

Awareness of consequence of high school students on loss of bio-diversity

Nazım Kaşot*, Irfan Günsel Research Center, Ataturk Faculty of Education, Near East University, North Cyprus.

Serap Özbaşı, Ataturk Faculty of Education, Near East University, North Cyprus.

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Abstract

The aim of this study is to assess the egoistic, altruistic and biospheric awareness of the consequence of high school students regarding the loss of bio-diversity, then comparing the results on the basis of some independent variables (gender, class and family income). The research data were collected from 884 ninth and tenth grade high school students through the survey on the consequence of awareness of the loss of bio-diversity. According to the outcome of the research, students believed in biospheric, egoistic and altruistic results at the similar levels. While the impact of gender and family income on biospheric, altruistic and egoistic awareness of consequence is not so significant, the impact of class is significant on biospheric and altruistic awareness of consequence. Finally, class level and school variables may lead to the prediction of awareness of consequence on loss of bio-diversity; school type-family income, parent education levels not.

Keywords: norm activation model, biodiversity, awareness of consequence, high school.

1. Introduction

The loss of bio-diversity happens all around the world. Pursuant to researches, one tenth of bird species, one quarter of mammals and 70% of plant species are now under threat of extinction (Gunes, 2009). An international effort is required to prevent the loss of bio-diversity, which is considered to be the biggest environmental issue. Therefore, a Bio-diversity Convention (BDC) has been prepared in the framework of international organisations. There are three main objectives under the convention as “protection of bio-diversity”, “sustainable use of biological resources” and “fair share of benefits from the use of genetic resources” (T.R. Ministry of Environment and Forestry, 2007). The aforementioned objectives is comprised of meeting the needs of present generations, protecting inter-regional equality and guaranteeing the rights of future generations (Demirayak, 2002). The loss of bio-diversity includes the loss of habitat, loss of species and decrease of inter-species genetic diversity (Isik, 1998). Sustainable use is vital for the prevention of bio-diversity and the protection of diversity. For sustainable use, the values of production, goods and services should be determined (Demir, 2009). Moreover, mankind should make important decisions on the environment for the prevention of the loss of bio-diversity, protection of diversity and sustainable use (Helldén & Helldén, 2008). In this framework, the decision-making processes of individuals and society regarding environmental behaviours should be understood. One of the models describing the pro-environmental decision-making process and behaviour of individual is the Norm-Activation Model (Onwezen, Bartels & Antonides, 2013).

Schwartz (1977) developed the Norm-Activation Model (NAM). Schwartz explained this model in the context of altruistic behaviour and claimed that personal norms constituted the basis of this model. Namely, it is foreseen that altruistic behaviours depend directly on the personal norms. Personal norms “are the own expectations of an individual for specific actions performed by the individual at certain conditions.” When being in a close relationship with personal expectations, personal norms differentiate from the social norms. Personal expectations are based on the interiorised values in order. Values, unlike personal norms, have building blocks independent from certain conditions. Each individual has priorities and although main values are universal, each individual may have different values due to his priorities. NAM is foreseen to be horizontally linked with values and personal values (Figure 1).

Values and personal norms affect the review of action considered to be mutual (Menzel, 2007). According to researches, NAM is also successful in explaining pro-environmental behaviour (Dervisoglu, 2007; Menzel, 2007; Thøgersen, 2009; Onwezen et al., 2013). The introduction of the model in terms of the environment assumes that altruistic and pro-environmental behaviours are motivated by the same main values. Therefore, this expression means that a person having the tendency of getting into action for the welfare of others would also have the tendency of doing the same thing for the welfare of environment (Menzel, 2007).

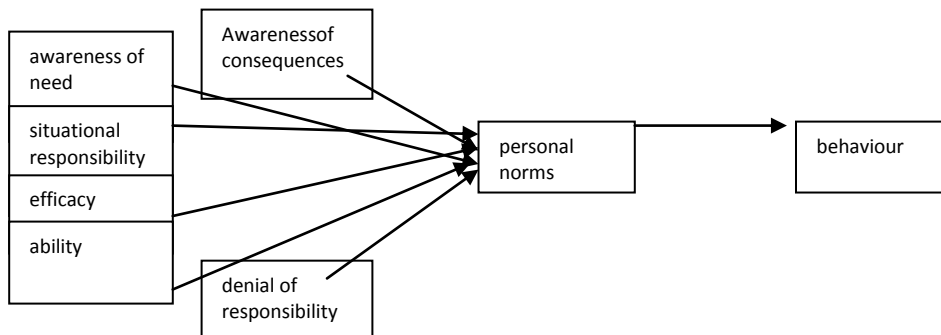


Figure 1. Norm-Activation Model of Schwartz (Harland, Staats & Wilke 2007).

In NAM, it is assumed that the impact of personal norms on behaviour is regulated by the awareness of consequence and ascription of responsibility. Responsibility feeling is considered as that which activates the personal norms and such norms affect the individual behaviour (Onwezen et al., 2013). In other words, NAM should include awareness of consequences and the ascription of responsibility as the way to activate the personal norm regarding the performance of behavioural traits. The determinants of intention for the realisation of pro-environmental behaviours should also include the awareness of consequence (Garling, Fujiib, Garling & Jacobssona, 2003). The awareness of consequence is the belief regarding the environmental unwanted outcomes.

At the same time, the model argues that the beliefs on the egoistic, altruistic and biospheric consequences regarding the environment are related with the value orientations. There is a difference between egoistic, altruistic and biospheric awareness of consequence that are the basis for three different main value orientation: egoistic value orientation is related with focusing on individual outcomes; altruistic value orientation with an interest in the welfare of others; and biospheric value orientation indicating the importance of the environment and biosphere. Value orientation is about the process. In this process, when information is in coherence with values, it is believed, and when not, it is rejected (De Groot & Steeg, 2008; Hansla, 2011). Therefore, values have an indirect impact on environmental behaviour through belief, attitude and norms. Values, at the same time, affect the level of awareness of people in terms of environmental problems. When significant environmental values are under threat and people judge their own behaviour for the minimisation of this threat, the awareness/consciousness of consequences on the part of people increases (De Groot & Steg, 2007). In other words, NAM represents a complex model attempting to make an appropriate decision in accordance with the ethical status of an individual.

According to research studies, the Norm-Activation Model may be used to explain pro-environment behaviour and behavioural intent (e.g. Harland et al., 2007), while two situational activator, those acting as awareness of consequence and awareness of responsibility focused of NAM and personal norms, were used to explain pro-environment behaviour. Former research projects, such as that of Dervisoglu (2007), had used NAM in one part of her study to indicate that high school students in Turkey were the most aware of the consequences regarding the biosphere in terms of loss of bio-diversity. Menzel's study (2007) states that there is a significant difference between the egoist and biospheric awareness of consequence about the loss of bio-diversity among German and Chilean students. In the study of Olbrich, Quaas and Baumgärtner (2011) with the sample of cattle breeders in Namibia, they had assessed the personal norm in regard to ecological-economic sustainability. The related researcher noted that personal norms among farmers are heterogeneous in terms of sustainability, while such norms change with the social demographical characteristics. Brekke, Kipperberg and Nyborg (2010) have reviewed the relation between household recycling and the ascription of responsibility, and the ascription of responsibility has an impact on beliefs regarding the behaviour of others. Here, the researchers had used the Norm-Activation Model for the determination of pro-environment behaviours like the loss of bio-diversity, sustainability, and household recycling. Some of the research studies have also assessed the relations between the Norm Activation Model and social demographical characteristics (e.g. Olbrich et al., 2011).

This study concentrates on the biospheric, egoistic and altruistic awareness of consequences in accordance with the Norm Activation Model. Therefore, the study discusses the beliefs of participants on the loss of bio-diversity and damage to nature, while the protection of diversity would be beneficial to nature. Meanwhile, the medical materials acquired from the non-discovered species would disappear, while the next generations would get harmed and there would be less natural products due to increasing species loss. It also examines the impact of demographical characteristics on awareness of consequence about the loss of bio-diversity. This study is significant for providing an insight into explaining the pro-environmental behaviour of Turkish Cypriot high school students. Thus, the outcomes from this study are expected to

contribute to raising the awareness of students regarding the loss of bio-diversity and restricting the lessons and programmes on bio-diversity in order to provide protection.

The aim of this study is to evaluate the egoist, altruistic and biospheric awareness of consequences in regard to bio-diversity among high school students in TRNC For this purpose, the following questions were asked:

- What are the beliefs of students regarding the biospheric, altruistic and egoistic consequences regarding bio-diversity?
- Is the impact of gender on the biospheric, altruistic and egoist consequences regarding bio-diversity significant?
- Is the impact of class level on the biospheric, altruistic and egoist consequences regarding bio-diversity significant?
- Is the impact of monthly family income on the biospheric, altruistic and egoist consequences regarding bio-diversity significant?
- Is the common impact of some independent variables (class level, gender, family type, family income and parent education) on the biospheric, altruistic and egoistic consequences regarding bio-diversity significant?
- Is the awareness of consequence on loss of bio-diversity predicted through the individual variables?

2. Method

2.1. Working Group

Ninth and tenth grade students from the high schools of North Cyprus are the working group of this study. Sampling has not been used in this research and the aim was to reach the whole population. Since it was a voluntary process, 884 ninth and tenth grade students had attended to the research.

When the demographical characteristics of participants were analysed, we found that 540 are female (61.1%) and 336 are male students (38.9%). 435 (49.3%) of them are ninth grade and 443 (50.7%) are from tenth grade. 168 of them (19.1%) go to an Anatolian high School; 112 (12.7%) to science high school, 212 (24%) to college, 294 (33.2%) to general high school and 95 (10.7%) to vocational high school. In terms of the education level of parents, the fathers of 150 students (17%) are elementary school graduates, 137 (15.5%) secondary school, 359 (40.6%) high school, 198 (22.4%) university and 30 post graduates. Meanwhile, the mothers of 185 (20.9%) students are elementary school graduates, 115 (13.0%) secondary school, 400 (45.2%) high school, 149 (16.9%) university and 23 (2.6%) post-graduates. From the perspective of the monthly income levels of participant students, 127 (14.4%) have less than 1.500 TL income, 274 (31.0%) between 1.500-3.000 TL, 206 (23.3%) 3.001-4.500 TL, 142 (16.1%) 4.501-6.000 TL and 99 (11.2%) 6.000 TL. Finally, 36 (4.1%) students had not given any information regarding the family income.

2.2. Study Method

The questionnaire used in this research is structured by Menzel (2007) on the basis of a study by Stern, Dietz, Kalof and Guagnano (1995) and adapted to the Turkish language by Dervisoglu (2007). There are 15 items in the questionnaire, rated with a four point Likert scale. The validity of this questionnaire with three dimensions is .685 for Turkish Cypriot students.

2.3. Analysis of Data

The data acquired from the Turkish Cypriot students was analysed through a SPSS 20 program. Descriptive analysis (X, Sd, % and f), t-test, ANOVA, MANOVA and multiple regression techniques were used in the assessment. Since t-test, ANOVA and MANOVA techniques are parametrical statistics techniques, the distribution of data was checked. For the norms, the skewness (.118) and kurtosis (.039) values of data were evaluated and these values showed a distribution between +1 and -1. The MANOVA assumptions were then checked. Dependent and independent variables were identified in MANOVA and controlled for their variance homogeneousness and equality in their co-variance matrixes. Biospheric, egoist and altruistic awareness of consequence are considered as dependent variables for MANOVA while gender-class level, school type-family income and parent education status are assigned as independent variables. According to the Levene test, the variance of biospheric, egoist and altruistic awareness of consequence are homogeneous ($p > .05$). In order to check whether the co-variance matrix is equal, Box M (12.184) was controlled and matrixes were found to be equal. In MANOVA, the Bonferri (.0017) interval was used as a confidence interval for significance value. For the assessment of overlapping amongst variables in stepwise regression analysis, the tolerance and VIF were checked. Since the tolerance values are above .05 and VIF below 10.00, no overlapping was observed in the variables.

3. Findings

3.1. Descriptive Findings

The average values for the beliefs of high school students upon the biospheric, altruistic and egoistic consequences regarding the loss of bio-diversity are given in Table 1.

Table 1. Descriptive Outcomes

	X	SS	Skewness		Kurtosis	
	Statistics	Statistics	Statistics	SH	Statistics	SH
Egoistic	2.79	.55	.00	.08	.13	.16
Altruistic	2.93	.66	.08	.08	.21	.16
Biospheric	3.06	.70	.31	.08	.77	.16

According to Table 1, the averages for biospheric, altruistic and egoistic outcomes vary between 2.79 ± 0.55 and 3.06 ± 0.70 . The biospheric awareness of consequence has the highest average; the lowest is the egoistic awareness of consequence. At the same time, the students evaluated the biospheric, altruistic and egoistic awareness of consequence as “neither agree nor disagree”.

3.2. Impact of Gender on the Awareness of Consequence for the Loss of Bio-Diversity

The analysis results upon the impact of gender on the biospheric, altruistic and egoistic awareness of consequence for the loss of bio-diversity are given in Table 2.

Table 2. Impact of Gender on Awareness of Consequences - T-test results

Dimension	Gender	f	Mean	Sd	T	Df	p*
Biospheric	Female	539	3.07	.71	.76	873.00	.45
	Male	336	3.04	.70			
Altruistic	Female	540	2.92	.66	.04	874.00	.97
	Male	336	2.92	.64			
Egoistic	Female	539	2.78	.54	-.34	873.00	.73
	Male	336	2.79	.55			

* .05

According to Table 2, the impact of gender on the biospheric, altruistic and egoistic awareness of consequence for the loss of bio-diversity is not significant.

3. 3. Impact of Class on the Awareness of Consequences for the Loss of Bio-Diversity

The analysis results upon the impact of class level on the biospheric, altruistic and egoistic awareness of consequence for the loss of bio-diversity are given in Table 3.

Table 3. Impact of Class Level on Awareness of Consequences - T-test results

Dimension	Class	f	Mean	Sd	T	Df	p*
Biospheric	9 th grade	434	3.13	.72	2.56	875.00	.01
	10 th grade	443	3.00	.69			
Altruistic	9 th grade	435	3.00	.67	3.33	876.00	.00
	10 th grade	443	2.85	.64			
Egoistic	9 th grade	435	2.81	.54	1.06	875.00	.29
	10 th grade	442	2.77	.55			

* .05

According to Table 3, the impact of class level on the biospheric and altruistic awareness of consequences is significant; it is not according to the egoistic awareness of consequence. The analysis results show that the significant difference is in favour of 9th grade students.

3. 4. Impact of Family Income on the Awareness of Consequences for the Loss of Bio-Diversity

The analysis results of the impact of family income on the biospheric, altruistic and egoistic awareness of consequences for the loss of bio-diversity are given in Table 4.

Table 4. Impact of Class Level on Awareness of Consequences - ANOVA results

	Income	f	Mean	Sd.	df.	F	P*
Biospheric	Below1,500 TL	127	2.99	.73	4.00	.97	.42
	1,500-3,000	273	3.10	.70			
	3,001-4,500	206	3.04	.72			
	4,501-6,000	142	3.01	.67			
	Above 6,000	99	3.13	.71			
Altruistic	Below1,500 TL	127	2.89	.66	4.00	.23	.92
	1,500-3,000	273	2.93	.66			
	3,001-4,500	206	2.92	.64			
	4,501-6,000	142	2.90	.65			
	Above 6,000	99	2.96	.64			
Egoistic	Below1,500 TL	127	2.76	.57	4.00	.44	.78
	1,500-3,000	273	2.81	.56			
	3,001-4,500	206	2.77	.53			
	4,501-6,000	142	2.82	.54			
	Above 6,000	99	2.81	.51			

* .05

According to Table 4, the impact of family income on the biospheric, altruistic and egoistic awareness of consequences for the loss of bio-diversity is not significant.

3.5. Common Impact of Some Variable on the Awareness of Consequence for the Loss of Bio-Diversity

The analysis results upon the common impact of some variables (class level, gender, family type, family income and parent education) on the biospheric, altruistic and egoistic awareness of consequence for the loss of bio-diversity are given in Table 5.

Table 5. Common Impact of Some Variables on the Awareness of Consequence - MANOVA Results

	Wilk's Lamda	F	Hypothesis Df	Error Df	p*	n ²
Gender-Class Level	1.00	.14	3.00	865,00	.94	.00
School Type-Family Income	.93	1.35	45.00	2436,79	.06	.02
Education Level of Parent	.94	1.11	45.00	2496,21	.28	.02

*.017

According to Table 5, the common impact of gender and class level, school type and family income and education level of parents on the biospheric, altruistic and egoistic awareness of consequence for the loss of bio-diversity is not significant.

3.6. Prediction of Awareness of Consciousness for Loss of Bio-Diversity from Independent Variables

In consideration of the data from high school students, stepwise regression analysis has been used for the identification of whether the class level, school type, family income and educational level of parents has led to predictions of the awareness of consciousness for loss of bio-diversity, and the analysis results are given in Table 6.

Table 6. Stepwise Regression Analysis on the Prediction Status of Independent Variables on Awareness of Consciousness

	Stepwise 1	Stepwise 2	Stepwise 3	Stepwise 4	Stepwise 5
	B	B	B	β	β
Consequence Awareness					
Class Level	.108*	.102*	.102*	.101*	.102*
School Type	–	.175*	.178**	.169**	.171**
Family Income	–	–	.020	.038	.033
Education Status of Mother	–	–	–	.042	.056
Education Status of Father	–	–	–	–	.030
R ²	.108	.205	.206	.209	.211
F	9.84**	18.20**	12.24**	9.45**	7.65**

*p<0.05 **p<0.01

According to Table 6, at the first phase of stepwise regression analysis, the class level explains the 11% of awareness of consequence regarding bio-diversity. Class level and school type explain together 21% of consequence awareness in stepwise regression. Class level, school type and income level together explain 21% of consequence awareness in the third phase of stepwise regression. On the other hand, independent variables explain 21% of consequence of awareness in the fourth and fifth phases of stepwise regression. In the first phase, class levels are predicted in the awareness of consequence for the loss of bio-diversity; during the other phases, only class level and school type variables are predicted in the awareness of consequence for the loss of bio-diversity.

4. Discussion and Conclusion

The Norm-Activation Model (Schwartz, 1977) representing the process of structuring the self-expectations of people in their social behaviour is one of the models explaining pro-environment behaviour (Harland, 2007; Menzel, 2007). In this model, it is vital to explain pro-environment behaviour, the awareness of the individual of the consequences of an action with regard to the welfare of others, and taking responsibility for the performance of this action (Turaga, Howarth & Borsuk, 2010). This research evaluates the beliefs of high school students in North Cyprus regarding egoistic, altruistic and biospheric consequences for the loss of bio-diversity. According to the research data, students believe in biospheric, egoistic and altruistic results at the similar levels and students stated this awareness in “neither agree nor disagree”. Dervisoglu (2007) indicated in her study that high school students in Turkey have more biospheric awareness of consequence than egoistic and altruistic awareness of consequence. Similarly, Menzel’s study (2007) states that Chilean students have a much more significant and higher egoistic and biospheric awareness of consequence than German high school students.

The step to activation starts with awareness. This awareness is composed of needs status and action to meet the needs. The interaction of moral obligation, values and norms are at stake to get into action. The more importance is given to an action, the stronger is the moral obligation for the performance of action (Turaga et al., 2010). Moreover, Turaga et al. (2010) emphasise that people who have a high level of awareness of consequence and feel responsible for the performance of action have also shown pro-environment behaviour. Therefore, in order to form awareness of consequence on the loss of bio-diversity among students, it is important to examine the value that they assign to bio-diversity and evaluate personal norms to protect bio-diversity.

Another result of the research is the impact of independent variables on the awareness of consequence for the loss of bio-diversity. The common impacts of gender, the impacts of family income and gender-class levels, school type-family income and education status of parents are not significant in the biospheric, egoistic and altruistic awareness of consequence for the loss of bio-diversity, only class level is significant in biospheric and altruistic consequences. In other words, female and male students believe in the biospheric, egoistic and altruistic awareness of consequences for the loss of bio-diversity equally. Regardless of family income, their beliefs for the biospheric, altruistic and egoistic awareness of consequences for the loss of bio-diversity are the same. The common impact of school type and family income is not significant in the biospheric, altruistic and egoistic awareness of consequences for the loss of bio-diversity. Similarly, the common impact of the educational status of mother and father is not significant in the biospheric, altruistic and egoistic awareness of consequences for the loss of bio-diversity. On the other hand, the impact of class level is significant in the biospheric, altruistic and egoistic awareness of consequences for the loss of bio-diversity. This significant impact is in favour of 9th grade students. The subject of “Bio-Diversity” in 9th grade biology lesson is considered to have an impact on this outcome.

The last outcome from the research is related to the independent variables foreseeing the awareness of consequence for the loss of bio-diversity. While class level and school type predicts the awareness of consequence for the loss of bio-diversity, they cannot do the same for family income and the educational status of parents. According to the study conducted by

Harland et al. (2007), needs awareness and state responsibility predict the pro-environment behavioural intention in the first stepwise of multiple regression. In the second stepwise, the variables of efficacy and ability are then predicted.

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