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## The determination of the environmental attitudes of secondary education students

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### Abstract

Environmental pollution, which has risen rapidly due to increased production resulting from developments in science and technology, threatens all living beings and natural living spaces at the present time. It is emphasized that people's life styles and approach on environment are responsible for such disruption in the environment. Environmentally-conscious individuals displaying responsible behaviors should be cultivated in order to reduce dangers arising from environmental problems. In this regard, the present study attempted to determine the environmental attitudes of students. The study involved 1003 secondary education students. The New Ecological Paradigm (NEP) Scale was used for determining environmental attitudes. It was found out that the attitudes of students were closer to eco-centric perspective than anthropocentric perspective.

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### 1. Introduction

It was realized in the late twentieth century that some widely-accepted rooted values, attitudes, and beliefs were the source of ecological problems. There are psychological, sociological, economic, and technological factors that give shape to the consumption behaviors and life styles of people (i.e. their manners of using the nature for meeting their needs). Values, attitudes, confidence and beliefs felt or adopted in regard to wealth, continuous development,

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and technological and scientific achievements (i.e. dominant social paradigm) have been described as the reason for little awareness of environmental problems (Dunlap and Van Liere 1978; Catton and Dunlap 1980; Trobe and Acott 2000). There is a shift from the dominant social paradigm, which is influential on defining the relationship between human and nature, to a more eco-centric paradigm in the individual or social interpretation of the nature within the system of all these values, beliefs, and attitudes (Dunlap and Van Liere 1978; Albrecht, Bultena, Hoiberg and Nowak 1982).

One of the scales developed for determining environmental approach is the New Ecological Paradigm Scale developed by Dunlap and Van Liere. Dunlap and Van Liere (1978) put forward the new ecological paradigm against the dominant social paradigm, which they defined as ‘anti-ecological’, and developed the above-mentioned scale in order to determine the degree to what such new paradigm was accepted. It was accepted to be a one-dimensional scale composed of 12 items. On the other hand, Furman (1998) described the dimensions of the same scale as ‘balance of nature’, ‘limits of growth’, and ‘human over nature’, and Taşkın (2009), similarly, put forward a three-factor structure for the scale (‘steady-state economy’, ‘human exemptionalism paradigm’, and ‘limits of growth and balance of nature’). In the course of time, The New Ecological Paradigm Scale was revised to involve the change in environmental problems. Since global environmental problems came to the forefront more, two more dimensions were added to the original scale theoretically, thereby leading to a 15-item new form.

The degree to what such change of paradigm is achieved (determined in the Western communities) in the Turkish society should be investigated. This is because; vigorous efforts for growth, industrialization, and enrichment in Turkey, which is a developing country, may cause ignoring environmental problems. This study focused on investigating the degree to what secondary education students accepted the new eco-centric paradigm. In this regard, the primary goal of the study was to determine the environmental attitudes of secondary education students and to predict the degree to what the change in environmental approach, whose effect is felt throughout the entire world, was reflected in students. The secondary purpose of the study was to examine the factor structure of The New Ecological Paradigm Scale used as a one-dimensional scale.

## **2. Method**

### *2. 1. Study group*

The study group consisted of 1003 students from all grades of secondary education. These students lived in Ankara, and their average age was 16. 55% of these students were male. While 57% of the students attended a vocational high school, the rest of them received education in an Anatolian high school. The students participated in the study on a voluntary basis. The study was carried out in the 2013-14 academic year.

### *2. 2. Measurement and analysis*

The 15-item revised form of the New Ecological Paradigm Scale was used as a measurement tool in the current study. The degree to what the new ecological paradigm was accepted was evaluated based on the percentage distribution of the answers given to each item and the average score. In addition, the Cronbach’s alpha internal consistency coefficient of the scale was calculated.

The items were rated as follows; 1: I strongly disagree, 2: I don’t agree, 3: I am unsure, 4: I agree 5: I definitely agree. While the items of odd numbers in the scale included opinions in favor of the new ecological paradigm (NEP), the items of even numbers involved those in favor of the dominant social paradigm (DSP). Thus, the above-mentioned rating was reversed for all statistical procedures except for percentage calculation in the items of even numbers.

## **3. Findings**

Table 1 presents the evaluations of the participants regarding each item based on percentage (%) distribution and averages.

Table 1. Percentage and mean distribution of the NEP scale items

Items-Do you agree or disagree that	SD	D	U	A	SA	M
1. We are approaching the limit of the number of people the earth can support	12.0	14.1	29.8	22.8	21.3	3.28
2. Humans have the right to modify the natural environment to suit their needs	39.0	19.8	15.9	14.1	11.2	3.62
3. When humans interfere with nature, it often produces disastrous consequences	8.6	7.6	16.7	30.3	36.8	3.79
4. Human ingenuity will insure that we do NOT make the earth unlivable	29.2	17.6	24.2	15.0	14.0	3.33
5. Humans are severely abusing the environment	8.7	8.0	16.0	26.1	41.3	3.83
6. The earth has plenty of natural resources if we just learn how to develop them	7.5	8.0	17.4	32.8	34.3	2.22
7. Plants and animals have as much right as humans to exist	6.7	5.6	12.8	19.6	55.3	4.11
8. The balance of nature is strong enough to cope with the impacts of modern industrial nations	14.3	17.7	31.7	20.9	15.4	2.95
9. Despite our special abilities, humans are still subject to the laws of nature	10.2	11.5	28.6	27.0	22.7	3.41
10. The so-called “ecological crisis” facing humankind has been greatly exaggerated	28.9	20.3	20.8	16.7	13.3	3.35
11. The earth is like a spaceship with very limited room and resources	13.3	14.1	33.3	21.9	17.4	3.16
12. Humans were meant to rule over the rest of nature	30.7	18.4	22.3	16.6	12.0	3.39
13. The balance of nature is very delicate and easily upset	8.8	10.8	20.1	25.6	34.7	3.67
14. Humans will eventually learn enough about how nature works to be able to control it	11.9	16.3	27.4	26.4	18.0	2.77
15. If things continue on their present course, we will soon experience a major ecological catastrophe	7.1	5.6	18.0	25.4	43.9	3.93
Cronbach’s Alpha: 0.60						3.38

SD: Strongly disagree, D: Disagree, U: Unsure, A: Agree SA: Strongly agree

The average score of the students participating in the study regarding their level of accepting the new ecological paradigm was found to be 3.38.

According to the table 1, the evaluation of many items contained ‘unsure’ by over 25%. Most of the items involving ‘unsure’ answers were those about the dominant social paradigm standing against the new ecological paradigm.

*Anti-exemptionalism*: It is one of the theoretical sub-dimensions covering the items 9, 4, and 14 of the New Ecological Paradigm Scale. It is based on the idea that the people who accept the New Ecological Paradigm are

supposed to reject that human being is exempt from nature and the laws of nature. In the present study, the averages of the items included in this sub-dimension varied between 2.77 and 3.40, and most of the answers in this matter contained indecisiveness.

*Anti-anthropocentrism:* It is the theoretical sub-dimension involving the view that nature exists for meeting the needs of human beings in the first place (items 2 and 12) as well as the view rejecting it (item 7). In the present study, the most accepted item was found to be ‘plants and animals have as much right as humans to exist’ (M= 4.11). According to the examination of the student answers to the items 2 and 12, although more than half of the students delivered opinions against anthropocentrism, anthropocentrism was supported by 25% in the item 2, and by 28% in the item 12.

*Limits to growth:* The New Ecological Paradigm suggests that growth and development have a limit, which is based on the limitedness of the resources in the world. In line with this view, the item 1 puts an emphasis on population increase, and the item 11 highlights the limitedness of resources via an analogy likening the world to a spaceship. The item 6, which is based on this theoretical background, stands as a negative item suggesting that the world has plenty of resources. 30% and 33% of the participants said ‘unsure’ for the item 1 and the item 11 respectively. On the other hand, while almost half of the students agreed that population increase was about to exceed the capacity of the world, fewer students agreed with the world-spaceship analogy based on limited resources. In parallel with that, 68% of the students agreed, ‘the earth has plenty of natural resources if we just learn how to develop them’.

*Balance of nature:* NEP claims the existence of a balance that can be disrupted by human beings. The items 3, 13, and 8 of the scale are about the theoretical sub-dimension of balance of nature. While 67% of the students agreed with the item 3 suggesting, ‘When humans interfere with nature, it often produces disastrous consequences’, 60% of the students agreed with the item 13 stating, ‘The balance of nature is very delicate and easily upset’. On the other hand, while 32% of the students rejected, ‘The balance of nature is strong enough to cope with the impacts of modern industrial nations’ (a dominant social paradigm perspective), a considerable number of the students (30%) were unsure about it.

*Eco-crisis:* NEP argues that human intervention in nature may lead to negative results at a disaster level that might be described as an eco-crisis. The items 5, 10, and 15 of the scale are about the theoretical background of eco-crisis. 41% of the students strongly agreed with the item 5, ‘Humans are severely abusing the environment’ while 26% of the students agreed with it. 48% of the students rejected the idea, ‘The so-called ‘ecological crisis’ facing humankind has been greatly exaggerated’. Likewise, 44% of the students strongly agreed with the item 15, ‘If things continue on their present course, we will soon experience a major ecological catastrophe’ while 25% of them agreed with it.

### 3. 1. Dimensionality of NEP-scale

Although the revised New Ecological Paradigm Scale was designed to be a five-dimensional scale, Dunlap et al (2000) stated that it might be considered one-dimensional as it had a high Cronbach’s alpha value and a strong item total correlation. However, no high Cronbach’s alpha value and no strong item total correlation were obtained in the present study conducted on Turkish population. Thus, the data set obtained from the scale was analyzed via the principal component analysis factor extraction method, and a Varimax rotation was applied. Through the analysis, a four-factor structure which explained 54% of the variance and where eigen values varied between 3.30 and 1.08 was obtained. However, the items were not distributed among the factors in accordance with the theoretical structure, and only one item was included in the fourth factor. Therefore, the scale was considered to have a two-factor structure (one factor comprising of items in favor of NEP and one factor composed of items in favor of DSP against NEP). To determine the distribution of the items among factors, exploratory factor analysis was repeated to produce

a two-factor structure. The two-factor structure explained 40% of the variance. The eigen values varied between 3.30 and 2.72. Table 2 shows the factor loadings and distribution of the items.

Table 2. The Factor Loading Distribution of the Items of the New Ecological Paradigm Scale

Items	NEP	DSP
7. Plants and animals have as much right as humans to exist	<b>0.720</b>	0.069
15. If things continue on their present course, we will soon experience a major ecological catastrophe	<b>0.697</b>	0.079
3. When humans interfere with nature, it often produces disastrous consequences	<b>0.678</b>	0.003
13. The balance of nature is very delicate and easily upset	<b>0.613</b>	-0.043
5. Humans are severely abusing the environment	<b>0.572</b>	0.081
1. We are approaching the limit of the number of people the earth can support	<b>0.569</b>	-0.053
9. Despite our special abilities, humans are still subject to the laws of nature	<b>0.530</b>	-0.259
2. Humans have the right to modify the natural environment to suit their needs	0.032	<b>0.701</b>
10. The so-called “ecological crisis” facing humankind has been greatly exaggerated	0.063	<b>0.698</b>
12. Humans were meant to rule over the rest of nature	0.125	<b>0.689</b>
4. Human ingenuity will insure that we do NOT make the earth unlivable	0.085	<b>0.682</b>
8. The balance of nature is strong enough to cope with the impacts of modern industrial nations	-0.183	<b>0.611</b>
14. Humans will eventually learn enough about how nature works to be able to control it	-0.170	<b>0.546</b>
	Cronbach’s Alpha:	0.75      0.74
	M:	3.72      3.25

Since the loadings of the items 6 and 11 were not found to be as expected in the first exploratory factor analysis, both of these items were removed. Then the exploratory factor analysis was repeated, and it was seen that the items of odd numbers in the scale were distributed to support the new ecological paradigm while the items of the even numbers were distributed to support DSP against NEP. It was found out that the Cronbach’s alpha values of two sub-scales (NEP and DSP) were higher than the internal consistency coefficients obtained in the one-dimension structure of the scale.

#### 4. Discussion and Conclusion

This study aimed at determining the environmental attitudes of the students within the framework of the new ecological paradigm. To this end, the students’ levels of agreeing with each item were evaluated based on percentages and average scores through the theoretical sub-dimensions of The New Ecological Paradigm (NEP) scale. It was determined that more than half of the students agreed with the items in favor of the new ecological paradigm. Especially the average scores related to the items included in the dimension of the new ecological paradigm (NEP) determined through factor analysis demonstrated that the students agreed with such items in favor

of nature. On the other hand, the items in favor of the dominant social paradigm (DSP) were neither accepted nor rejected by the students. In other words, there was indecisiveness about the dominant social paradigm among the students. Similarly, Erdogan (2009) carried out a study on university students by using The New Ecological Paradigm (NEP) Scale, and found out that while the new ecological paradigm items were supported, the dominant social paradigm (DSP) items were rejected. Thapa (2001) reported similar results, too.

The item 6 of the scale (The earth has plenty of natural resources if we just learn how to develop them) was the most-accepted item in favor of the dominant social paradigm. It was removed from the scale as it was found not to have the requested factor loading during factor analysis. Similarly, Taskin (2009) removed the item 6 from factor analysis. Erdogan (2009) argued that the items 1, 6, and 11 were not determinative for Turkish culture, and thus suggested revising or removing them. In this study, the items 11 and 6 were removed because they did not have appropriate factor loadings. Although the dimensionality (i.e. one-dimension or two-dimension) of The New Ecological Paradigm Scale seems to be controversial, it is accepted, based on a high internal consistency coefficient and a strong item total correlation, that all items express a particular attitude system (Dunlap et al. 2000). However, the results of the present study and Erdogan (2009) make it difficult to consider the scale a one-dimensional scale because it does not yield high internal consistency coefficient in the case of samples from the Turkish society and some items are problematic. Therefore, it is thought that the scale should have a two-dimensional structure (dimensions named New Ecological Paradigm and Dominant Social Paradigm). In this way, two sub-scales having much stronger internal consistency coefficients may provide a more accurate measurement of the perspective (i.e. new ecological paradigm or dominant social paradigm) to which environmental attitudes are closer.

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