

Full Length Research Paper

Testing the new ecological paradigm scale: Turkish case

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This study was designed to test the reliability and dimensionality of the revised New Environmental Paradigm (NEP) scale constructed by Dunlap et al., (2000) and to examine the extent to which university students in Turkey are endorsing the NEP. A sample of 1295 undergraduate students from four universities in Turkey was selected for the study. Students' worldviews were measured by the NEP scale which consisted of 15 statements. A self-administered survey questionnaire was used to collect the necessary data. Findings from the study indicate that there is no widespread support for the NEP: 56.0% of students hold pro-NEP views while 24.9% embrace pro-DSP views and 19.1% have ambivalent views. It was found that the NEP scale has low consistency and four dimensions, thus, the NEP items should be taken cautiously as a single (unidimensional) internally consistent measuring device. It was concluded that the NEP scale should be carefully constructed and evaluated according to the historical and cultural context and characteristics of the population under study.

Key words: Environmental worldviews, dominant social paradigm, new ecological paradigm, ecology, environmental measurement.

INTRODUCTION

People all over the world have increasingly witnessed nuclear accidents, oil spills, mismanagement of solid and hazardous waste, depletion of resources, environmental deterioration, global warming, environmentally induced deadly diseases and other environmental problems since 1970s. With mounting awareness along with environmental problems, it was recognized that humans are not immune to ecological constraints and future generations and ecosystem are in jeopardy (Bodur and Sarigollu, 2005; Cordano et al., 2003; Talay et al., 2004; Taskin, 2009; Vlek and Steg, 2007).

Critical researchers argue that the mode and relations of industrial production, distribution and consumption are responsible for the environmental crisis (Duffy, 2000; Wilson et al., 2008). Others put forward that there are set of basic beliefs and values behind the problem of the ecological crisis (Dunlap and Van Liere, 1978; Noe and Snow, 1990) and that a long tradition of an anthropocentric worldview was established in the western world along the history of industrialization and disseminated to the other parts of the world (Martinez et al., 2008). According to the anthropocentric view: (a) Humans are superior and above nature; (b) There is abundance of

natural resources and there is no need for conservation; (c) Human beings, by virtue of possessing culture and technology, are able to adapt nature to human ends, rather than adapt to the natural environment (Dunlap 1980); (d) Social sciences considered humans as exempt from ecological constraints. These views had been manifested in a set of beliefs and values, called the Dominant Social Paradigm (DSP). It entails: (1) A belief in limitless resources, continuous progress, and the necessity of growth; (2) Faith in the problem solving abilities of science and technology, and (3) Strong emotional commitment to a laissez-faire economy and to sanctity of private property rights (Albrecht et al., 1982).

With an increasing sensitivity toward, and concern for the environment, a shift from the DSP to the ecocentric New Environmental Paradigm (NEP) has emerged. The NEP worldview is based on (1) High valuation of nature, (2) Generalized compassion toward other species, other peoples and other generations, (3) Careful planning and acting to avoid risks to humans and nature, (4) Recognition that there are limits to growth to which humans must adapt, (5) New society with cooperation, openness and participation, and (6) Consultative and

participatory new politics emphasizing on foresight and planning (Milbrath, 1984).

Concurrently, studies about environment have proliferated. Using the assumption that the nature of environmental condition depends on the character of people's way of life, most studies have concerned with the existing environmental conditions and organizations' and people's use of and disposition toward their environment. At the same time, new measurement techniques were developed. Dunlap and Van Liere (1978) constructed a 12-item scale to measure the extent to which people are endorsing this new worldview. They argued that their NEP scale is reliable, valid and unidimensional. Many studies attempted to test the NEP scale and found that the NEP scale proved to be a reliable scale and a valid tool to measure environmental values (Fransson and Garling, 1999; Olli et al., 2001). Some studies argue that the degree to which the original NEP scale remains a valid and reliable measurement tool is open to discussion (Lalonde and Jackson, 2002). However, most researchers found that the NEP scale is not unidimensional. Contrary to Dunlap and Van Liere's (1978) assertion that it is appropriate to treat all 12 items as forming an internally consistent and unidimensional NEP scale, Gooch (1995), Bechtel et al. (1999) and Nooney et al. (2003) found two dimensions, whereas Manoli et al. (2007) found three dimensions. Furthermore, La Trobe and Acott (2000) found four dimensions, while Lück (2003) found five dimensions. The multidimensional nature of the NEP scale suggests that environmental attitudes of any kind are more complex than was originally thought. Researchers suggest that there is not enough evidence for a definite number of dimensions and further research in that area is recommended (Lalonde and Jackson, 2002). Such differing conclusions raise the question of the reliability and dimensionality of the scale in different societies like Turkey.

Some researchers have used the NEP scale in its original and complete form (Lalonde and Jackson, 2002; Noe and Snow, 1990). Most researchers used only parts of the NEP scale or revised some statements to reflect the particular focus of their study (Lück, 2003; Rideout et al., 2005; Bechtel et al., 2006). Moreover, some researchers studied each factor individually when using the original NEP (Ebreo et al., 1999; La Trobe and Acott, 2000). They extracted subsets of items to use as stand-alone measures of environmental concern. Dunlap et al. (2000) came up with important revisions and renamed the New Environmental Paradigm as the New Ecological Paradigm (revised NEP).

Studies using the original and revised NEP also focused on selected groups of people, including students, in order to provide information on the nature of environmental worldviews. Most researchers (Aytülkaspoglu and Ecevit, 2002; Johnson et al., 2004; Poortinga et al., 2004; Tuna, 2004) conducted cross-sectional

analyses using various socio-demographic, cultural, attitudinal and behavioral variables. Some researchers (Nooney et al., 2003; Rideout et al., 2005; Bostrom et al., 2006) worked with a single selected population and tried to determine the character of general distribution and test the scale. Some others (Bechtel et al., 2006; Rauwald and Moore, 2002; Leung and Rice, 2002) were also interested in cross-national or cross-cultural comparisons.

Studies about the character of environmental orientations, worldviews, opinions, attitudes and behaviors in the countries outside the developed world have been steadily increasing in recent years. Some of them have focused on the differences due to the different structure of worldviews, beliefs and attitudes. For instance, Bechtel et al. (2006) indicated that their results "support the idea of particular psychologies that are culture-dependent as Triandis (2000) and Yang (2000), among others, suggest." Similarly, some studies also found that the internal consistency of the New Ecological/Environmental Paradigm scales varies across cultures (Bostrom et al., 2006). Such findings imply that there is a high probability that the reliability and dimensionality of the revised NEP scale will differ in Turkish culture, too.

In Turkey, environmental problems have increased rapidly since mid 1970s. Urban and especially rural landscapes have been rapidly changing. Agricultural lands have been diminishing in size because of the unplanned, scattered and disruptive developments expanding to the open countryside. The 1990s and 2000s represent important changes in environmental consciousness, attitudes and behavior of Turkish people (Erdogan and Baris, 2007; Talay et al., 2004; Taskin, 2009). However, the adequate awareness of industries and people on environment is still yet to develop. The present and future of the environment and human race lie in taking necessary precautions by means of educating environmentally aware and concerned young generations, advancing the environmental measurements and applying proper policies. Like other related fields, landscape architecture profession has important role in the stewardship of environmental planning. The most important issue facing landscape architects and all parties concerned with environmental protection, planning and designing in the 21st century is to preclude and remedy, preserve and build more livable and sustainable communities and find ways and means to integrate current economic and political thinking with ecological reality.

Thus, there is increasing need to conduct academic and administrative studies in Turkey. The objectives of this study are to explore the environmental worldviews of Turkish university students, assess the reliability and dimensionality of the Revised NEP scale in Turkish culture, and, thus, contribute to the need for environmental knowledge which is useful for academicians, policy makers, field workers and organizations. Students were chosen as study population, because they are the

future of the society and have been the leading crusaders in the modern environmental movements throughout the world.

METHODS

Study population and sample

The study population of this survey research consisted of 1295 students from one private (Baskent University, Ankara) and three state universities (Ankara University, Ankara; Mustafa Kemal University, Hatay; Karadeniz Teknik University, Trabzon). A convenient sample of 145 students from Mustafa Kemal University, 107 from Karadeniz Teknik University and 102 from Ankara University and a simple random sample of 941 students from Baskent University were selected for the study.

Each participant freely consented to the self-filled survey questionnaire which was administered by the surveyor-students. Data were collected during the 2006 - 2007 academic year.

Measurement and analysis

The study used the revised NEP scale which included 15 items. It is one of the most widely used and scrutinized methods to measure environmental orientation, attitudes and behavior.

Socio-demographic variables included gender, school status and Socio-economic status (SES).

Mean scores for central tendency and frequency analysis for evaluation of distributions were used. Besides providing the percent and mean distributions for every item on the study scale, summary-indexes were developed in order to determine the overall environmental orientation: Two types of summary-indexes were constructed in order to obtain the average distributions from the 15 items: (1) An overall environmental orientation index was calculated by averaging the mean scores of 15 items. (2) Frequency distribution indexes for each column were calculated by averaging the column scores. These summary-indexes were calculated in order to provide (a) A general central tendency score of students on the mean distributions of the 15 items, and (b) General frequency distribution scores on each level of 5 scale ordinal measurement. This is not done in order to test the scale, but to summarize the responses of students further.

Cronbach's alpha was used to test the reliability of (a) The 15 item NEP scale, thus, measure the extent to which the NEP scale will yield the acceptable level of score when administered in different times (2008), locations (Turkey) and populations (Turkish university students). High or low alpha score in the study does not mean that the study scale is unidimensional or multidimensional.

We could have a high Cronbach's alpha even if our scale is not unidimensional. That is why, the principal components analysis and varimax factor rotation were carried out in order to find out the existence of dimensions. An eigenvalue of 1.00 was stipulated for factor identification.

The items that formed the NEP scale can be seen in Table 1. Each item was measured on a scale ranging from 1 to 5. All pro-NEP responses were expected to be relatively high scores and all DSP responses were expected to be relatively low score. Agreement with the eight odd-numbered items indicates pro-NEP orientation; therefore, responses were scored as 5 = strongly agree, 4 = mildly agree, 3 = unsure, 2 = mildly disagree, and 1 = strongly disagree. Agreement with the seven even-numbered items indicates pro-DSP orientation. Therefore, the scores were reversed for these seven items for the statistical analyses.

Findings

The respondents comprised of 37.6% first year, 32.3% second year, 16.8% third year and 13.4% fourth year students. The majority of them (54.7%) were female. Their ages ranged from 17 to 28, with 93.6% between 18 and 24 years of age. Household income distribution was as follows: 38.8% less than 1500 Turkish Lira (TL), 32.2% between 1501-3000 TL and 29.0% over 3000 TL per month.

Environmental worldviews

The environmental worldviews of the students were determined by providing percentage distribution, mean scores and indexes of the students' NEP scores (Table 1). The mean score for the 15 items, after correcting for the directionality of the items (that is, pro-NEP views are represented as higher numbers), was found to be 3.50 (out of a possible 5) which indicate that the overall orientation of students falls at the lower rank of pro-NEP scale. 28.6% of the students have strong and 27.4% have mild pro-NEP view, whereas 24.9% show mild to strong DSP views. Moreover, a significant amount of students (19.1%) have ambivalent views on the environmental issues.

The mean scores for eight pro-NEP items range from 3.40 to 4.58, whereas, the mean scores for seven DSP items range from 1.60 to 3.78. Frequency distributions on the Pro-NEP items show that three thirds of students (75.3%) agreed on these statements, whereas only 10.5% disagreed. Conversely, distributions on the pro-DSP items reveal that 45.6% agreed with the statements, while there are considerable numbers of disagreeing (28.6%) and undecided (25.8%) students.

Hence, examination of the overall frequency and mean

Table 1. Frequency and mean distribution of the NEP scale items^a.

NEP items	% distribution					N	Mean ^b
	SD	MD	U	MA	SA		
1. We are approaching the limit of the number of people the earth can support.	7.5	8.5	22.0	33.5	28.5	1273	3.67
2. Humans have the right to modify the natural environment to suit their needs.	38.6	26.5	15.1	13.6	6.2	1289	3.78
3. When humans interfere with nature it often produces disastrous consequences.	5.2	9.3	13.9	35.4	36.2	1286	3.88
4. Human ingenuity will insure that we do not make the earth unlivable.	8.5	16.8	34.6	25.2	14.9	1278	2.79
5. Humans are severely abusing the environment.	3.6	6.1	6.5	35.3	48.4	1288	4.19
6. The earth has plenty of natural resources if we just learn how to develop them.	2.3	3.0	7.8	26.4	60.5	1287	1.60
7. Plants and animals have as much right as humans to exist.	2.4	2.4	4.2	16.5	74.5	1291	4.58
8. The balance of nature is strong enough to cope with the impacts of modern industries.	18.3	27.9	28.8	16.6	8.4	1286	3.31
9. Despite our special abilities humans are still subject to the laws of nature.	4.7	7.5	20.6	37.9	29.2	1289	3.79
10. The so-called "ecological crisis" facing humankind has been greatly exaggerated.	29.3	30.0	25.5	11.1	4.1	1292	3.69
11. The earth is like a spaceship with very limited room and resources.	9.1	13.7	23.2	35.7	18.2	1283	3.40
12. Humans were meant to rule over the rest of nature	31.3	22.2	19.6	18.7	8.2	1283	3.50
13. The balance of nature is very delicate and easily upset.	3.1	12.0	14.6	35.7	34.6	1289	3.87
14. Humans will eventually learn enough about how nature works to be able to control it.	6.4	10.2	30.0	32.1	21.3	1279	2.48
15. If things continue on their present course, we will soon experience a major ecological catastrophe.	2.9	4.8	19.9	36.8	35.6	1290	3.97
overall Index ^c	11.5	13.4	19.1	27.4	28.6	1285	3.50

^aSD = Strongly disagree, MD = Mildly disagree, U = Unsure, MA = Mildly agree, SA = Strongly agree;

^bMean Likert scores after adjustment for direction. Higher score indicates pro-NEP worldview;

^cPro-NEP worldview index for frequency distributions was calculated by allowing for the reversed direction of even-numbered items.

distributions reveals that majority of students support for the NEP statements to varying degree, but there is no widespread support for pro-NEP view in general.

Findings on the statements are as follows:

Anti-exemptionalism: The NEP assumes that people reject the human exemptionalism which is based on the worldview that humans are exempt from the constraints of nature. This view supports the human domination and domination of economy over nature. Findings on items 4 (Human ingenuity will insure that we do not make the earth unlivable) indicate that 25.3% of the students have mild (16.8%) to strong (8.5%) anti-exemptionalist worldview, whereas 40.1% students have exemptionalist views and 34.6% have ambivalent opinions. Similarly, 16.6% of them have mild (10.2%) to strong (6.4%) anti-exemptionalist worldview, whereas 53.4% students have exemptionalist views and 30.0% have ambivalent opinions on the item, 14 stating that humans will eventually learn enough about how nature works to be able to control it. It seems that more students have trust in

human ingenuity and ability to overcome the constraints of nature. However, over two thirds of them (67.1%) believe that "despite our special abilities, humans are still subject to laws of nature" (item 9).

Anti-anthropocentrism: The NEP does not accept the idea that nature exists primarily for human use and has no inherent value of its own (item 12), and humans have the right to modify the natural environment to suit their needs (item 2). Over one third of the students (35.0%) strongly and 24.3% mildly oppose anthropocentric view (items 2 and 12). There is still considerable number of supporters (23.4%). The Anti-anthropocentric statement about the right of existence of plants and animals (item 7) is supported by the vast majority (91.0%). This result suggests that one does not have to be an environmentalist in order to acknowledge the right of existence of plants and animals.

Limits to growth: The NEP is concerned with equity and development issues (item 6), limits to human interference

Table 2. Item-total statistics (n = 1295).

NEP Items	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
1. We are approaching the limit of the number of people the earth can support.	0.192	0.090	0.508
2. Humans have the right to modify the natural environment to suit their needs.	0.237	0.122	0.497
3. When humans interfere with nature it often produces disastrous consequences.	0.257	0.139	0.494
4. Human ingenuity will insure that we do not make the earth unlivable	0.140	0.106	0.519
5. Humans are severely abusing the environment.	0.228	0.182	0.501
6. The earth has plenty of natural resources if we just learn how to develop them.	-0.242	0.256	0.580
7. Plants and animals have as much right as humans to exist.	0.234	0.310	0.502
8. The balance of nature is strong enough to cope with the impacts of modern industrial nations.	0.285	0.140	0.487
9. Despite our special abilities humans are still subject to the laws of nature.	0.090	0.072	0.529
10. The so-called "ecological crisis" facing humankind has been greatly exaggerated.	0.338	0.159	0.476
11. The earth is like a spaceship with very limited room and resources.	0.113	0.067	0.526
12. Humans were meant to rule over the rest of nature.	0.278	0.158	0.486
13. The balance of nature is very delicate and easily upset.	0.260	0.163	0.494
14. Humans will eventually learn enough about how nature works to be able to control it.	0.045	0.107	0.538
15. If things continue on their present course, we will soon experience a major ecological catastrophe.	0.363	0.237	0.476

with nature (item 11) and limits to population growth with regard to carrying capacity of the earth (item 1). An examination of this dimension reveals that over half of the students (58.0%) embrace beliefs about population control (62.0%) and conservation of resources (53.9%). However, most students (86.9%) accept the DSP idea of unlimited resources and learning to use them (item 6), thus, give support to the assumption that some people are less accepting of the NEP valuation of nature and more aligned with the DSP value on economic growth.

Balance of nature: The NEP holds the idea that there is balance in nature and human interference endangers this balance. The items 3 and 13 spotlight the negative consequences of human interference and the delicate character of nature. 71.0% students agreed with these two statements, whereas 14.9% disagreed. Item 8 provides a DSP view: 46.2% disagree and 25.0% agree with the statement that the balance of nature is strong enough to cope with the impacts of modern industries.

Eco-crisis: The NEP stresses on human dependence to nature and disastrous outcome of human interference to nature. The great majority of students (78.1%) agree with two statements about human abuse (item 5) and probable ecological catastrophe (item 15). Similarly, 59.3% disagreed and 15.2% agreed that the ecological crisis has been

greatly exaggerated (item 10).

Assessing the NEP: Reliability and Dimensionality

The objective of the study was to test the reliability of the revised NEP scale and determine the dimensionality in order to find out if the 15 items can be treated as measuring a single construct in Turkish case.

A reliability coefficient of 0.70 or higher is considered "acceptable" in most research situations. The coefficient, alpha for 15 items was rather low (53). Similarly, the findings on the corrected item-total correlations for each item show very low to low correlations, ranging from .045 to .364 (Table 2). The removal of items with low correlation changed the alphas of the scale up to 0.58. This result indicates that the NEP scale has low consistency in Turkish case. A high degree of internal consistency indicates that a set of items can be combined into a single measure and item responses constitute a reasonably consistent worldview.

In order to check the possible dimensionality, the factor analysis was used. Principal components analysis using varimax factor rotation produced four factors with eigenvalues of more than 1 (Table 3).

The total amount of variance in the original data set that the new factors accounted for was 44.79%. In other

Table 3. Total variance explained.

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative (%)	Total	% of Variance	Cumulative (%)
1	2.609	17.392	17.392	1.931	12.875	12.875
2	1.781	11.874	29.267	1.706	11.375	24.250
3	1.269	8.463	37.730	1.623	10.821	35.071
4	1.059	7.062	44.792	1.458	9.721	44.792
5	.948	6.320	51.112			
6	.910	6.070	57.182			
7	.901	6.004	63.186			
8	.877	5.849	69.035			
9	.772	5.146	74.181			
10	.732	4.880	79.060			
11	.722	4.812	83.872			
12	.699	4.657	88.529			
13	.633	4.219	92.748			
14	.593	3.955	96.704			
15	.494	3.296	100.000			

Extraction method: Principal component analysis.

Table 4. Principal component analysis of NEP items with varimax rotation.

NEP items	Dimensions	Factors			
		1	2	3	4
2	Anti-anthropocentrism	0.534	.096	.257	-0.151
8	Fragility of nature's balance	0.610	0.189	0.047	-0.126
10	Possibility of eco-crisis	0.573	0.235	-0.021	0.084
12	Anti-anthropocentrism	0.651	-0.117	0.071	0.065
14	Anti-exemptionalism	0.440	-0.400	-0.242	0.107
1	Limits to growth	0.066	0.540	0.026	0.070
11	Limits to growth	-0.061	0.582	-0.052	-0.011
13	Fragility of nature's balance	0.111	0.579	0.138	0.163
15	Possibility of eco-crisis	0.202	0.617	0.070	0.290
4	Anti-exemptionalism	0.435	-0.162	-0.462	0.297
6	Limits to growth	-0.047	-0.030	-0.767	-0.214
7	Anti-anthropocentrism	0.201	0.046	0.749	0.252
3	Fragility of nature's balance	0.050	0.212	0.030	0.666
5	Possibility of eco-crisis	0.097	0.099	0.309	0.573
9	Anti-exemptionalism	-0.153	0.052	0.084	0.558

words, these four factors explain 44.79% of the total variance. Each of the four factors contains at least two of five NEP dimensions which include issues of (1) Fragility of nature's balance, (2) Possibility of eco-crisis, (3) Anti-anthropocentrism, (4) Anti-exemptionalism and (5) Limits to growth (Table 4). These results show that the NEP scales is multidimensional measuring at least five NEP dimensions.

The first one of these four factors contains five related dimensions focusing on the issues of fragility of nature's balance, possibility of eco-crisis, anti-anthropocentrism and anti-exemptionalism. These five dimensions include one item on the possibility of eco-crisis (item 10), the fragility of nature's balance (item 8) and anti-

exemptionalism (item 14), and two anti-anthropocentrism items (items 2 and 12).

The second factor has 4 items and includes two items on the limits to growth (items 1 and 11), one item on the fragility of nature's balance (item 13) and one item on the possibility of eco-crisis (item 15).

The third factor includes one item on the anti-exemptionalism (item 4), one item on the limits to growth (item 6) and one item on the anti-anthropocentrism (item 7).

The fourth factor is about the human dependence to nature (anti-exemption), disastrous outcome of human interference to nature (eco-crisis). It consists of one item on the anti-exemptionalism (item 9), one item on the

possibility of eco-crisis (item 5) and one item on the fragility of nature's balance (item 3).

All the above findings indicate that the NEP Scale can not be readily accepted as a unidimensional measure of ecological worldview. It has more than one dimension and each dimension (even each item in some cases) should be evaluated separately.

Discussion and Conclusion

The purpose of the study was to test the consistency and dimensionality of the NEP scale through assessing the students' environmental worldviews.

Supporting the results of previous studies (Thapa, 2001), the present study results show that majority of students (56.0%) hold pro-NEP views. However, about one fourth of students have pro-DSP oriented ideas in varying degree. Furthermore, one of five students can not decide on environmental issues. Thus, these results indicate that there is no widespread adoption of the NEP orientation by students. Students approve some statements of the NEP scale while disapproving other parts of it. For some, the different constituent parts seem unrelated. Moreover, there are some items that respondents probably can not relate to without hesitation. For instance, the item 11 uses "spaceship with very limited room and resources" metaphor. Moreover, some people may agree with "limited room" idea, but disagree with "limited resources." It seems that this usage confused respondents and prevented a stronger support for the item 11, because 23.2% of students were unsure and 22.8% disagreed, while only 18.2% strongly agreed. Lalonde and Jackson (2002) indicated that the spaceship metaphor of the 1970s has been replaced by the more abstract, but scientific, notion of carrying capacity. The item 1 implicitly refers to the rapid population growth, but it has little to do with environment except the carrying capacity. The problem with this statement is not because human population growth is a serious concern that is not addressed adequately, but because it is everybody's concern for different reasons. For instance, the fear of population growth which is imposed by Malthusian claim plays a supportive functional role in the process of population control policies. Furthermore, agreeing or disagreeing with the items 1, 6 and 11 does not necessarily make a person a supporter of the NEP (or DSP) view, at least in Turkish culture. These three items should be reconsidered, revised or eliminated.

Supporting the findings of Nooney et al. (2003), Manoli et al. (2007), La Trobe and Acott (2000), Lück (2003), Lalonde and Jackson (2002), the present study found that the NEP scale has more than one dimension and each dimension (even each item in some cases) should be evaluated separately. Acknowledging this possibility, Dunlap et al. (2000) indicated that Differing populations will no doubt vary in the degree to which the NEP

beliefs are organized into a highly consistent belief system, and in many cases it will no doubt be more appropriate to treat the NEP as multidimensional.

The multidimensional nature of the NEP scale suggests that environmental attitudes/views of any kind are more complex than was originally thought. The detection of more than one dimension does not detract from the usefulness of the NEP scale. Any of the individual factors can be used as a unique and separate scale. However, it seems that there should be few extractions from and new additions to the NEP scale in order to treat it as a measure of coherent belief system or worldview.

Findings from the present study also suggest that the set of 15 NEP items should be taken cautiously as an internally consistent measuring device in, at least, different socio-cultural environments, because alpha test is low and all 15 items have weak item-total correlations. Furthermore, low inter item correlations and low factorial loadings indicate that the NEP scale in measuring the attitudes/worldviews on wide range of ecological/environmental issues might have construct and/or predictive validity problems.

It further appears that the original and revised NEP scales, like many similar instruments, are products of a certain organized space and time with respect to their conceptual content and formulation of issues in selected statements. Therefore, using the unmodified scale in different cultures may be problematic, e.g., in terms of reliability and validity. As Gooch (1995) indicated, modern research into environmental values is predominantly western in origin and the DSP and the NEP as theoretical concepts have been formulated and developed in the United States. Similar concern was addressed by some other studies (Noe and Snow, 1990; Schultz et al., 2000) that found significant cultural differences in the NEP scale. Similarly, findings which are related with reliability and dimensionality are probably due to the contextual (cultural and historical) character of the study population. If it is to continue to be a useful measurement instrument, the NEP statements should include contextual items on current environmental concerns, such as global climate change, air pollution, water pollution, deforestation, reductions in biodiversity and sustainable development. Researchers should also be concerned with the causes such as the mode and relations of mass production and conspicuous consumption and with mechanical, technocratic and structural solutions.

Although, there are studies that found relationship between the NEP and behaviors (Ebreo et al., 1999), as Lück (2003) indicated One may conclude that even though the majority of the population is endorsing the NEP, their actions in reality might be far away from their good intentions.

A quantitative measurement of the response may be insufficient to determine respondents' true attitude and behavior which cannot be revealed by the NEP statements. Similarly, the ex-post-facto verbal manifesta-

tions of thoughts, values and attitudinal dispositions about the statements in a study may not truly reflect a person's daily life practices. Depending on the manifest content (text) or verbal response is the general problem of the quasi-experimental survey research.

Furthermore, traditionally, some researchers assume that there is a causal relationship between ideas (values, attitudes) and behavior. Various studies (Gregory and Leo, 2003; Boman and Mattsson, 2008) show that attitudes, beliefs, opinions, ethics, awareness and knowledge do not necessary and automatically lead to environmentally conscious behavior. There are many strong intervening variables such as personal interest, high risk, fear, feelings, power relations, authority and control that may override the attitudes, ideas, ethics, values and thoughts. Significant causal and intervening variables should be sought and studied by using multi-factorial designs.

Although this study provides fresh information on the subject, additional research in different settings is needed before definite conclusions can be made about the worldviews and the NEP scale. First, the present study was limited to a sample of university students. Additional research should be designed to include different samples representing other populations from different geographical and cultural locations, regions and nations. It would be ideal to design a longitudinal observational study. Second, the study was limited to a principal level of a research design which is needed in social and scientific environments that lack the culture-bound distributional and descriptive information. Future studies, even if they use socio-demographic variables for, e.g., cross-sectional comparisons, should extract hypotheses through theoretical reasoning based on the accumulated knowledge about the subject.

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