A Study of Developing an Environmental Attitude Scale for Primary School Students

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Abstract

The aim of this research is to develop an instrument that measures environmental attitudes of third grade students. The study was completed in six stages: creating scale items, content validity study, item total and remaining item correlation study, determining item discrimination, determining construct validity study and examining the internal consistency reliability of Cronbach's Alpha. In this research, quantitative research methods and techniques were used. According to the data obtained from exploratory factor analysis, scale came under three sub-factors as "Positive Environmental Behaviors", "Environmental Knowledge and Awareness" and "Negative Environmental Behaviors". As a result of the confirmatory factor analysis, it is determined that chi square/df, RMSEA value and the other statistical significance levels are consistent with the collected data. Cronbach's Alpha coefficient was taken between 0.71-0.94 for sub-scales and 0.93 for the total scale. In the light of these data, it is concluded that the environmental attitude scale has the validity and reliability.

Introduction

Environment was basically defined as all of the natural and artificial elements that condition the human life (Keleş and Hamamcı, 2005). It is possible to say that environmental problems are one of the most important problems of today. In order for the current problems to be minimized and the future generations to live in a healthy place, the role of the educators is huge. Because, as gradually accumulating, wrong behaviors can lead to bigger problems. For that reason, it is crucial to raise environment conscious individuals, for not doing any mistakes at early ages, even if they seem minor and unimportant. For the first time in the world history, humankind seems to become a part of this process as a separate problem other than those originating from the world itself (Demir, 2016).

It is a fact that the education activities are important in the approaches on permanent solutions on environmental problems. Because, the easiest, cheapest and firmest way to develop such approaches, is to educate our children starting from early ages. Accordingly, raising individuals conscious and aware of environment comes out as the most effective way to solve those problems (Benli, Ay and Kahramanoğlu, 2011). It is clear that individuals with negative attitudes towards the environment will be inconsiderate towards environmental problems and will continue to pose problems to the environment (Uzun and Sağlam, 2006). Environmental condition in long-term, is related with the future generations to take care of the environment. In a report published by the Childhood Alliance, it is indicated that the childhood is a critical period in acquiring anxiety, interest, awareness, tendency, dignification and knowledge acquisition related to natural world. For this reason, it is crucial to start studies concerning the environment at early ages (Yaşaroğlu, 2012). Students who cannot develop positive attitudes regarding the environment at early ages may face the risk of not being able to develop positive attitudes for the rest of their lives. Provided that the student develops negative attitude at early ages, these negativities become permanent and lay the foundations of unwanted behaviors in the future. Positive attitude acquired at early ages, forms the basis of the following years (Chapman&Sharma, 2001; Erten, 2004; Gökçe, Kaya, Aktay and Özden, 2007).

The objective of this research is to develop a valid and reliable instrument that measures environmental attitudes of third grade students. Within this scope, it is aimed to develop an instrument including the dimensions of cognition, perception and behavior. Related literature review shows that there are many studies aimed at middle school, high school and university students, whereas there is no such environmental attitude scale including dimensions of cognition, perception and behavior aimed at elementary school students. So as to gain

environment-oriented positive attitudes, the attitudes gained at earlier ages are important. It is emphasized in researches that the attitudes acquired at early ages will continue to be in the future (Chapman&Sharma, 2001; Erten, 2004; Gökçe and et al. 2007). Thus, it is important to develop such scale in order to emphasize the environmental education of children at early ages and measure to what extent they develop environmental consciousness, which is not included in the literature.

Sustainable development which is one of the learning sub-fields of Science-Technology-Society-Environment of Science lesson contains "enabling future generations to meet their needs by using natural resources economically, developing conscious on individual, society and economic benefits of an economical usage." (MEB, 2013). In order for sustainable development conscious to be improved, students have to hold the environmental attitude. It will be possible to reach a measuring instrument which shows to what extent this program succeeded in instilling the objectives of the program in the students. It also will help determine the environmental attitudes of the students who have not attended Science class since the class is introduced at the 3rd grade. There is a need for a scale that includes the dimensions of cognition, perception and behavior in regard to the importance of environmental attitude to be acquired at early ages. Individuals, who are conscious of environmental attitude, have to have the environmental knowledge, recognize the environmental problems, be sensitive to these problems and act accordingly.

Method

Study Group

Since this study is a scale development study, population and sample method had not been chosen. Study group was determined by easily accessible sampling method. The study group of the research consists of 416 third grade students studying in four elementary schools in 2014-2015 academic year in central district of Eskişehir. Demographic information of 416 voluntary participants of the study can be seen on Table 1.

Table 1. Distributions according to the demographic attributes of the study group

Variables		N	Mean
	F	198	47.6
Gender	M	209	50.2
	Unspecified	9	2.2
Total		416	100

In the sampling group, there are 198 male and 209 female students. 9 students did not mark the gender selection. Since 66 students did not fully complete the scale form, they were not included in the study group and thus, the study group regarded as 416 students. In this study, three point Likert scale was chosen since the study is conducted among the 3rd grades. Draft scale was prepared as three point Likert as Agree (3), Partially Agree (2), Disagree (1).

Creating the Scale Items

In order to develop data collection tool, Education Program of Science and 3rd grade Science Lesson books were examined. In accordance with "Sustainable Development" - one of the sub-learning fields of Science-Technology-Society-Environment, which includes the acquirements that take place in the educational program as *"Knows the environment and takes active roles in cleaning these places. Understands the importance of natural habitat on living creatures and takes precautions in order to save the natural habitat. Understands the importance of economical usage of the resources such as electric and water and acts accordingly. Understands the importance of the required situations for a healthy life and performs in daily life. Discusses the harms of waste batteries to the environment and actions to be taken about them."* and enables future generations to meet their needs by using natural resources economically, develops conscious on individual, society and economic benefits of an economical usage, a 65-item scale pool was created.

Content Validity Study

The main objective of this study is to provide content validity in order to put forward whether the developed scale reflects the behaviors of the items sufficiently or not. Within the framework of content validity, expert

opinions were taken into consideration when determining the scale items whether they are enough by means of number and quality or not. Scale items were rearranged according to expert's suggestions. Draft scaling form consisting of 65 items was asked for three different experts' opinions. The experts consisted of Associate Professor of the department of School Teaching who had studies on science and environmental education, Associate Professor of the department of School Teaching who is a geography teacher and had environmental education studies and Assessment and Evaluation Expert (Associate Professor). Expert evaluation form was created and all the experts asked to evaluate the items on the draft form. Evaluations made as "has to be removed, revised or acceptable). Evaluations of three experts were examined and 5 items decided to be left out considering that they will not help scaling the environmental attitude.

The Study of Face Validity

"Face validity is defined as scaling the feature aimed to be scaled, the name of the measuring instrument, its instructions, organization and items and the questions reflecting this." (Büyüköztürk, 2004; p.117). In that study, two expert opinions were taken for face validity of the draft measuring instrument. Following the content and face validity, pilot testing was carried out with twenty students which did not take part in the sample group of the draft form. The unknown words by these students were determined. The synonyms were used or changes made on draft scaling form by writing the definitions in brackets. Validity and reliability analyses were performed on 416 primary third grade students. Draft scale was prepared as three-point Likert scale as Agree (3), Partially Agree (2), Disagree (1). For the item discrimination of scale items and for the determination of remaining item coefficient, Pearson's product moment correlation analysis was carried out and for the comparison of %27 subgroup and super group item points, independent samples t test was performed. In order to determine the construct validity, exploratory and then confirmatory factor analysis were carried out. For internal consistency, Cronbach's alpha coefficient was calculated. Validity and reliability calculations of the scale were conducted considering the SPSS and LISREL 8 programs.

Data Analysis

In research, before dealing with the data analysis collected by the data collection tool, measuring instruments were numerated from 1 to 416. After the numbering process, data were transferred to computer environment in accordance with the given numbers. Following the transfer, environmental attitude scale and validity and reliability of the sub dimensions were calculated in the SPSS 21 Windows package software. Besides, descriptive analysis of the scale such as percentage, arithmetic mean and standard deviation, were carried out. The significance level for statistical analyses on this research was determined as 0,01.

Findings

In order to determine the item scales by means of features to see how effective they are to discriminate the people, item total and item rest correlations on the collected data obtained from 416 students, were calculated. The obtained correlation coefficient is the validity coefficient of that item and it indicates its consistency with the overall test. The correlation coefficients obtained from the item total correlations changes from 0.12 to 0.73, whereas the correlation coefficients taken from the item rest correlations changes from 0.06 to 0.73. As a result of item total correlation, item 8 "If there is a recycling box, I throw my garbage on it." had been removed from the scale items since it had not regarded as statistically significant. As concluded from the item rest correlation, item 15 "Pollution of the sea only affects the animals living in the sea." And item 46 "I should not take part in cleaning the class." had been removed from the scale items since it had not regarded as statistically significant.

Table 2. Item total and item rest correlation coefficients of the item scale

Item Number	Item Total r	Item Rest r
1. It is important for our future to have an economical use of resources (water, electricity, natural gas, etc.).	.68**	.66**
2. Clean air is important for our health.	.70**	.69**
3. Environmental pollution only affects human life negatively.	.25**	.21**
4. Clean environment makes me happy.	.70**	.69**

5. Trees and flowers need clean water.	.64**	.63**
6. Damage to forests affects the natural life negatively.	.30**	.26**
7. Environmental pollution is dangerous to all living creatures.	.56**	.54**
8. If there is a recycling box, I throw my garbage on it.	.12	.06
9. I discuss current environmental problems with my family.	.50**	.47**
10. Recycling contributes to the national economy.	.52**	.49**
11. All living creatures need a clean world.	.67**	.65**
12. Protecting the nature is important for endangered animals.	.45**	.42**
13. I separate trashes at home for throwing them on recycling boxes.	.48**	.45**
14. I feed street animals.	.50**	.47**
15. Pollution of the sea only affects the animals living in the sea.	.15*	.09
16. Random disposal of used batteries damages the environment.	.51**	.48**
17. I know the plants in my environment.	.36**	.32**
18. I love animals.	.66**	.65**
19. We may have trouble finding clean drinking water in the future.	.36**	.32**
20. Recycling is important.	.65**	.64**
21. We do less harm to environment when we use public transport instead of cars.	.26**	.20**
22. I know the things that can be recycled.	.44**	.42**
23. I know where the recycling boxes are for used batteries.	.50**	.47**
24. I do not throw garbage on street.	.66**	.64**
25. It is not my responsibility to protect the environment.	.41**	.38**
26. The garbage thrown away at school attracts my notice.	.50**	.48**
27. I don't be upset about the pollution in my environment.	.46**	.43**
28. I use water economically.	.44**	.42**
29. Trees and flowers need clean soil.	.73**	.72**
30. I do my part regarding the cleanliness of our class.	.63**	.62**
31. I get upset about fishes living in dirty water.	.57**	.55**
32. I watch documentaries about living creatures.	.43**	.40**
33. I would like to participate in environmental cleaning activities.	.65**	.63**
34. I do not damage trees.	70**	.69**
35. We should protect the nature.	.72**	.71**
36. I take part in environmental activities.	.49**	.46**
37. I talk about current environmental problems with my friends.	.45**	.42**
38. Environmental pollution affects the habitats of some living things.	.36**	.32**
39. Unconscious hunting causes some animals to be extinct.	.39**	.35**
40. I don't do harm to animals.	.69*	.67**
41. I know the animals in the environment I live.	.56**	.53**
42. I enjoy watching documentaries about living creatures.	.40**	.37**
43. The lights left open do not attract my attention	.23**	.18**
44. People throwing litter makes me sad.	.64**	.62**
45. I would like to plant trees.	.66**	.65**
46. I should not take part in cleaning the class.	.17**	.12
47. Damaging forests do not affect the natural life negatively.	.28**	.23**
48. Animal extinction makes me sad.	.59**	.57**
49. When I see a flowing faucet, I close it.	.63**	.62**
50. I would like to grow plants.	.51**	.49**

51. I do harm to animals.	.47**	.44**
52. I plant trees.	.53**	.50**
53. Garbage on street attracts my notice.	.62**	.60**
54. I would like to work for my environment to be clean.	.60**	.59**
55. I feel sorry when I see the wasted taps.	.59**	.57**
56. I throw waste pills on waste battery box.	.66**	.64**
57. Feeding animals makes me happy.	.67**	.66**
58. I turn off the lights that are left on.	.71**	.69**
59. I do not use the water economically.	.28**	.24**
60. I do not harm the plants.	.58**	.57**

n=416 *p<.05 **p<.01

Item Discrimination Power

In order to determine the discriminating power of the items on the scale, item analysis was made. For every item, obtained points were sorted as biggest to smallest and independent group t test was performed for %27 top and bottom parts. In Table 3, independent group t test results which had been carried out so as to determine the item discriminating powers are given below.

Table 3. Results of the independent group T test results determining the item discrimination powers

Item No	t
1. It is important for our future to have an economical use of resources (water, electricity, natural gas, etc.).	4.806*
2. Clean air is important for our health.	5.070*
3. Environmental pollution only affects human life negatively.	17.356*
4. Clean environment makes me happy.	4.967*
5. Trees and flowers need clean water.	5.114*
6. Damage to forests affects the natural life negatively.	17.525*
7. Environmental pollution is dangerous to all living creatures.	7.016*
9. I talk about current environmental problems with my family.	16.182*
10. Recycling contributes to the national economy.	7.683*
11. All living creatures need a clean world.	5.689*
12. Protecting the nature is important for endangered animals.	1.459
13. I separate trashes at home for throwing them in recycling bins.	16.654*
14. I feed street animals.	11.175*
16. Random disposal of used batteries damages the environment.	7.975*
17. I know the plants in my environment.	15.989*
18. I love animals.	7.067*
19. We may have trouble finding clean drinking water in the future.	16.776*
20. Recycling is important.	4.410*
21. We do less harm to environment when we use public transport instead of cars.	24.269*
22. I know the things that can be recycled in my environment.	11.535*
23. I know where the recycling boxes are for used batteries.	16.029*
24. I do not throw garbage on street.	6.342*
25. It is not my responsibility to protect the environment.	9.376*
26. The garbage thrown away at school attracts my notice.	8.210*
27. I don't be upset about the pollution in my environment.	6.742*
28. I use water economically.	8.080*

29. Trees and flowers need clean soil.	5.145*
30. I do my part regarding the cleanliness of our class.	6.459*
31. I get upset about fishes living in dirty water.	7.046*
32. I watch documentaries about living creatures.	15.986*
33. I would like to participate in environmental cleaning activities.	10.621*
34. I do not damage trees.	4.980*
35. We should protect the nature.	4.737*
36. I take part in environmental activities.	16.165*
37. I talk about current environmental problems with my friends.	16.437*
38. Environmental pollution affects the habitats of some living things.	9.586*
39. Unconscious hunting causes some animals to be extinct.	10.278*
40. I don't do harm to animals.	4.600*
41. I know the animals in the environment I live.	15.989*
42. I enjoy watching documentaries about living creatures.	16.062*
43. The lights left open do not attract my attention	13.382*
44. People throwing litter makes me sad.	7.842*
45. I would like to plant trees.	6.517*
47. Damaging forests do not affect the natural life negatively.	19.811*
48. Animal extinction makes me sad.	7.846*
49. When I see a flowing faucet, I close it.	6.183*
50. I would like to grow plants.	6.991*
51. I do harm to animals.	5.529*
52. I plant trees.	10.894*
53. Garbage on street attracts my notice.	8.000*
54. I would like to work for my environment to be clean.	8.112*
55. I feel sorry when I see the wasted taps.	7.704*
56. I throw waste pills on waste battery box.	6.279*
57. Feeding animals makes me happy.	6.630*
58. I turn off the lights that are left on.	5.345*
59. I do not use the water economically.	10.914*
60. I do not harm the plants.	4.778*

n= 230, SD= 124 , *p<.01

According to the values on Table 3, item 12 "Protecting the nature is important for endangered animals." had been removed since the item is not p<.01 and do not have statistical significance.

Construct Validity

In order to determine the construct validity of the item, factor analysis was carried out. Factor analysis is performed in order to find out whether the scale items separated into fewer factors which keep each other out or not. Items gathering in the same group are named according to their contents (Baloğlu, Karadağ ve Karaman, 2008). In this study, two factor analyses in literature were used. Primarily, exploratory factor analysis had been carried out, and then confirmatory factor analysis was performed. Kaiser-Meyer-Oklin and Bartlet values required for determining the construct validity of the scale were determined. Since KMO= .908 and Barlett value is p<.01, it is shown that the data set is suitable for factor analysis. This indicates that there are high correlations between the variables, in other words, Environmental Attitude Scale is suitable for factor analysis. Since KMO values are over 0.60, it includes the acceptable values. If KMO values are calculated high, Barlett values will be high accordingly. If the two of them have high values, then it will indicate the utility of the factor analysis and also show that the correlation values between the items are high (Kalaycı 2008). Varimax Rotation

Technique is preferred since the scale has a multifactor structure and it is aimed at the generalizability of the data obtained (Acat, Tüken&Karadağ, 2010). According to Büyüköztürk (2004), if the item-total correlation is positive and high; it indicates that the items on the scale exemplify similar behaviors and that the internal consistency of the test is high. Generally, item-total correlations valued .30 and higher contribute to the measurement of the overall measure of the scale. If one variable is below the factor load of 0.30; it is considered as low level and these items have to be removed from the scale (Kline, 1994). As a result of the factor analysis carried out, items with inappropriate factor loadings were removed from the scale (factor load <0.30). In Table 4, three sub-factors and item loadings that came out as a result of the exploratory factor analysis are given.

Table 4. The results of exploratory factor analysis related to the scales

Item	1.	Item	2.	Item	3.
35. We should protect the nature.	.85				
40. I don't do harm to animals	.79				
34. I do not damage trees.	.78				
58. I turn off the lights that are left on.	.76				
2. Clean air is important for our health.	.75				
4. Clean environment makes me happy.	.75				
49. When I see a flowing faucet, I close it.	.74				
24. I do not throw garbage on street.	.73				
11. All living creatures need a clean world.	.73				
57. Feeding animals makes me happy.	.70				
60. I do not harm the plants.	.69				
5. Trees and flowers need clean water.	.69				
56. I throw waste pills on waste battery box.	.68				
20. Recycling is important.	.67				
30. I do my part regarding the cleanliness of our class.	.66				
1 It is important for our future to have an economical use of resources (water, electricity, natural gas, etc.).	.63				
18. I love animals..	.62				
48. Animal extinction makes me sad.	.59				
31. I get upset about fishes living in dirty water..	.55				
54. I would like to work for my environment to be clean.	.54				
53. Garbage on street attracts my notice.	.52				
50. I would like to grow plants.	.51				
7. Environmental pollution is dangerous to all living creatures.	.48				
55. I feel sorry when I see the wasted taps.	.46				
26. The garbage thrown away at school attracts my notice.	.41				

28. I use water economically.   .38

38. Environmental pollution affects the habitats of some living things.   .32
5

37. I talk about current environmental problems with my friends.   .65

17. I know the plants in my environment.   .62

32. I watch documentaries about living creatures.   .56

23. I know where the recycling boxes are for used batteries.   .54

41. I know the animals in the environment I live.   .48

21. We do less harm to environment when we use public transport instead of cars.   .48

14. I feed street animals.   .47

19. We may have trouble finding clean drinking water in the future.   .46

22. I know the things that can be recycled in my environment.   .44

16. Random disposal of used batteries damages the environment.   .40

47. Damaging forests do not affect the natural life negatively.   .68

59. I do not use the water economically.   .66

43. The lights left open do not attract my attention.   .65

27. I don't be upset about the pollution in my environment.   .61

25. It is not my responsibility to protect the environment.   .54

51. I do harm to animals.   .48

As a result of factor analysis, three subfactors as "Positive Environmental Behaviors", "Environmental Information and Awareness", "Negative Environmental Behaviors" were created. "Positive Environmental Behaviors" subfactor consists of 27 completely positive items, "Environmental Information and Awareness" subfactor consists of 10 completely positive items and "Negative Environmental Behaviors" subfactor consists of 6 completely positive items. Their item loads valued between .32 and .85. In Table 8, eigenvalue and variance values that represented by scales are given. The eigenvalue of "Positive Environmental Behaviors" subfactor is 14.70, eigenvalue of "Environmental Information and Awareness" subfactor is 2.53 and "Negative Environmental Behaviors" subfactor's eigenvalue is 2.11. Total variance percentages were founded as 44.56. It can be said that the scale is consisted of three factors since it's variance rate is over the acceptable value of %41 (Kline, 1994).

Table 5. Eigenvalues and variances explained by the scale factors

Subscales	Eigenvalues	Variance
1. Positive Environmental Behaviors	14.70	34.19
2. Environmental Information and Awareness	2.53	5.47
3. Negative Environmental Behaviors	2.11	4.90
Total	19.34	44.56

Bogner and Wiseman (2006) and Costello and Osborne (2005) propose a confirmatory factor analysis to test the correctness of the model which resulted from the exploratory factor analysis. Table 9 shows the results of confirmatory factor analysis.

Table 6. Compliance parameters related to the confirmatory factor analysis model of the scale

Conformity Parameter	Index
GFI (Goodness of Fit Index)	0.65
AGFI (Adjusted Goodness of Fit Index)	0.62
RMSEA (Root Mean Square Error of Approximation)	0.089
Df	857
x^2	2120.64
(Chi-square) x^2/df	2,47

In Figure 1, the standard value diagram of the proposed model is presented:
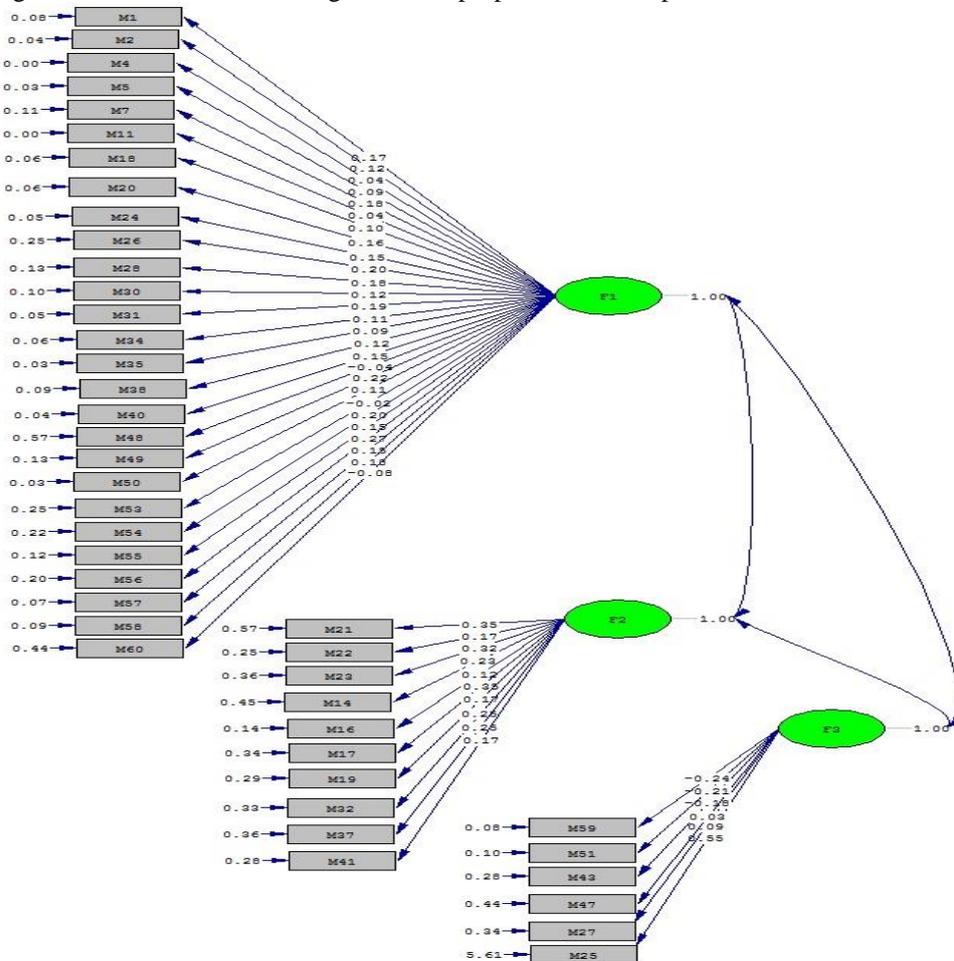
Chi-Square=2120.64, df=857, P-value=0.00000, RMSEA=0.089

Figure 1. Standard value diagram related to the confirmatory factor analysis model

The results of confirmatory factor analysis and exploratory factor analysis were verified. x²/df value was found significant. If x²/df ratio is below 3, it is the perfect fit, whereas below 5 is satisfactory. In this case, x²/df ratioof the scale is a perfect fit (Şimşek, 2007).

RMSEA is acceptable between .05 and .08 and it is regarded as perfect fit when the value is between .00 and 0.50 (Brown and Cudeck, 1993). According to these values, RMSEA value was considered acceptable. Pearson's product-moment correlation analysis was used. Correlations between subscale points of the scale are changed between 0.26 and 0.59 and statically significant. Table 7 shows the correlations between all subscales.

Table 7.Correlation coefficients between the subscales

Subscales	*1*	*2*	*3*
1. Positive Environmental Behaviors	-	0.59**	0.35**
2. Environmental Information and Awareness		-	0.26**
3. Negative Environmental Behaviors			-

** p<.01

Findings Related to the Reliability of the Scale For the reliability, Cronbach's Alpha coefficient was calculated. In Table 8, subfactors of scale and Cronbach's Alpha coefficient values of all are given.

Table 8. Cronbach's alpha coefficients of scale subscales

Subscales	*Alpha*
Positive Environmental Behaviors	0.94
Environmental Information and Awareness	0.75
Negative Environmental Behaviors	0.71
Total	0.93

Cronbach's Alpha coefficient was determined between 0.71-0.94, and 0.03 for all of the scale. These values indicate that the scale can measure consistently. According to Büyüköztürk (2004) reliability coefficients over 0.70 and above is acceptable, whereas Şencan (2005) stated that although this value is acceptable in scientific studies, interest and talent type of researches requires scales to have at least 0.85 reliability coefficient.

Discussion and Suggestions

As a result of this study, three point Likert scale consisting of 43 items, in order to measure the third grade students environmental attitudes, was developed. In that scale, "Positive Environmental Behaviors" subfactor consists of 27 items, "Environmental Information and Awareness" subfactor consists of 10 items and "Negative Environmental Behaviors" subfactor consists of 6 items. When examining the studies concerning environmental attitudes in literature, it is seen that these studies were performed mostly with the teacher candidates, high school students and middle school students (Alp, Ertepınar, Tekkaya and Yılmaz, 2006; Altınöz, 2010; Atasoy, 2005; Atasoy, 2012; Atasoy and Ertürk, 2008; Beklan Çetin, 2002; Erdoğan and Ok, 2008; Ergezin and Çetin Teke, 2013; Karataş, 2013; Okur and Yalçın Özdilek, 2012). It is seen that there is not much weight given to environmental education in literature for early ages. More importance should be given to environmental education in primary school. Moreover, it is seen that the studies concerning the environmental attitude (Alp, Ertepınar, Tekkaya and Yılmaz, 2006; Atasoy, 2005; Atasoy, 2012; Atasoy and Ertürk, 2008; Beklan Çetin, 2002; Erdoğan and Ok, 2008; Ergezin and Çetin Teke, 2013; Uzun and Sağlam, 2006) deal with the environmental attitude as different components (knowledge, behavior, attitude). Atasoy (2005) examined the knowledge and attitude of primary second grade studens. While there are differences of environment knowledge among 6th and 8th, 7th and 8th grade students, it is seen that there is a difference of environmental attitude among 6th and 8th grade students. Alp, Ertepinar, Tekkaya and Yilmaz (2006) found that primary school students' attitudes and knowledge towards the environment, class level and gender influence on their knowledge and

attitudes, and the relationship between useful behaviors towards the environment and intentions, emotions, information and internal-external control focus. Kuhlemeier, Bergh and Lagerweij (1999) examined the relationship between environmental knowledge, environmental attitude and behavior in their studies. Uzun and Sağlam (2006) dealt with the "behavior" and "thought" of attitude's three dimensions, and left "emotion" dimension to their next study. Beklan Çetin (2002) examined environmental information, environmental attitudes and environmental behaviors. It was found that environmental knowledge has a significant influence on environmental attitudes.

In scale development studies, performing analysis as exploratory factor analysis with induction, confirmatory factor analysis with deductive contributes to the theoretical foundation to be steady (Okur and Yalçın-Özdilek, 2012). In this respect, besides the exploratory factor analysis in scale development studies, using other factor analyses in literature will contribute to studies to build on strong foundations. The environmental attitude scale developed for primary school students, was prepared to include cognition, perception and behavior dimensions of environmental attitudes of the third grade students. Moreover, while developing the scale, exploratory and confirmatory factor analyses were used. For that reason, scale development study is important.

Teachers can use the scale in their classrooms in order to determine the environmental attitudes of the students. With this developed scale, survey studies can be carried out in province, region or throughout Turkey. In surveys, joint studies can be carried out with the help of the academicians and form teachers in order to raise individuals who have positive attitude for environment, in schools and classes that the scale gives low results. The scale can be used by the teachers implementing educational programs and also by program developing experts in an attempt to determine the situation and the needs. Being individuals having positive attitudes towards the environment is a prior condition required for health of today's world and its continuity. It is significant to acquire this attitude at early ages. Changing the acquired wrong attitudes is harder than acquiring new attitudes. It is important to spend less energy and resources, and try to acquire environmental attitude at early ages so that nature gets least harm.

Note

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Appendix

Environmental Attitude Scale

Note: The original scale has been developed in Turkish. It is necessary to ensure the language validity for using in different languages.

A. Positive Environmental Behaviors	Agree	Partially Agree	Disagree
We should protect the nature.			
I don't do harm to animals.			
I do not damage trees.			
I turn off the lights that are left on.			
Clean air is important for our health.			
Clean environment makes me happy.			
When I see a flowing faucet, I close it.			
I do not throw garbage on street.			
All living creatures need a clean world.			
Feeding animals makes me happy.			
I do not harm the plants.			
Trees and flowers need clean water.			
I throw waste pills on waste battery box.			
Recycling is important.			
I do my part regarding the cleanliness of our class.			
It is important for our future to have an economical use of resources (water, electricity, natural gas, etc.).			
I love animals.			
Animal extinction makes me sad.			
I get upset about fishes living in dirty water.			
I would like to work for my environment to be clean.			
Garbage on street attracts my notice.			
I would like to grow plants.			
Environmental pollution is dangerous to all living creatures.			
I feel sorry when I see the wasted taps.			
The garbage thrown away at school attracts my notice.			
I use water economically.			
Environmental pollution affects the habitats of some living things.			
B. Environmental Knowledge and Awareness	Agree	Partially Agree	Disagree
I talk about current environmental problems with my friends.			
I know the plants in my environment.			
I watch documentaries about living creatures.			
I know where the recycling boxes are for used batteries.			
I know the animals in the environment I live.			
We do less harm to environment when we use public transport instead of cars.			

I feed street animals.			
We may have trouble finding clean drinking water in the future.			
I know the things that can be recycled in my environment.			
Random disposal of used batteries damages the environment.			
C. Negative Environmental Behaviors	*Agree*	*Partially Agree*	*Disagree*
Damaging forests do not affect the natural life negatively.			
I do not use the water economically.			
The lights left open do not attract my attention			
I don't be upset about the pollution in my environment.			
It is not my responsibility to protect the environment.			
I do harm to animals.			