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A case study on primary, secondary and university students' environmentally responsible behaviors in Turkey

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The purpose of the study is to prove the environmentally responsible behaviors of primary, secondary and university students in Turkey. The students', who attended the study as participants, environmentally political behaviors, consumer/economical behaviors, direct behaviors toward protecting the environment and individual and public persuasion behaviors about environmentally issues are examined considering variances of their educational levels, genders and grades. This research is based upon 2219 students who have been studying in state primary and secondary schools and Siirt University in the city of Siirt, Turkey. The data was conducted using "environmental responsible behavior scale" developed by Erdoğan (2009). Results indicated that while primary, secondary and university students' direct behaviors toward protecting environment has the highest average score, their political behaviors toward protecting environment has the lowest average score. It was found that there is a statically significant difference between the students' direct behaviors toward protecting the environment, consumer/economical behaviors and inducing behaviors about environmentally issues.

Key words: Attitudes, education, environmental, responsible behavior.

INTRODUCTION

Considering social, financial, climatic and flora-fauna dimensions of environmental problems such as population growth, nutritional deficiency, urbanization, improper land use, industrial activities, biodiversity reduction, destruction of ecosystems, deforestation, biological invasions, global warming, ozone layer depletion, melting of icebergs, decreasing of fresh water supplies, water, soil, air and noise pollution and nuclear pollution are the problems that are supposed to be solved universally not just for societies and governments. Erten (2003) stated that for the sake of industrialization the excessive use of nature by human being is the reason why we have been experiencing environmental problems. Kıvanç and Yücel (1998) defined environmental problems as changing the natural balance between living and non-living things by human being in order to have an artificial environment and their life threatening outcomes for living creatures. Having been threatening the human life, environmental problems have been on the agenda since the second half of the 20th century as there has been an increasing sensitivity about this issue and approaches toward solving these problems. The first article of the United Nations Stockholm Declaration is "All human being have a fundamental right as to live in a welfare environment with their freedom, equality and enabling sufficient live conditions. The protection and improvement of the human environment is a major issue which affects the well-being of peoples and future generations" (Aktan,

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1999). The United Nations Conference on the Human Environment, having met at Stockholm from 1972, was the first evaluation report that took the environmental problems into consideration globally. The I. Climate Conference held in 1972, Our Common Future Report published in 1987, II. Climate Conference held in 1990, Rio Summit and II. UN Environment and Climate Change Convention in 1992 were the most important meetings that brought the environment problems on the agenda. These meetings were not only crucial for the last century, but also they were so significant that they paved the way for determining the policies that could protect the environment in 21st century (Yıldız et. al. 2000)

According to Selvi (2007) environmental problems can only be solved forming a sustainable society and changing the lifestyles of people all around the world. Goleman, the writer of *Ecologic Intelligence* (2010) stated that *we buy "herbal" shampoos that contain industrial chemicals that can threaten our health or contaminate the environment. We dive down to see coral reefs, not realizing that an ingredient in our sunscreen feeds a virus that kills the reef. We wear organic cotton t-shirts, but don't know that its dyes may put factory workers at risk for leukemia. He stated that we do not have any knowledge of the effects of the products that we have been producing and consuming.* Human being, who discovered the fire, tamed the animals, survived in the world despite all the difficulties, had managed to make agriculture and industry revolutions; however, they have not made the ecological revolution yet *(*Atasoy, 2005). Environmental problems cannot be solved only using the technology or by the law (Erten, 2000). It is solely possible to change individual behaviors. Uzun and Sağlam (2006) stated that the most effective way of solving environmental problem is to raise conscious and sensitive individuals, thus providing environment education to these individuals to change the way they act. Environmentally irresponsible behaviors are the reasons of many environmental problems (Bradley et al., 1999). According to Erten (2003) if an ecological knowledgeable person does not make an effort to reduce waste, save energy and water, prefer returnable products and does not react towards other people who pollute the environment, this person cannot be regarded as "ecological knowledgeable". Even though the people are well informed about the environmental issues, if they do not behave accordingly, all this information is useless. Diekmann and Preisendörfer (1992) highlighted that individuals think in terms of their "cost benefit" aspect while carrying out beneficial activities to environment. If a behavior does not require spending money and sacrificing from self conformity and easy to perform these kinds of behaviors can be defined as "Low-cost", if they are vice versa can be defined as "High-cost" behaviors. For example separating the waste, switching off the electronic gadgets, turning off the faucet are "Low-cost" behaviors, whereas using public transportation instead of private cars, taking the gathered glass to the recycling glass taking precautions to use energy and water both in workplaces and houses are "High-cost" behaviors (Erten, 2005). Environmentally beneficial behaviors can be defined as active participation to environmental problem solving activities of individuals whose environmental knowledge, attitude and skills present a concrete sign. Therefore, environmentally responsible behaviors can be identified as the behavior of a person who intends to behave towards sorting the environmental problems out directly, considering social and environmental advantages more than thinking about the personal economic benefit (Kükrer, 2012). Environmentally responsible behaviors are classified under five different categories:

1. Physical Actions (Eco-Management or Direct Actions): the behaviors that performed directly to resolve or prevent environmental problems.
2. Consumer/ Economic Action: The use of monetary support or financial pressure to help prevent or resolve an environmental problem or issue.
3. Individual and Public Persuasion: the behaviors performed with persuasion and warning toward solving or preventing environmental problems.
4. Political Action: enforcements that are applied politically to solve or resolve environmental problems.
5. Legal Action: Use of the legal system to support or enforce existing laws that are designed to lead to an improved or maintained environment (Hsu, 1997; Mcbeth and Volk, 1997 cited in Güler, 2013; Erdoğan, 2009;).

Environmental risks, which are perceived as something threatening or as a risk, are highly important to motive the beneficial behaviors toward environment (Erten, 2000). In the study of Balcı (2012), it is stated that the primary school students have positive attitudes of saving energy and water and they are sensitive for recycling. Environmental sensitivity does not directly affect environmentally responsible behaviors; however, the people who build positive environmental attitudes show environmentally friendly behaviors and perform buying eco-friendly products behavior (Yılmaz et al., 2009). The purpose of this study is to present primary, secondary and university students' environmentally responsible behaviors such as politic actions, consumer/economic actions, physical actions and individual and public persuasion in order to protect the environment. It was also examined that whether there is a significant difference between these students' environmentally responsible behaviors and their educational level, gender and grades variances or not.

METHOD

Research model

In this research, screening model was used as a quantitative research method. Screening method is a research approach that

Table 1. Arithmetic mean and standard deviation results of four dimensions of students' environmentally responsible behavior by their level of education.

Environmentally responsible behavior	Primary students		Secondary students		University students	
	X	SS	X	SS	X	SS
Political behaviors	1.44	.856	1.44	.800	1.37	.705
Physical behaviors	4.88	1.36	4.69	1.49	5.26	1.19
Consumer/economic behaviors	4.06	1.35	4.10	1.42	4.80	1.18
Individual and public persuasion behaviors	2.74	1.23	2.95	1.32	3.14	1.21

aims to describe a situation from the past or on that still exists (Karasar, 2006).

Sample

Population of this study was formed by primary, secondary and university students who have been studying at the Siirt city center in Turkey. Sample group of this study was formed by 2219 students; 1121 of them have been studying in 6^{th}, 7^{th} and 8^{th} grades in primary schools; 398 students at 9^{th}, 10^{th} and 11^{th} grades in secondary schools and 700 of them have been studying in primary teaching department of Education Faculty in Siirt University.

Data collection tools

The data was conducted using "environmental responsible behavior scale" developed by Erdoğan et. al. (2012) to determine the students' environmentally responsible behavior. The scale has four dimensions with 23 items; 6 of them are political actions, 6 of them are physical actions, 5 of them consumer/economic actions and 6 of them are individual and public persuasion. *Political Behaviors*: includes behaviors that perform individually to solve and prevent environmental problems along with interviewing government or authority. *Physical Behaviors*: includes environmental behaviors toward protecting natural life directly on environmental problems and issues. *Consumer/Economic Behaviors:* includes behaviors that using of monetary support or financial pressure to help prevent or resolve environmental problems or issues. *Individual and Public Behaviors*: includes behaviors that aim to courage or persuade the society and individuals in order to resolve or prevent environmental problems. In this study, Cronbach alpha reliability coefficient of all scale was found as .81. For the subtypes of the scale were calculated as; for political actions toward environment was .85, physical actions toward environment was .71, for consumer/ economic actions was .72 and for individual and public persuasion toward environment was .75.

Data analysis

In the data analysis we used statistical analysis such as arithmetic mean, standard deviation and variance analysis (ANOVA). In the condition of determining a significant difference, LSD test was applied to explain the source of this difference.

RESULTS

Students' environmentally responsible behaviors by their level of education

As can be seen in Table 1, when students' environmentally responsible behaviors examined, the physical behavior towards environmental protection of primary education, secondary education and university students has been found to be highest and political behavior towards environmental protection has been the lowest. It is determined that they have been followed by consumer/ economic behavior towards environmental protection and individual and public persuasion behaviors towards environmental protection. Nevertheless from the university students' environmentally responsible behaviors, the average of direct behavior towards environmental protection, consumer/economic behaviors towards environmental protection and individual and public persuasion behaviors towards environmental protection were found to be higher than primary and secondary education students. Yet, the average of primary and secondary school students' political behaviour towards environmental protection was found to be higher than university students.

As seen in Table 2, based on level of education, between students' physical behaviors towards environmental protection ($F=28.418$; $p<.01$), consumer/economic behavior towards environmental protection ($F=73.212$; $p<.01$) and individual and public persuasion behaviors towards environmental protection ($F=22.992$; $p<.01$), a statistically significant difference has been found. However no statistically significant difference has been found between students' level of education and political behaviour towards environmental protection ($F=2.002$; $p>.05$).

Students' environmentally responsible behavior by gender

As seen in Table 3, a statistically significant difference has been found between primary students' gender and political behaviour towards environmental protection ($t=-3.410$; $p<.05$), physical behavior towards environmental protection ($t=2.597$; $p<.05$) and consumer/economic behavior towards environmental protection ($t=2.546$; $p<.05$). However no statistically significant difference has been found between individual and public persuasion behaviors towards environmental protection ($t=-.295$; $p>.05$). No statistically significant difference has been found between secondary students' gender and political behavior towards environmental protection ($t=-.399$;

Table 2. Variance analysis (ANOVA) reports of students' environmentally responsible behaviors based on their level of education

	Source of variance	Sum of squares	Sd	Mean squares	F	p
Political behaviors	Between groups	2.574	2	1.287	2.002	.135**
	Within groups	1424.435	2216	.643		
	Total	1427.009	2218			
Physical behaviors	Between groups	101.623	2	50.812	28.418	.000*
	Within groups	3962.270	2216	1.788		
	Total	4063.893	2218			
Consumer/economic behaviors	Between groups	254.785	2	127.392	73.212	.000*
	Within groups	3855.918	2216	1.740		
	Total	4110.703	2218			
Individual and public persuasion behaviors	Between groups	71.269	2	35.635	22.992	.000*
	Within groups	3434.545	2216	1.550		
	Total	3505.815	2218			

*p<.01; **p>.05

p>.05), physical behavior towards environmental protection (t=-.174; p>.05), consumer/economic behavior towards environmental protection (t=1.539; p>.05) and individual and public persuasion behaviors towards environmental protection (t= 1.620; p>.05). A statistically significant difference has been found between university students' gender and consumer/economic behaviors towards environmental protection (t=1.572; p<.05); however, no statistically significant difference has been found between university students' gender and political behaviour towards environmental protection (t=-1.495; p>.05), physical behavior towards environmental protection (t=2.749; p>.05) and individual and public persuasion behaviors towards environmental protection (t=-.147; p>.05).

Students' environmentally responsible behaviors by class levels

As seen in Table 4, a statistically significant difference has been found between political behaviour towards environmental protection (F=4.664; p<.05), consumer/economic behavior towards environmental protection (F=12,495; p<.01) and individual and public persuasion behaviors towards environmental protection (F=9.603; p<.01) according to primary students' environmentally responsible behaviors by class levels. As a result of the LSD test applied to determine the source of this differentiation, a significant differentiation has been found in political behaviors towards environmental protection and individual and public persuasion behaviors towards environmental protection between 6th grades with 7th grades and 7th grades with 8th grades. Nevertheless a significant differentiation has been found for consumer/economic behaviors towards environmental protection between 6th grades with 7th and 8th grades and between 7th grades with 8th grades. When primary students' grade level is investigated with physical behavior towards environmental protection, no statistically significant differentiation (F=2.753; p>.05) has been found.

As seen in Table 5, a statistically significant difference has been found between consumer behavior towards environmental protection (F=3.711; p<.05) according to secondary students' environmentally responsible behaviors by classes they attend. As a result of the LSD test applied to determine the source of this differentiation, a significant differentiation has been found in consumer/economic behaviors towards environmental protection between 9th grades with 10th grades and 10th grades with 11th grades. Nevertheless no significant differentiation has been found between secondary students' political behaviour towards environmental protection (F=1.161; p>.05), physical behavior towards environmental protection (F=2.154; p>.05) and individual and public persuasion behaviors towards environmental protection (F=.528; p>.05).

As seen in Table 6, a statistically significant difference has been found between political behaviors towards environmental protection (F=2.860; p<.05) and physical behaviors towards environmental protection (F=3.012; p<.05) according to university students' environmentally responsible behaviors by classes. As a result of the LSD test applied to determine the source of this differentiation, a significant differentiation has been found in political behaviors towards environmental protection between 2nd grade with 3rd and 4th grade, physical behaviors towards environmental protection between 2nd with 3rd grade.

Table 3. T-test results of primary. secondary and university students' environmentally responsible behaviors based on the gender

		Gender	N	X	SS	t	p
Primary School	Political behaviors	Female	558	1.35	.758	-3.410	.001*
		Male	561	1.53	.937		
	Physical behaviors	Female	558	4.98	1.30	2.597	.010*
		Male	561	4.77	1.40		
	Consumer/economic	Female	558	4.16	1.31	2.546	.011*
		Male	561	3.95	1.38		
	Individual and public persuasion behaviors	Female	558	2.73	1.23	-.295	.768**
		Male	561	2.75	1.24		
Secondary School	Political behaviors	Female	94	1.34	.653	-.399	.690**
		Male	217	1.38	.718		
	Physical behaviors	Female	94	4.73	1.46	-.174	.862**
		Male	217	4.76	1.42		
	Consumer/economic behaviors	Female	94	4.34	1.47	1.539	.125**
		Male	217	4.08	1.33		
	Individual and public persuasion behaviors	Female	94	3.12	1.41	1.620	.106**
		Male	217	2.86	1.22		
University	Political behaviors	Female	357	1.41	.757	1.572	.116**
		Male	344	1.32	.645		
	Physical behaviors	Female	357	5.20	1.26	-1.495	.135**
		Male	344	5.33	1.11		
	Consumer/economic behaviors	Female	357	4.67	1.23	2.749	.006*
		Male	344	4.92	1.12		
	Individual and public persuasion behaviors	Female	357	3.14	1.21	-.147	.883**
		Male	344	3.15	1.21		

*p<.05; **p>.05

However, no significant differentiation has been found between university students' consumer/economic behaviors towards environmental protection (F=2.293; p>.05) with individual and public persuasion behaviors towards environmental protection (F=.528; p>.05).

DISCUSION AND RECOMMENDATIONS

In recent studies, students stated that environmental problems cannot be solved only with technology and laws but also people should change their individual behaviors. Also, students' knowledge about environment is not enough for them to show beneficial behaviors, but it takes a long time to transform positive attitude towards environment to change into behaviors (Erten, 2005). Environmental education is a lifelong lasting course starting with pre-school and primary school; continues with secondary school and taking the final shape with higher education. In our study; primary, secondary and higher education students' direct behaviors towards environmental protection average (*I throw the trash in appropriate bins, I throw paper, glass, plastic, aluminum and battery waste in recycle bins, I water trees and flowers not to dry out, I take measures to protect animals*) was found to be higher than consumer/economic behavior towards environmental protection (*I purchase recycled products, I buy organic and ecological products, I donate my old and us used books, clothes and goods to individuals and organizations who are in need*), individual and public persuasion behaviors towards environmental protection (*I talk to my family, friends and other people to protect environment and prevent environmental problems*) and political behaviour towards environmental protection

Table 4. ANOVA and LSD test analysis results of primary students' environmentally responsible behaviors according to 6th. 7th and 8th class levels

		Sum of Squares	df	Mean Square	F	Sig.	LSD
Political behaviors	Between Groups	6.798	2	3.399	4.664	.010*	6-8 7-8
	Within Groups	814.876	1118	.729			
	Total	821.675	1120				
Physical behaviors	Between Groups	10.179	2	5.089	2.753	.064**	
	Within Groups	2066.690	1118	1.849			
	Total	2076.868	1120				
Consumer/economic behaviors	Between Groups	45.019	2	22.510	12.495	.000*	6-7.8 7-8
	Within Groups	2014.017	1118	1.801			
	Total	2059.036	1120				
Individual and public persuasion behaviors	Between Groups	28.848	2	14.424	9.603	.000*	6-8 7-8
	Within Groups	1679.336	1118	1.502			
	Total	1708.185	1120				

Table 5. ANOVA and LSD test analysis results of secondary students' environmentally responsible behaviors and their sub-dimensions according to 9th. 10th and 11th class levels

		Sum of Squares	df	Mean Square	F	Sig.	LSD
Political behaviors	Between groups	1.488	2	.744	1.161	.314**	
	Within groups	253.129	395	.641			
	Total	254.617	397				
Physical behaviors	Between groups	9.599	2	4.799	2.154	.117**	
	Within groups	879.986	395	2.228			
	Total	889.585	397				
Consumer/economic behaviors	Between groups	14.893	2	7.447	3.711	.025*	9-10 10-11
	Within groups	792.684	395	2.007			
	Total	807.577	397				
Individual and public persuasion behaviors	Between groups	1.853	2	.926	.528	.590**	
	Within groups	693.175	395	1.755			
	Total	695.028	397				

(*I planned to communicate with state authorities on subjects of environmental protection (for example write a letter, prepare an e-mail), I talked to state authorities for the punishment of those who harm the environment by failing to comply with laws and regulations*). This may be caused by the lack of sufficient environmental education programs given to students towards environmental protection, in terms of consumer/ economic, politic and individuals and public persuasion. Pooley and O'Connor (2000) indicated that mainly information towards environment is covered in the curriculum but the dimension of behaviors and attitudes towards environment is neglected. Tanrıverdi (2009) stated that gains about sustainable environment are insufficient in terms of quality and quantity which take place in primary school programs.

In our study, primary, secondary and university students' direct and consumer behavior towards environmental protection was found to be mid-level, however political behavior and individual and public persuasion behaviors towards environmental protection were seen as low level. The reason of this situation may be that students find direct behavior towards environmental

Table 6. ANOVA results of university students' environmentally responsible behaviors according to 1st. 2nd. 3rd and 4th class levels

		Sum of Squares	df	Mean Square	F	Sig.	LSD
Political behaviors	Between groups	4.240	3	1.413	2.860	.036*	2-3.4
	Within groups	343.904	696	.494			
	Total	348.143	699				
Physical behaviors	Between groups	12.761	3	4.254	3.012	.030*	2-3
	Within groups	983.056	696	1.412			
	Total	995.817	699				
Consumer/economic behaviors	Between groups	9.682	3	3.227	2.293	.077**	
	Within groups	979.623	696	1.408			
	Total	989.305	699				
Individual and public persuasion behaviors	Between groups	1.438	3	.479	.324	.808**	
	Within groups	1029.894	696	1.480			
	Total	1031.332	699				

protection more concrete and easier to perceive; however, consumer/economic and political behaviors towards environmental protection can not be formalized or adequately perceived. In similar studies, Atasoy (2008) stated that the primary school students' knowledge and positive attitude towards the environment are not in an adequate level. Kaya et al. (2009) specified that high school students' are insufficient in transforming environmental thoughts to behavior. Erol and Gezer (2006) emphasized those university students' attitudes towards environment and environmental issues are in low level. Çabuk and Karacaoğlu (2003) indicated that in Turkey, the number of consumers with environmental awareness and environmental concern are increasing yet environmental products are not yet effective enough to show in consumer behaviors. When students' environmentally responsible behaviors analyzed by gender variable, a significant differentiation has been found between politic, consumer/economic and direct behaviors according to primary school students' gender variable. Nevertheless primary school girl students' direct and consumer/ economic behaviors towards environmental protection average was found to be higher than boy students, in spite of that boy students' political behavior towards environmental protection average was found as higher than the girl students. No significant differentiation has been found for secondary school students' direct, consumer/economic and political behaviors towards environment according to gender variable. A significant differentiation has been found between university students' consumer and economic behaviors according to gender variable. According to Blocker and Eckberg (1997) this situation is explained with theory based socialization. For all that, women indentify themselves as "caregiver" role more than men and feel more responsible for the protection of the environment both locally and globally (Weaver, 2002; Yeşilada, 2009).

In similar studies, statistically significant differentiations are found between attitudes and behaviors towards the environment according to students' gender. (Aydın and Çepni, 2012; Kahyaoglu and Özgen, 2012; Özpınar, 2009; Gökçe et al., 2007; Yılmaz et al., 2004). Moreover, girls are more sensitive to environmental issues than men, whereas women's participation to political movements towards protecting the environment is found to be less than men (Mohai and Twight, 1987; Stern et al., 1993; Yılmaz and Arslan, 2011). When students' environmentally responsible behaviors are investigated by the class variable, a significant difference is identified for primary students' political, consumer/economic behaviors and individual and public persuasion behaviors towards environmental protection. In similar studies of a statistically significant differentiation has been found in primary students' environmental attitudes and behaviors according to class variable (Sağlam and Demirci-Güler, 2013). In this study, for the secondary students, a statistically significant differentiation was found between class variable and the consumer behavior towards environmental protection. For university students, a statistically significant differentiation was found between political and direct behavior towards environmental protection. Tuncer et.al. (2005), statistically significant differentiations were stated between the increasing age of students and environmental behaviors. In light of the data obtained, suggestions are presented below as:

1. The quality, scope and depth of environmental education given to primary school, secondary school and university should be revised.
2. Environmental education program applied to students should be updated in regard of different aspects (political behaviour towards environmental protection, individual

and public persuasion behaviors towards environmental protection and consumer/economic behavior towards environmental protection).

3. In order to build environmentally responsible behaviors to the students, education and training environments should be removed out of the classroom and school garden, nature and ecology based learning environments should be prepared. Students are getting away from the nature as the cities turn to concrete ones. To be sensitive to nature and environment should not be expected from the students who are away from the nature.

4. Also teachers who educate them should receive a good education in this direction in order to build environmental awareness, environmental ethics, love of nature and ecological culture awareness to the students.

5. Environmentally responsible behaviors should not be perceived as only subjects of lessons such as social science, science, technology and geography but they have to be associated with religion and moral studies, visual arts, history and technology design lessons.

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