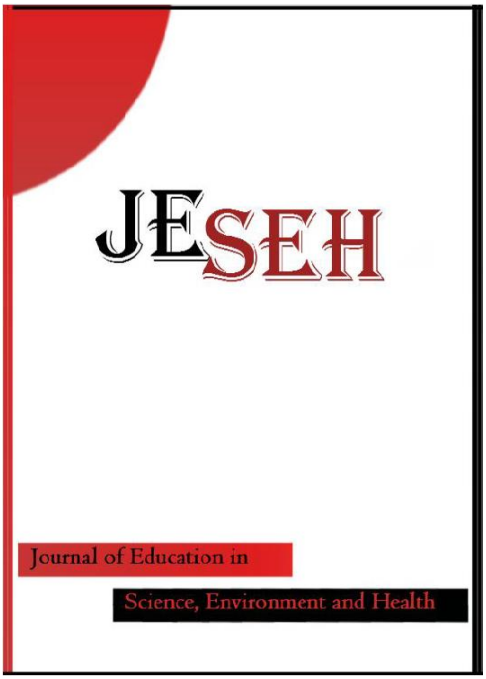

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Environmental Attitude Scale for Secondary School, High School and Undergraduate Students: Validity and Reliability Study

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Abstract

The purpose of this study was to develop a valid and reliable "Environmental Attitude Scale" (EAS) for secondary school (5th, 8th grade), high school (11th) and undergraduate college students. The reliability and validity studies of the scale were carried out in three different countries (Finland, USA and Turkey). The sampling size was 1687 students. For the construct validity, exploratory factor analysis (EFA) was run and in order to test the accuracy of the obtained factor structure. The scale was composed of three sub scales: "Environmental Behaviour Sub Scale (EBSS)", "Environmental Opinion Sub Scale (EOSS)" and "Environmental Emotion Sub Scale (EESS)". The EBSS and EESS consist of two factors each and the EOSS consists of one factor. The EBSS had 13 items, EOSS 11 items and EESS 16 items, all using a 5-point Likert scale. The Cronbach alpha reliability coefficient for the whole scale was found to be α=.94, and reliability coefficient of the first subscale was found to be α=.91, second subscale α=.82 and third subscale α=.94 and the Spearman Brown coefficients were found to be .85, .83, .80 and .85, respectively. Reliability and validity results of the study show that the "Environmental Attitude Scale" can be used to measure the environmental attitudes of the different levels of students.

Introduction

Before designing effective environmental education programs, it is necessary to investigate the variables that are important in the development of environmental literacy. Environmental knowledge, attitudes, and behaviors have been studied in a variety of ways in environmental education and psychology. Milfont and Duckitt (2010) pointed out environmental attitudes as a crucial construct in environmental psychology but there is still lack of knowledge how the same environmental attitudes scales can be used in different countries. Attitudes are a latent construct and as such cannot be observed directly. Thus, rather than being measured directly, attitudes have to be inferred from overt responses (Himmelfarb, 1993). The techniques of attitude measurement can be broadly organized into direct self-report methods and implicit measurement techniques (Krosnick, Judd, & Wittenbrink, 2005). Studies measuring EA have generally used direct self-report methods (e.g., interviews and questionnaires), and much less frequently implicit techniques (e.g., observation, priming and response competition measures) (Milfont and Duckitt, 2010).

Environmental education is a process of clarifying thoughts and values to develop important attitudes and skills for people to understand and appreciate the relations between the culture and bio-physical environment (Palmer, 1998). Palmer (1998) emphasized that students should acquire an appropriate range of knowledge, understanding, and concepts about the environment so that critical judgment can be achieved for one's behavior toward the environment. Further, experiences and reflection in the natural environment should be allowed to refine "environmentally focused skills, … further relevant knowledge, and development of appropriate attitudes and environmental awareness" (p.146). These three components of attitude, knowledge, and awareness, play an important role on students' behaviors throughout their lives inside and outside of classrooms.

Holahan (1982, p.92) described environmental attitudes as "people's favorable feelings toward some feature of the physical environment or toward an issue that pertains to the physical environment". This description includes only favourable aspects. However, should both favourable (positive) and unfavourable (negative) feelings be included, this statement may serve as a basis for a relationship between human beings and the natural environment. Differences in this relationship can be traced to different perspectives regarding whether humans are an integral part of nature, each depending on the other for survival; or whether humans are in some way

superior to nature, and hence have the right to dominate and exploit the natural world regardless of the consequences (Ponting, 1991).

Orr (1992) reflected upon the concept of forming attitudes in order to build on ecological literacy. This ecological literacy should not be interpreted as the knowledge of facts and concepts only, but "the knowledge necessary to comprehend interrelatedness, and an attitude of care or stewardship" (p.92). Therefore "knowledge, the attitude of caring, and a practical competence are the basis of an ecological literacy" (Orr, 1990, p.51). Measures of environmental attitudes examine the acceptance of environmental and ecological worldviews (Dunlap, Van Liere, Mertig, & Jones, 2000). Ewert, Place, & Sibthorp (2005) asserted that environmental attitudes are formed in the early stages of one's life.

Many studies have been developed to evaluate these objectives in environmental education by focusing mostly on the levels of knowledge and attitudes in students and children's lives (Keles, 2011; Uzun, 2007, Worsley & Skrzypiec, 1998; Ma & Bateson, 1999; Salmivalli, 1998; Knapp, 1996; Zimmermann, 1996; Malkus, 1992; Musser & Malkus, 1994;). Several instruments have been developed to measure these specific attributes. Among the most common instruments cited in early studies are the Revised Scale for the Measurement of Ecological Attitudes and Knowledge developed by Maloney, Ward, and Braucht (1975), the New Environmental Paradigm (NEP 1978) by Dunlap and Van Liere (1978), the Children's Environmental Attitude and Knowledge Scale (CHEAKS) by Leeming, Bracken, and Dwyer (1995), and the revised NEP scale the New Ecological Paradigm (NEP, 2000) Scale by Dunlap, Van Liere, Mertig, and Jones (2000), and the development and validation of an environmental attitudes scale for high school students by Uzun and Sağlam (2006). Some studies focus on attitudes regarding factors that may influence an adults' positive, negative, or neutral attitude toward environmental issues. These studies often include possible relationships between attitudes toward the environment and interventions such as environmental education, or, attitudes and a persons' gender, background, religion, ethnicity, or education (Bögeholz, 2006; Ewert, Place, & Sibthorp, 2005; Murphy, 2004; Franzen, 2003; Hodgkinson, & Innes, 2001).

In environmental education-related works, it is valuable to measure student attitudes towards the environment and then connect them with other variables and compare them in relation to those other variables (e.g., knowledge). In the related literature, there is a paucity of studies dealing with environmental attitudes at different grade levels. It seems clear that such studies are necessary to measure one's progress of environmental literacy. Hence, we believe that developing a scale to solicit student attitudes about the natural environment will contribute to the field of environmental education and will help to fill this gap in the literature. It is notable that the environmental attitude scales in the literature are mostly comprised of cognitive and behavioral sub-dimensions. However, attitude is made up of emotions, opinions and behaviors related to an object. Emotion is a state of feeling, but it encompasses physiological, cognitive and behavioral components (Solomon, 2008, as cited in Dietrich, 2013).

The experience of negative or positive emotions, may significantly impact not only people's experiences with the environment, but also their tendency to engage in pro-environmental behavior. If one experiences negative emotions, he or she may be less likely to engage in pro-environmental behavior, feeling helpless to engage in meaningful behavior change or to deny the need to change behavior in the first place. Research has identified a number of emotional and affective components of pro-environment behavior (Stern, 2000). For example, Kals, Schumacher, and Montada (1999) developed an "emotional affinity toward nature" scale to identify a construct by which people are connected to nature and express positive feelings with nature. Furthermore, research shows that an emotional bond with nature often serves as a motive to engage in behavior that protects nature (Fisherlehner, 1993, as cited in Kals et al., 1999).

Overall, the studies on the environmental knowledge suggest that adult environmental knowledge is lacking and of concern since basic environmental knowledge is recognized as important for informing or affecting positive environmental attitudes and/or positive environmental behaviors (Fraj-Andrés & Martínez-Salinas, 2007; Frick, Kaiser & Wilson, 2004). Several studies have found a positive but weak association between: increased environmental knowledge, a positive environmental attitude, and behavior changes to protect the environment (Coyle, 2005).

As can be understood from the revised literature cited above, the determination of attitudes towards environment is a function of opinions as well as the construction of knowledge, emotions and by increasing one's motivation towards the protection of environment. This approach can affect positive behaviors which can be of vital importance. Accordingly, all of these components play important roles in creating individuals with environmental awareness. These components should not be addressed separately. Thus, this study aimed to

develop a new scale by adding an affective dimension to the scale made up of two environment-related dimensions. When this three-dimensional structure of attitude is considered, it is seen that a majority of the scales developed in the literature lack the affective dimension. Therefore, the aim of this study was to develop a valid and reliable scale to determine the attitudes of secondary school, high school and university students towards the environment. Further, it was tested in three different countries: Turkey, The United States, and Finland.

Methods

Piloting

In the development process of the scale, a comprehensive literature review was performed to guide the development of an item pool which was designed by drawing on the items included in the behavior and opinion dimensions of the "Environmental Attitude Scale" developed by Uzun and Sağlam (2006). The linguistic validity of the scale was checked by three academicians specialized in the field of environmental education, whose mother tongues are Turkish, English and Finnish and who have a good command of at least two of these languages. An expert on translation checked the accuracy of the translations made from Turkish to English and Finnish (Appendix). With the help of three experts who are specialized in environmental education, 47 (13 behavior, 14 opinion and 20 emotion items) 5-point Likert type items were taken from the item pool and piloted among 486 students from secondary schools, high schools and undergraduate college students at the University of Aksaray, Turkey. At the end of the analysis, two items with an item-total correlation value lower than .30 were discarded from the scale and the final form of the scale with 45 items was obtained.

Study Group

Reliability and validity of the Environmental Attitude Scale were conducted in Finland (256 students), USA (616 students) and Turkey (807 students). Out of 1687 students participating in the study, 402 (23.8%) were students in fifth grade, 275 (16.3%) were in eighth grade, 612 (36.3%) in eleventh grade and 383 (22.7%) were undergraduate college students. 904 (53.6%) of the students were girls and 762 (45.2%) were boys. Using a "cluster sampling" method, one class from each grade level (5^{th}, 8^{th}, 11^{th} and college undergraduate) from each school was randomly selected and involved in the study. In order to establish a match between the grade levels from the three countries, 11^{th} grade students were excluded from the study.

Statistical Analysis

The data obtained from the scale were analyzed through SPSS (Statistical Package for the Social Sciences). Data were deemed suitable for factor analysis by using the Kaiser-Meyer-Olkin (KMO) coefficient and the Bartlett Sphericity test (Büyüköztürk, 2005). In order to test the construct validity and factor structure of the Environmental Attitude Scale, an exploratory factor analysis was used. Finally, a principle components analysis (PCA) was used. In the analyses, common factor variance of the factors on each variable, factor loadings of the items, explained variance ratios and a scree plot were examined. The factor loading of the items was determined to be at least .30. Factor loading over .30 is considered to be acceptable (Büyüköztürk, 2005). In order to examine the factor structures, a varimax principle components analysis was conducted. In order to determine the connection of the scales with the factors and factors with each other, a Pearson correlation coefficient was used. The reliability analysis was carried out by calculating item-total correlation using Cronbach's alpha internal consistency and Spearman Brown coefficients.The Environmental Attitude Scale was evaluated by looking at the responses given to the positive items as 5: Strongly agree/Always, 4: Agree/Often, 3: Partially agree/Sometimes, 2: Disagree/Rarely and 1: Strongly disagree/Never and reversing the scoring from 1 to 5 for the negative items. As a result, an environmental attitude score was obtained for each student. From the reliability measures and factor analysis, 5 of the 45 items were discarded. The scale was then evaluated over 40 items. Therefore, the lowest score to be obtained from the scale is 40 and the highest is 200.

Findings

In this section, results of the normality belonging to the EBSS, EOSS and EESS**,** reliability and validity works are presented.

Normality Belonging to the EBSS, EOSS and EESS

One of the prerequisites to conduct comparative parametric tests such as t-test, variance analysis etc. is the normal distribution of the data (Büyüköztürk, 2005). A Skewness and Kurtosis coefficient being "0" means complete symmetric distribution according to the mean. Skewness and Kurtosis being between -1 and +1 means that the scores do not show significant deviance from the normal distribution (Büyüköztürk, 2005). In the analysis, Skewness coefficients of the scores were calculated to be .110, -.748 and -.829, respectively and Kurtosis coefficients of the scores were calculated to be -.520, .893 and .283, respectively. Based on the deviance values we concluded that the means showed a normal distribution.

Reliability Results Belonging to the EAS, EBSS, EOSS and EESS

As shown in Table 1, the Cronbach' alpha and reliability of the scales in general were found to be α=.94, α=.91, .82 and .94, respectively and the Spearman Brown coefficients were found to be .85, .83, .80 and .85, respectively. The internal reliability coefficients for the factors of the scale were found to be over .77

Table 1. Cronbach's alpha and split-half reliability of the EAS, EBSS, EOSS and EESS and their factors

Scale	Cronbach's Alpha	Spearman Brown Coefficients
EAS	.94	.85
EBSS	.91	.83
Factor 1	.84	.77
Factor 2	.88	.81
EOSS	.82	.80
Factor 1	.82	.80
EESS	.94	.85
Factor 1	.92	.91
Factor 2	.90	.88

As shown in Table 2, there is a high and positive correlation between the students' scores from the EAS and sub scales (r=.844, .605 and .916; p<.001, respectively). Moderate, positive and significant correlation was found between the EBSS and EOSS, EESS (r=.246, .711; p<.001) and between EOSS and EESS (r=.388; p<.001). Hence, it can be claimed that there is a positive consistency between the sub-scales. In light of these findings, it is concluded that the EAS we developed can be confidently used to determine the environmental attitudes of the secondary school, high school and undergraduate university students.

Table 2. Correlation between the environmental attitude scores and their subscales

Parameters		EBSS	EOSS	EESS
EAS	Pearson Correlation (r)	.844(*)	.605(*)	.916(*)
	Sig. (2-tailed)	.000	.000	.000
	N	1320	1320	1320
EBSS	Pearson Correlation (r)	-	.246(*)	.711(*)
	Sig. (2-tailed)	-	.000	.000
	N	-	1423	1445
EOSS	Pearson Correlation (r)	-	-	.388(*)
	Sig. (2-tailed)	-	-	.000
	N	-	-	1382

* Correlation is significant at p<.001

Validity (Factor Analysis) Results Concerning the Environmental Behavior Sub Scale

In order to test the compliance of the data with the factor analysis a Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett Sphericity test were examined. A high value KMO coefficient (KMO coefficient=.924) and Bartlett test' being significant (p<.001) showed the compliance of the data with the factor analysis (Büyüköztürk, 2005). Hence, it is possible to claim that the KMO coefficient is an acceptable value (Table 3).

Table 3. Kaiser-Meyer-Olkin (KMO) coefficient of the environmental behavior sub scale and Bartlett Sphericity test results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.924
Bartlett's Test of Sphericity	Approx. Chi-Square	9644.688
	df	78
	Sig.	.000

When Table 4 is examined, results show that the 13 items in the scale are subsumed under two factors with an eigenvalue above 1. The first factor explains 31.8% of the variance on its own, and the second factor explains 26.1% of the variance, together they explain 57.9% of the total variance. The common variance of the two factors defined in relation to the items ranges from .446 to .663. The findings in Table 4 show that the first six items in the scale constitute the first factor and items between 7 and 13 comprise the second factor.

Table 4. Factor analysis results concerning the environmental behavior sub scale

Items	Communalities	Factor-1 Component Matrix	Rotated Component Matrix	
			Factor 1	Factor 2
1	.504	.673	.608	
2	.556	.599	.727	
3	.524	.652	.663	
4	.636	. 749	.694	
5	.593	.652	.735	
6	.567	.583	.741	
7	.623	.728		.751
8	.663	.726		.792
9	.658	.740		.779
10	.596	.709		.737
11	.607	.768		.668
12	.446	.632		.620
13	.549	.691		.700
	Explained variance	Total: 57.9%	Factor 1: 31.8%	Factor 2: 26.1%

The loading values of the items in the first factor ranges between .608 and .741. This range is between .620 and .792 for the items of the second factor (Table 4).

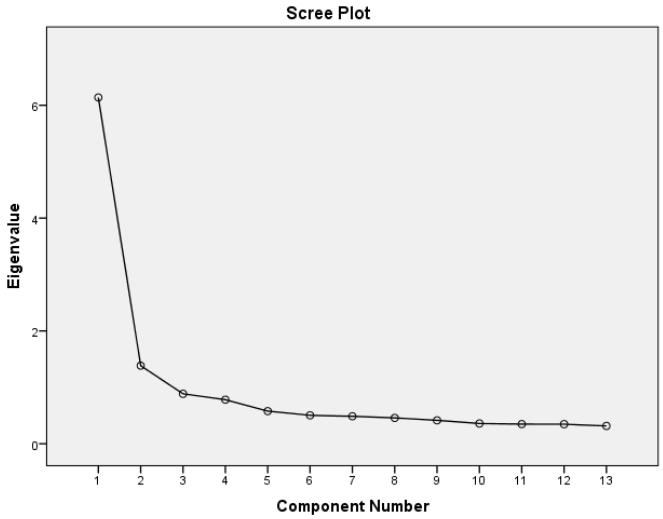

Figure 1. Eigenvalue graph of the factors belonging to the environmental behavior sub scale

Figure 1 shows that there is a high momentum fall after the first factor in the scree plot according to eigenvalues. This finding indicates that the scale may have a general factor. On the other hand, a relatively lower fall observed after the second factor indicates that the number of the significant factors is two. The contributions of the other subsequent factors to the variance are close to each other. The first factor loadings of all the items of the scale are .608 or above. These results indicate that the scale has a general factor. Hence, besides using the scale with two factors, it is suitable to use it with one factor.

Validity (Factor Analysis) Results Concerning the Environmental Opinion Sub Scale

In order to test the compliance of the data with the factor analysis a Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett Test of Sphericity were utilized. A high value KMO coefficient (KMO coefficient=.905) and Bartlett test was significant (p<.001) showing the compliance of the data with the factor analysis indicates that the KMO coefficient was an acceptable value (Table 5).

Table 5. Kaiser-Meyer-Olkin (KMO) coefficient of the environmental opinion sub scale and Bartlett Sphericity Test results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.905
Bartlett's Test of Sphericity	Approx. Chi-Square	3782.886
	df	55
	Sig.	.000

Table 6 shows that the 11 items in the scale are subsumed under one factor with an eigenvalue above 1. The factor explains 37% of the variance on its own, and explains 37% of the total variance. The common variance of the factor defined in relation to the items ranges from .232 to .501. The loading values of the items in the factor ranges between .481 and .708.

Table 6. Factor analysis results concerning the environmental opinion sub scale

Items	Communalities	Factor-1 Component Matrix
1	.401	.634
2	.397	.630
3	.232	.481
4	.238	.488
5	.320	.566
6	.312	.559
7	.425	.652
8	.501	.708
9	.455	.674
10	.404	.636
11	.382	.618
	Explained variance Total: 37%	Factor 1: 37%

Figure 2 indicates a high momentum fall after the first factor in the line graph plotted according to eigenvalues. This finding indicates that the scale may have a general factor.

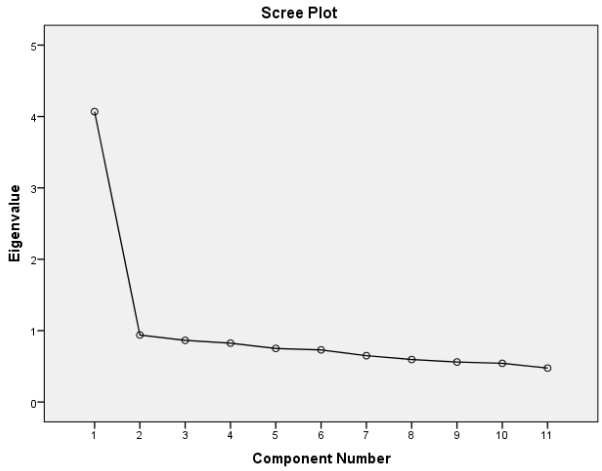

Figure 2. Eigenvalue graph of the factors belonging to the environmental opinion sub scale

Validity (Factor Analysis) Results Concerning the Environmental Emotion Sub Scale

In order to test the compliance of the data with the factor analysis a Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett Test of Sphericity were examined. A high value KMO coefficient (.961) and Bartlett test' being

significant (p<.001) indicates that the compliance of the data with the factor analysis shows that the KMO coefficient is an acceptable value (Table 7).

Table 7. Kaiser-Meyer-Olkin (KMO) coefficient of the environmental emotion sub scale and Bartlett Test of Sphericity results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.961
Bartlett's Test of Sphericity	Approx. Chi-Square	14583.233
	df	120
	Sig.	.000

Table 8 findings indicate that the 16 items in the scale are subsumed under two factors with an eigenvalue above 1. The first factor explains 31.2% of the variance on its own and the second factor explains 30.1% of the variance. Together they explain 61.3% of the total variance. The common variance of the two factors defined in relation to the items ranges from .544 to .692.

Table 8. Factor analysis results concerning the environmental emotion sub scale

Items	Communalities	Factor-1 Component Matrix	Rotated Component Matrix	
			Factor 1	Factor 2
1	.632	.774	.679	
2	.544	.666	.698	
3	.631	.775	.677	
4	.655	.693	.788	
5	.661	.756	.750	
6	.651	.723	.767	
7	.692	.802	.729	
8	.652	.789	.686	
9	.645	.706		.767
10	.691	.769		.762
11	.590	.751		.641
12	.564	.705		.677
13	.556	.724		.634
14	.559	.707		.667
15	.544	.632		.713
16	.549	.664		.698
	Explained variance	Total: 61.3%	Factor 1: 31.2%	Factor 2: 30.1%

The first eight items in the scale constitute the first factor and last eight items make up the second factor. The loading values of the items in the first factor ranges between .677 and .788, the range is between .634 and .767 for the items of the second factor (Table 8).

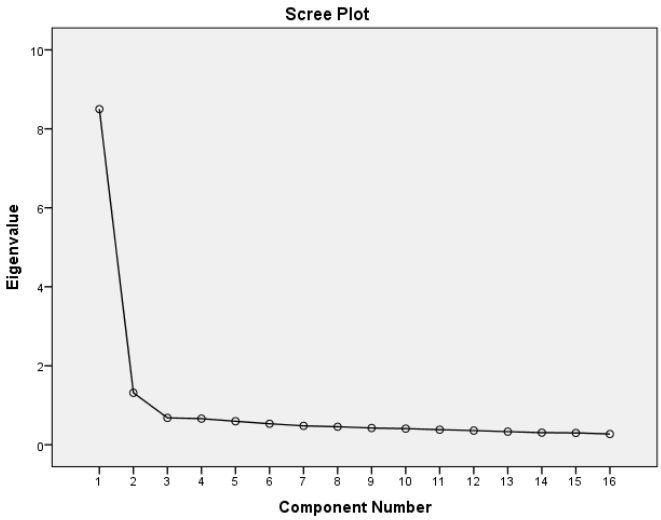

Figure 3. Eigenvalue graph of the factors belonging to the environmental emotion sub scale

The scree plot in Figure 3 shows a high momentum fall after the first factor in the line graph plotted according to eigenvalues. This finding indicates that the scale may have a general factor. On the other hand, a relatively lower fall observed after the second factor indicates that the number of the significant factors is two. The contributions of the other subsequent factors to the variance are close to each other and thus are not considered. First factor loadings of all the items of the scale are .677 or above. These results further indicate that the scale has a general factor. Besides using the scale with two factors, it is suitable to use it with one factor.

Results and Discussion

The aim of this work was to develop a valid and reliable "Environmental Attitude Scale" to determine the attitudes of secondary school, high school and undergraduate university students towards the natural environment. Within the context of the validity of the scale the content and construct validity were tested. By reviewing the relevant literature, in addition to the dimensions of behavior and opinion, 20 items were included under the affective sub-dimension of the scale in the item pool. To establish the content and face validity, the items were submitted to the scrutiny of three experts in environmental education. In line with the expert opinions and results of piloting and actual application, 7 of the 47 items in the item pool were discarded and thus a 40-item scale was obtained.

In order to analyze the factor structure of the data collected through the scale, an exploratory factor analysis (EFA) was conducted. The findings show that the data are suitable for factor analysis. These factors of the scale indicated a three-factor structure complying with the three dimensions of the attitude towards environment; namely, opinion, behavior and emotion reported in the attitude literature. Therefore, the scale is composed of three sub scales "Environmental Behaviour Sub Scale (EBSS)", "Environmental Opinion Sub Scale (EOSS)" and "Environmental Emotion Sub Scale (EESS)".

The Cronbach's alpha and Spearman Brown coefficients show that the instrument has a high reliability. The Cronbach alpha reliability coefficient for the whole scale was found to be α=.94, and reliability coefficient of the first subscale was found to be α=.91, second subscale α=.82 and third subscale α=.94 and the Spearman Brown coefficients were found to be .85, .83, .80 and .85, respectively. The findings show that the EBSS and EESS consist of two factors each and the EOSS consists of one factor. The EBSS has 13 5-point Likert-type items, the EOSS has 11 and EESS has 16 items.

There was a high positive correlation between the scores obtained from the EAS and sub scales (r=.844, .605 and .916; $p<.001$, respectively). It was found that EBSS items are subsumed under two factors with an eigenvalue above 1. The first factor explains 31.8% of the total variance and the second factor explains 26.1% of the total variance. Together they explain 57.9% of the total variance. In a line graph, after the first factor, a decrease with high momentum was observed indicating that the scale may have a general factor. After the second factor, a decrease with relatively lower momentum was observed indicating that the number of the factors is two.

It was found that EOSS items are subsumed under one factor with an eigenvalue above 1. This factor explains 37% of the total variance. In the line graph, after the first factor, a decrease with high momentum was observed indicating that the scale has a general factor. It was found that EESS items are subsumed under two factors with eigenvalue above 1, first factor explains 31.2% of the total variance and the second factor explains 30.1% of the total variance and together explain 61.3% of the total variance. In the line graph, after the first factor, a decrease with high momentum was observed indicating that the scale may have a general factor. After the second factor, a decrease with relatively lower momentum was observed indicating that the number of the factors is two.

In the behavior dimension of the Environmental Attitude Scale (EAS), statements such *as I want to voluntarily participate in any activity organized related to the environment at school; while purchasing a product, I prefer a recyclable one; I read books about environmental issues apart from textbooks*; in the opinion dimension of the scale, statements such as *The environment can clean itself, human wastes are not a problem; while going out of a room, turning off the light does not lead to great amount of energy saving; in the world, there is so much water that humans can never use all of it;* and in the affective dimension, statements such as *environmental pollution caused by wars angers me; natural disasters such as the tsunami is extremely worrying; it gives me more pleasure to go for an outdoor activity instead of shopping* were included.

The reliability and validity results of the study show that Environmental Attitude Scale can be used responsibly to measure the environmental attitudes of the different level students. Because the EAS applies to different countries (Turkey, USA, and Finland) and across differing upper grade levels, it provides a good contribution to the field of Environmental Education by being a tool that can measure attitude changes through time and/or through differing types of studies about the natural environment that include attitude measures. Application of the scale to determine the environmental attitudes with respondents from three different countries are thought to contribute to the environmental education research by establishing an attitude scale that is applicable globally. The developed Environmental Attitude Scale is important as it includes the sub-dimensions of behavior, opinion and emotion. In further research, these dimensions can be used individually.

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Appendix: Environmental Attitude Scale

	a - Environmental behavior sub-scale	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**
1	I watch environmental programs that are broadcast on TV and radio.					
2	I read about environmental issues in daily newspapers.					
3	I watch environmental documentaries.					
4	I read books about environmental issues apart from textbooks.					
5	I read popular environmental journals.					
6	I read scientific articles about the environment.					
7	I warn a person who is damaging the environment without hesitation.					
8	I want to voluntarily participate in any activity organized related to the natural environment at school.					
9	My friends see me as a person who is sensitive to the environment.					
10	If necessary, I am willing to work for a livable environment for a long time with low pay.					
11	I share my knowledge about the environment with my friends.					
12	While purchasing a product, I prefer to buy recyclable ones.					
13	Even if it is more expensive, I prefer to buy goods that are not harmful to the environment.					
	b - Environmental opinion sub-scale	**Strongly disagree**	**Disagree**	**Partially agree**	**Agree**	**Strongly agree**
1	I think that endangered species are exaggerated, that there are many species in nature; So, it is not important for a few of them to be extinct.					
2	It is better to spend money on the construction of high-quality roads rather than on historical sites.					
3	There is no erosion in our country any more.					
4	Pesticides used in agriculture are useful for environment.					
5	There is nothing wrong to sell areas that have lost their natural characteristics to bring money to our country.					
6	Construction of hotels for tourism in national parks and forests should be allowed.					
7	For housing, wetlands should be drained so houses can be built there.					
8	Since the environment can clean itself, human wastes are not a problem.					
9	The Ozone layer has been thinned so there is no danger for our country.					
10	While going out of a room, turning off the light does not save much energy					
11	In the world, there is so much water that humans can never use all of it.					
	c - Environmental emotion sub-scale	**Strongly disagree**	**Disagree**	**Partially agree**	**Agree**	**Strongly agree**
1	I am angry with people who cause environmental pollution.					
2	Natural disasters such as a tsunami are extremely worrying.					
3	I worry about the global environmental issues.					
4	I get angry if anybody damages any live plants or animals.					
5	Environmental pollution caused by wars angers me.					
6	If I don't warn the people who damage habitat for animals, I would regret it.					
7	I feel anxious because of the decrease of the forests.					
8	I feel guilty when I do harm to the environment.					
9	Hiking in natural areas gives me peace of mind.					
10	I get excited when I participate in any activity in nature.					
11	Generally, I would be proud of myself because of my sensitivity to the environment.					

12	I would be happy doing nature based sports such as hiking.					
13	I am curious of the changes in nature.					
14	I would be satisfied if we have more environmental lessons in school.					
15	It gives me more pleasure to go for an outdoor activity instead of shopping.					
16	Being alone in nature relaxes me.					