The Role of Environmental Knowledge and Recycling Incentives in Formation of Recycling Attitudes

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Abstract

Today in which change is continuous and affects all the World, management understandings, fields of activity, marketing strategies, consumer needs and demands are changing rapidly. This study, which is based on John Grant (2007)'s argument about "if production and consumption continues in this way, resources will be resumed and there will be no sustainable market for marketing activities in the future", tries to focus on responsibilities of every individual who is considered as producer and/or consumer. The research model of the study is formed in order to determine the role of environmental knowledge and incentives on attitudes that comprised for recycling activities. The data is collected via survey while the survey is conducted through face to face interview method. The first section of the survey form consists of 14 items to measure environmental knowledge. The second section includes 14 items to measure incentives for recycling activities (better conditions for ecological waste points, categorization for type of waste and easiness in deposits, existence of moral and material sanctions, providing support and cooperation with other participants). In the third section, a scale of attitudes towards recycling is included.

A positive and statistically significant relationship is found between environmental knowledge of individuals and attitudes toward recycling. The results also reveal that there is a significant relationship between recycling incentives and attitudes toward recycling. The effect of incentives is higher than environmental knowledge.

Keywords: Environmental Knowledge, Recycling Incentives, Recycling Attitudes

1. Introduction and Research Questions

Consumption and production decisions change rapidly with the development of society and individuals. Consumers' needs of consumption affect their decisions and the society positively or negatively. The responsibilities laying a burden on both society and individuals should be taken into account while making these kind of decisions. In this context, environmental sustainability has been an important factor to be considered. A number of methods were developed to promote environmental sustainability. These methods include recycling, ecological consumption, preferring energy saver products, etc. (Bratt, 1999; Cheung*et al*., 1999; Vining and Ebreo, 2002).

The participation in recycling is critical for a sustainable environment. Consumers in developed countries tend to participate in recycling more intensively than their counterparts in developing countries. Therefore much more effort is needed for developing countries. It can be useful to focus on the attitudes of consumers before examining their behaviours. In this context, not only the attitudes towards recycling but also its antecedents should be considered. Studies in the literature focus more on environmental knowledge but incentives should also be considered intensively. It is important to investigate the effect of incentives as well as environmental knowledge.

The present study aims to investigate the effects of environmental knowledge and incentives for household recycling participation on attitudes towards recycling in Eskisehir (a city of Turkey). Research questions of the study are:

1. Is there a relationship between environmental knowledge (and also its sub-dimensions) and attitudes towards recycling?
2. Is there a relationship between incentives for household recycling participation (and also its sub-dimensions) and attitudes towards recycling?

2. Theoretical Framework

2.1. Environmental KnowledgeandAttitudes towards Recycling

Studies in the literature focus heavily on the antecedents of individuals' participation in recycling and their environmental knowledge (De Young, 1989; Nyamwange, 1996; Margai, 1997; Schultz, 1998; Valle *et al*., 2004; Ölander and Thøgersen, 2006; Goldsmith and Goldsmith, 2011; Viscusi *et al*., 2011; Fiorillo, 2013). Environmental knowledge refers to have an idea about the relationship between human-being and the universe, a thought of protecting the environment, and a prerequisite for implementing it (Chen and Lou, 2003).

Schultz (1998) suggested that recycling behaviour depends on personal and social norms and there is a positive relationship between recycling knowledge and recycling tendency of individuals. Arbuthnot and Lingg (1975) revealed that recycling behaviour is associated with environmental sensitivity and personal characteristics. Their study argued that the environmental awareness of American consumers are lower than their French counterparts. Their study also indicated that French consumers re-use recyclable waste instead of recycling while Americans recycles these kind of waste instead of re-using. Ferrara and Missios (2012) investigated ten different countries including Austria, Canada, Czech Republic, French, Italy, Korea, Mexico, Netherlands, Norway, and Sweden and found that

recycling behaviour and types of waste recycled differ based on culture. They also indicated that recycling tendency of individuals living with their families is higher than the ones who live single. The more information and explanations about recycling, the more participation in recycling (Thøgersen, 1994; Nyamwange, 1996). Goldsmith and Goldsmith (2011) highlighted the importance of education programs aiming to inform individuals about recycling, increasing the number of communication channels, and the role of government, NGOs, and individuals.

2.2. Incentives for Household Recycling Participation

Many studies about environment and recycling focus on attitudes towards recycling. Although there are a number of antecedents of attitudes towards recycling, incentives play an important role. In this context, Viscusi *et al*. (2011) suggested that financial prizes promotes recycling behaviour such as returnable bottles. Law enforcement is an effective way of extension of recycling behaviour even for individuals with low environmental awareness (Viscusi et al., 2011). The effects of distance and position of garbage bins and collection systems on recycling were investigated and the importance of physical infrastructure was highlighted by previous research (De Young, 1989, 1990; Margai, 1997; Valle *et al*., 2004).

Recycling behaviours are positively associated with waste collection and recycling services as well as traditional and personal characteristics of individuals (Ölander and Thøgersen, 2006). Fiorillo (2013) found that age, gender, education and income level, and the number of recycle bins affect recycling behaviour directly and suggested that local media, churches, and politicians should send messages about recycling. Fiorillo (2013) also concluded that punishment and raising the duties for non-recyclers do not affect recycling behaviour because of its volunteering nature.

3. Research Hypotheses

Environmental awareness is associated with recycling behaviour (Arbuthnot and Lingg, 1975). Goldsmith and Goldsmith (2011) highlighted the importance of education programs aiming to inform individuals about recycling. There is a positive relationship between recycling knowledge and recycling tendency of individuals (Schultz, 1998). The more information and explanations about recycling, the more participation in recycling (Austin *et al*., 1993; Nyamwange, 1996). Thus we propose the following hypothesis:

H_1: Environmental knowledge is positively associated with attitudes towards recycling.

The literature emphasize the importance of attitudes toward recycling (McCarty and Shrum, 1994; Gamba and Oskamp, 1994; Corral-Verdugo, 1997, Werner and Makela, 1998). Viscusi *et al*. (2011) suggested that financial prizes promotes recycling behaviour such as returnable bottles. Therefore we propose the following hypothesis:

H_2: Incentives for household recycling participation is positively associated with attitudes towards recycling

4. Methodology

4.1. Research Model

The study aims to investigate the effects of environmental knowledge and incentives for household recycling participation on attitudes towards recycling. Figure 1 shows the research model.

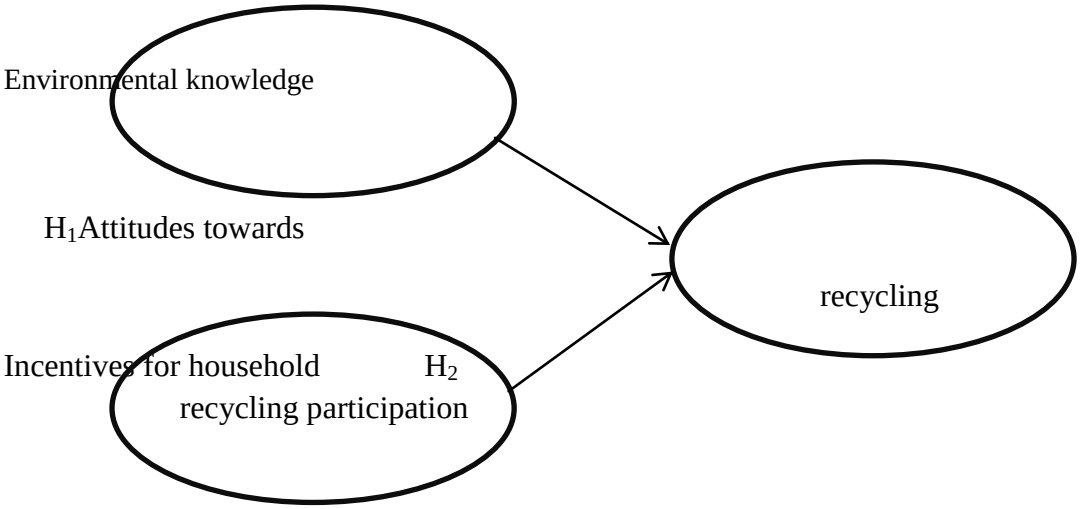

Figure 1: Research Model

4.2. Sample and Data Collection

Data of the study were collected via survey from 387 respondents in Eskisehir (a city of Turkey). Convenience sampling was employed because of time constraint (The data were collected in August 2015). Table 1 shows the demographic characteristics of the respondents.

Table 1: Demographic Characteristics of Respondents

Gender	**Frequency**	**Percent%**
Female	197	50,9
Male	190	49,1
Total	**387**	**100,0**
Age	**Frequency**	**Percent%**
18-24	65	16,8
25-31	110	28,4
32-38	66	17,1
39-45	60	15,5
46-52	40	10,3
53-59	20	5,2
60 and above	26	6,7
Total	387	100,0
Marital Status	**Frequency**	**Percent%**
Married	213	55
Single	161	41,6
Other	13	3,4

Total	**387**	**100,0**
Occupation	**Frequency**	**Percent%**
Housewife	58	15,0
Teacher	24	6,2
Student	43	11,1
Academician	10	2,6
Employee	45	11,6
Retired	36	9,3
Artisan	34	8,8
Engineer	20	5,2
Other	117	30,2
Total	**387**	**100,0**
Monthly Income	**Frequency**	**Percent%**
0-750 Turkish Liras (TL)	58	15,0
751-1500 TL	24	6,2
1501-2250 TL	43	11,1
2251-3000 TL	10	2,6
3001-3750 TL	45	11,6
3751-4500 TL	36	9,3
4501-5250 TL	34	8,8
5251-6000 TL	20	5,2
6000TL and above	117	30,2
Total	**387**	**100,0**

4.3. Measures

The environmental knowledge scaledeveloped by Haron *et al*. (2005), the scale of incentives for household recycling participation (Ludwig *et al*., 1998; Margai, 1997; Vicente and Reis, 2007) and the scale of attitudes towards recycling (Schwartz, 1977; Vining and Ebreo, 1992; Valle *et al*., 2004; Vicente and Reis, 2007) were used to measure research variables. Reliability, validity, and regression analyses were employed.

5. Results

Means and standard deviations of the scale items were shown in Table 2. Experts' opinions were taken to provide internal validity for the scales.

Table 2: Means and Standard Deviations of the Scale Items

Items	**Mean**	**Std. Deviation**
1.All living things play an important role in maintaining balance in the ecology	4,5659	,54599
2.Natural resources should be conserved for future generations	4,7468	,45292
3.The condition of our environment can affect our health	4,6150	,51815
4.Destruction of forests will cause biological imbalances	4,6977	,50804
5.There is abundance of natural resources that can never be depleted	4,3023	,78791

6.The main cause of air pollution in Malaysia is fumes from vehicles	3,5297	,79573
7.Most rivers in Malaysia are polluted	3,7726	,74457
8.Our country is faced with serious solid waste (garbage) and landfill problems	4,1705	,70296
9.Alternative energy, e.g. solar energy can be utilized in place of electricity	4,2506	,71019
10.The natural environment should be sacrificed in the name of development	4,5168	,72097
11.Usage of disposable goods should be encouraged as it provides convenience to consumers	3,7390	,93110
12.Unleaded petrol is better than leaded petrol as it is less harmful to the environment	3,8372	,71393
13.Using public transport can help alleviate air pollution	4,1240	,67149
14.Vehicles improperly maintained will cause pollution	4,1034	,63545
15.Keep Ecopoints clean	3,4884	,52576
16.Place Ecopoints in safe and pleasant locations	3,4574	,54356
17.Empty the Ecopoints regularly	3,6150	,50293
18.Have an Ecopoint nearer home	3,5245	,55411
19.To have information about the whole process of waste recycling	3,2558	,61853
20.To have more information on how to recycle	3,1964	,61306
21.To have more information on recycling participation in my community and country	3,2403	,60792
22.To be given recycling bins to store sorted waste	3,4755	,55877
23.To have a collection system that collects sorted waste at my door	3,4625	,58080
24.To receive a money prize for sorting domestic waste	2,4057	1,09557
25.To know that public celebrities cooperate with recycling	2,7235	,82922
26.To punish those who do not sort their waste	2,7829	,89583
27.To have family's cooperation in waste recycling	3,2713	,67623
28.To know that my friends and neighbours participate in recycling	3,0103	,68658
29.Household recycling is a major way to conserve energy	2,6873	,46418
30.Household recycling is a major way to reduce waste	2,7855	,41099
31.Household recycling is a major way to reduce pollution	2,7623	,42624
32.Household recycling is a major way to preserve natural resources	2,7726	,42582
33.Household recycling is a major way to reduce landfills	2,6977	,47099
34.My friends expect me to recycle household waste	2,2222	,56424
35.I expect my friends to recycle household waste	2,4109	,56144
36.I recycle my household waste because my neighbours do it too	2,2248	,62222
37.I feel a strong personal obligation to recycle a large proportion of my household waste	2,4031	,58282

38.I feel guilty if I do not recycle my household waste regularly	2,3385	,59064
39.I do not have time to think about how to recycle my household waste	2,5659	,54123
40.It is difficult for me to recycle	2,6279	,54918
41.Recycling household waste is not up to me	2,5891	,55214
Note: The first part(14 items) measured environmental knowledge with 5 point likert scale. The second part(14 items) measured incentives for recycling activities with 4 point likert scale. The third part (13 items) measured attitudes towards recycling with 3 point likert scale.		

5.1. Reliability and Validity

Cronbach's Alpha coefficients were provided for the reliability of the scales (Table 3).Factor analysis was applied to all scales separately. Table 3 shows the results of factor analyses. The result of the factor analyses revealed that 3 components were extracted for environmental knowledge scale. The results also indicated that incentives scale emerged with 5 components, while attitudes towards recycling scale emerged with 3 components.

Table 3: Results of Factor Analyses

	Factors	
	Loadings	**Cronbach's α**
Items of Environmental Knowledge Scale		0,641
Component 1		
All living things play an important role in maintaining balance in the ecology	0,683	
Natural resources should be conserved for future generations	0,690	
The condition of our environment can affect our health	0,768	
Destruction of forests will cause biological imbalances	0,745	
Component 2		
The main cause of air pollution in Turkey is fumes from vehicles	0,678	
Most rivers in Turkey are polluted	0,779	
Our country is faced with serious solid waste (garbage) and landfill problems	0,738	
Alternative energy, e.g. solar energy can be utilized in place of electricity	0,506	
Component 3		
Unleaded petrol is better than leaded petrol as it is less harmful to the environment	0,642	
Using public transport can help alleviate air pollution	0,735	
Vehicles improperly maintained will cause pollution	0,771	
% Variance explained: 53,218, KMO:0,688, df:55, x^2:719,259, p<0.05		
Items of Incentives for Household Recycling Participation Scale		0,766
Component 1 (better conditions of Ecopoints)		
Keep Ecopoints clean	0,739	
Place Ecopoints in safe and pleasant locations	0,734	
Empty the Ecopoints regularly	0,721	
Have an Ecopoint nearer home	0,729	

Component 2 (to have information on recycling)		
To have information about the whole process of waste recycling	0,805	
To have more information on how to recycle	0, 870	
To have more information on recycling participation in my community and country	0,781	
Component 3 (to simplify sorting and deposits)		
To be given recycling bins to store sorted waste	0,786	
To have a collection system that collects sorted waste at my door	0,588	
Component 4 (to be given material or moral incentives)		
To receive a money prize for sorting domestic waste	0,879	
To know that public celebrities cooperate with recycling	0,553	
Component 5 (to have support and cooperation from others)		
To have family's cooperation in waste recycling	0,754	
To know that my friends and neighbours participate in recycling	0,848	
% Variance explained: 69,378, KMO:0,819, df:78,x^2:1436,282, p<0,05		
Items of Attitudes Towards Recycling Scale		
Component 1 (environment conservation)		
Household recycling is a major way to conserve energy	0,775	
Household recycling is a major way to reduce waste	0,840	
Household recycling is a major way to reduce pollution	0,776	0,746
Component 2 (pressure of social and personal norms)		
My friends expect me to recycle household waste	0,658	
I expect my friends to recycle household waste	0,698	
I recycle my household waste because my neighbours do it too	0,703	
I feel a strong personal obligation to recycle a large proportion of my household waste	0,790	
I feel guilty if I do not recycle my household waste regularly	0,833	
Component 3 (indifference)		
I do not have time to think about how to recycle my household waste	0,763	
It is difficult for me to recycle	0,786	
Recycling household waste is not up to me	0,782	
% Variance explained: 60,148, KMO:0,753, df:55, x^2:1103,148, p<0,05 *5, 10, 11, 26, 32, and 33rd items were eliminated based on factor analysis.*		

5.2. Hypothesis Testing

SPSS 16.0 was used to analyse the data.Multiple regression analysis was employed to test the relationship between dependent variable and independent variables. Table 4 shows the results of regression analysis.

Table 4: Results of Multiple Regression

Model	IndependentVariables	B	t	p
$A=b_o+b_1xEK+b_2xI$*	Constant	1.255	6.240	0.000
	EK	0.135	2.717	0.007
	I	0.211	4.791	0.000
Adjusted R Square:0.108, F:24.401, p<0.000				
*p<0,05 A: Attitudes Towards Recycling, EK: Environmental Knowledge, I: Incentives for Household Recycling Participation				

According to the multiple regression results in Table 4, both environmental knowledge and incentives for household recycling participation are positively associated with attitudes towards recycling. Therefore both H_1 and H_2 were supported. The effect of incentives on attitudes towards recycling is higher than environmental knowledge (Beta value of incentives is higher than Beta value of environmental knowledge in Table 4).

6. Conclusion

The results of the study reveals that there is a positive and statistically significant relationship between environmental knowledge and attitudes towards recycling. Incentives are positively associated with attitudes towards recycling. Moreover having better conditions for Ecopoints, simplification of sorting and deposits, the presence of material and moral incentives, and having support and cooperation from others are positively associated with attitudes towards recycling.

The study contributes to marketing theory and practice in terms of social, societal, and green marketing. In this context marketing activities should benefit society rather than the companies. Therefore it is important to assess attitudes towards recycling for a sustainable environment.Both consumers and sellers should care about the environment for their own interests. Policy-makers should also take these variables into account for nations' welfare.

In this context, environmentally-conscious behaviours in terms of social marketing as well as environmental knowledge and consumer education gains importance (Knights, 2000; Weinreich, 2010).Environmental knowledge education aims to develop a global community which is aware of environmental problems and their solutions (Stapp, 1976).

7. Further Research

Further research should test the hypotheses from different contexts, i.e. different regions, countries. Further research can also focus on antecedents and consequences of recycling behaviour in addition to attitudes towards recycling.

8. Limitations

The study has some limitations. Firstly the data is collected in a limited period of time. Secondly, the study only focus on attitudes towards recycling, environmental knowledge, incentives, and their sub-dimensions. Further research can investigate other variables. Thirdly the data of the study is collected from Turkey. Lastly convenience sampling was employed. Therefore the generalizability is limited.

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