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Environmental Value Orientations and its Relation to Pro-Environmental Behavior among Petra University Students in Jordan

Eman Gheith
Faculty of Arts, Petra University, PO box 961343, Amman, Jordan
E-mail: egheith@uop.edu.jo

Abstract
This study aimed at identifying environmental value orientations held by the students of Petra Private University– Jordan, identifying the reported level of pro- environmental behavior that is expected from them, and finding the relationship between environmental values and the students' pro-environmental behavior. The study sample consists of (296) male and female students enrolled at Petra Private University. Two questionnaires have been used in this study; the first questionnaire consists of (25) items to assess the environmental value orientations in three dimensions: ecocentrism, anthropocentrism, and environmental apathy. The second questionnaire consists of (31) items to measure the pro-environmental behavior expected from the students. The study results indicated that students hold several environmental values in all three dimensions at various degrees. Moreover, the students' values lean more toward ecocentrism and less toward anthropocentrism, whereas the least students' values lean toward environmental apathy. The results also show that significant and positive correlation exists between ecocentrism and the reported level of pro-environmental behavior.
Keywords: pro-environmental behavior, environmental value orientations, ecocentrism, anthropocentrism, environmental apathy.

1. Introduction

Values are considered to be one of the important inputs that govern human behavior and actions; they also play an important role, both on the individual and societal level; they guide the behavior of the individual, as well as forming the basis to his/her behaviors, choices, and preferences, and mean to achieve cohesion and social cooperation.

Values are provisions which an individual may attain through socialization, and are widely influenced by parents, home environment, teachers, peers, religious preaches and the media. Values are often dynamic, despite being closely related to the self-concept. There are also several motivating factors that could drive a person to change his values after a period of time, such as the need to achieve self-actualization (Hartsell, 2006).

Values serve various daily-life purposes as they provide a sense of self-direction and allow us to control ourselves, determine the expectations of others, judge their behavior and attitudes, and provide enough awareness in order to recognize and categorize these behaviors, as well as differentiate between that which is right or wrong, wanted or unwanted, and ethical or unethical (Al-Kharabshe, 2007). Additionally, values play a basic role in the advancement and cohesion of society; they nurture a sense of social responsibility, commitment and internal-control. Human values, such as equality, justice, and altruism, all aid in maintaining the unity and solidarity of society, and give it the ability to advance, prosper, and confront the problems of modern day (Atta, 2006).

Values are naturally intangible, which is why a person can deduce them through their outcomes only; this is because they are what lies behind behavior and social situations, and are thus strongly related to the actions of the individual (Khader, 2006). Most Sociologists agree that Values are deeply rooted in the minds of individuals, and are abstract motivations that may guide, justify, and explain a person's attitudes, standards, opinions and actions. However, Values differ from attitudes or beliefs because they work as a system which specifies attitudes and behavior (Schultz & Zeleyny, 1999).

There has been increased interest in Values in the mid-last century, which has given rise to various definitions of what a value is. "Schwarz and Sagiv" define it as trans-situational goals (terminal or instrumental) that express the interests (individual, collective, or both), concerned with motivational type and that are evaluated according to their importance, and works as the guiding principles in the individual' life (McMillan, 2002). Values, based on the Islamic perspective, are a group of principles, rules, and high morals which have been part of the revelation that a Muslim believes in, which identify his/her choice of behavior, based on how an individual may judge his/her own actions, words, or behaviors that connect him to Allah Almighty and the Universe (Naser, 2006).

Schwartz and Bilsky (1987) have outlined the basic features of values:

- They are concepts, beliefs or cognitive structures related to emotions.

- They point out desirable end states or behaviours, so that, for example, equality and justice are considered Values.
- They transcend specific situations or actions; for example, obedience and honesty work well in jobs, education, sports, or with friends and family.
- They guide the selection or evaluation of behavior and events.
- They are ordered by relative importance, and each group of ordered values form an individual's personal value system (Grunert, & Juhl, 1995).

Schwartz proposed a systematic structure for human values which is universal and applicable to different cultures (Schultz & Zelezny, 1999). He further identified ten types of general human values organized into two basic dimensions, where one dimension contrasts openness to change (including stimulation and self-direction) with conservation (including conformity, traditions and security), and the other dimension contrasts self-enhancement (including power and achievement) with self-transcendence (including welfare for others, universalism, and benevolence) (Bjerke & Kaltenbomm, 1999). In addition to these general values, we find values that promote or support actions directed toward caring for the environment and taking responsibilities, they are called environmental values (Kaltenbornm & Bjerke, 2002). Environmental values can be defined as "the values that propose or support action - oriented toward the environment and take responsibility." (McMillan, 2002).

There are various approaches or theories that focus on the relationship between Values and Behavior, and attempt to explain the differences between individuals in terms of behavior and attitudes. One of these approaches is offered by Schwartz′ norm activation model of altruism. According to this approach, behavior toward others is an result of the personal and social standards, awareness of consequences, and taking responsibilities on a personal level (Snelgaer, 2006); this is because the individual possesses personal moral standards or norms, and acts accordingly whenever there might be a negative result that might affect others (meaning that the person here is aware of the possible consequences). This way, a person can decide what action to take in order to prevent these consequences from occurring (i.e. personal responsibility) (Stern & Dietz, 1994). Stern and his colleagues have developed Schwartz's model to explain environmental behavior, and they brought forth the Values–Beliefs–Norms (VBN) theory of environment concern and behavior. This theory tackles the existence of indirect links between values and the decisions we make regarding the environment. The values affect the overall outlook for the environment, which in turn affect our beliefs about the consequences of environmental change on things we value, which affects our understanding of the extent of our ability to reduce the threat of things which we appreciate, and this in turn affects our standards about taking action. The actions taken by the individual have more than one form, including political activism and nonactivist political behavior, as well as actions that take place in private sphere including consumer choices and behaviors in pro-environmental oriented organizations (Dietz et al, 2005).

The literature in the field of environmental values indicates that there are three different classifications to environmental values or moral responsibility which form the basis of beliefs about environmental justice, and affect environmental behaviors. These three classifications are anthropocentrism, biocentrism, and ecocentrism (Karch, 2002). The human-centered values i.e. (anthropocentrism) point to what is derived from the interests of human beings, and in accordance with this approach, the humans are the center of the universe and must protect the environment because of its value in maintaining a good quality of life for them. Since human health and well-being depends on the sustainability of natural resources, the environment must be protected as it holds benefits for future generations (Casey& Scott, 2006). The values centered on living organisms i.e. (biocentrism) indicate that all forms of life have the right to remain as members of the bio-system (Zimmerman, 2006). Some advocators of this theory believe that animals, for example, have the right to be protected more than plants, while rare animals and colorful birds should receive more attention than mosquitoes or mice (Karch, 2002). Meanwhile, the nature-centered value i.e. (ecocentrism) gives ethical considerations of environment and its elements independently of the interests of human beings. The supporters of this approach tend to appreciate nature for nature itself; they believe that nature deserves protection for its intrinsic value, regardless of whether beneficial to humans or not (Casey & Scott, 2006).

Kempton, Poster, and Hartley (1996) have provided another classification of environmental values which is somewhat similar to the former category, using different terms. The first category consists of religious values and spirituality - all religions call for the protection of the environment. The second category includes values based on the human (human- centered) and is interested in utilitarianism and environmental changes that affect the well-being of humans. Finally, the third category includes values concerned with living organisms, which gives nature rights; especially the right of different types of organisms to remain alive (Kempton et al, 1996).

Stern et al. (1994), on the other hand, made no distinction whatsoever between environmental values concerned with living beings and those concerned with nature; they also called attention to three basics of environmental standards: (a) The individual himself (meaning the environmental problems that could cause harm to an

individual on a personal level); (b) Others (meaning any environmental problems that could cause harm to other people beside oneself); and finally (c) Nature (meaning that nature has rights as well, and all living beings have the right to exist separately and independent of human interest). They have also categorized the values revolving around the individual person into values that focus on the individual himself, and values that focus on others, while neglecting those standards that are derived from religion (Kaltendorn & Bjerke, 2002). Stern et al. assume that these values are formed and modified through socialization, and are relatively stable in adults. He also believes that individuals may hold on to environmental values on different levels, and that these standards differ based on personal preferences or society, and have different forms of influence on a person's attitudes and behavior (Stern & Dietz, 1994).

Thomson & Barton have set up environmental values that are important to the person (individualistic), and others that are important to others (social) under the pretext of anthropocentrism. The values concerning nature have been placed in the category alone under the name of ecocentrism. They have also observed that there are a third group of individuals who are apathetic about environment and even antagonistic toward environmental issues (Casey & Scott, 2006). This categorization method is the one that has been chosen for this study. Thomson & Barton believe that there is a relationship between the environmental value orientations and environmental behavior. Individuals who have environmental values focused on nature tend to care and work for the environment regardless of the consequences; such as reducing the amount of comfort or luxury, or putting up with extra financial expenses. While the individuals that have values focused on the individual or the community were less likely to work for, or support, the environment because it could threaten other human values they might have such as life quality and a good income. They assume that environmental values concerned with nature are strongly correlated with behaviors that attempt to protect the environment, while those focused on the individual and society are less correlated with the same type of behavior (toward protecting the environment) (Stern & Dietz, 1994).

We conclude from the above that Environmental Value orientations play a significant role in environmental issues, and ought to be taken into account when attempting to find solutions for environmental problems that face different societies; such as global warming, loss of biodiversity, air and water pollution, and the destruction of wildlife. Dealing with these problems and actions taken to protect and preserve the environment depend on the environmental values held by an individual, and his/her attitudes toward the environment. Changing these values is the way to get sustainable behaviors and policies, because the environmental values, as noted earlier, affect the decisions we make, whether on the individual or group level, and thus affect our behavior. Additionally, if our values were to change and become more inclined towards ecocentrism, it would lead us to make decisions that protect environment, particularly with regard to consumption or conservation of natural resources, and thus lead to changes in our environmental behavior.

2. Previous studies

Researches have conducted a number of studies on general human values and environmental value orientation, and how they are related to certain variables such as environmental attitudes and social demographics; as well as whether students do or do not sign up for courses that tackle and discuss environmental subject, issues, and behaviors. One of these studies was conducted by (Grunert & Juhl, 1995) on the relationship between human values, environmental attitudes, and buying organic food. The purpose of their study was to investigate the effectiveness of Schwartz's Value Theory, which has been used in many countries to explain certain aspects of consumer behavior. The study sample consisted of 174 teachers of both sexes, who were asked to fill a survey consisting of several parts, in order to collect the essential data needed. The study results showed that testing Value Theory on a sample of Danish teachers has given results very similar to other countries, and have found a relationship between 30 human sub-values and attitudes toward the environment.

Another study (Bjerke & Kaltenborn, 1999) was conducted in Norway on the relationship between anthropocentrism, biocentrism, ecocentrism and the attitudes toward carnivorous animals. This study aimed to compare and contrast between the environmental values of those who work in sheep farms, those who are responsible for wild animals, and those who conduct researches in the field of Biology. It also aimed at finding a relationship between environmental values and attitudes, and to test the hypothesis that there is a positive correlation between anthropocentrism and negative attitudes toward carnivorous animals, and between ecocentrism and positive attitudes toward carnivorous animals for all three groups. The sample consisted of 853 sheep farmers, 379 researchers in the field of Biology, and 551 managers of wild animals. The researchers used Thomson & Barton's questionnaire to measure environmental value attitudes, as well as another questionnaire that had been translated and edited to be consistent with the Norwegian Environment. The results have shown that environmental values held by sheep farmers were more anthropocentrism, and less ecocentrism; whilst all other participants showed environmental values more ecocentrism.

McMillan et al (McMillan, 2004), on the other hand, conducted a study on the impact of attending an

environmental course at university on the environmental values of the students, where they investigated the effect of having been enrolled in a certain environmental-related university course on the student environmental values. Data was collected through distributing a survey on a large number of students, as well as interviewing smaller groups to find out whether their environmental values had changed or developed after the end of the course. Results showed that student environmental values had indeed became deeper, more ecocentric, and less homocentric after having finished an environmental-related university subject included in the university study plan.

A study entitled "Environmental Concern and Behavior in an Australian Sample Within an Ecocentrism-Anthropocentrism Framework" (Casey & Scott, 2006), aimed at investigating the correlation between demographic and social aspects, and environmental concern in Australians; as well as test Thomson & Barton's hypothesis on whether the level ecocentrism would be positively correlated to level of environmental behavior, whilst the level of anthropocentrism concern and environmental apathy would be negatively correlated with environmental behavior in Australians. A total of 292 Australians participated in this study. The researchers used an environmental behavior scale, as well as Thomson & Barton's scale to measure environmental values and Dunlap et al. scale to measure attitudes toward environment NEP. Results have shown that females, elders and the better educated had higher levels of ecocentrism concern for the environment, and reported more pro-environmental behavior.

Another study conducted by (Hansla et al, 2008) investigated the relationship between the awareness of the consequences, environmental interests, and values. A total of 1965 Swedish residents participated in the study. Results have shown that environmental attitudes of the participants related to the individual, to others, and to nature are connected with how they perceive the consequences related to the individual, others, and nature (in that order). Results have also shown a correlation between how participants perceive the consequences related to the individual, others, and nature, and between the values of power, benevolence, and universalism (in that order).

3. Problem and questions of the study

For more than forty years, researchers have tried to understand the forces that drive people to show concerned toward environmental issues. In Western countries, new approaches emerged in the 1990's which attempted to identify the values that form the basis of environmental attitudes and behaviors, rather than focusing on the study of the general attitudes on environmental issues. Many of the studies conducted in this area had provided contradicting results about the stability or change of environmental values after the students had attended environmental courses at university, as well as the impact of the sex of the individual on environmental values. The results of these studies also showed that the environmental values of students affect the individual and collective decisions concerning the environment, which they make on daily basis, or in their choice and practice of future professions.

Educational literature reviews on environmental values on the local level indicated the presence of a small number of studies that have investigated environmental values and its relationship with the environmental behavior of students in Jordan. This encouraged the researcher to conduct this study (which aimed at examining the environmental value orientations and behaviors of the students of the University of Petra in Jordan), to discover the correlation between the two; as well as examine the impact of two variables (the sex of students, and whether they have or have not attended environmental courses at university) on their environmental value orientations and behaviors. The purpose of this study is to answer these specific questions:

1. What are the environmental value orientations found in Petra University students?
2. Are there differences between environmental value orientations among the students of the university based on their sex, and on whether they have or have not attended environmental courses?
3. What is the level of environmental behaviors among the students of the University of Petra?
4. Is there a relationship between environmental value orientations among university students and their environmental behavior?

3.1 Objectives of the study

The present study aims to:

1. Identify environmental value orientations among the students of the University of Petra in Jordan in three dimensions (ecocentrism, anthropocentrism, and apathetic). As well as study the impact of the sex of students, and whether they have or have not attended environmental courses found in the University's study plan.
2. Identify the environmental behavior of university students.
3. Examine the relationship between environmental value orientations and environmental behavior.

3.2 The importance of this study

The importance of this study stems from the importance of values in general and environmental values in

particular in the lives of individuals and communities as guidelines for environmental behavior, in addition to its impact on the individual and collective decisions concerning the environment. Values are one of the important things that must be taken into account when attempting to come up with solutions to the environmental problems facing the developed or developing societies alike, especially in light of the increasing problems of local and global environmental issues faced by the entire world. Additionally, the importance of this study is to give an idea about environmental value orientations among university students in Jordan, and its relationship with their environmental behavior. Also, the study is necessary for improving the quality and effectiveness of environmental education programs that are offered both at school and universities. The results of this study may help environmental education specialists at universities in the preparation of programs that focus on deepening the environmental values of the students (especially ecocentric values), and focus on the use of appropriate strategies to help students acquire the environmental values that will motivate them to practice environmental behaviors.

3.3 Study limitations

The study sample is limited to undergraduate students at the University of Petra, Jordan. Certain questionnaires were used to collect data needed for the study; therefore, the results of this study are based on the sample and the tools used, and one should be cautious when generalizing the results to all Jordanian universities' students.

4. Definitions of the study

A set of terms were used in this study, and hold the following implications:

Environmental Value Orientations: The values that propose or support action oriented toward the environment and holding responsibility. These values may be ecocentrism, anthropocentrism, or environmental apathy. Environmental Value Orientations have been measured using a scale developed by Thompson and Barton (1994), procedurally defined as the degree to which the student gets on the scale used in this study.

Ecocentrism: The values that give moral considerations to the environment and its elements independent of human beings. This is because Nature deserves protection for its intrinsic value, regardless whether it is useful to humans or not.

Anthropocentrism: The values that consider humans as the center of the universe, and the environment must be protected because of its value in maintaining a good quality of life, for either the individual or the society or both.

Environmental Apathy: The values that refer to carelessness toward the protection and maintenance of the environment.

Environmental behaviors: A set of behaviors that can be practiced by the individual in his/her daily life to protect the environment, in an attempt to reduce consumption, reach an optimal use of energy, and protect natural resources. The environmental behavior was measured using a scale developed by the researcher. It is procedurally defined as the degree to which the student gets on the scale used in this study. To determine the level of environmental behavior, I have decided on these criteria:

75 % -100 %: high level; 50% -74 %: medium level; and less than 50%: low level.

5. Methodology

5.1 Study Population and Sample

The Study Population is students enrolled in the undergraduate program at the University of Petra for the second semester of the academic year 2009/2010. The total number of Petra students was (6130). The study sample consisted of (296) students (139 males and 157 females) from various faculties of the university, of which (148) were enrolled in the course entitled "Environmental Science" introduced by the university, while (148) students had not been enrolled in the same course. Table (1) shows the distribution of students in the study sample according to the sex of the students, and whether they have or have not registered for and attended the environmental course mentioned above.

Table 1. Sample characteristics (N=296)

Sample	Male	Female	Total
Attended the course of Environmental Science	67	81	148
Did not attend the course of Environmental Science	72	76	148
Total	139	157	296

5.2 Data collection

The data was gathered in this study using several questionnaires as follows: The first part collects general data on Petra University students; the second part measures environmental values; and the third part measures the pro-environmental behavior.

5.3 Study tools

Two scales were used to collect data in this study as follows:

First: The Scale of Environmental Values, developed by (Thompson and Barton) in 1994 to measure the

environmental value orientations. It consists of 25 statements, with responses organized on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), and measures the environmental values orientations in three dimensions (anthropocentrism, ecocentrism, and environmental apathy). Several procedures were followed to ensure this questionnaire is suitable for local use; as the researcher translated the questionnaire into Arabic, taking into account the accuracy of the translation and clarity. The questionnaires were given to experts for evaluation and feedback, while some of the statements have been customized to suit the Jordanian society.

Second: The Scale of Environmental Behavior, developed by the researcher to measure the environmental behavior of university students. This scale consists of 31 statement, related to desirable environmental behavior to protect the environment. The scale has been built as follows:

The scale was constructed after reviewing the educational literature and brochures published by the Queen Alia Fund for volunteer work in Jordan, which tackles the desired environmental behavior which can be exercised by the individual on a daily basis. The scale was designed to cover several areas such as rationalize consumption, optimal use of energy, and natural resources (Kaiser et al, 2007).

The questionnaire was presented to a group of specialists in the field of environmental education to ensure the clarity of statements and that it had covered different areas. Some statements have been deleted while others were modified to suit the Jordanian society. The pro-environmental behavior scale was piloted on a small sample, and after making use of feedback, the scale was finalized to include 31 statements as shown in the appendix 1, with responses organized on a 4-point Likert scale ranging from 1 (never) to 4 (always).

5.4 Reliability of the tools

Reliability coefficients were calculated for all scales used in the study. It has been found that the reliability coefficients (Cronbach's alpha) for the environmental values orientation dimensions (ecocentrism, anthropocentrism, and apathetic) were 0.67, 0.58, and 0.42 respectively. The reliability coefficient for pro-environmental behavior was 0.75. This is acceptable for the purposes of the study, except reliability coefficient for environmental apathy, which was somewhat low.

6. Results and discussion:

To answer the first question of the study dealing with identifying the environmental value orientations among university students, means and standard deviations for all students' scores were calculated for each statement of the environmental value orientations scale. Table (2) shows these results in descending order of the mean for each statement of the scale. Table 2 shows that the means of the sample scores on environmental value scale ranged between 1.68 and 4.40.

Table 2. Means and standard deviations for the sample grades on Environmental Values scale

No	statement	Scale dimensions	M	Std. dev.
9	I need time in nature to be happy	Eco	4.40	0.91
21	Being out in nature is a great stress reducer for me	Eco	4.37	0.83
2	I can enjoy spending time in natural settings just for the sake of being out in nature	Eco	4.32	0.82
20	We need to preserve resources to maintain a high quality of life	Anthr	4.32	0.79
15	It makes me sad to see natural environments get destroyed	Eco	4.31	0.93
18	Nature is important because of what can contribute to the pleasure and welfare of humans	Anthr	4.28	0.87
11	Sometimes when I am unhappy I find comfort in nature	Eco	4.22	1.00
13	One of the most important reasons to keep rivers and lakes clean is so that people can have a place to enjoy water sports.	Anthr	4.14	1.13
16	The most important reason for conservation is human survival	Anthr	4.05	0.91
22	One of the most important reasons to conserve is to ensure a continued high standard of living	Anthr	3.96	0.91
6	I prefer wildlife reserves to zoos	Eco	3.88	1.04
1	One of the worst things about overpopulation is that natural areas are getting destroyed for development	Eco	3.87	0.99
4	Sometimes it makes me sad to see forests cleared for agriculture	Eco	3.83	1.14
19	Too much emphasis has been placed on conservation	Apath	3.78	1.02
24	Continued land development is a good idea as long as a high quality of life can be preserved	Anthr	3.74	0.98
23	One of the most important reasons to conserve is to preserve wild areas	Eco	3.70	1.03
3	The worst thing about the loss of rain forest is that it will restrict the development of new medicines	Anthr	3.27	1.11
17	One of the best things about recycling is that is saves money	Anthr	3.23	1.11
7	The best thing about camping is that is it a cheap vacation	Anthr	3.20	1.22
8	I find it hard to get too concerned about environmental issues	Apath	3.12	1.16
10	The thing that concerns me about deforestation is that there will not be enough lumber for future generations	Anthr	3.10	1.23
25	Sometimes animals seem almost human to me.	Eco	2.91	1.35
5	It seems to me that most conservationists are pessimistic and somewhat paranoid	Apath	2.69	1.13
12	I don't care about the environmental problems	Apath	2.39	1.18
14	I am opposed to programs to preserve wilderness, reduce pollution and conserve resources	Apath	1.68	1.08

To identify environmental values among university students in three dimensions, the mean and standard deviation for each were calculated on the three dimensions: anthropocentrism (10 statements), ecocentrism (10 statements), and environmental apathy (5 statements). Table 3 shows the results.

Table 3. Means and standard deviations for the sample grades on environmental values scale in three dimensions

Environmental value dimensions	mean	Std.dev
ecocentrism	3.98	4.65
anthropocentrism	3.73	5.20
environmental apathy	2.73	3.06

Table 3 shows means of the study sample in three dimensions, (3.98) with respect to ecocentrism, (3.73) with respect to anthropocentrism, whereas (2.73) for environmental apathy.

We can conclude that university students have a combination of environmental values in three dimensions, but the environmental values were more inclined toward ecocentrism, followed by values inclined toward anthropocentrism, then apathy values toward the environment, which ranked last. The results of this study were consistent with the results of several previous studies, which concluded that any individual may have environmental values in three dimensions with varying degrees (Stern & Dietz, 1994, McMillan et al, 2004, Snelgaer, 2006).

The high levels of environmental values among students in the two dimensions (ecocentrism and anthropocentrism) may be attributed to the efforts made by the educational institutions of Jordan. The Ministry of Education and Jordanian universities introduced courses in environmental science and work within theirs study plans to provide students with knowledge related to the environment, increase their awareness on environmental issues, and use appropriate strategies to equip the students with environmental attitudes and values. In addition, it is necessary to recognize the role played by non-formal associations and organizations dealing with the environment in Jordan, such as the Royal Society for the Protection of Nature, Jordan Environment Society, Friends of the Environment Association of Jordan, and others; as these associations work to provide extracurricular activities, whether for school or university students or members of the local community; so as to encourage them to take actions that seek for the preservation of the environment, increase their awareness toward the environment, development of environmental values and the promotion of environmental behavior.

To answer the second question of this study, which is concerned with investigating the impact of the following variables on environmental value orientations among Petra university students: (sex of the student and whether he /she have or have not attended environmental courses at the university). Means and standard deviations were calculated according to the previous variables. These results are shown in table 4.

Table 4. Means and standard deviations of the sample grades on values scale in three dimensions according to sex, and whether he/she has or has not attended environmental courses at the university

Sub scale	variable		∑M	M	Std. dev.
ecocentrism	sex	Male	39.32	3.93	4.75
		female	40.25	4.03	4.54
	Attended course	Attended	39.61	3.96	4.92
		Not attended	40.02	4.00	4.37
anthropocentrism	sex	Male	36.61	3.66	5.20
		female	37.90	3.79	5.14
	Attended course	Attended	37.48	3.75	5.22
		Not attended	37.11	3.71	5.19
environmental apathy	sex	Male	13.93	2.79	3.16
		female	13.39	2.68	2.96
	Attended course	Attended	13.90	2.78	3.09
		Not attended	13.39	2.68	3.02

Table 4 shows that the means of the study sample grades of female students were higher than male students on two dimensions (ecocentrism and anthropocentrism), while the means of male students were higher than those of female students on the third dimension (environmental apathy), which means that the environmental values orientations of female students are more inclined toward ecocentrism and anthropocentrism, and less inclined toward environmental apathy (compared to male students). Table 4 also shows that there are small differences between the means of students on each of the three-dimensional variable depending on whether they have or have not attended study courses on the environment. To investigate whether these differences were statistically significant, a t-test was performed. The results can be seen in Table 5.

Table5. T-test of the sample grades on environmental value orientations scale in three dimensions according to two variables.

Sub scale	variable		t	Sign.
ecocentrism	sex	Male	1.74	0.08
		female		
	Attended course	Attended	0.76	0.45
		Not attended		
anthropocentrism	sex	Male	2.14	0.03
		female		
	Attended course	Attended	0.61	0.54
		Not attended		
environmental apathy	sex	Male	1.50	0.14
		female		
	Attended course	Attended	1.43	0.15
		Not attended		

Table 5 shows significant differences according to the sex of the student in anthropocentrism dimension in favor of female students. It also showed that the difference arising from whether the student had or had not attended

the environmental course is not statistically significant. This means that there is no statistically significant difference between students who have or have not taken a course within the university study plan with respect to environmental value orientations on the three dimensions.

These findings with respect to the sexes of the students are consistent with the results of many previous studies, which have shown that females are more interested in the environment compared to males (Casey and Scott, 2006, Schultz, 2001). The differences were in favor of females, especially with regard to environmental value orientations in the two dimensions: ecocentrism and anthropocentrism (Stern & Dietz, 1994). In general, previous studies in this area indicate that females give greater attention to the environment compared to males in different parts of the world, regardless of their level of education, or culture, especially if the environmental issues pose a risk to health. The study carried out by Tuncer and his colleagues showed that females are more aware of environmental problems and individual responsibility than males (Tuncer, et al, 2005).

Some of Women's rights advocates believe that women are more interested in the problems of the environment than men, because women are more closely related to the land due to of their ability to give birth and care for newborns. Women are working to achieve the common goal of restoring the natural environment and work to ensure a good quality of life for humans and creatures on planet Earth. Females are generally developing positive attitudes towards the environment and struggling to achieve balance and harmony with nature more than males, Therefore, females' values lean mostly towards ecocentrism (Karch, 2002). Additionally, some attribute concern for the environment by females to socializing or societal forces, as the different communities prepare women to play the role of care and protection and encourage them to be more compassionate, merciful, and tender (Casey & Scott, 2006). But we should not use this result to give the wrong impression that males do not have high levels environmental value orientations inclined toward ecocentrism and anthropocentrism.

We can see from the above that the environmental value orientations have not become deepened when students attended the course in environmental science. This was not consistent with the results of several previous studies, which showed that the environmental value orientations of the students had deepened after attending courses in the environment, particularly with regard to the ecocentrism values (McMillan et al, 2004).

It is important to point out that the course mentioned is an optional one at Petra University, which aims to provide students with knowledge about environmental issues and developing their attitudes toward the environment, as well as encourage them to work individually or in groups to solve environmental problems. The study results showed no statistically significant differences due to the variable of whether they have or have not attended environmental courses at the University, and it can be attributed to the fact that the values are usually deeply rooted in an individual before being enrolled into the university - acquired through different sources, such as parents, school, mosque, and media. It is also characterized as relatively stable, especially among students who have graduated from the school, and therefore may not be changed through the study course of one semester; therefore, to modify the values or deepen them requires more time, as well as the use of up-to-date methods and techniques. It also calls for the use of new teaching strategies such as inquiry, problem solving, group working, and the use of modern technology. It also appears that there is a need to provide several courses concerned with the environment issues at the university, and to encourage students to sign up for these courses.

The previous result can also be explained by the fact that students have high levels of environmental values orientation before registration for the course, and so that the simple differences were not statistically significant. It can also be said that there are limitations in the study design, as the questionnaire was not implemented at the beginning of the semester before student sat for the course, to make a comparison of the results before and after the course were taken.

In order to answer the third question of this study dealing with the level of students practicing in environmental behaviors, the mean and standard deviation were calculated for each paragraph of the scale of the environmental behavior of university students and for the entire questionnaire. The result of each paragraph is found in Appendix 1. Table 6 shows the mean, standard deviation, and percentage of the entire questionnaire.

Table 6. Mean, standard deviation, and percentage of the study sample grades on environmental behavior scale

scale	mean	Std.dev	percentage
environmental behavior	2.57	1.05	64%

Table 6 shows that the mean of the sample scores on environmental behaviors scale reaches (2.57). Whereas the percentage of the degree of environmental behavior reaches about 64%, which shows that the expected level of the practice of environmental behavior by the sample is medium in average. However it must be noted that the level of the practice of environmental behavior that was specified in the study is the behavior that is measured by the questionnaire, which may be different from the actual environmental behavior.

In order to answer the last question of the study which is concerned with investigating the correlation between the environmental value orientations and environmental behavior, Pearson coefficient correlations were calculated. The results are shown in table 7.

Table 7. Pearson coefficient correlations between environmental value orientations and environmental behavior

Environmental value dimensions	r	Sig.
ecocentrism	0.32	0.01
anthropocentrism	0.08	0.16
environmental apathy	-0.24	0.01

Table 7 shows a positive correlation between environmental values in two dimensions (ecocentrism & anthropocentrism), and environmental behavior, where the correlation coefficients were 0.32 and 0.08 (respectively). Whereas table 7 shows a negative correlation between environmental values in term of environmental apathy dimension and environmental behavior reaching -0.24, where the correlation coefficients were statistically significant in two dimensions: ecocentrism, and apathetic ones.

Based on previous results, we can say that the Thompson and Barton scale has the ability to predict the expected level of environmental behavior among a sample of university students in Jordan. This result is consistent with the results of several previous studies in this area (Schultz, 2001, Casey & Scott, 2006). Most of the studies have shown that there is a positive correlation between the environmental values orientations in term of ecocentrism and the expected level of environmental behavior. The results of this study are in agreement of a Schultz study (Schultz, 2001) regarding the correlation in term of ecocentrism dimension and the environmental behavior.

Therefore, it is essential that educational institutions in Jordan work hard toward developing students' environmental values and deepen them, so that these values become more inclined towards nature. This is because individuals whose values are more inclined towards Nature (ecocentrism) are more likely to work in support of the environment, even if it poses an increased financial cost to them; while the individuals that are anthropocentric (inclined toward the individual and society) are less likely to support the environment because it threatens their values, such as welfare and quality of life.

7. Recommendations of the study

Based on the findings of the current study, the researcher recommends the following:

- The need to make efforts by specialists in Jordanian universities to develop and deepen environmental values among students, so that they would become more ecocentrism, as there is a strong correlation between ecocentrism and environmental behavior.
- To offer several courses in environmental science in Jordanian universities, and encourage all students to attend them. Furthermore, to have universities organize field trips and outdoor activities to encourage environmental behavior among students.
- Conduct more research to study the relationship between social demographic characteristics (such as age, level of education, and religious commitment) and between environmental values, and study other factors that may affect the environmental behavior such as general human values.

References

Al-Kharabshe, Omar (2007).the extend of application of educational values among the female students of princess alia university college of AL Balqa'a applied university in Jordan**.** *Journal of educational and psychological sciences JEPS* 8(3), 187-212. Arabic resource

Ata, M. (2006). *Behavioral values among students of intermediate and secondary education in the Member States of Education for the Gulf States Bureau, theoretical and field study* (2nd ed.), Saudi Arabia. Riyad, Arabic resource.

Bjerke, T. & Kaltenborn, P. (1999).The relationship of ecocentric and anthropocentric motives to attitudes toward large carnivores. *Journal of environmental psychology***,** 19, 415-421.

Casey, P, J., & Scott, k. (2006) .Environmental concern and behavior in an Australian sample within an ecocentric – anthropocentric framework. *Australian Journal of Psychology*, 58(2), pp.57-67

Dietz, T., Fitzgerald A., & Shwom, R. (2005). Environmental Values, *Annu. Rev. Environ.Resourc.* Retrieved December 16, 2010 from Web site :http:// www.annualreviews.org.

Grunert, S, C., & Juhl, H. J. (1995). Values, environmental attiudes, and buying of organic foods. *Journal of Economic Psychology,* 16, 39-62.

Hansla, A., Gamble, A., Juliusson, A., & Garling, T.(2008). The relationships between awareness of consequences, environmental concern, and value orientations. *Journal of Environmental Psychology*, 28, pp 1-9

Harstell, B. (2006). Teaching toward compassion: Environmental values education for secondary students. *The journal of secondary,* XVII (4), 265-271.

Kaiser, F. G., Oerke, B., & Bogner, F. X. (2007). Behavior-based environmental attitude: Development Of an instrument for adolescents. *Journal of environmental psychology*, 27, 242-251

Kaltendorn, B. P., & Bjerke, T. (2002). Associations between Environmental Value orientations and landscape preferences. *Landscape and urban planning*. 59(2002) 1-11

Karch, p. (2002): Environmental Awareness in Germany and USA: A Comparative Study of Two Selected student Bodies. Unpublished master's thesis, University of Southern California.USA.
Kempton,W., Boster, J,S., & Hartley,J. (1995): *Environmental Values in American Culture*. Cambridge,MA:MIT press.
Khadr, Fakrhi (2006). *Methods of teaching social sciences,* Amman, Al-Masira Publications, Arabic resource.
Kortenkamp, K. V. Moore, C. F. (2001). Egocentrism and Anthropocentrism: Moral Reasoning about Ecological Commons Dilemmas. *Journal of Environmental Psychology,* 21, pp 261-272
McMillan, E, E. (2002). The Impact of a University Introductory Environmental Studies Class on the Environmental Values of Students. Unpublished master's thesis, Dalhousie University, Halifax, Canada.
McMillan, E, E., Wright, T., & Beazley, K. (2004). Impact Of University – Level Environmental Studies Class on Student's Values. *The Journal of Environmental Education,* 35(3), pp 19-28.
Nassir, Ibrahim (2006). *Ethical Education*, Amman, Wa'el Publications, Arabic resource
Schultz, p. W., & Zelezny, L. (1999). Values as predictors of environmental attitudes: Evidence for consistency across 14 countries. *Journal of environmental psychology*, 19, 255-265.
Schultz,P.W.(2001).The Structure of Environmental concern: Concern for Self, Other People, And The Biosphere. *Journal of Environmental Psychology,* 21, pp 327-339.
Snelgaer, R. S. (2006). Egoistic, altruistic and biospheric environmental concerns: Measurement and structure. *Journal of environmental psychology*, 26, 87-99.
Stern, P. C., Dietz, T. (1994). The Value Basis of Environmental concern. *Journal of social issues*. 50(3), pp 65-84.
Tuncer, G., Ertepinar, H., Tekkaya., C & Sungeur, S. (2005). Environmental attitudes of young people in Turkey: effects of school type and gender*, Environmental Education Research*. 11 (2), 215-233.
Zimmerman, M. E., translated by Rumieh M. Sh. (2006). Environmental Philosophy "From Rights to Radical Ecology. 2nd part, alam almarifa.vol.333. Arabic resource.

Appendix 1: Mean and standard deviation of the study sample grades on a scale of environmental behavior.

Number	Paragraph	means	St. Dev
16	When I am the last to leave a room, I turn off the lights.	3.38	0.86
15	I turn off the radio or stereo when I'm not using it.	3.33	0.93
20	After a picnic or trip, I leave the place clean.	3.31	0.87
4	I turn off the TV when I'm not using it.	3.04	1.02
8	When I am at home, I use sunlight if it's enough – and when it's not, I turn on electric lights.	3.04	1.01
12	When I'm brushing my teeth, I close the tap instead of leaving it open.	3.03	1.07
10	When I write, I use both sides of a paper.	3.02	1.02
22	During winter, I turn off the heater in my room when I leave it for a duration longer than 15 minutes.	3.01	3.01
19	I eat fruits and vegetables in their natural seasons.	2.93	2.93
27*	I usually eat at Fast Food restaurants.	2.90	2.90
31	I advise my parents to use energy-efficient light bulbs.	2.85	2.85
30	I advise my parents to set up a solar water heating system.	2.81	2.81
13	I re-use glass utensils more than once.	2.80	2.80
5	I use the shower more often, in order to save water.	2.78	2.78
17*	I leave my computer and/or TV on standby	2.77	1.01
23*	During winter, I make sure my room is warm enough for me to wear light clothing.	2.77	3.03
9*	I advise my mother to use the washing machine only when it can be fully filled with laundry.	2.68	1.16
11	When I have to make a trip that does not take more than 10 minutes, I choose to go on foot instead of using the car or bus.	2.57	1.10
24*	When I am having a party of some sort, I use plastic cups and plates.	2.40	1.01
21	I try to convince my parents of buying an economic car that saves gas.	2.38	1.08
18	When I go to university, I use public transportation, and avoid taking a car.	2.29	1.21
1	I re-use plastic bags more than once whether for shopping or other purposes.	2.27	0.95
26	I re-use paper (that has writings on one side only) to write notes.	2.23	1.00
2	I avoid using air fresheners that come in spray cans because they harm the environment.	2.08	0.93
25	When I receive a present, I keep the wrapping to re-use it in the future.	2.06	1.02
29*	I kill harmful insects using bug spray or pesticides.	1.99	0.94
14	When I buy a small number of items at the supermarket, I do not carry them in a plastic bag.	1.97	1.02
28	I read books and brochures that tackle environmental issues.	1.97	0.87
7	I try my best to buy goods that use the least possible amount of plastic packaging.	1.90	0.86
3	I buy goods made from recyclable materials whenever possible.	1.66	0.75
6	I collect old newspapers and send them to recycling organizations.	1.31	0.73

* statements were built negatively