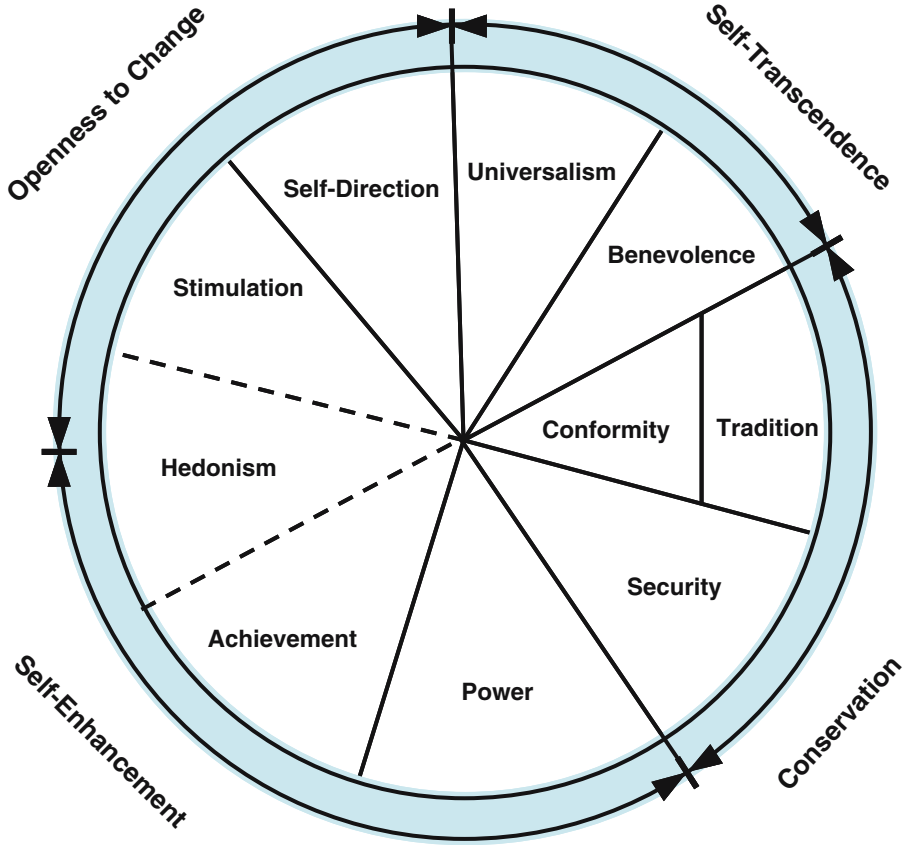

Figure 1. The Structure of Values According to Schwartz's Theory (Schwartz 1994).

predicted willingness to take action, but in a negative direction: people with strong self-enhancement values were less supportive of pro-environmental actions. Stern et al. (1995) proposed that the higher-order value domain comprising the cluster of Conformity, Tradition, and Security values reflects a low level on Maslow's hierarchy and a materialist or prematerialist world view (in Inglehart's terms). This higher-order value cluster should, they argued, be negatively related to environmental concern. Their results, however, showed that traditional values had no direct effects on environmental concern. Both the "Openness to Change" and "Conservation" domains were also unrelated to environmental actions in the studies by Stern and colleagues.

Self-transcendent values underlie altruistic or "helping" behavior. In a study of household garbage reduction behavior, Taylor and Todd (1995) found that benefits to society are more important in influencing individuals than are any personal advantages. This supports the view in the environmental literature that waste management is altruistic behavior (Hopper and Nielsen, 1991).

Therefore, the following is hypothesized:

H3: Self-transcendent values (Universalism and Benevolence) are positively related to pro-environmental action.

H4: Self-enhancement and Openness to Change values (Power, Achievement, Hedonism, Stimulation, and Self-Direction) are negatively related to pro-environmental action.

H5: Conservation values (Conformity, Tradition, and Security) are unrelated to pro-environmental action.

An Islamic environmental ethic?

In many less affluent countries, there is often a general lack of adherence to the law, and to environmental laws, in particular. Ethics are far more effective in bringing about behavior changes (Izzi Dien, 2000). Religions suggest how people should treat others and how people should relate to nature. These directives make up the ethical orientation of a society and, while it is clear that there is a discrepancy between the real and ideal in Muslim societies (Rice, 1999), this should not be a deterrent to trying to identify resources from within the world's religions, such as Islam, for more environmentally supportive or ecologically sound ethics (Tucker and Grim, 2003). For Muslims, the Qur'an (believed to be a revelation from God) and the Sunnah (a historical record of the Prophet Muhammad's sayings and deeds), are the primary and secondary sources of Islamic principles. Muslims believe these sources provide the answers for all ethical questions, including environmental ethics (Wersal, 1995). Thus, religious teachings could provide individuals with a sense of obligation or responsibility regarding pro-environment behaviors.

The Islamic perspective on the environment is summarized in Table II. Muslims believe that humans are merely part of the holistic system of life created by God and while humans have the right to survive, they have been given the role of responsible leadership (vicegerency) on earth (Izzi Dien, 2000). Thus, as vicegerents or stewards, individuals are personally responsible for the care and preservation of their fellow communities: human, plant or animal. In this context, every life-form possesses intrinsic value independent of its resource worth to humanity (Chishti, 2003). The basic foundations of an environmental ethic in Islam then, are to use no more that what is necessary, to respect the privileges of other species, and to preserve and protect creation in all its various forms (Chishti, 2003). Although such an ethic might result in the same consequences as an ethic based in modern environmental science, the underlying ethical paradigms are quite different. Practicing Muslims behave in a particular way because they believe their actions implement the commands of God. The tenth century scholar, Al-Biruni wrote that ''man does not have a right to exploit other kingdoms for his own desires, which are insatiable, but may use them only in conformity with the law of God and in His Way'' (Ozdemir, 2003). A just society, one in which humans relate to each other and to God as they should, will be one in which environmental problems will not exist (Folz, 2003).

Although there is a growing body of literature on the existence of an environmental ethic in Islamic teachings (see Izzi Dien, 2000 and Folz et al., 2003 for excellent summaries), and in religions in general, there is a dearth of empirical research. Although not examining respondents of the Muslim faith, Granzin and Olson (1991) found that different environmental behaviors appealed to those holding different sets of values. For example, respondents who donated used items instead of discarding them, appeared to have more religiously-oriented values. Stern et al. (1999) found that people with beliefs in the sacredness of nature (for whatever reason) are more likely to engage in pro-environmental behavior. In Bangkok, a study indicated that Buddhists are more likely to consider the environment in their purchase decisions (Leelakulthanit and Wongtada, 1993). Based upon the pro-environment injunctions of the Islamic faith listed in Table II, the following is hypothesized:

H6: Individuals who perceive themselves to be more religious are more likely to engage in pro-environmental behaviors.

Methodology

The empirical study involved the administration of a self-completion questionnaire to citizens in Cairo, Egypt. Data were collected using the drop-off, pick-up method (Craig and Douglas, 1999) in April and May 2004. This method of data collection is very frequently used in studies conducted in the Middle East because of research difficulties such as obtaining random samples and reaching respondents (Parnell and Hatem, 1999; Robertson et al., 2002). The sample selected to test the hypotheses consisted of two sub-samples. One sub-sample was a sample of students from the University of Cairo and Ain Shames University, both in Cairo, Egypt. These universities are the top two universities in Egypt in terms of quality. With respect to the socio-

TABLE II

A summary of the Islamic environmental ethic

Ethical principle	Evidence
1. Stewardship	''And we have given you [humans] mastery over the earth and appointed for you therein a livelihood....'' (Qur'an 7:10)
2. Preservation and protection of creation in all its forms	The reason for conserving the environment is that the environment is God's creation. The creation of this earth and all its natural resources is a sign of His wisdom, mercy, power, and His other attributes and therefore serves to develop human awareness and understanding of the Creator. Muslims should protect and preserve the environment because by doing so they protect God's creatures, which pray to Him and praise Him (Izzi Dien, 2003). ''Work not corruption in the earth after it has been set in order, and call on Him in fear and hope. Surely the mercy of God is near to those who act with excellence.'' (Qur'an 7:56) ''The seven heavens and the earth, and all beings therein, declare His Glory. There is not a thing but celebrates His praise, and yet you understand not how they declare His Glory.'' (Qur'an 17:44.)
3. Respect for the privileges of other species	''There is not an animal in the earth, nor a flying creature, flying on two wings, but they are communities like you.'' (Qur'an 6:38) ''...there is no Muslim who plants a tree or sows a field from which a human, bird, or animal eats, but it shall be reckoned as charity.'' (Saying of the Prophet Muhammad quoted in Izzi Dien 2000)
4. Using no more than what is necessary	Prophet Muhammad instructed one of his companions not to waste water, even when performing the religiously mandated ablutions. He said: ''Even if you take the ablutions in a fast-flowing river, do not waste the water.'' (Saying of the Prophet Muhammad quoted in Ozdemir, 2003) ''...and do not waste in excess, for God loves not those who waste.'' (Qur'an 6:141)

economic status of students' families, there is a cross-section of the Cairo population, because in Egypt, education is free and acceptance is based on merit. Students represent the lower economic classes as well as the upper echelons of society. Questionnaires were given to professors who agreed to recruit student respondents for this study. The professors encouraged and asked students to participate and complete the questionnaire during time allotted in class. Ninety percent of questionnaires distributed were returned. The second sub-sample was a sample of teachers teaching a wide variety of subjects to students aged 15–18 at public high schools in central Cairo. The schools were representative of the common type of school for that student age group. The teachers were asked by a senior official in the school system to participate in a research study being conducted by an American professor. No incentives or rewards were given for completion of the questionnaire. The response rate was 95 percent.

The total number of respondents was 330. Fifty-nine percent of the sample were teachers of whom there were equal proportions of males and females. Of the students, 73 percent were female. The degree majors represented among the students were arts or law (19 percent), social science (35 percent), science or medicine (25 percent) and engineering (21 percent). The ages of respondents ranged from 17 to 63, with 84 percent of the teachers being over 30 and 94 percent of the students being under 30.

The questionnaire included questions in the form of Likert scales to measure beliefs about self-efficacy and personal responsibility with respect to the environment, and the possible negative consequences of environmental problems. The variable ''self-efficacy'' was measured by scales such as ''I feel a sense of helplessness about environmental

problems'' and ''Working with others to improve the environment is hard because people today are not as cooperative as they used to be.'' To evaluate the ''bystander effect'' (Granzin and Olson, 1991), a measure of belief about the government's role in environmental clean-up was included, as well as an item concerning neighbors' willingness to take pro-environmental action.

A few of the belief statements were adapted from the New Ecological Paradigm (NEP) Scale Items (Dunlap et al., 2000) and from Hopkins et al. (2001). For example, an item in the NEP, ''When humans interfere with nature it produces disastrous consequences'' was adapted to read ''When humans don't care about their environment it often produces disastrous consequences'' in order to be more applicable to the current situation for citizens of Cairo. This was one of the statements to measure the variable ''belief about one's responsibility to care for the environment.'' Other statements to measure this variable included belief regarding a religious basis for environmental care (''We know nature is God's creation so it's wrong to misuse it'' and ''My religion teaches cleanliness, so I feel obliged to keep my neighborhood clean''). All belief statements were written to be consistent with the Egyptian ''health and cleanliness'' metaphor for the environment. Additional Likert scales measured ''belief concerning negative consequences of pollution'' (loud noise levels, harmful chemicals in the air, and garbage) on an individual's family.

A list of pro-environmental behaviors was generated based on the literature, press reports, and magazine articles from Egypt, as well as discussions with individuals living in Cairo, in order to ensure relevance to the respondents. The behaviors were presented in no particular order on the questionnaire and the frequency of engaging (never, sometimes or always) in each was measured.

To measure individual values, the Schwartz Value Survey (SVS) was used. The SVS asks respondents to rate the importance of each of 57 value items ''as a guiding principle in my life'' on a nine-point scale labeled 7 (of supreme importance) 6 (very important, 5, 4 (unlabeled), 3 (important), 2, 1 (unlabeled), 0 (not important), and −1 (opposed to my values). Schwartz (2003) explains that this nonsymmetrical scale is stretched at the upper end and condensed at the bottom because pre-testing demonstrated that such a scale maps the way people think about values – viewing most of them as varying from mildly to very important. The scale also enables respondents to report their opposition to values that they try to avoid expressing or promoting, because people in one culture may well reject values from others' cultures. Intermixed throughout the SVS are items that index the different value types. For example, Self Direction is measured using items such as Creativity and Independent. Items measuring Tradition include Humble and Devout, and items measuring Power are Authority and Wealth. (For full details, see Table I).

Religiosity was measured by asking the respondents how religious they perceived themselves to be. Note that because of sensitivities in Egyptian society, it was not possible to ask to which religion the respondent adhered. At least 90 percent of the Egyptian population is Muslim and because, in this respect, the university and teacher populations are known to be representative of society as a whole, it can be assumed fairly that at least 90 percent of the respondents are Muslim.

The questionnaire was translated from English into Arabic using a combination of back translation and parallel translation, depending upon the degree of adaptation of other researchers' scales needed to measure the specific variables defined for the present study. The Arabic version of the SVS needed some adjustments in translation so that it was appropriate for completion by speakers of the Egyptian Arabic dialect. The entire questionnaire was reviewed by several Egyptian Arabic native-speaking professionals in both the U.S. and Egypt.

Results

Value structure results

To test for the structure of relations of similarity and distance among the value items in Egypt, smallest space analysis (SSA), a nonmetric multidimensional scaling technique (Guttman, 1968) was performed, on an aggregate of three Egyptian samples. Two were the sub-sample of high school teachers and the sub-sample

of university students collected for this study. The third sample, from another study, consisted of 202 employees from nine organizations selected to provide representation of the public and private sectors and a variety of industry sectors. All samples were collected in Cairo by the author during the same time period. The total number of responses across all samples that were usable for the purposes of the SSA was 502. It was necessary to analyze the three samples together in order to have a sample size that would yield reliable results from the SSA. It took 5.5 moves to construct the theoretical structure of similarity and distance among the value items; 5.5 is a number that is higher than in 90 percent of the samples studied by Schwartz. Nevertheless, the basic set of higher order value domains (Openness to Change, Conservation, Self-Enhancement and Self-Transcendence; see Figure 1), and the two main oppositions between them were present. The coefficient of alienation was 0.290, above the conventional level for good representation of the correlation matrix, but a reasonable stress value when 57 items are represented in two-dimensional space (Ros et al., 1999). The SSA revealed 11 errors, that is, locations of value items not in the expected regions of the theory depicted in Figure 1. However, only six of these were for any of the 46 items that are part of the indices making up the ten value types. The 46 items are recommended for the indices because these items emerged in their postulated region in at least 75 percent of samples studied, or in this or adjacent regions in 95 percent of samples (Schwartz, 2004). Thus, for the present study, corrections had to be made to the value items that, based on the *a priori* theory (Schwartz, 2004), should have been included in each value type index. These corrections were made on the basis of the SSA results for all three Egyptian samples. The items included in the indices of the value types for this particular study are those italicized in Table I. The italicized single value items representing a value type were summed, and then divided by the number of items included. Prior to forming the indices, the data were standardized within subjects, according to Schwartz et al. (1997).

Interestingly, the Egyptian SSA results revealed two areas of Universalism: one comprising value items representing ''Universalism with respect to people'' (value items: social justice and a world at peace) and the other, ''Universalism with respect to nature'' (value items: wisdom, unity with nature, a world of beauty, protecting the environment, and healthy). That the value item, ''healthy,'' was located in the Universalism-Nature area supports the findings by Hopkins et al. (2001) regarding how U.S. and Egyptian cultural models of the environment vary: recall that the U.S. metaphor for environmental protection is ''nature, ''while the Egyptian metaphor is ''health and cleanliness.'' According to Schwartz (personal communication), although the location of ''healthy'' is not cross-culturally stable, it is extremely rare for it to emerge near universalism values, where it occurs in just in nine out of 229 samples.

Pro-environmental behaviors

The data on pro-environmental behaviors were factor analyzed using principal components with varimax rotation. Three factors emerged, accounting for almost 52 percent of total variation (see Table III). The factors were labeled Public Sphere Behavior, Private Sphere Behavior, and Activist Behavior.

Public Sphere Behavior was the most common among the respondents, with a mean frequency of 1.999 on a three-point scale (and a standard deviation of 0.357). Private Sphere Behavior had a mean frequency of 1.675 and a standard deviation of 0.440. Activist Behavior was less frequent, with a mean of 1.454 and a standard deviation of 0.393. The application of t tests revealed that the mean frequencies of all possible pairs of the three types of behavior were different from one another, all significant at the level of $p \leq 0.001$.

Demographic variables

One-way analysis of variance (see Table IV) revealed that gender was unrelated to pro-environmental behavior. Marital status, family size, and occupation were significantly related to all three types of pro-environmental behavior. Respondents who were married, who had more children, and who were high school teachers rather than university students were more likely to engage in pro-environmental behaviors. Education was significantly related to Public Sphere and Activist Behavior only,

TABLE III

Environmental behaviors: factor analysis

Pro-Environmental behavior item	F1: Public sphere behavior	F2: Activist behavior	F3: Private sphere behavior
Not smoking in public	**0.623**	0.243	0.091
Talk often with my friends about ways to deal with environmental pollution	**0.681**	0.142	0.160
Teach children the value of cleanliness	**0.659**	−0.004	0.021
Discuss environmental problems with work or school colleagues	**0.641**	0.135	0.063
Consciously try to reduce my driving in order to reduce traffic problems	**0.625**	0.311	0.189
Attend meeting of a local citizens' environmental committee	0.047	**0.745**	0.018
Attend workshops/seminars about environmental issues	0.197	**0.709**	−0.014
Contact an official to request that an environmental problem in my neighborhood be corrected	0.228	**0.678**	0.116
Recommend environmentally friendly actions to my workplace, school or club authorities	0.218	**0.636**	0.354
Watch TV programs to learn about environmental issues	0.095	0.329	**0.598**
Try to buy paper and boxes that I can reuse/recycle	0.038	0.022	**0.805**
Dispose of my mobile phone battery in the proper way	0.194	−0.007	**0.685**
Eigenvalue	3.689	1.275	1.223
Variance explained	30.74%	10.62%	10.19%
Cronbach's alpha	0.70	0.71	0.55

TABLE IV

ANOVA: Pro-environmental behavior by demographic variables (n = 330)

	Private sphere behavior *F*-value	Public sphere behavior *F*-value	Activist behavior *F*-value
Gender	0.281	1.194	3.381
Marital status	5.554**	10.512**	10.256**
Education	1.413	4.503*	4.491*
Occupation (Teacher or Student)	10.882**	32.933**	20.445**
Family Size (No. of Children)	3.701**	7.625**	6.239**

**$p \leq 0.01$.
*$p \leq 0.05$.

with more education resulting in more self-reported pro-environmental behavior. Age was positively correlated with Public Sphere Behavior (r = 0.369, $p \leq 0.01$), Private Sphere Behavior (r = 0.314, $p \leq 0.01$), and Activist Behavior (r = 0.173, $p \leq 0.01$). Therefore, H1 is partially supported. The Egyptian respondents who participate in pro-environmental behavior are indeed more likely

to be married, more educated and have larger families, but they are not likely to be younger or female.

Self-efficacy

For these Egyptian samples of students and teachers, belief about optimism with respect to the environment is significantly and positively correlated with all three types of self-reported pro-environmental behavior (see Table V), while a sense of helplessness about environmental problems is significantly and negatively correlated with Public Sphere and Activist Behavior. Thus H2(a) is supported. Interestingly, the more respondents felt a sense of helplessness about environmental problems, the less they agreed that neighbors were willing to "make sacrifices to keep our local environment clean and healthy" ($r = 0.241$, $p \leq 0.01$) and the more they agreed that "working with others to improve the environment is hard because people today are not as cooperative as they used to be" ($r = 0.225$, $p \leq 0.01$).

Personal responsibility

The findings on personal responsibility are as follows. The belief that a lack of human caring for the environment often produces disastrous consequences is significantly and positively correlated with Public Sphere Behavior. Two statements rooted in religious teachings, "We know nature is God's creation so it's wrong to misuse it" and "My religion teaches cleanliness so I feel obliged to keep my neighborhood clean" are significantly and positively correlated with Public Sphere Behavior. Belief about neighbors' willingness to keep a locality health and clean is significantly and positively correlated with all types of pro-environmental behavior. Finally, the belief statement, "The task of environmental clean-up is not mine because the government takes the lead around here," is significantly and positively correlated with Public Sphere and Activist Behavior. These results provide support for H2(b) that self-reported pro-environmental behavior is more common for individuals who believe they have a personal obligation to care for the environment.

Negative consequences

Two belief statements concerning negative consequences of pollution are related to the pro-environmental behaviors. The belief that the polluted environment will cause diseases for children is significantly and positively correlated with Private and Public Sphere Behavior. A belief that noise levels are harmless is significantly and negatively correlated with Private Sphere Behavior. Therefore, the findings support H2(c) with respect to Private and Public Sphere Behavior.

Values

Both Benevolence and Universalism – Nature (Self-Transcendent values) are significantly and positively correlated with Public Sphere Behavior (see Table VI). Stimulation (an Openness to Change value) is significantly and negatively correlated with Public Sphere and Activist Behavior. However, Achievement (a Self-Enhancement value) is significantly and positively correlated with Activist Behavior, and Tradition is significantly and positively correlated with Public Sphere behavior. These results support H3, only partially support H4, and do not support H5.

Religiosity

Religiosity is positively correlated with Public Sphere Behavior ($r = 0.203$, $p \leq 0.01$) and Activist Behavior ($r = 0.110$, $p \leq 0.01$). The correlation between religiosity and Private Sphere Behavior is positive but not statistically significant. H6 is supported.

Discussion of results

Like Stern (2000) and Rice et al. (1996), this study identified different types of pro-environmental behavior. Following Stern's (2000) labeling, the factors in the Egyptian study were designated as Public Sphere, Private Sphere and Activist Behavior. This study did not reveal a factor similar to Stern's

TABLE V

Belief correlates of Pro-environmental behaviors (n = 330)

Belief statements (Source, where applicable)	Mean (standard deviation)	Private sphere behavior	Public sphere behavior	Activist behavior
H2(a) Self-Efficacy				
I consider myself an optimist with respect to the environment (Hopkins et al., 2001)	2.797 (1.223)	0.155**	0.138*	0.252**
I feel a sense of helplessness about environmental problems (Kaplan, 2000)	3.188 (1.196)	0.030	−0.137*	−0.135*
H2(b) Personal Responsibility				
When humans don't care about their environment, it often produces disastrous consequences (adapted from Dunlap et al., 2000)	4.339 (0.568)	0.107	0.220**	−0.011
We know nature is God's creation so it's wrong to misuse it (Hopkins et al., 2001)	4.697 (0.492)	0.072	0.162*	0.010
My religion teaches cleanliness, so I feel obliged to keep my neighborhood clean	4.742 (0.445)	0.057	0.157**	0.019
I find that my neighbors are willing to make sacrifices to try to keep our local environment healthy and clean	3.070 (1.187)	0.164**	0.276**	0.205**
The task of environmental clean-up is not mine because the government takes the lead around here (Opotow and Weiss, 2000)	1.688 (0.766)	−0.080	−0.121*	−0.134*
H2(c) Negative Consequences				
In the future, for sure the polluted environment will cause diseases for my children	4.512 (0.610)	0.158**	0.196**	0.064
The loud noise levels in my neighborhood cause my family no harm	1.497 (0.553)	−0.116*	0.015	−0.027

*$p \leq 0.05$.
**$p \leq 0.01$.

"Behavior in Organizations." The distinction in Rice et al. (1996) between Thai respondents' consumption activities, and non-consumption activities such as recycling or planting trees, is less clear in the Egyptian study, although Private Sphere Behavior is more reflective of consumption than are Public Sphere and Activist Behavior. The more frequent type of behavior revealed in this study – Public Sphere Behavior – is characterized more by *talking* about environmental issues than by taking action to improve the environment. Private Sphere Behavior includes a particularly passive form of behavior: watching TV programs about the environment. Activist Behavior is exemplified instead by the types of actions that take up an individual's personal time and energy to bring about changes. The question can be raised of whether the perceived negative consequences affecting people and their families and neighborhoods are not severe enough in Egypt to bring about activist behaviors. Notably, Activist Behavior is the least common of the three types of pro-environmental behavior. Hamed (2005), however, observed that activist behavior in Egypt is rare. This is undoubtedly because of the authoritarian regime and lack of freedoms within society to express opinions on matters that could be construed as having political import. Also, access to information is limited in Egypt and sometimes impossible,

TABLE VI

Individual value correlates of Pro-environmental behaviors (n=330)

Individual value	Private sphere behavior	Public sphere behavior	Activist behavior
Conformity	−0.070	0.050	−0.004
Tradition	−0.016	0.139*	0.049
Benevolence	−0.050	0.121*	0.016
Universalism	−0.009	0.069	0.057
Universalism-Nature	0.058	0.112*	0.080
Self-Direction	−0.055	0.045	0.078
Stimulation	−0.026	−0.216**	−0.155**
Hedonism	0.051	−0.030	−0.014
Achievement	−0.057	0.080	0.146**
Power	−0.080	−0.052	−0.006
Security	0.018	0.104	0.012

*$p \leq 0.05$.
**$p \leq 0.01$.

denying citizens the right to be informed of the impact of various projects on their environment (Gomaa, 1997).

The commonly accepted hypothesis that environmental concern and behavior are stronger among younger people was not validated in this study. Interestingly, the result is instead similar to the finding in a Turkish study (Furman, 1998), which failed to find a negative correlation between age and environmental concern. Furman did not measure the relationship between age and environmental behavior, however. Hamed (2005) argues that the small number of young people participating in environmental activism in Egypt is a serious drawback because 45 percent of the population is under the age of eighteen. Gomaa (1997) found that members of the Egyptian Green Party (despite its name, not a political party, but an NGO) were older, conservative academic scientists. Only 25 percent of Greens were under 40. It should be noted that, in Egypt, cultural norms mean that there is great respect for older individuals and they are expected to be the ones who take the lead on matters of significance to society (Patai, 2002).

This study's results about self-efficacy raise some concerns. Levels of optimism of the respondents in the present study are much lower than those reported by Hopkins et al. (2001). Hopkins et al. report that in 1995, 80 percent of their respondents in four localities in the Cairo area agreed with the statement, "I consider myself an optimist with respect to the environment" and in 1997, this percentage had risen to 91 percent. In the present study, only 39 percent agreed with the statement, and a higher percentage (56 percent) said that they felt a sense of helplessness about environmental problems. These results might reflect worsening conditions in Cairo, where, for the past few years, an unexplained black cloud has appeared over the city each October, giving rise to much speculation and discussion in the media.

Hopkins et al. (2001) found that only a third of respondents in Cairo believe that the government helps to protect the environment. Hamed (2005) confirmed that a majority of the population has no faith in the government agency in charge of the environment and Nasr (2003) comments that, for the Islamic world as a whole, governments cannot provide an answer to environmental ills because they are more part of the problem than the solution. The results of the present study bear out this opinion, with respondents having little faith in the government, and show that the less faith people have, the more likely they are to engage in pro-environmental behaviors themselves. This contrasts with Berger and Corbin (1992) who found that as faith in the government increased, there was a corresponding increase in attitudes and support for regulatory action. In Egypt, a passive careless attitude prevails

(Hamed, 2005; Rice, 1999). There is an apathetic dependency on the government, despite a lack of faith in its leadership on environmental matters. Disrespect for laws is common, as evidenced by the routine disregard for a ban on anchoring boats during tours to see dolphins off Hurghada, an Egyptian Red Sea resort (Hoath, 2003).

The positive relationship between sacrifices by neighbors to keep a local environment healthy and clean and all three types of pro-environment behavior might point to altruistic behavior, where neighbors are helping one another, lending support to Granzin and Olson (1991).

With respect to values, the results confirm the predicted relationship of values in the self-transcendent domain. One unusual finding was the presence of the Universal-Nature value, which correlated positively with Public Sphere Behavior. Therefore, one contribution of the present study is the identification of an unequivocal ''ecocentric'' value. Such a value had been sought by Stern et al. (1995) and Stern and Dietz (1994). Furthermore, in this study Universalism-Nature is clearly defined from the Egyptian perspective because the value includes the item ''healthy.''

The unexpected positive correlation between Achievement, a self-enhancement value, and Activist Behavior may be explained as follows. It is possible that self-interest is a potential solution to environmental problems (De Young, 2000) and works with altruism to promote pro-environment behavior (Stern et al., 1993). Self-interest, according to De Young (2000) is not the same as selfishness. Self-interest concerns a person's happiness, but this is derived from attaining any outcome about which a person cares (Wallach and Wallach, 1983). Also, it is likely that someone could feel a sense of achievement from activist behavior.

Based upon previous research findings it was unexpected that pro-environmental behavior (Public Sphere Behavior) would be positively correlated with Tradition. Here, Tradition was also related to religiosity. Higher scores on the Tradition value were associated with higher levels of religiosity ($F = 3.227$, $p \leq 0.05$). That Tradition has an important association with pro-environmental behavior supports the argument that within Islam, there is a strong pro-environmental ethic. Hopkins et al. (2001) showed that approximately 95 percent of Cairo-area respondents felt that the teachings of religion had some relevance to environmental issues. In the present study, two ''personal responsibility'' belief statements anchored in religion also had a positive relationship with Public Sphere Behavior.

Limitations

This study has a number of limitations. The sample is not a random sample of Cairo inhabitants although it is deemed to be fairly representative of university students and high school teachers in the metropolis. Self-reported behaviors are surrogate indicators of actual activity and may misrepresent behavior patterns (Pickett et al., 1993). However, given the low awareness of environmental issues in Egypt and the low incidence of pro-environmental behaviors, it is unlikely that any socially desirable response bias occurred.

Conclusions and recommendations

This study of a sample of citizens in the Cairo metropolis is relevant to a number of issues involved in promoting pro-environmental behaviors. Optimism about the environment is disturbingly low and is lower than that recorded in two previous studies in Cairo. The lack of optimism and feelings of helplessness might account for the low incidence of pro-environmental behaviors. Clearly, there are infrastructural obstacles that need further investigation by researchers, such as the political system. Additional research, using in-depth interviews or ethnographic approaches might reveal the motivations behind environmental activism and the reasons why younger people are less engaged than their elders in pro-environmental behavior.

According to Hamed (2005), it is surprising that the environmental movement in Egypt has rarely made use of the environmental ethics of the Shari'a (or Islamic Law). This study confirms this opinion. There is a clear link between religiosity and pro-environmental behaviors. The results lend support to Izzi Dien (2000) who argues that focusing on personal ethics will be far more effective in promoting environmental conservation than a focus on

laws that are not adhered to in many less affluent nations. The principles contained within the religion of Islam that concern pollution, public health, natural resource management and ecological values are relevant but rarely promoted in Egypt. As Hamed (2005) notes, 90 percent of Egypt's population is Muslim and the Friday prayer sermons reach a wider audience that any of Egypt's mass media. Without the personal connection with environmental considerations and sustainable development that religion allows, a purely secular approach to assuring ecological stability is bereft of a valuable ally (Chishti, 2003). Gomaa (1997) emphasizes that, in Egypt, personal or informal channels of communication are usually much more effective than organizational or formal ways to achieve an objective. Governmental or non-governmental groups promoting pro-environmental behaviors should focus their efforts at the grassroots level and find ways to use faith-based messages.

The task to improve environmental conditions in Egypt is challenging. It needs the implementation of pro-environmental actions by citizens at every level and segment of society. This entails targeting opinion leaders, perhaps older and more educated individuals, in addition to local religious leaders (*imams*) in the expectation that they will engage in pro-environmental behaviors and enthusiastically disseminate a pro-environmental ethic to others who try to emulate them. Helping people to feel that they have more personal control in terms of solving environmental problems may also encourage a stronger environmental ethic. Using informal communication channels at the grassroots level to announce and tell stories about local successes could encourage others to be more confident in tackling environmental issues. Such an approach might be supplemented by mass media approaches using popular television personalities and lay preachers to create a competitive atmosphere to achieve documentable, visible progress at the local level among citizens, who, as this study's results imply, presently talk more about environmental issues than taking action.

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Gillian Rice
Global Business,
Thunderbird,
The Garvin School of International Mgt.,
15249 N 59th Ave.,
Glendale, AZ, 85306,
U.S.A.
E-mail: riceg@t-bird.edu