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# The relationship between secondary school students' environmental and human values, attitudes, interests and motivations

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## Abstract

Education for sustainability (ESD) is meant to enhance learners' knowledge, values, attitudes, and skills concerning sustainable development. In this study the relationships among Finnish grade nine students' ( $N = 2,367$ ) values, attitudes, interests, and motivations were studied. Human-centered values, biocentric nature value, pro-environmental and pro-social attitudes, interests, and motivations were found to be interconnected. Attitudes, interests, and motivations connected to dismissive human and utilistic nature value correlated negatively with the factors. It is important to notice the connections between students' values and value-related orientations because they affect students' engagement in issues and activities concerning ESD at school.

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*Keywords: ESD, basic human values, biocentric nature values, utilistic nature values, interest, motivation*

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## 1. Introduction

The goal of the United Nations Decade of Education for Sustainable Development (2005-2014) is meant to integrate the principles, values, and practices of sustainable development into all aspects of education and learning. Teaching future-oriented thinking and building a future upon ecologically, economically, socially, and culturally sustainable premises is demanding. In spite of its actuality, not enough research on education for sustainable development (ESD) is available (UNESCO, 2009). For instance, the clarification of concepts, methods for building capacity to undertake research related to ESD and the evaluation of practices and learning are important focuses for research. It is evident that the 'hot questions' of sustainability vary with time for instance among different communities and countries in which it has impacts on teaching, research, and the interpretation of results. According to the UNESCO strategy, ESD is based on five pillars: learning to know, learning to be, learning to live together, learning to do and learning to transform oneself and society. These pillars emphasize the knowledge, skills, and values needed by citizens to improve their quality of life in a sustainable way.

In addition to philosophy, values are studied for instance in behavioral and social sciences. According to the intercultural studies of Schwarz (1992), basic human motivational values are universal, therefore the research instrument used in these studies may provide a valuable tool in studying ESD as well. To clarify the factors influencing students' engagement with ESD, in this study Schwarz's (1992) social-psychological theory of basic

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human values was applied. We also compare values and attitudes (Eagly & Chaiken, 1993) with interests and motivations, applying the theories of educational psychology (Hidi & Renninger, 2006; Krapp, 2003).

In Finland, aspects of ESD are included in the national curriculum as a cross-curricular theme. At least in the ESD active schools this means that sustainability is included to the school culture; the students experience and learn the skills and actions in everyday life by recycling, saving energy and resources, participating sustainability activities at school and outside of the school.

## 2. 2. Values, attitudes, interests, and motivations

Values are considered to be crucial for understanding personal attitudes and behavior. According to Schwartz's norm-activation model, moral or personal norms are determinants of pro-social behavior. Based on earlier studies on human values and wide cross-cultural studies, Schwartz (1992) defined motivational personal values to be desirable goals varying in importance and serving as guiding principles in one's life. According to Davidov, Schmidt, & Schwartz (2008) values are also defined as "deeply rooted, abstract motivations that guide, justify or explain attitudes, norms, opinions and actions" (p. 2). Ten motivationally distinct basic values are defined: *universalism* (understanding, appreciation, tolerance, and protection of the welfare of all people and of nature), *benevolence* (preservation and enhancement of the welfare of people with whom one is in frequent personal contact), *tradition* (respect for, commitment to, and acceptance of the customs and ideas that traditional culture or religion provide the self), *conformity* (restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms), *security* (safety, harmony, and stability of society, of relationships, and of self), *power* (social status and prestige, and control or dominance over people and resources), *achievement* (success, ambition), *hedonism* (pleasure and sensuous gratification for oneself), *stimulation* (excitement, novelty, and challenge in life), *self-direction* (independent thought and choice of action, creating, exploring) (Davidov, Schmidt, and Schwartz 2008, p. 5). The basic values can be divided to four opposing dimensions; *self-transcendence* (*universalism, benevolence*) versus *self-enhancement* (*achievement, power*) and *openness to change* (*hedonism, stimulation, self-direction*) versus *conservation* (*tradition, conformity, security*).

The norm-activation model has also been used as theoretical background in studies concerning peoples' environmental values, attitudes, and behavior. Stern, Dietz, and Kalof (1993) developed a model, which is also called the value-belief-norm theory (Stern, 2000; Stern, Diez, Abel, Guagnano, & Kalof, 1999). This model describes egoistic, altruistic, and biospheric value orientations towards nature and the environment. The model can be related to that of Thompson and Barton (1994), who define three different attitudes towards nature; ecocentrism emphasizes environmental protection because of the intrinsic value of nature, while anthropocentrism sees that the environment should be protected because of its value for the quality of life for humans, and environmental apathy is the ignorance of the value of nature and environmental protection.

Although basic human values are presented as deeply rooted motivations that guide personal attitudes, the difference between 'value' and 'attitude' has remained unclear, and according to Davidov, Schmidt, and Schwartz (2008), survey researchers seldom distinguish between values and attitudes. Attitudes can be understood to be the reflection of basic human values. In general, attitude is defined as a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor (Eagly & Chaiken, 1993). Attitudes towards the environment have been conceptualized as one-dimensional, as in the first version of the New Environmental Paradigm (Dunlap and Van Liere, 1978), or multidimensional, as stated by Dunlap, Van Liere, Mertig, and Jones (2000). Recently Wiseman and Bogner (2003) and Munoz, Bogner, Clement and Carvalho (2009) have presented a two-dimensional environmental attitude model (The Model of Ecological Values), which is described to include a biocentric dimension reflecting conservation of the environment (preservation) and an anthropocentric dimension reflecting the utilization of natural resources (utilization).

Personal interest is known to be the basic factor in developing and maintaining an internal motivation to study (Hidi & Renninger, 2006; Krapp, 2003). Interest is understood to refer to a psychological state arising from specific characteristics of the learning environment (Krapp, 2003). Interest can be defined not only by cognitive aspects, but

also by affect and value (Hidi & Renninger, 2006). Schiefele (1991) suggested that interest includes intrinsic feeling-related and value-related valences. The former approach is understood as the interestingness of current learning engagements or situational interest and the latter as already existing personal interest. Personal interest is assumed to develop slowly and become gradually persistent, while situational interest is assumed to be spontaneous, fleeting, and shared among individuals (Hidi & Renninger, 2006). Personal interest can be subdivided into latent and actualized interest (Schiefele, 1991, 1999). Latent personal interest is able to guide students' cognitive engagement. For instance, students who are interested in plants and animals may also enjoy learning about ecology, and environmental issues (Uitto, Juuti, Lavonen, & Meisalo, 2006). According to Hidi and Renninger (2006), personal interest has long-lasting effects on personal values. In science education, interest in learning specific environmental issues has shown to be related to pupils' environmental attitudes and values (Uitto, Juuti, Lavonen, Byman & Meisalo, in press).

### 2.1. Study questions

In the present study, we analyzed the relation between the factors regarded to be essential to reach the goals of ESD. The questions that we asked were:

- What are the relations among students' basic human values (Schwarz, 1992), other human-related values, biocentric and utilistic nature values, attitudes towards environmental and social responsible behavior, interest in environmental and human issues, and the motivation to act in environmental and social responsible ways at school?
- Are there any differences between the human-centered and nature-centered orientations?

## 3. Methods

This study was carried out in the Finnish research project Sustainable Food Education for Self-Efficacy Development (SEED). We developed a specific questionnaire to survey the factors behind primary and secondary teachers' and students' sustainable actions at school. In the present paper, we consider only grade nine students' answers. In total, the grade nine students questionnaire contains 12 sections eliciting responses from students to items concerning ecological and social sustainability.

At the beginning of each section the students were instructed in how to answer the questionnaire. Basic human values (Schwartz, 1992) were measured with a 6-point Likert-type scale: 6 = very much like me, 5 = like me, 4 = somewhat like me, 3 = a little like me, 2 = not like me, 1 = not like me at all (see e.g. Schwartz, Melech, Lehmann, Burgess, & Harris, 2001). More specific values, attitudes and motivations were measured as the students' responses to different statements concerning humans, nature and the environment and different types of behaviors. The answers were recorded with a five-point Likert-type scale: 5 = strongly agree, 4 = agree, 3 = neither agree nor disagree, 2 = disagree, 1 = strongly disagree. The level of interest was measured as students' responses to the question of how much they are interested in learning specific environmental and human issues. The responses were recorded with a five-point Likert-type scale: 5 = very interested, 4 = quite interested, 3 = some interest, 2 = a little interested, 1 = hardly interested at all.

To obtain a valid sample from age cohort of the grade nine students, 3,232 questionnaires were sent to 54 lower secondary schools. Because Finland is a bilingual country with a Swedish-speaking population of 5.5%, the original SEED questionnaire was translated into Swedish. Of all the students participating in the study, 7.2% were Swedish-speaking. The maximum number of questionnaires sent to each school was 65, and the number of participating students per school varied between 21 and 64. Thus, in each school the questionnaire was usually completed in two or three classes. The organizers of the education, the schools or municipalities, as well as the school principals were informed of the forthcoming study in November 2009. The questionnaires were sent to the schools in February 2010, and the principals were asked to organize the survey in each school. The total number of returned questionnaires was 2,367. Altogether 1,246 girls and 1,109 boys answered the questionnaire, and 12 students did not indicate their sex. The response rate for the selected schools was 91%, and for the students, 73%.

A principal component analysis (PCA) was used to identify the latent variables describing values, attitudes, interests and motivations. The extraction method used was maximum likelihood, Promax rotation ( $\kappa = 4$ ). Only factors with eigenvalues exceeding 1.0 were accepted. The Kaiser-Mayer-Olkin Measure showed that the data were adequate for the PCA. In most cases the sum factors used in this study were calculated according to the PCA results, accepting only items with factorial loadings exceeding .3. Because of the varying number of items in each sum factor, they were recoded to a 1-5 scale by dividing the sum with the number of items (Table 1).

## 4. Results

### 4.1. All Basic human values

The sum factors presenting the students' basic human values (Schwartz, 1992) are presented in Table 1. In general, the values of the dimensions of *openness to change* and *self-transcendence* received the highest scores. The results indicate that *hedonism*, *stimulation*, *self-direction*, and *benevolence* were the most important basic values among the students. Less important values were *nature-centered universalism*, *power*, *security*, *conformity* and *tradition*. Skewness and kurtosis were relatively high for *hedonism*, because the alternative describing the students' choice 'very much like me' had the most ticks. The distributions of the values of *power* and *conformity* were most normal. Cronbach's  $\alpha$  indicating the internal consistency of the factor was low for *self-direction*, *power* and *tradition*.

### 4.2. Specific values, attitudes, interests and motivations

The students' responses to the statements measuring the biocentric nature value indicated that, on average, they consider that living nature, such as animals, plants and ecosystems, to have an intrinsic value to exist (Table 1). Likewise, the students agreed with the statements concerning specific positive human-related values and a pro-social attitudes. For the utilistic nature value the students were neutral or indicated their disagreement with the statements concerning the human mastery over nature and the use of living nature only as a resource for human well-being. The scores for the dismissive human value and attitude showed that the students mostly disagreed with the statements on the intolerance and suspicion or an irresponsible behavior towards other people. On average, students had only some or little interest in nature and pro-environmental issues. The scale describing students' interest in human issues was very normally distributed (kurtosis = 0). As for their motivations, the students agreed more with the statements that indicate an internal than an external motivation to act in pro-environmental and pro-social ways at school (Table 1).

### 4.3. Correlation between different factors

In this study, we consider only significant ( $p < .001$ ) two-way Pearson correlations with medium or large effect size. As stated by Cohen (1992), the correlation coefficient is often significant in large samples but the low value of the coefficient does not tell much about the relations between the studied factors. Cohen (1992) presents a characterization of the effect size of the Pearson two-way correlation; the effect size of the coefficient is 'small' if  $r = .1-.23$ , 'medium', if  $r = .24-.36$ , and 'large' if  $r$  is  $.37$  or larger. Because of the large sample size, the degrees of freedom varied between 2048 and 2298.

In this study the correlation between the values within each of the four value dimensions was large ( $r = .37-.56$ ). There was also large correlation between the values of the *self-transcendence* and *conservation* dimensions ( $r = .39-.46$ ). As for the basic values, *benevolence* and *achievement* correlated largely with the values of the *openness to change* dimension ( $r = .37-.50$ ).

Universalistic nature-related and human-related values correlated in this study (see also Schwartz, 1992). The human-related *universalism* and *benevolence* correlated largely with the pro-environmental and pro-social attitudes, the specific positive human value, the interest in environmental and human issues and the intrinsic motivation to

behave pro-environmental and pro-social way at school ( $r = .38-.65$ ), so that the correlation between human-centered universalism and the interest in human issues was highest. The nature-centered *universalism* correlated largely with the biocentric nature value, the pro-environmental attitude, the interests in environmental and human issues, and the internal motivation to behave pro-environmental way at school ( $r = .37-.61$ ). In this case the correlation between the nature-related *universalism* and the biocentric nature value was highest. The values of the *conservation* dimension had large correlations with the interests in environmental and human issues ( $r = .37-.40$ ). *Self-direction* in the dimension of *openness to change* correlated also largely with the interests in environmental and human issues ( $r = .38$ ). There was also a moderate correlation between the *power* and the utilistic nature value ( $r = .31$ ).

The correlations between the specific human values, attitudes, interests, and motivations followed the same kind of pattern as the values of the *self-transcendence* dimension. There were large correlations between the biocentric nature value and the specific positive human value, the pro-environmental and pro-social attitudes, the interests in environmental and human issues, and the internal motivations to act in pro-environmental and pro-social ways at school ( $r = .37-.7$ ). Large correlations were also found between the utilistic nature value and the dismissive human value and attitude ( $r = .45-.74$ ). There was also a large negative correlation between utilistic and biocentric nature value ( $r = -.37$ ). Moderate correlations were found between utilistic nature value, disinterest in human and environmental issues, and the external motivations to act pro-social and pro-environmental ways at school ( $r = .27-.31$ ).

Table 1. Means (*M*), standard deviations (*SD*), skewness, kurtosis, number of items and Cronbach's  $\alpha$  of the students' basic human values (Schwartz 1992), the specific values, attitudes, interests and motivations concerning humans, nature and the environment. For the basic human values the range is 1-6, for other factors 1-5,  $N = 2172-2354$ .

Values	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	<i>n</i> of items	Cronbach's $\alpha$
<b>Self-transcendence</b>						
Universalism – humans	4.09	1.24	-0.46	-0.37	2	0,72
Universalism - nature	3.20	1.33	0.16	-0.72	2	0,80
Benevolence	4.43	1.06	-0.71	0.38	2	0,66
<b>Openness to change</b>						
Hedonism	4.74	1.08	-0.94	0.74	2	0,75
Stimulation	4.43	1.14	-0.64	0.08	2	0,76
Self-direction	4.32	1.03	-0.50	0.078	2	0,51
<b>Self-enhancement</b>						
Achievement	4.03	1.24	-0.39	-0.37	2	0,82
Power	3.41	1.16	0.05	-0.48	2	0,56
<b>Conservation</b>						
Security	3.58	1.18	-0.14	-0.47	2	0.60
Conformity	3.09	1.22	0.10	-0.72	2	0.72
Tradition	2.81	1.10	0.43	-0.15	2	0.42
<b>Specific values, attitudes and interests</b>						
Biocentric nature value	3.41	0.89	-0.38	-0.12	4	0.79
Utilistic nature value	2.65	0.68	0.26	0.68	9	0.83
Positive human value	3.59	1.09	-0.67	-0.28	2	0.74
Dismissive human value	2.42	0.95	0.32	-0.41	2	0.47
Pro-environmental attitude	3.40	0.88	-0.36	0.19	2	0.61
Dismissive environmental attitude	2.50	0.89	0.53	0.29	3	0.73
Pro-social attitude	3.42	0.85	-0.41	0.50	2	0.55
Dismissive social attitude	2.72	0.77	0.31	0.44	4	0.72
Interest in environmental issues	2.36	0.83	0.28	-0.40	12	0.92
Interest in human issues	2.83	0.98	0.00	-0.66	8	0.92
<b>Motivation for pro-environmental and pro-social behavior at school</b>						
Internal, pro-environmental	3,23	1.05	-0.39	-0.42	2	0.62
External, pro-environmental	2.80	0.99	0.14	-0.35	2	0.48
Internal, pro-social	3.33	1.06	-0.38	-0.39	3	0.85
External, pro-social	2.56	0.89	0.21	-0.15	4	0.75



## 5. Discussion

This study provides new information on the relationship between environmental and human values, attitudes, interests, and motivations, as experienced by Finnish grade nine students. To answer the study questions, we can conclude that the studied factors are logically related with each other in that the positive nature-centered and human-centered values, attitudes, interests and motivations are inter-connected. Utilistic nature value, the dismissive human and environmental values, attitudes and motivations, were also related to each other.

According to Davidov, Schmidt, and Schwartz (2008), basic human values are the deepest motivations that guide human attitudes. Without committing ourselves to ‘wrong’ or ‘right’ values concerning ESD, our results suggest that at least *universalism* and *benevolence* can be regarded to resemble value goals of ESD (UNESCO, 2009), because they were connected to pro-environmental and pro-social interests, attitudes and motivations. In general, responsibility for others, living nature and the environment are cornerstones of ESD. In this study values reflecting *hedonism* and *stimulation* were graded highest by the grade nine students, suggesting that personal pleasure and a fascinating life are important to teen-age students. The results are similar to those of Puohiniemi (2002), who found that *hedonism* and *stimulation* are at their highest level in the age group of 15-24 years in Finland but change over the individual’s lifetime, from the dimension of *openness to change* towards the dimension of *conservation*. Verkasalo, Lönnqvist, Lipsanen and Helkama (2009) found similar results in an international sample collected during the European Social Study in 2003. However, in this study *hedonism* and *stimulation* correlated with *benevolence*, which suggests that students’ pleasure is linked with human relations: social life and close personal relationships with friends and family are important. When compared to the value categorization of Stern, Diez, Abel, Guagnano, & Kalof (1999), these values could be categorized to reflect egoistic value orientation towards nature and the environment. However, in this study *hedonism* and *stimulation* were not strongly connected with any of the studied factors, but correlated moderately only with pro-social attitude and interest in social issues. This is not necessarily controversial to the ESD values, because they may reflect general well-being and human responsibility of an individual.

Although *universalism* (Schwartz, 1992) includes both human- and nature-related values, this study reveals that they are somewhat differently weighted, when students’ attitudes, interests and motivations are considered. Universalism was also related to the values of the *conservation* dimension, suggesting that norms may be important in accepting the goals of sustainability. Students that appreciate humans, nature and the environment also seem to accept rules and norms, such as those included in *tradition*, *security* and *conformity*. The values of the *conservation* dimension were also related to the pro-environmental and pro-social attitudes, interests, and motivations, but in this case the correlations were moderate or small. *Self-direction* was related to *universalism* as well as with the pro-environmental and pro-social attitudes, interests and motivations, which may also indicate ‘environmental empowerment’ (Hungerford & Volk, 1990).

The results showed that the value of *power* in the *self-enhancement* dimension was linked to the utilistic nature value, which in turn was linked to the dismissive human and nature values and attitudes, disinterest in environmental and human issues and attitudes as well as external motivations to behave pro-social and pro-environmental ways at school. In Schwarz’s theory, *power* indicates social status and prestige, as well as control or dominance over people and resources, which is close to the utilistic nature value. Egoism (c.f. Stern, 2000; Stern, Diez, Abel, Guagnano, & Kalof, 1999), egoism can hardly serve any goals of ESD.

Personal or situational interests are important aspects in research on motivation, learning achievements, and processes at school (Hidi & Renninger, 2006; Krapp 2003). Interest in studying a specific issue is influenced by many cognitive and affective factors. According to Schiefele (1991), interest includes intrinsic feeling-related and value-related valences. In this study, we consider the valences to be the connection to personal values and attitudes. On average, the grade nine students were not especially interested in environmental or human issues. However, the students who ranked sustainable values and attitudes higher were also more interested in studying on environmental and human issues and motivated to act in responsible ways at school. The result agrees with the study of Uitto, Juuti, Lavonen, Byman and Meisalo (in press), who found that biocentric values, environmental attitude and interest in environmental issues are interconnected in grade nine students in Finland.

In the ESD it is important to notice the close connection between the affective and cognitive domains. Human- and nature-related values, attitudes, interests and motivations are interconnected, but they have different weights. It is also important to consider the controversy between the value groups of *universalism-biocentrism-altruism* and *power-utilism-intolerance* and their connections to students' engagement with issues and activities dealing with sustainability at school. More research is needed to clarify the role of school education, teaching methods and experiences in enhancing students' learning and orientations towards sustainability.

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