Predictors of Behavior Factors of High School Students Against Recycling

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Abstract

This study aims to determine the variables that predict high school students' recycling behaviors. The study was designed as survey model. The study's sample consists of 203 students at a high school in Ankara. A recycling behavior scale developed by the researchers was used as a data collection tool. The scale has 3 dimensions: recycling behavior, recycling interest and recycling preferences. The reliability coefficient of the scale was determined to be .90. The data were analyzed using Pearson's correlation and multiple regression with the SPSS 18 package program. A significant correlation was found between high school students' recycling behaviors and variables such as environment anxiety, recycling knowledge and environmental student club membership. Also, as a variable, recycling knowledge was found to be a significant predictor of recycling behavior in general and its behavior and preferences dimensions. Recommendations are offered based on these results.

Keywords: Recycling, recycling behavior, recycling knowledge, environment clubs.

Introduction

Animals and humans are two species who have been in interaction from the beginning Today, one of the most important environmental problems is solid wastes. Excessive solid waste production has become a crucial issues for countries. The resolution of waste problems is among their priorities (Vicente & Reis, 2007). It has local, national and international levels. On the one hand, there are technological innovations, on the other hand there are decision mechanisms about human behaviors and recycling (Davies, Foxall & Pallister, 2002). Solid wastes are produced as a result of social, domestic and industrial activities. As a result of population increases and technological developments, the amount and variety of solid wastes has also increased. Solid wastes remain in nature without deteriorating for a long time, cause environmental pollution and affect human health negatively (Kayranlı, Tankut &Pampal, 2003). The most important ways of reducing waste production and resource consumption are recycling and reusing. Wastes from production and consumption can be reused. High quality raw materials or by-products can be obtained, reused, and energy can be obtained (Meriç & Kayranlı, 2003).

Recycling is the inclusion of waste that can be reused in the production process again by putting them through a variety of physical and/or chemical processes and transforming it into secondary raw materials. Thanks to recycling, waste products, the negative effects of waste materials on environment, health and economy are lessened, and the destruction of natural resources is prevented (Spiegelman & Sheehan, 2004). Recycling is one of the most frequently measured dimensions of environmentally



sensitive behaviors since recycling makes important contributions to economy and environment (Iyer & Kashyap, 2007; Valle, Rebelo, Reis & Menezes, 2005).

Environmental problems cannot be solved with only technology or laws. This is possible only with changes in individual behavior. Changing behavior requires changes in attitudes, knowledge and moral values. The adoption of positive attitudes and moral values for the environment is only possible with environmental education (Erten, 2002). Miranda and Blanco (2010) emphasized that environmental awareness is one of the most important factors that affect recycling. Environmental education and structural amenities encourage recycling. The purpose of environmental education is to raise the awareness of young individuals about environmental issues (Byerne & Regan, 2014).

Studies have been conducted on factors such as the available infrastructure for recycling, recycling programs, awareness about the results of recycling, environmental knowledge and interest, settlement locations and types, perceived social effect and attitudes towards recycling (Davies et al., 2002; Barr et al., 2001; Tonglet et al., 2004). Correlations between recycling and a variety of variables have been examined in studies about recycling. The fact that there is a correlation between the socioeconomic levels of individuals and their recycling behaviors has also been noted by studies (Oskamp et al., 1991). Vining and Embro (1990) stated that attitudes towards special fields such as recycling can affect general behaviors. Easy access to recycling bins is the most important factor that affects recycling behavior and attitudes towards recycling (Ebreo & Vining, 2000; Schultz, Oskamp & Mainieri 1995; Schultz, Oskamp & Maineri, 1996; Hansmann et al., 2006).

Ebreo and Vining (2001) conducted their study to examine how the self-regulation behaviors of individuals affect their recycling behaviors. Tonglet, Philips and Read (2004) examined the predictors of recycling behavior according to the theory of planned behavior in their study. Corral Verdugo et al. (2003) investigated the effect of individual and situational factors on recycling behaviors. Nigbur, Lyons and Uzzell (2010) examined the effect of attitudes, norms, personal characteristics and environmentally sensitive behaviors on recycling according to the theory of planned behavior.

The environmentally sensitive behaviors of students are shaped by environmental education in schools. Considering the fact that recycling is an important component of environmentally sensitive behaviors, the determination of predictors of students' recycling behaviors is crucial.

Thus, this study aims to examine the variables that predict high school students' recycling behaviors. These are its research questions in the light of this general aim:

- a) Is there any significant correlation between the recycling behaviors of high school students and variables such as gender, grade, environmental club membership and environmental knowledge?
- b) Do the variables in the study predict the recycling behavior of high school students?
- c) Do the variables in the study predict the recycling behavior, recycling preferences and recycling interest dimensions?

Methodology

Research Model

A survey model was used in this study. A survey model is a research approach that aims to describe, represent and explain a case such as events, groups, objects and characteristics in the past or today by using different variables and generating data about them (Büyüköztürk, Çakmak, Akgün, Karadeniz & Demirel, 2008;).

Participants

Research participants consisted of 203 students attending two high schools in Ankara. Descriptive details of participants are as follows: 48% were females; 52% were males; 38% attended 9th grade; 32% attended 10th grade; 30% attended 11th grade; 13% were members of environment clubs; and 87% were not.

Data Collection Tools

A recycling behavior scale developed by the researchers was used as a data collection tool. During the scale development process, a group of 40 high school students were asked open-ended questions following a review of related literature (Ajzen and Fishbein, 1980; Wright, 2011; Ando and Gosselin, 2005; Barr, 2007; Nixon and Saphores, 2009; Lansana, 1992). Items were created through the analysis of responses to open-ended questions and a question pool was formed with those items and other items obtained from literature review. The scale has 11 items. It has three dimensions: recycling behavior, recycling preferences and recycling interest. The KMO value of the scale was found to be .855. Its Bartlett's sphericity significance level was found to be 0.00, and its Cronbach's alpha reliability coefficient, .90. It is a 5-point Likert type scale with the response options of: "never," "rarely," "sometimes," "often," "always." Scores for each item on the scale range from 1 to 5.

Data Analysis

Data obtained in the research were analyzed through Pearson Correlation and Multiple Regression with SPSS 18 software package.

Findings

Findings of the study are presented in this section.

Table 1.

Pearson Correlation values associated with the relationship between high school students' recycling behaviors and variables

		Overall scale	Recycling behaviors	Prefence	Interest
Gender	Pearson Correlation	-,029	-,099	-,006	,048
	P N	,803 132	,394 132	,958 132	,682 132
Grade	Pearson Correlation	,098	,154	,033	,053
	P N	,398 132	,185 132	,779 132	,650 132
Membership in	Pearson Correlation	-,244*	-,178	-,209	-,234*
environment clubs	P N	,034 132	,123 132	,069 132	,041 132
İnterest to environment	Pearson Correlation	,256 [*]	,288*	,272*	,059
	P N	,025 132	,012 132	,017 132	,615 132
Knowledge	Pearson Correlation	,491**	,558**	,424**	,220
	P N	,000 132	,000 132	,000 132	,057 132
Income level	Pearson Correlation	-,155	-,059	-,144	-,204
	P N	,182 132	,613 132	,215 132	,077 132
Age	Pearson Correlation	-,012	-,024	,016	-,025
	P N	,915 132	,840 132	,889 132	,827 132

As Table 1 shows, no significant correlation was found between variables such as gender, grade, income level, age and the entire scale or its recycling, preferences and interest subdimensions. However, significant correlations were determined between environmental club membership and the entire scale and recycling interest, between the anxiety about the future of environment and the entire scale, its recycling and preferences dimensions, between the recycling knowledge variable and the entire scale, its recycling and preferences sub-dimensions.

The multiple regression results of variables for the recycling behavior scale such as environmental club membership, anxiety about the future of environment, recycling knowledge are displayed in Table 2.

	В	Standart error	β	t	p
Constant	24,999	7,723		3,237	,002
Environment club	-6,615	3,220	-,206	-2,054	,044
Concern	,376	1,186	,035	,317	,752
Knowledge	4,693	1,131	,460	4,150	,000,
		R= 0,534	R ² =0,285	9,584*	

Table 2.

Multiple regression results associated with variables predicting the scale overall

Table 3 shows that the variables explained approximately 29% of the variance (R²=0.285). According to the regression model parameters, the standardized regression coefficients (β) show that the predictor variables for recycling behavior scale were, in order of importance, recycling knowledge (β =0.460, t=4.150, p<0.05), environmental club membership (β =0.230, t=2.817, p<0.05) and environmental anxiety (β =0.35, t=0.317, p>0.05). Thus, recycling knowledge and environmental club membership are significant predictors of recycling behavior, and environmental anxiety is an important predictor of recycling behavior.

The multiple regression results of variables, such as environmental club membership, environmental anxiety and recycling knowledge that predict the behavior dimension are displayed in Table 3.

Table 3.

Multiple regression results associated with variables predicting the behavior dimension

	В	Standart error	β	t	p
Constant	6,784	3,242		2,092	,040
Environment club	-1,873	1,352	-,134	-1,386	,170
Concern	,201	,498	,043	,403	,688
Knowledge	2,341	,475	,529	4,932	,000,
		R= 0,576	R ² =0,332	11,912*	

Table 3 shows that the variables explained approximately 33% of the variance (R²=0.332). When the regression model was examined, it was found that environmental club membership (β =0.134, t=1.386, p>0.05) and environmental anxiety (β =0.043, t=0.317, p>0.05) variables were not significant predictors of recycling behavior dimension; however, the recycling knowledge variable (β =0.529, t=4.932, p<0.05) was a significant predictor of recycling behavior dimension.

The multiple regression results of variables, such as environmental club membership, environmental anxiety and recycling knowledge that predict the recycling preferences dimension are displayed in Table 4.

Table 4.

Multiple regression results associated with variables predicting the recycling preference dimension

	В	Standart error	β	t	p
Constant	8,529	3,295		2,588	,012
Environment club	-2,263	1,374	-,173	-1,647	,104
Concern	,409	,506	,094	,809	,421
Knowledge	1,539	,483	,370	3,190	,002
		R= 0,468	R ² =0,219	F=6,715*	

Table 4 indicates that the variables explained approximately 22% of the variance (R²=0.332). When the regression model was examined, it was found that the environmental club membership (β =0.173, t=1.347, p>0.05) and environmental anxiety (β =0.094, t=0.809, p>0.05) variables were not significant predictors for the recycling preferences dimension; however, the recycling knowledge variable (β =0.370, t=3.190, p<0.05) was a significant predictor for the recycling preferences dimension.

The multiple regression results of variables, such as environmental club membership, environmental anxiety and recycling knowledge that predict the recycling interest dimension are displayed in Table 5.

Table 5.

	В	Standart error	β	t	p
Constant	9,687	2,997		3,232	,002
Environment club	-2,478	1,250	-,223	-1,890	,051
Concern	-,234	,460	-,063	-,508	,613
Knowledge	,812	,439	,230	1,851	,068
		R= 0,315	R ² =0,099	F=2,642	

Multiple regression results associated with variables predicting the recycling interest dimension

Table 5 shows that there is no significant correlation between the environmental club membership, environmental anxiety and recycling knowledge variables and the recycling interest dimension (R=0.315, R²=0.099, P>0.05). This means that environmental club membership (β =0.063, t=0.508, p>0.05), environmental anxiety (β =0.230, t=0.230, p>0.05) and recycling knowledge variables were not significant predictors of the recycling interest dimension.

Discussion

Recycling is one of the most frequently measured dimensions of environmentally sensitive behaviors since recycling makes important contributions to the economy and the environment (lyer & Kashyap, 2007; Valle, Rebelo, Reis & Menezes, 2005). Variables that predict the recycling behaviors of high school students were examined in this study.

One of the results obtained from the study is the fact that no significant correlation was found between high school students' recycling behaviors and the gender, grade, family income and age variables. In the literature, Tindall, Davies and Maubulues (2003) found that gender is not an important determinant of environmentally sensitive behavior. Bakar and Aydınlı (2012) found that participants' plastic waste recycling did not vary significantly by their income level. Corral-Verdugu et al. (2003) found in their study that age is not an important predictor of recycling behaviors. Although these results are similar to those of this study, there are dissimilar results in literature. For example, Ando & Gosselin (2005) found that gender affected environmentally sensitive behaviors. Saphores et al. (2006) found that young adults have more tendency to participate recycling programs than the elderly. Daneshvary, Daneshvary and Schwer (1998) found that the income level variable is an important determinant of recycling behavior.

The fact that recycling knowledge, environmental student club membership and environmental anxiety variables are important predictors of recycling behavior is among the results found in the study. Schultz, Oskamp & Mainieri (1995) emphasized that knowing the benefits of recycling is an important factor that enables individuals to show recycling behavior. Mostafa (2007) stated that environmental knowledge is an important factor that affects environmentally sensitive behaviors. Being a member of environmental club and participating in environmental activities help students show interest in environment. Bamberg (2003) stated that environmental interest is an important factor that affects recycling behaviors.

When the results about recycling behavior sub-dimension were examined, it was determined that recycling knowledge variable was an important predictor of recycling behavior; environmental club membership and environmental interest did not predict recycling behavior. Wright (2011) found that recycling knowledge level is an important predictor of recycling behavior. Tonglet, Philips and Read (2004) found that previous experiences are important predictors of recycling behavior. This result is unlike the results of this study.

When the results for the recycling preferences sub-dimension were examined, it was found that the recycling knowledge variable was an important predictor of recycling preferences. Environmental club membership and environmental interest did not predict for the recycling behavior sub-dimension. Acquiring knowledge about recycling enables individuals to prefer recyclable products. Thomas (2001) stated that knowledge campaigns about recycling increase students' recycling behaviors. Dono, Webb and Richardson (2010) found that there are significant correlations between environmental volunteering and environmentally sensitive behaviors.

Moreover, it was also found that recycling knowledge, environmental anxiety and environmental club membership variables did not predict the recycling interest dimension.

Conclusion

As a result, it can be argued that there is a correlation between variables such as recycling knowledge, environmental club membership and environmental anxiety, and that among these variables, having knowledge about recycling is one of the most important predictors of recycling behavior. In other words, knowing about recycling and its benefits increases recycling behavior.

Recommendations

Given these results, the following recommendations can be made. The fact that knowledge about recycling and its benefits is the most important factor in enabling students to recycle is one of the study's results. Thus, activities that help students acquire knowledge about recycling should be carried out in lessons and activities about environment at schools.

Since being a member of a environmental club and carrying out environmental activities affect students positively in terms of recycling, the activities of environmental clubs at schools should be increased.

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APPENDIX 1.

Recycling Behavior Scale

Dear students, The aim of this study is to investigate your recyling begaviours with various variables. Please fill in the blanks according to your ideas correctly. Thanks.... Dr. Osman ÇİMEN

Gender: Age:.....Class level:....

Membership in environment club:	Yes () No () Income level:
Interest to environment:	1 2 3 4 5
Knowledge level to environment:	1 2 3 4 5

Recycling Behavior Scale	Never	Rarely	Sometimes	Often	Always
1.I do not throw batteries and plastics directly in the waste.	10	2□	3ロ	4	5ロ
2. I carry waste glass with me until I find a recycling bin.	10	2□	3ロ	4	5
3. I purchase rechargeable batteries.	10	2□	3ロ	40	5🗆
4. I prefer to buy products in reduced packages and in natural, recyclable packages.	10	2□	3ロ	40	5
5. I buy products in reusable containers, as much as possible.	10	2□	3ロ	40	5
6. As family members and friends come together, we talk about recycling.	10	2□	3ロ	4	5
7. I prefer to choose paper products made from reusable paper.	10	2□	3ロ	4	5
8. I follow news about recycling in newspapers and journals.	10	2□	3ロ	40	5
9. When I go on a picnic, I put aside the recyclable waste.	10	20	3ロ	4	5
10. I follow videos of recycling on the Internet.	10	2ロ	3ロ	4	5🗖
11. I separate waste at my home in order to get them reused.	10	2□	3ロ	40	5

Lise Öğrencilerinin Geri Dönüşüme Karşı Davranış Faktörlerinin Belirleyicileri

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Özet

Bu çalışmanın amacı, lise öğrencilerinin geri dönüşüm davranışlarını belirleyen değişkenlerin belirlenmesidir. Çalışma tarama modelinde tasarlanmıştır. Çalışmanın örneklemini Ankara'da bir lisede öğrenim gören 203 öğrenci oluşturmaktadır. Veri toplama aracı olarak araştırmacılar tarafından geliştirilmiş olan Geri Dönüşüm Davranışı Ölçeği kullanılmıştır. Ölçeğin üç boyutu vardır: geri dönüşüm davranışı, geri dönüşüme ilgi ve geri dönüşüm tercihleri. Ölçeğin güvenirlik katsayısı .90 olarak bulunmuştur. Veriler SPSS 18 paket programında Pearson katsayısı ve çoklu regresyon kullanımıyla analiz edilmiştir. Lise öğrencilerinin geri dönüşüm davranışlarıyla çevresel kaygı, geri dönüşüm bilgisi ve öğrencinin çevre kulübü üyeliği gibi değişkenler arasında anlamlı bir ilişki bulunmuştur. Ayrıca, bir değişken olarak geri dönüşüm bilgisinin genel olarak geri dönüşüm davranışı ve geri dönüşüm tercihleri boyutlarının anlamlı birer yordayıcısı olduğu tespit edilmiştir. Bu sonuçlar doğrultusunda önerilerde bulunulmaktadır.

Anahtar Kelimeler: Geri dönüşüm, geri dönüşüm davranışı, geri dönüşüm bilgisi, çevre kulüpleri.

