

Structural Equation Model for Environmentally Conscious Purchasing Behavior

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ABSTRACT: In this study, the effect of environmental concern, attitudes and behaviors of the university students on the environmentally conscious purchasing behavior was investigated with the help of Structural Equation Model (SEM). SEM is an effective data analysis tool that expresses the complicated causative relations between the latent variables. In this study, we collected the data from 400 university students by means of a survey. The results of this research showed that environmental attitudes, environmental behavior and green product awareness have a positive effect on environmentally conscious purchasing behavior. The developed model showed that, environmental concern explains 48% of the variation in the environmental attitudes and 28% of the product recovery awareness; environmental attitudes and product recovery awareness explain 55% of green product awareness; environmental attitudes explains 44% of the variation in the environmental behavior; environmental attitudes, green product awareness and environmental behavior explain 74% of the variation in the environmentally conscious purchasing behavior.

Key words: Structural Equation Model, Latent variable, Environmental consciousness, Green product, Product recovery, Consumers' behavior

INTRODUCTION

Public consciousness on environmental issues and recent more strict environmental legislations have been compelling manufacturers from various industries and consumers to produce and dispose of used products in an environmentally conscious manner. The rapid exhaustion of raw materials and growing amount of solid waste also fuel this trend. Gungor and Gupta (1999) reviewed the literature and emphasized the two major objectives of the environmentally conscious manufacturing and product recovery. These objectives are environmentally friendly product generation and development of product recovery and waste management technologies. The objective of product recovery management, as stated by Thierry *et al.* (1995), is 'to recover as much of the economic (and ecological) value as reasonably as possible, thereby reducing the ultimate quantities of waste'. In a subsequent paper, Ilgin and Gupta (2010) expand the environmentally conscious manufacturing and product recovery literature and examined it under four major categories; environmentally conscious product design, reverse and closed-loop supply chains, remanufacturing, and disassembly. Environmental problems and the accelerating changes in living conditions have become a fundamental part of the world in general and metropolises in particular. Earlier, environmental

problems have been considered as technical and economic problems; while in the recent decades the social dimensions of environmental problems such as public attention and people's attitudes towards environment have become one of the areas of environmental sociology and environmental psychology (Kalantari and Asadi, 2010).

Environmentally conscious manufacturing and product recovery efforts are directly related with the consumer's awareness and involvement into this process. Taking different factors into consideration, the researchers develop many environmental attitude and environmental behavior models. Hini *et al.* (1995) examine the relationship between environmental attitudes and behaviours. Environmental behavior includes actions which contribute towards environmental preservation and/or conservation (for instance, energy conservation, water conservation, consumerism, etc). On the other hand the object of one's environmental attitude is either the natural environment itself or conservation behavior (Axelrod and Lehman (1993), Kaiser *et al.* (1999) and (2007)).

The literature in the area of environmental attitude and behavior involves various models which are arising from the perspective of the researchers towards the issue. Some of the researchers used environmental

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attitude as the estimator of the environmental behavior (Chan, 1999; Kaiser *et al.*, 1999; Fraj and Martinez, 2007; Steg and Vlek, 2009). Alternatively, both environmental attitude and environmental behavior are also considered simultaneously as the estimator of the environmentally conscious purchasing behavior (ECPB) (Mostafa, 2007; Tilikidou and Delistavrou, 2008).

The roots of environmental problems lie in human behavior, so the solution could lie in changing the behavior of organizations and groups and so in cultural and lifestyle changes, i.e., environmental awareness is needed from the point of view of both supply and demand (Mondéjar-Jiménez *et al.*, 2011). The main focus of this research is individuals' ECPB, we considered environmental behavior (EB) as an exogenous latent variable of the ECPB. The major reasons that we have considered the ECPB in the model as follows;

- (1) ECPB together with environmental behavior can be seen as significant actions measuring nature friendliness and protection.
- (2) Recent consumer's trend towards green products may direct the enterprises to change their entire way of production process in an environmentally friendly manner.
- 3) Companies which fail to put into service environmentally responsible operation procedures will encounter a loss of competitiveness or loose market share. Hereby consumers accompanied by producers/manufacturers will have more effective roles in protecting the environment.

In this study, we developed an analytical model to examine the effect of environmental concern, attitude and behavior of the consumers on their environmentally conscious purchasing behavior (ECPB). We employed the Structural Equation Model (SEM) to investigate the complex correspondence of abovementioned factors. SEM describes the complicated causative relations between the latent variables. For this purpose, firstly, environmental concern and environmental attitude of the students as the estimator of the environmental behavior were used. Secondly, environmental concern, environmental attitude and product recovery awareness were used as the estimator of the green product awareness. Finally, consumer's environmental attitude, environmental behavior and green product awareness were used as the estimator of the environmentally conscious purchasing behavior of the university students.

In the literature, the relationship among environmental concern, environmental attitude,

environmental behavior and environmentally conscious purchasing behavior were analyzed separately. On the other hand, the most significant distinction of this work is SEM comprehensively comprises all of the factors in the model, viz. environmental concern, environmental attitude, product recovery awareness, green product awareness, environmental behavior and environmentally conscious purchasing behavior of individuals' simultaneously.

The paper is organized as follows. Section 2 presents mainly relevant literature in the area. Section 3 briefly presents Structural Equation Model (SEM) and its' analysis. Section 4 presents the results of the analysis. Finally, Section 5 provides conclusion and Section 6 discusses the findings of this study.

Kaiser and Shimoda (1999) indicated that environmental concern could be used as the estimators of the environmental behaviors. Kaiser *et al.* (1999) indicated that environmental attitudes could be used as the estimator of the environmental behavior. Nordlund and Garvill (2002) determined that personal norm mediated the effects from general values, environmental values and problem awareness on proenvironmental behavior.

Mannetti *et al.* (2004), searched the attitudes of the Italians towards recycling efforts by means of the SEM. Authors found that, personal judgments have a significant effect on explaining the product recovery awareness. Bolaane (2006) determined that educational status considerably affects the contribution to product recovery efforts. Sidique *et al.* (2010) pointed out that demographic factors like age, educational status, income and number of the individuals in a household have an influence on the recycling efforts. Tilikidou and Delistavrou (2006) found that there is a negative correlation between the environmental behavior and environmental insensitivities among Greek consumers. Also, authors emphasized that females with higher education contribute the environmental activities more. Mostafa (2007) determined that environmental anxieties are effective on the attitudes of the people on the consumption of green products and he found that there is a weak relationship between the consumers' green product awareness and their actual green product consumption behavior. Fraj and Martinez (2007) depicted that environmental attitudes are the estimators of the environmental behavior. Tilikidou (2007) found that while environmentally concerned consumption has a positive correlation with environmental awareness; it has a negative correlation with environmental unconcern. Tilikidou and Delistavrou (2008) determined that the consumers, who behave in accordance with

environment and who are interested in product recovery and participate in environment-priority activities, are high-educated people. Birgelen *et al.* (2009) found that env-friendly purchase and disposal decisions for beverages are related to the environmental awareness of consumer and their env-friendly attitude.

Dono *et al.* (2009) found that there is a significant relationship between environmental attitudes and environmental behaviors. Steg and Vlek (2009) indicated that when the environmental behaviors of individuals are to be explained, environmental attitudes related to them shall primarily be examined and in case those environmental attitudes are to be changed, this would be reflected on the behavior, as well.

MATERIALS & METHODS

The following notation is used through the paper;

AGFI	Adjusted Goodness of Fit Index
CFI	Comparative Fit Index
EA	Environmental Attitude
EB	Environmental Behavior
EC	Environmental Concern
ECPB	Environmentally Conscious Purchasing Behavior
GFI	Goodness of Fit Index
GPA	Green Product Awareness
NFI	Normed Fit Index
NNFI	Non-Normed Fit Index
PRA	Product Recovery Awareness
RMSEA	Root Mean Square Error of Approximation
RMR	Root Mean Square Error
SECPBM	Students' Environmentally Conscious Purchasing Behavior Model
SEM	Structural Equation Model

Structural Equation Modeling

SEM is a comprehensive statistical method used in testing hypotheses about causal relationships among observed and unobserved (latent) variables has proved to be useful in solving problems and in formulating theoretical constructions (Reisinger and Turner, 1999). SEM also can expand the explanatory ability and statistical efficiency for model testing with a single comprehensive method (Pang, 1996). Steenkamp and Baumgartner (2000) reflect on the role of SEM in marketing modeling and managerial decision making, and discuss some of its benefits. Authors underlined that although SEM has potential for decision support modeling, it is probably most useful for theory testing, which is a key phase in developing models. Applied to data on attitudes, perceptions,

stated behavioral intentions, and actual behavior, SEM can be used to specify and test alternative causal hypotheses (for SEM and LISREL see Byrne, 1998; Cheng, 2001; Cudeck *et al.* 2000; Hayduk, 1987; Jöreskog and Sörbom, 2001).

Measurement

The measurement tool used in this study was adapted from Kaiser and Wilson (2000), Fraj and Martinez (2007), Tilikidou and Delistavrou (2008). In the measurement tool, the items of attitude and behavior were measured by 5 point likert scale. The attitudinal questions were labeled either strongly disagree to strongly agree. The behavioral questions were labeled never to always. There are 26 items in the measurement tool that include various attitudes and behaviors (fifteen of them are measures attitude and eleven of them are measures behavior). The values of Cronbach Alpha (α), which is the reliability criteria related to the factors in the model, are given in Table 1. The Cronbach Alpha (α) value between 0.50 and 0.60 means a "close to reliability" and that they are between 0.60 and 0.80 means that it is "reliable". Table 1 shows that, five of the calculated Cronbach Alpha (α) values are between 0.60 and 0.80; one of them is between 0.50 and 0.60.

Data collection

In this research, since the general proportion of the attitude and behavior expressions within the frame of research was not known, we couldn't prepared the research frame by means of the contingent sampling technique. However, to determine the sample size we utilized the acceptable error level method under the normality assumption for the sample statistic. The sample size was calculated as 384; on 0.05 relevance level, $z=1.96$ d (sensitivity) =0.05 or p and q values, being 0.5 (for the details of sample size calculation please see; Kish, 1965).

The survey was applied by talking face to face to 400 students, who were chosen randomly within the university campus. Forty-seven of the applied surveys were soon realized that erroneous and inconsistent and they were not included within the analyses.

Theoretical Framework

The theoretical premise of this study is based on the theory of planned behavior. The theory of planned behavior was formulated by Ajzen (1985) after the development of the theory of reasoned action (Ajzen and Fishbein, 1980). According to the theory of planned behavior, human behavior is under the influence of certain factors with certain underlying causes, and exhibits itself in a planned manner. Initially, an

Table 1. Items within the Factors and their Means

Factors / Cronbach Alpha(α) / Items	\bar{x}	\bar{x} Male	\bar{x} Female
Environmental Concern(EC)/ Cronbach Alpha(α)= 0.75			
a1. The idea that human, as the master of the earth, has the right to distribute the natural sources in whatever way she/he wishes to, frustrates me.	4.21	4.06	4.31
a2. The fact that factories perform production without checking whether it is harmful to nature or not, scare me.	4.37	4.03	4.58
a3. The idea of not leaving a clean world to next generations worries me.	4.35	4.05	4.53
a4. The fact that people hunt animals for their furs aggravates me.	4.02	3.76	4.29
a5. I don't think that the problem of environmental pollution is exaggerated.	3.99	3.79	4.12
Environmental Attitude(EA) / Cronbach Alpha(α)= 0.53			
b1. If it provided an advantage for the environment, the products which are produced, processed and packaged in a friendly way to environment, could be paid more.	3.53	3.26	3.70
b2. If there is to be a choice between two products, the product that causes the least harm to people and environment shall be purchased.	3.98	3.80	4.09
b3. Products, whose basins and boxes could be used for other purposes shall be preferred.	3.73	3.56	3.83
b4. Reactional activities, performed in behalf of protecting the environment, provide benefit for the environment.	2.83	2.68	2.92
Product Recovery Awareness (PRA) / Cronbach Alpha(α)= 0.77			
d1. The contribution, acquired as a result of product recovery, gains favor for the society.	4.08	3.84	4.23
d2. Product recovery helps to protect the natural sources.	4.21	4.03	4.33
d3. The package of the purchased product shall be made of recyclable material.	4.16	3.97	4.27
Green Product Awareness (GPA) / Cronbach Alpha(α)= 0.65			
e1. I believe that consuming green products is better for human health.	3.97	3.85	4.04
e2. I think that green products are completely friendly to nature.	3.45	3.27	3.60
e3. The wastes of green products are harmless, since they can be annihilated during the natural process.	3.69	3.56	3.77
Environmental Behavior(EB) / Cronbach Alpha(α)= 0.74			
e1. I discuss about the environmental problems during the fellow conversations.	2.76	2.62	2.84
e2. I throw the wastes by separating.	3.20	2.94	3.37
e3. I do not purchase the products of the firms that damage the environment.	2.90	2.74	3.01
e4. I try to convince my family members and friends not to buy the products that damage the environment.	3.10	2.85	3.25
e5. I have changed my lifestyle in behalf of protecting the nature.	2.47	2.37	2.53
e6. I decrease the consumption of electricity, water and fuel in order to protect the nature.	3.31	3.12	3.42
e7. I do attend to planting tree.	3.05	3.08	3.03
Environmentally Conscious Purchasing Behavior (ECPB) / Cronbach Alpha(α)= 0.77			
f1. Considering their damages, I exchange the products I own, with ecological products.	2.59	2.56	2.61
f2. While purchasing a product, I look whether there is an ecological product label on the package or not.	2.81	2.58	2.95
f3. I prefer ecological products since they do not disturb the natural balance.	3.52	3.27	3.68
f4. I purchase ecological products although they are more expensive than the similar products.	2.98	2.65	3.18

^a **Inverted items.**

“Intention” has to be developed in order that a person performs the behaviour. Factors affecting “Intention” can be listed as “Attitude towards the Behavior”, “Subjective Norm”, and “Perceived Behavioral Control”. According to the planned behavior theory, “Behavior” is directly under the influence of “Intention” (Ajzen, 1991; Ajzen, 2005; Ajzen and Fishbein, 2000). This paper is based on Ajzen’s (1985) theory of planned behavior and Kaiser *et al.*’s (1999) environmental attitude and ecological behaviour model.

Research model and hypotheses

In this research model, environmental concern was used as the estimator of the environmental attitude and product recovery awareness. Environmental attitude and product recovery awareness were used as the estimator of the green product awareness. Environmental attitude, environmental behavior and green products awareness were used as the estimator of the environmentally conscious purchasing behavior (Fig. 1).

Here, we explained the research hypothesis and their foundations. These hypotheses are depicted in Table 2. Individuals, who encounter with environmental problems, are expected to react to the problem that affects her/him. This expected reaction constitutes the concept of concern about environmental problems. Kaiser and Shimoda (1999) indicated that as the concern of individuals about the environment increases, their environmental attitudes increases in parallel to it. In order to investigate the relationship between environmental concern and environmental attitude, an H₁ hypothesis was developed.

Product recovery is being used as an effective way in protecting the environment. Environmentally concerned enterprises shape their production processes in an environmentally conscious manner. Bolaane (2006), Sidique *et al.* (2010) stated that consumers with environmental concern prefer recyclable products. In order to search the relationship between environmental concern and product recovery awareness, H₂ hypothesis was introduced.

Green products are known to be the products that play an effective role in protecting the environment. It could be assumed that, product recovery awareness may affect green product awareness. Both factors are also having a positive affect on protecting the environment. In order to investigate the relationship between product recovery awareness, which is effective in protecting the nature, and green products awareness, H₄ hypothesis was developed. On the other hand, environmental concern was used as the estimator of product recovery awareness and product recovery awareness was used as the estimator of green product awareness. H₂ and H₄ hypothesis, which examine these relationships, were adapted from Mannetti *et al.* (2004), Bolaane (2006) and Sidique *et al.* (2010).

In order to reveal the existence of the relationship between environmental attitude and behavior, H₃ hypothesis was introduced. It was assumed that individuals with environmental attitudes would have green product awareness by converting this awareness into environmental behavior. Environmental attitudes and behaviors, on the other hand, would turn into environmentally conscious purchasing behavior. In order to determine the existence of the relationship of

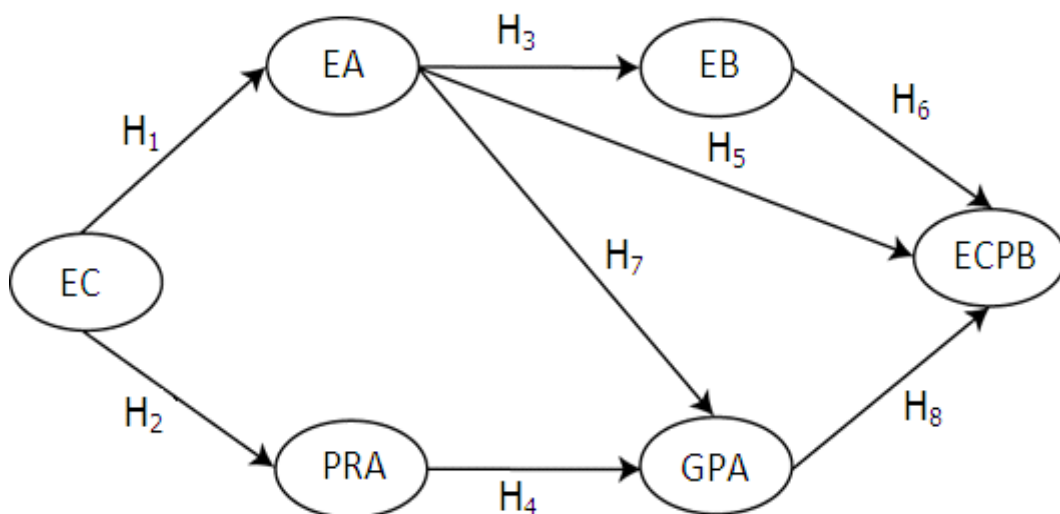


Fig. 1. Research Model

environmental attitude and environmental behavior with green product awareness and environmentally conscious purchasing behavior, H₅, H₆ ve H₇ hypothesis were developed respectively. With the assumption that environmentally conscious purchasing behavior would develop by converting the green product awareness, H₈ hypothesis was introduced. The relationship between environmental concern and environmental attitudes was investigated by Kaiser and Shimoda (1999). The relationship between the green product awareness and environmentally conscious purchasing behavior was examined in the studies of Mostafa (2007) and Tilikidou and Delistavrou (2008).

H₁, H₃, H₅, H₆, H₇ and H₈ hypothesis, which were examined in this study, were adapted from of Kaiser and Shimoda (1999), Mostafa (2007) and Tilikidou and Delistavrou (2008) and Fraj and Martinez (2007). Kaiser and Shimoda (1999) examined the relationship between environmental concern and environmental attitude; Tilikidou and Delistavrou (2006) examined the relationship between environmental concern and environmental behavior; Kaiser *et al.* (1999); Fraj and Martinez (2007) examined the relationship between environmental attitude and

environmental behavior. In this research, in addition to the existing literature a much more comprehensive model was developed and hypotheses were tested. The hypotheses, examined within the research, are presented in Table 2.

RESULTS & DISCUSSION

Descriptive statistics

The analysis and averages related to the scale that was used in the studied items within the factors are given in Table 1. Examination of the items within the factors show that the statement “The fact that factories perform production without checking whether it is harmful to nature or not, scares me.” within the “EC” factor, has the highest average (4.37). The statement of “If there is to be a choice between two products, the product that causes the least harm to people and environment shall be purchased.” within the “EA” factor, has the highest average (3.98). The statement of “Recycling helps to protect the natural sources.” within the “PRA” factor, has the highest average (4.21). The statement of “I believe that consuming ecological products is better for human health.” within the “GPA” factor, has the highest average (3.97). The statement of “I decrease the consumption of electricity, water

Table 2. Research Hypothesis

Hypothesis	
H₁	As the environmental concern increases, environmental attitude increases, as well.
H₂	As the environmental concern increases, product recovery awareness increases, as well.
H₃	As the environmental attitude increases, environmental behavior increases, as well.
H₄	As the product recovery awareness increases, green product awareness increase, as well.
H₅	As the environmental attitude increases, environmentally conscious purchasing behavior increases, as well.
H₆	As the environmental behavior increases, environmentally conscious purchasing behavior increases, as well.
H₇	As the environmental attitude increases, green products awareness increase, as well.
H₈	As the green products awareness increases, environmentally conscious purchasing behavior increases, as well.

Table 3. T-test Results for the Comparison of Males and Females with Respect to the Factors Considered in the Study

Factors	t	sig.	Mean Difference
EC	-5.072	$p < 0.001$	-0.422
EA	-4.069	$p < 0.001$	-0.312
PRA	2.039	0.043	-0.136
GPA	-2.821	0.005	-0.236
EB	-3.41	0.001	-0.275
ECPB	-4.423	$p < 0.001$	-0.437

and fuel in order to protect the nature.” within the “EB” factor, has the highest average (3.31). The statement of “I prefer ecological products since they do not disturb the natural balance.” within the “ECPB” factor, has the highest average (3.52). Checking the averages related to factors, it is seen that the highest average belongs to the “EC” (4.19) factor, which is respectively followed by “PRA” (4.15), “GPA” (3.70), “EA” (3.51), “EB” (2.97) and “ECPB” (2.97).

Examining the green product awareness, it is seen that females is more concerned about this subject and consequently, their positive attitudes are higher. Besides, the frequency of environmentally conscious purchasing behavior is higher in females, being parallel to green product awareness. Examining the study in general, it could be said that females are more concerned and conscious about the issues of environmental attitude and behavior than males (Table 3).

Structural model results

There are more than one goodness of fit index for Structural Equation Model. When the literature is searched, the most commonly used test statistics in SEM are likelihood ratio chi-square statistics (χ^2), root mean square error of approximation (RMSEA), goodness of fit index statistics (GFI) and adjusted goodness of fit index (AGFI). If the value of $\{\chi^2/d.f.\}$ is less than 3 it means that there is an acceptable fit. If the RMSEA is less than 0.05 it shows the perfect fit, $0,05 < RMSEA < 0,1$ is close to perfect, $RMSEA > 0,1$ means poor fit. GFI is used similar to the statistics of coefficient of determination (R^2) in Regression Analysis. AGFI is used similar to the statistics of adjusted coefficient of determination in Regression Analysis. AGFI and GFI have value between 0 and 1 and generally having the value of close to 1 means that the model fits well. (Raykov & Marcoulides, 2006).

LISREL 8.74 program was used in the analysis of the data. The goodness-of-fit indexes of the model are calculated as; $\chi^2 = 487.77$; $df. = 291$; $\chi^2 / df. = 1.68$;

RMSEA=0.047; NFI=0.92; NNFI=0.97; CFI=0.97; RMR=0.068; GFI=0.89; AGFI=0.87. The goodness-of-fit indexes show that the model is within acceptable limits. Goodness-of-fit indexes acceptable limits are presented in Table 4 (for more information about goodness-of-fit indexes, see Schermelleh-Engel *et al.* (2003); Byrne (1998); Hayduk (1987); Jöreskog and Sörbom (2001)).

Structural equations, the results related to hypothesis and standardized parameter estimation values are given in Table 5. Looking at the Table 5; it is seen that an increase of one unit in the factor of “environmental concern (EC)” causes an increase of 0.69 units in “environmental attitude (EA)” and an increase of 0.53 units in “product recovery awareness (PRA)”. Besides, while an increase of one unit in the factor of “environmental attitude (EA)” causes an increase of 0.67 units in “environmental behavior (EB)” and an increase of 0.64 unit in “green product awareness (GPA)”, it could be said that an increase of one unit in the factor of “product recovery awareness (PRA)” causes an increase of 0.21 unit in “green product awareness (GPA)”. Additionally, it is revealed that an increase of one unit in the factor of “green product awareness (GPA)” causes an increase of 0.24 unit in “environmentally conscious purchasing behavior (ECPB)” and an increase of one unit in the factor of “environmental behavior (EB)” causes an increase of 0.70 unit in “environmentally conscious purchasing behavior (ECPB)” (Table 5). Besides, since the relationship of “EA” → “ECPB” was not statistically found significant, H_5 could not be confirmed. R^2 value, related to the “Model of Students’ Environmentally Conscious Purchasing Behavior (SECPBM)”, was found as 0.74. This R^2 value shows that the factors explain 74% of the change within “EPB” and 26% of it could be explained through the factors, which do not exist within the model.

It could be said that the increase of environmental concern and environmental attitudes of university students display an amplifier effect on their

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ECPB	-4.423	$p < 0.001$	-0.437

Table 4. Goodness-of-Fit Indexes Acceptable Limits

Fit Measures	Good Fit	Acceptable Fit	Developed Model
RMSEA	$0 < \text{RMSEA} < 0.05$	$0.05 \leq \text{RMSEA} \leq 0.10$	0.047
RMR	$0 \leq \text{SRMR} \leq 0.05$	$0.05 < \text{SRMR} \leq 0.10$	0.068
NFI	$0.95 \leq \text{NFI} \leq 1$	$0.90 \leq \text{NFI} \leq 0.95$	0.92
NNFI	$0.97 \leq \text{NNFI} \leq 1$	$0.95 \leq \text{NFI} \leq 0.97$	0.97
CFI	$0.97 \leq \text{CFI} \leq 1$	$0.95 \leq \text{CFI} \leq 0.97$	0.97
GFI	$0.95 \leq \text{GFI} \leq 1$	$0.90 \leq \text{GFI} \leq 0.95$	0.89
AGFI	$0.90 \leq \text{AGFI} \leq 1$	$0.85 \leq \text{AGFI} \leq 0.90$	0.87

Table 5. Standardized parameter estimation values, *t* values and hypothesis

Hypothesis	Path	Std. parameter estimation values	<i>t</i> -value	Result
H ₁	(EC)→(EA)	0.69	6.82	Confirmed
H ₂	(EC)→(PRA)	0.53	6.91	Confirmed
H ₃	(EA)→(EB)	0.67	5.52	Confirmed
H ₅	(EA)→(ECPB)	0.02	0.16	<i>Not Confirmed</i>
H ₇	(EA)→(GPA)	0.64	5.38	Confirmed
H ₄	(PRA)→(GPA)	0.21	2.66	Confirmed
H ₈	(GPA)→(ECPB)	0.24	2.15	Confirmed
H ₆	(EB)→(ECPB)	0.70	5.62	Confirmed
Structural Equations				
EA = 0.69*EC				R ² =0.48
PRA = 0.53*EC				R ² =0.28
GPA = 0.64*EA + 0.21*PRA				R ² =0.55
EB = 0.67*EA				R ² =0.44
ECPB = 0.02*EA + 0.24*GPA + 0.70*EB				R ² =0.74

Table 6. Correlation matrix related to the factors

	EA	PRA	GPA	EB	ECPB	EC
EA	1.00					
PRA	0.36	1.00				
GPA	0.71	0.44	1.00			
EB	0.67	0.24	0.48	1.00		
ECPB	0.66	0.28	0.59	0.83	1.00	
EC	0.69	0.53	0.55	0.46	0.47	1.00

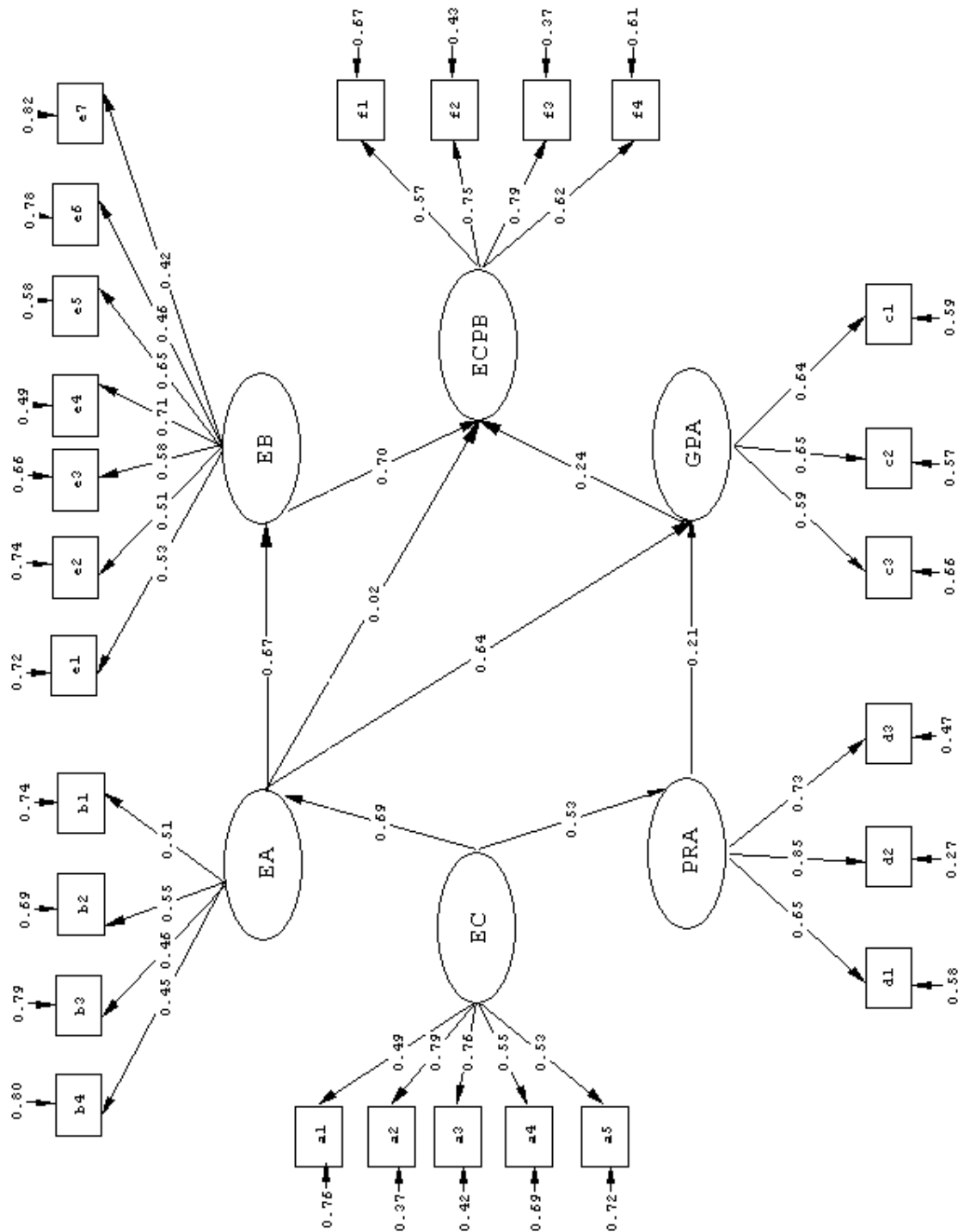


Fig. 2. Students' Environmentally Conscious Purchasing Behavior Model (SECPBM) LISREL 8.74 Output

environmental behaviors. Besides, in the developed structural equation model, it was seen that environmental concern, environmental attitude and product recovery awareness play an amplifier role for the student's green products awareness. Finally, it was revealed that environmental attitudes, environmental behavior and green products awareness display a positive effect on environmentally conscious purchasing behaviors. Additionally correlation matrix, related to the factors is given in Table 6.

Fig. 2 shows a structural equation model for students' environmentally conscious purchasing behavior. While environmental concern explains 48% of the change in the environmental attitude and 28% of the product recovery awareness, environmental attitudes and product recovery awareness explain 55% of the green product awareness. While environmental attitudes explain 44% of the change in the environmental behavior; environmental attitudes, green product awareness and environmental behavior explain 74% of the change in the environmentally conscious purchasing behavior (Fig. 2).

CONCLUSION

The results of the study revealed that environmental attitudes could be used as the estimator of the environmental behavior ($EA \rightarrow EB$). This finding coincides with the findings, acquired through the studies which were performed in different cultures in the literature (Kaiser and Shimoda, 1999; Dono *et al.* 2009). Considering the fact that the study was conducted with the university students, it is seen that it has similarities with the results of the study conducted by Kaiser and Wilson (2000) with the students in California, as well. Besides, the significant relationship between environmental attitude and environmental behavior ($EA \rightarrow EB$), which is obtained from the study, depicts a similarity with the findings of the study done by Dono *et al.* (2009). No statistically significant relationship was found between environmental attitude and environmentally conscious purchasing behavior ($EA \rightarrow ECPB$) in this study. Mostafa (2007) determined the existence of a weak relationship between the interest of the individuals in green consumption and their real consumption behaviors. The fact that no statistically significant relationship between environmental attitude and environmentally conscious purchasing behavior ($EA \rightarrow ECPB$) could be found in the structural equation model, which was developed in this study, confirms the findings in the study of Mostafa (2007). In addition to the findings of Mannetti *et al.* (2004), Bolaane (2006) and Sidique *et al.* (2010), who investigated the product recovery awareness, it was seen in the findings of this study that environmental concern effects the product recovery awareness ($EC \rightarrow PRA$) positively.

While Bolaane (2006) and Sidique *et al.* (2010) claim that educational status influences the product recovery awareness in their studies, it was additionally determined that gender, as well, has also a significant effect on product recovery awareness in this study. This result could be seen in the result of the *t* test (Table 3).

The findings of this study show that compared to males, females have much more environmental concern and attitudes and they also support the view of Tilikidou and Delistavrou (2006), which claims that female with high education take more participation in environmentally activities than others. As a result of this study, it was revealed that there is a statistically significant difference between the environmental attitudes of female and male university students (Table 4). As a result of the study, two situations were emerged to be discussed. The first of them is the indirect relationship of " $EA \rightarrow EB \rightarrow ECPB$ " ($\beta = 0.46$) statistically significant, whereas no direct cause-and-effect relationship was found between environmental attitude and environmentally conscious purchasing behavior (" $EA \rightarrow ECPB$ ", $\beta = 0.02$). From the structure of this relationship (" $EA \rightarrow EB \rightarrow ECPB$ "), it is understood that among the ones who developed environmental attitude, only the ones who converted these attitudes into environmental behavior, display environmentally conscious purchasing behavior. In the second situation, while the relationship of " $EA \rightarrow ECPB$ " ($\beta = 0.02$) was not found statistically significant, the indirect relationship of " $EA \rightarrow GPA \rightarrow ECPB$ " ($\beta = 0.15$) was found significant. From the structure of this relationship (" $EA \rightarrow GPA \rightarrow ECPB$ "), it is understood that among the ones who developed environmental attitude, only the ones who supported these attitudes by green product awareness, directed towards environmentally conscious purchasing behavior. Considering the first situation, it might be conceived that there is the conditional dependence structure between green product awareness and environmentally conscious purchasing behavior, upon realising the environmental behavior. In the second situation, on the other hand, it is conceived that there might be the conditional dependence structure between environmental attitude and environmentally conscious purchasing behavior, upon realising the green product awareness.

The following could be said for these two situations; there are actually conditional relationships between latent structures. On condition that the individual displays environmental behavior, there might be a cause-and-effect relationship between environmental attitude and environmentally conscious

purchasing behavior. In order to reveal these conditional dependence structures, an additional study is being planned with the help of graphical models. In the future studies, the research of (“EA”→”EB”→”ECPB”) and (“EA”→”EPA”→”ECPB”) conditioned dependence structures and results of their conditional dependence coefficients are being planned. According to the descriptive results of the study (Table 1 and Table 3), it could be said that females are more environmentalist compared to males. Many psychological reasons could be depicted among the reasons of this condition; however, probably one of the most important of these reasons might be the sense of protection, which comes from maternal instinct of females.

As a brief summary; in the literature environmental concern, environmental attitude, environmental behavior, product recovery awareness, green product awareness and environmentally conscious purchasing behavior concepts analyzed independently from each other. Whereas these mentioned concepts are correlated and in this research we consider their joint effect by means of the SEM. This research can be extended to evaluate the effect of cultural differences on the environmentally conscious purchasing behavior. Although the developed model is statistically suggestible for intercultural assessments, still it should be examined with larger samples and different cultures for the validation purpose.

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