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Effects of Educational Background on Students' Attitudes, Activity Levels, and Knowledge Concerning the Environment

PÄIVI M. TIKKA, MARKKU T. KUITUNEN, and SALLA M. TYNYS

ABSTRACT: The objective of this study was to establish whether students in a variety of educational establishments differed in their attitudes toward nature and the environment and to discover more about their nature- and environment-related activities and knowledge. Major variations among students were found according to their gender and educational backgrounds. Female students tended to show more responsibility toward the environment than male students. Of the different educational groups studied, students of biology exhibited the most positive attitudes and the greatest levels of knowledge; they also participated in many nature-related activities. In contrast, there was some evidence that students of subjects related to technology and economics adopted a more negative attitude toward the environment and, on average, had fewer nature-related hobbies than students in general. Attitudes, the quantity of nature-related activities, and knowledge about environment- or nature-related issues correlated with one another. Although educational background seemed to affect attitudes, activity levels, and knowledge, there are without a doubt a number of other underlying factors.

The state of the environment has long been a subject of debate. Environmental problems cannot be solved solely by biological or technological inventions (Newhouse, 1990) because the most serious obstacles to preserving a healthy environment and viable wildlife are related to economic growth and the constant growth in demand and con-

sumption by the human population (Maloney & Ward, 1973). The environmental crisis is, to a significant extent, based on people's behavior and their patterns of thought. Many of the failed attempts to preserve a healthy environment result from the overemphasis of socio-economic or political factors and from inadequate attention given to the non-economic value of the environment. Only after understanding the relationships between the attitudes that people have toward the environment and the factors that influence these attitudes we will be able to comprehend and improve the public's attitudes toward nature.

Attitudes find their expression in action and in interaction among people. The context as well as the social groups we

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belong to constrain what we do, feel or think. Therefore, Kellert (1983, 1986, 1991, 1993) has concentrated on studying the willingness of people belonging to different nationalities and social groups to make personal sacrifices in favor of the environment and wildlife. In general, it seems obvious that the most significant factor affecting nature is not the official environmental policy but the public's willingness to take care of the environment and to bear the costs of minimizing the adverse impact of their activities (Ramsey & Rickson, 1976).

In this paper, we focus on students' attitudes toward their environment by comparing students from a variety of educational establishments. Our objective is to determine whether there are any significant connections among (a) students' attitudes to the environment, (b) their willingness to participate in nature- or environment-related activities, and (c) their knowledge of current environmental problems or biological facts. We realize that education is only one of the factors contributing to learning and thinking in a cognitive learning process (Jenkins, 1979). Bearing this fact in mind, we set out to discover how strongly educational background can affect attitudes, activity, and knowledge.

Methods

This survey was conducted in the spring of 1994 in ten educational establishments in the county of Central Finland. This region has 350,000 inhabitants and four towns with populations over 10,000. Jyväskylä and its surroundings (106,000 inhabitants) are located at the center of the region. A total of 464 students who had completed comprehensive school and represented different types of educational establishments were involved in the study (Table 1). In Finland, all children start school at the age of seven, and basic education lasts nine years. After completion, students choose between vocational training and high school, which lasts three years and qualifies them for university or college studies. The choice of students in our study was determined by the availability of different educational establishments. All the major types of postcomprehensive educational establishments in and around Jyväskylä were included.

All the educational establishments from which students were selected are situated in Jyväskylä except for the Colleges of Forestry, which are in Pieksämäki (approximately 80 kilometers from Jyväskylä) and Evo (approximately 150 kilometers from Jyväskylä). The type of education provided by these two colleges of forestry differs, although they both offer college-level education. In Pieksämäki, the education concentrates primarily on the economic aspects of forest management: logging, growing, and planting of seedlings. In Evo, in addition to traditional forestry, forest conservation and the recreational use of forests are emphasized.

The University of Jyväskylä is the largest of the educational establishments from which students were selected. It has five faculties (Humanities, Education, Sport and Health Sciences, Mathematics and Natural Sciences, and Social Sciences) and about 12,000 students. To obtain a comprehensive

TABLE 1. The Educational Establishments in Our Study and Numbers of Male and Female Students

Educational establishment/ major subject	No. of male students	No. of female students	Total
University of Jyväskylä			
1. Psychology	5	24	29
2. Biology	5	20	25
3. Physical education	11	14	25
4. Economics	12	14	26
5. Social policy	6	19	25
6. Statistics	8	9	17
7. History	12	17	29
Jyväskylä Institute of Technology			
8. Technical students	24	1	25
9. Engineering students	25	0	25
Other schools			
10. College of Health Care	4	22	26
11. Preschool Teacher Training Institute	2	23	25
12. Commercial College	11	13	24
13. High school	9	18	27
14. Pieksämäki College of Forestry	17	8	25
15. The Evo Institute of Forestry	11	15	26
16. Vocational school	29	23	52
17. Hotel and Restaurant College	11	22	33

picture of the students attending the university, we chose students from different faculties and seven major subjects. We included a group of students from the Department of Biological and Environmental Science in order to test whether people concentrating on nature-related studies also expressed positive attitudes. We supposed that this group would have higher levels of nature-related activities and greater knowledge of the environment than students on average.

To collect the data for the study, we first contacted the headmasters of the educational establishments. The headmasters indicated which classes were present at the time we wished to visit the establishment. The classes chosen from different educational establishments had no common factors. Also, in these educational establishments a class or a teaching group is seldom a fixed entity. Students choose different courses independently and, consequently, do not attend lessons as part of a group. This fact decreases the interdependency of the cases within educational establishments.

One member of the study team distributed questionnaires to the students in the classroom. In some cases (Pieksämäki College of Forestry, history students, and technical students), we gave the forms to teachers and asked that they distribute them at an appropriate moment. Filling in the form took students about half an hour and they worked

independently. As a model, we used a questionnaire designed at the University of Jyväskylä in 1983 (Kuitunen & Törmälä, 1994). In the main, we retained the existing questions, although some were modified to make them more appropriate to the situation. Some of the questions were new, replacing outdated details. The form covered a wide range of topics and included a total of 87 questions to assess each student's involvement in nature- and environment-related activities, their knowledge of environmental issues, and their attitudes toward nature and the environment. The questionnaire was in Finnish and, to ensure the reliability of the questions employed, it was checked by researchers at the Educational Research Centre of Jyväskylä University before the study began.

The first set of questions ($n = 23$) dealt with a student's keenness to participate in any nature- or environment-related activities. This set included multiple-choice questions on activities such as how many species of birds the students could recognize, how many times they had gone fishing or picking forest berries in the previous year, or what kind of waste they recycled. They were also asked whether they had visited any national parks in the previous year, read any environmental articles in newspapers, or if they chose environmentally friendly detergents.

The second set of questions ($n = 21$) included multiple-choice questions that tested each student's knowledge of environmental facts or biological phenomena in nature. Students were asked, for example (correct answers underlined), how many nuclear power reactors there are in Finland (2, 3, 4, or 5), which of the following four bird species overwinters in Finland (wagtail, chaffinch, raven, or starling), which of the following plant species is protected in Finland (pale pasque flower, lily-of-the-valley, cornflower, or water lily), or which of the following elements causes water eutrophication (mercury, phosphorus, oxygen, or potassium).

Students' attitudes toward the environment were evaluated by the third set of questions ($n = 34$). These included statements with which the students could agree or disagree by choosing a suitable option from the Likert scale of five alternatives. The statements were of the following type: "Protection of environment reduces our material welfare" (agreement gives low score) and "Wandering in nature is interesting and refreshing" (agreement gives high score).

We formed three scoring indices based on the three sets of questions: (a) extent of nature- and environment-related activities; (b) knowledge of nature and environment; and (c) attitudes toward nature and environment. In the activity index, the points given for each question increased with the student's degree of activity in nature-related hobbies and attention paid to environmental issues in their everyday choices. The highest possible score was 75 points. To derive the knowledge index, we summed the points that students obtained from the knowledge questions. A correct answer scored 1 point, and a wrong answer scored nothing. Therefore, the possible range was between 0 and 23 points. To obtain the attitude index, the value 4 was assigned to the alter-

native in each question that was regarded as the most positive toward nature, and the value 1 was assigned to the most negative alternative. The mean of the choices was then calculated to give the student's attitude index. The higher the attitude index, the more positive the student's attitude. The lowest possible score was 1 and the highest possible score was 4.

Finally, the form included questions about the students' background. We requested the respondent's age, gender, hometown or municipality, and home county, as well as the professions of their parents. Students' parents were classified according to their professions into the following social classes: (a) executives and upper officials, (b) salaried employees, (c) entrepreneurs, (d) farmers, (e) workers, (f) pensioners, and (g) others (Anonymous, 1983). Students were classified on the basis of age into three roughly equal-sized groups: 18–21, 22–25, and over 25 years old.

Results

Students' Attitudes, Activity Levels, and Knowledge

Attitudes toward the environment varied significantly among students from different educational establishments; analysis of variance (ANOVA) was used ($F = 7.62$, $df = 16$, $p < .001$; Table 2). Students majoring in biology clearly had the most positive attitudes. Psychology majors and the forestry students in Evo had the next highest scores. Engineering students, vocational school students, and students majoring in statistics had the most negative attitudes.

Similarly, activity level scores varied greatly among student groups (ANOVA, $F = 9.15$, $df = 16$, $p < .001$; Table 3). Students majoring in biology formed the most active group, followed by forestry students in Evo and Pieksämäki. Com-

TABLE 2. Students' Attitudes Toward Nature and the Environment

Educational establishment/major subject	<i>M</i>	<i>N</i>
2. Biology	2.424	29
1. Psychology	2.150	29
15. The Evo Institute of Forestry	2.145	26
11. Preschool Teacher Training Institute	2.135	25
10. College of Health Care	2.105	26
5. Social policy	2.097	25
7. History	2.088	29
3. Physical education	2.046	25
8. Technical students	1.973	25
13. High school	1.964	27
17. Hotel and Restaurant College	1.963	33
12. Commercial College	1.934	24
14. Pieksämäki College of Forestry	1.927	25
4. Economics	1.923	26
6. Statistics	1.907	17
16. Vocational school	1.907	52
9. Engineering students	1.746	25
<i>M</i>	2.021	

Note. The minimum index value is 1, and the maximum index value is 4.

TABLE 3. Students' Nature and Environment-Related Activities

Educational establishment/major subject	<i>M</i>	<i>N</i>
2. Biology	39.560	25
15. The Evo Institute of Forestry	39.346	26
14. Pieksämäki College of Forestry	35.040	25
10. College of Health Care	32.385	26
5. Social policy	28.880	25
3. Physical education	28.720	25
7. History	27.793	29
17. Hotel and Restaurant College	26.970	33
16. Vocational school	26.788	52
1. Psychology	26.448	29
13. High school	26.111	27
9. Engineering students	25.800	25
11. Preschool Teacher Training Institute	25.600	25
8. Technical students	23.720	25
4. Economics	23.000	26
6. Statistics	22.706	17
12. Commercial College	22.125	24
<i>M</i>	28.284	

Note. The minimum index value is 0, and the maximum index value is 75.

mercial college students were the least active. Also, students majoring in statistics and economics participated in few nature- or environment-related activities.

Additionally, there were considerable differences among the student groups in knowledge of current environmental problems and nature-related questions (ANOVA, $F = 11.6$, $df = 16$, $p < .001$; Table 4). Once again, biology students scored the highest. Students at the Evo Institute of Forestry were second, followed by students majoring in history and students of the Pieksämäki College of Forestry. Students at the Commercial College, the Pre-School Teacher Training Institute and the College of Health Care gave incorrect answers most often.

Mutual Relations of Attitudes, Activity Levels, and Knowledge

We studied the correlations among the following three indices: attitude toward the environment, level of activity, and degree of knowledge. When comparing the characters of individual students, a person who had a positive attitude toward the environment also tended to have several activities related to nature and the environment ($r_s = 0.326$, $df = 462$, $p < .001$). When comparisons were made among educational establishments on the basis of their average attitude toward the environment and levels of activity, the biology students and the forestry students in Evo ranked high in both attitudes and activity (Figure 1). On the other hand, engineering students and the students of the commercial college represented the opposite extreme.

A significant correlation also existed between knowledge and attitude of individual students ($r_s = 0.283$, $df = 462$, $p <$

TABLE 4. Students' Knowledge of Nature and the Environment

Educational establishment/major subject	<i>M</i>	<i>N</i>
2. Biology	17.880	25
15. The Evo Institute of Forestry	15.885	26
7. History	15.690	29
14. Pieksämäki College of Forestry	15.440	25
4. Economics	14.692	26
5. Social policy	14.480	25
8. Technical students	14.120	25
13. High school	13.852	27
6. Statistics	13.814	17
9. Engineering students	13.800	25
1. Psychology	13.552	29
3. Physical education	13.529	25
16. Vocational school	13.192	52
17. Hotel and Restaurant College	12.697	33
10. College of Health Care	12.385	26
11. Preschool Teacher Training Institute	12.280	25
12. Commercial College	11.500	24
<i>M</i>	13.994	

Note. The minimum index value is 0, and the maximum index value is 23.

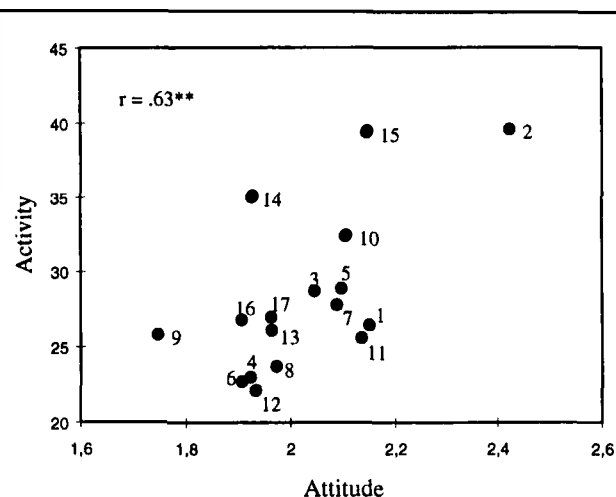


FIGURE 1. The effect of attitude on activity; the means of educational establishments or major subjects ($p < .01$). 1: Psychology, 2: Biology, 3: Physical Education, 4: Economics, 5: Social policy, 6: Statistics, 7: History, 8: Technical students, 9: Engineering students, 10: College of Health Care, 11: Preschool Teacher Training Institute, 12: Commercial College, 13: High school, 14: Pieksämäki College of Forestry, 15: The Evo Institute of Forestry, 16: Vocational school, 17: Hotel and Restaurant College.**

.001). When the average values in educational establishments were compared, the connection between a positive attitude and good knowledge was not as obvious (Figure 2). The biology students were exceptionally positive in their attitudes and ranked high in knowledge, whereas the other groups showed a fairly even distribution. For example, future kindergarten

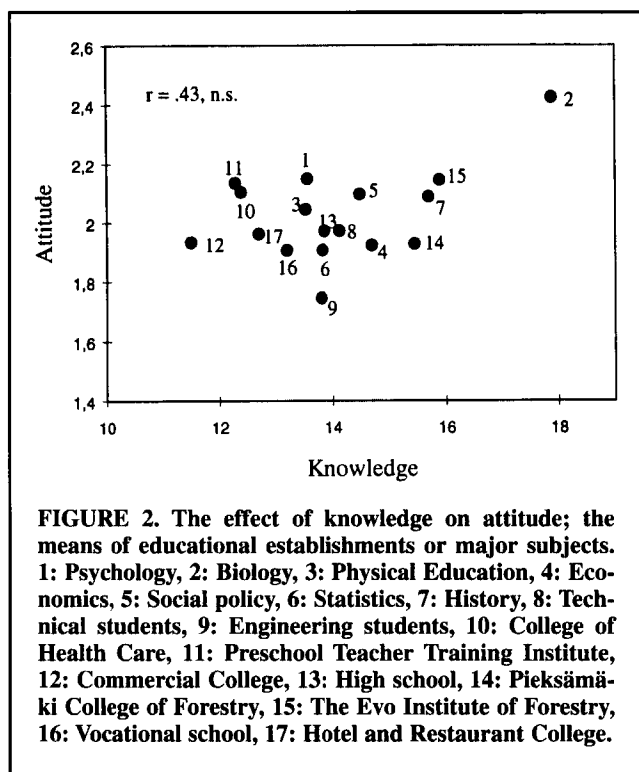


FIGURE 2. The effect of knowledge on attitude; the means of educational establishments or major subjects. 1: Psychology, 2: Biology, 3: Physical Education, 4: Economics, 5: Social policy, 6: Statistics, 7: History, 8: Technical students, 9: Engineering students, 10: College of Health Care, 11: Preschool Teacher Training Institute, 12: Commercial College, 13: High school, 14: Pieksämäki College of Forestry, 15: The Evo Institute of Forestry, 16: Vocational school, 17: Hotel and Restaurant College.

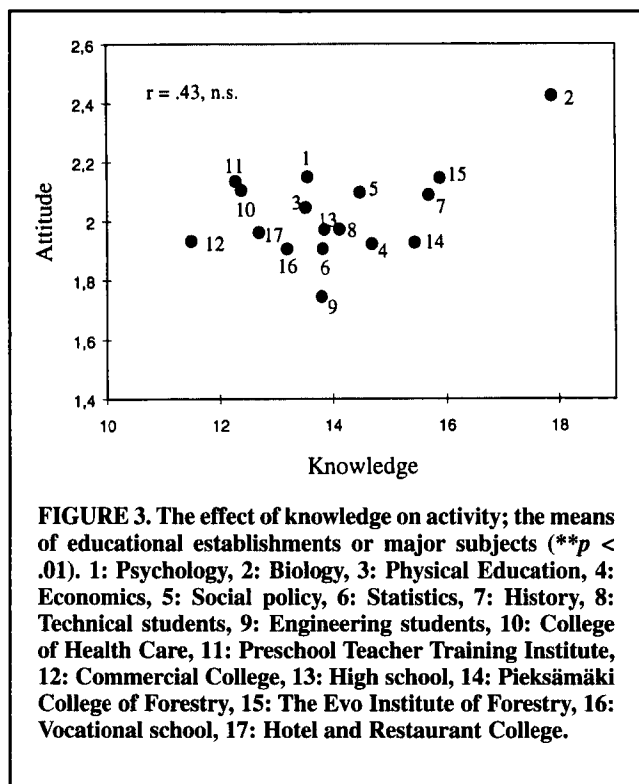


FIGURE 3. The effect of knowledge on activity; the means of educational establishments or major subjects (** $p < .01$). 1: Psychology, 2: Biology, 3: Physical Education, 4: Economics, 5: Social policy, 6: Statistics, 7: History, 8: Technical students, 9: Engineering students, 10: College of Health Care, 11: Preschool Teacher Training Institute, 12: Commercial College, 13: High school, 14: Pieksämäki College of Forestry, 15: The Evo Institute of Forestry, 16: Vocational school, 17: Hotel and Restaurant College.

teachers had moderately positive attitudes toward nature but their knowledge of it was the second lowest.

Furthermore, there was a significant correlation between degree of knowledge and level of activity ($r_s = 0.378, df = 462, p < .001$) for individuals. The comparison among entire educational establishments indicated once again that

the biology majors and the students at the Evo Institute of Forestry achieved the highest averages in both indices, whereas students of the commercial college were the least active and least knowledgeable (Figure 3). Although the correlation between the variables was significant, there were also some exceptions among the student groups. The knowledge exhibited by the students of nursing was moderately low but they were among the four most active groups. In contrast, the students majoring in history scored the third best in knowledge despite being fairly inactive.

The Effect of Gender on Attitudes, Activity Levels, and Knowledge

The type of education received cannot be regarded as the sole factor affecting attitudes, knowledge or activity. Gender seems to play an important role in explaining the variation in these variables. Our data included a total of 202 male and 262 female students (Table 1). We found a significant difference in attitude index scores between the two genders (Mann-Whitney U test, $z = 6.454, N = 464, p < .001$); on average, men had more negative attitudes toward the environment than women.

We detected no gender-related difference in total activity (Mann-Whitney U test, $z = 1.921, N = 464, p = .055$), but there was a divergence between the hobbies and activities in which men and women participated. Men hunted more often (Mann-Whitney U test, $z = 3.534, N = 464, p < .001$) and women picked more forest berries (Mann-Whitney U test, $z = 5.353, N = 464, p < .001$).

Knowledge of nature and the environment seemed to be dependent on gender because men answered correctly more often than women (Mann-Whitney U test, $z = 5.41, N = 464, p < .001$). The mean knowledge points scored by men (14.49) were only slightly higher than those scored by women (13.62), but because of the large dataset this difference was statistically significant. When attitude and knowledge scores were compared across educational establishments or major subjects, a good degree of knowledge tended to be linked with a positive attitude. But in the case of different genders, men gained higher scores for knowledge than women despite their negative attitudes. To discover which of the two—the educational establishment or the gender—was the more influential factor in determining knowledge and attitude, we compared the mean attitude and knowledge scores of the two genders separately at every educational establishment. In nearly all the educational establishments, men's attitudes were more negative than women's (Wilcoxon's Pairwise Test, $T = 3.493, N = 16, p < .001$). Likewise, men's greater degree of knowledge was evident in most educational establishments (Wilcoxon's Pairwise Test, $T = 2.947, N = 16, p < .001$).

The Effect of Students' Background on Attitudes, Activity Levels, and Knowledge

Students' background had some effect on the measured variables. Attitudes toward the environment were affected by

the home county (ANOVA, $F = 2.06$, $df = 10$, $p < .05$), with students coming from the densely inhabited southernmost parts of Finland having more positive attitudes on average than students coming from the central parts of the country. The respondent's age (Kruskal–Wallis, $F = 5.27$, $df = 2$, $p < .01$) and the social class of the respondent's father (ANOVA, $F = 3.18$, $df = 5$, $p < .01$) contributed to levels of activity. The oldest students and the children of farmers were the most active; students from the families of entrepreneurs were the least involved in nature- and environment-related activities. Finally, the student's age was found to be the only background factor contributing to the degree of knowledge (Kruskal–Wallis, $F = 8.81$, $df = 2$, $p < .001$). The older the respondents, the more often they gave correct answers.

Discussion

Students' Attitudes, Activity Levels, and Knowledge

As expected, biology students scored the highest on attitudes toward the environment. It is quite likely that the choice to study biology presupposes a somewhat positive attitude, or at least an interest in nature. On the other hand, the difference in attitude between the two groups of forestry students was surprising. In Evo, students had the third highest scores for attitude, whereas the students in Pieksämäki ranked fifth from the bottom. Emphasis on the multiple use and conservation of forests really seemed to have affected students' attitudes in Evo. An alternative explanation could be that the Evo students initially might have had positive attitudes toward the environment and, subsequently, selected to study at an educational establishment that is sympathetic to conservation.

The engineering students and students majoring in statistics were among the most negatively oriented groups. This may be related in part to their technology centered studies. Gigliotti (1992) found that university students were not willing to make personal sacrifices in favor of the environment if they trusted the capability of technology to solve environmental problems. Economic and social issues may also affect attitudes toward the environment. Economics students might be expected to have somewhat materialistic and laissez-faire opinions, which would appear as moderately negative attitudes toward the environment in this study. Interestingly, Shetzer et al. (1991) claimed that the opinions of business students were predominantly pro-environment. Nevertheless, the students concerned considered it to be unnecessary to limit economic growth to improve the state of environment. This pattern of thought might lessen the willingness to carry out actions for the benefit of nature. In fact, both of the economy related student groups in our study—students majoring in economics and the students at the commercial college—were among the least active.

The three groups exhibiting the highest levels of activity—students majoring in biology and students of forestry in Evo and Pieksämäki—participated in many courses that spent a lot of time outdoors. This contributed to the high levels of activity in those educational establishments, in

addition to voluntary nature-related hobbies. The same student groups also had good knowledge scores. This is understandable because their studies, in one way or another, involve nature or the environment. Moreover, these groups of students are often so interested in nature that they even gather information during their leisure time.

Mutual Relations Among Attitudes, Activity Levels, and Knowledge

The correlation between attitudes toward the environment and levels of activity was statistically significant when all individual responses were included and when the interdependence was tested between the mean attitude and activity scores of the educational establishments. Many other researchers also believe there is correlation between attitude and behavior. To reliably detect this connection, it is very important to measure both variables in a comparable way (Newhouse, 1990). Questions employed to measure behavior and attitude must relate to the same subjects and must be of equal difficulty (Rajecki, 1982). A good example of this is a study of recycling in New York state (Lansana, 1992). Those recycling their waste were of the opinion that recycling was important, and they also had positive attitudes toward nature and the environment in general. Differing social pressures, in addition to the wrong type of questions being asked, might be reasons for the non-correlation between attitude and behavior in some studies (Newhouse, 1990). Respondents may, for example, exaggerate when answering if they know that the attitude of their supervisor is positive towards nature.

In our data, the possession of good knowledge and a positive attitude were dependent on each other but this has not been the case in every study (Kellert, 1993). Also, our results exhibited some deviation. The students training to be kindergarten teachers, for example, obtained the second lowest scores for knowledge but their attitudes were still fairly positive. Hausbeck, Milbrath, and Enright (1992) observed a similar phenomenon among high school students in New York state: The students were highly concerned and aware of the existence of environmental problems, yet they gave correct answers to only half of the questions that measured their knowledge of the environment. The noncorrespondence of knowledge and attitude is also common in discussions concerning nuclear power. Those supporting nuclear power may use rational arguments based on technology and economy, but those opposing the use of nuclear power often justify their opinions by ethical, moralistic, or emotional claims (Sänkiäho & Rantala, 1987). Thus, attitude seems to be dependent on personal feelings and values in addition to factual knowledge.

Among the students in this study knowledge correlated with nature- or environment-related activity. It is not clear, however, whether good knowledge leads to high levels of activity or vice versa. Someone who has always been interested in bird watching probably gathers the majority of information on birds after taking up the hobby. But in the

case of environmental activity, people are perhaps more likely to change their actions after receiving information about desirable behavior.

The Effect of Gender on Attitudes, Activity Levels, and Knowledge

We found that female students have more positive attitudes towards nature and the environment than male students. Similarly, Kaila-Kangas, Kangas, and Piirainen (1994) noticed that, among the whole Finnish population, women were more concerned about environmental problems than men. Many researchers have identified similar tendencies: Men tend to emphasize mastering nature and deriving benefits from natural resources, whereas women take a more emotional attitude toward nature (Kellert & Berry, 1987; Caro, Pelkey, & Grigione, 1994). Women have traditionally been responsible for looking after the home and children, and men have concentrated on hunting and resource provision (Gilligan, 1982). The concern felt by women for nature and the environment could be seen as a way of taking care of their offspring, because a clean and safe environment is a precondition for welfare and survival. In fact, the female students in our study showed more responsibility in their everyday actions (e.g., in recycling) than the male students. Even though the division of labor between genders continues to become more equal, the traditional views of gender roles still affect our actions and opinions.

Female and male students had approximately the same quantity of nature-related activities but the types of hobbies were different. Men go hunting and fishing, as their ancestors have done, though the primary purpose of these activities is now recreation, not obtaining food. In addition to relaxation, hunting and fishing may also satisfy men's need for personal autonomy and authority (Gilligan, 1982) or even the need to control and master nature (Kellert & Berry, 1987). The ability to survive in the wild has been essential to the existence of human beings for hundreds of thousands of years. This fact probably continues to influence the actions of modern men.

As in many other studies (e.g., Arcury & Johnson, 1987), students' degree of knowledge was dependent on gender: Men gave correct answers to the knowledge questions more often than women. Gender had an even greater impact on knowledge than the educational establishment or the major subject being studied. The same gender-dependency also applies to the Finnish adult population. Kaila-Kangas et al. (1994) noticed that women had less knowledge about environmental facts even though they were as highly educated as men. This is confusing because we earlier observed a positive attitude toward the environment and a good degree of knowledge to be dependent on each other. Women's attitudes are more positive—in spite of the fact that they have less knowledge than men. It seems that women's attitudes are, at least partly, independent of their knowledge and are better explained by other factors such as culture and evolutionary history. According to Määttä (1996), benignity and

universal responsibility are general guiding principles in women's lives. These values are expressed as helpfulness, responsibility, and concern for the well-being of nature and people. Appreciation of a healthy environment is included in these values.

The Effect of Students' Background on Attitudes, Activity Levels, and Knowledge

The results that we obtained indicated that the size and location of one's hometown might shape attitudes toward the environment. The most positive attitudes were found among students coming from the metropolitan area in southern Finland, where population levels are the densest. It is possible that people living in crowded, urbanized environments are most likely to become aware of existing problems and, consequently, adopt sympathetic attitudes toward nature and protection of the environment.

The older the students in our study, the more active and aware they are of biological and environmental facts. Older students often live in households of their own and are independently responsible for their consumption and recycling habits. Conversely, the younger students who still live with their parents often added notes in the margins of their questionnaires explaining that they could not influence, for example, the choice of detergents. Besides age, father's profession also contributes to levels of activity: Students who come from farming families are the most active. Probably, several outdoor activities are a natural part of their lifestyle in their countryside homes. On the other hand, the low interest shown by entrepreneurs' children in nature- and environment-related activities could be a reflection of a business-oriented atmosphere at home.

According to modern ideas, one's personality, or self, is formed in a continuous interaction with other people, the environment, and culture (Fogel, 1993). The effects of individual factors on personality, attitudes, and behavior cannot be separated from one another. Even though we were able to prove attitudes toward the environment, levels of activity, and degrees of knowledge to be connected to educational background, we admit that numerous factors, uncontrollable by us, certainly have a further effect on these variables.

Conclusion

This research only concentrates on certain educational establishments, but we believe the results are also valid in a larger context. Our study indicates that students' attitudes, activity levels, and knowledge of nature and the environment differ drastically among Finnish educational establishments. Students, of course, have already adopted certain attitudes and behavior at home and while attending comprehensive school. As a rule, people coming from the most densely crowded regions seem to be the most worried about the state of the environment; whereas students who grew up on farms spend the greatest proportion of their time on nature-related activities.

Childhood experiences and milieu undoubtedly affect the subsequent choice of education. Although we do not claim that an educational establishment completely determines the attitudes, behaviors, and acquisition of knowledge of the students attending it, we believe the role of the educational field to be a significant one. That the most negative attitudes toward the environment were shown by engineers and the most positive attitudes were shown by biology students cannot be mere coincidence. Similarly, it seems symptomatic that neither students majoring in economics nor students at commercial colleges were very interested in participating in activities concerning nature or the environment. The gap between economics and environmental issues apparently remains, even though the health of nature should surely be seen as a guarantee of material well-being in the future.

The negative attitudes that are shown by engineers- and economists-to-be ring alarm bells. These people will become the experts who will be responsible for the planning of new technology and decisions on new investments in the future. Developing suitable environmental education, especially for the technology and economy-related fields, represents a great challenge.

NOTES

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