PSYCHOLOGICAL SOLUTIONS FOR ENVIRONMENTAL EDUCATION¹

Viktor KULHAVÝ

Abstract: This report discusses the field of environmental psychology, currently called conservation psychology, concepts of which have not become widespread in the Czech Republic yet. The study is based on a premise that psychology could potentially significantly contribute to the solution of the global problem consisting in the unsustainability of human activities. The study analyzes several components of the relationship between school-age children and the Nature from the position of conservation psychology that searches for methods of influencing environmental behavior of humans. It briefly outlines the development of studying the relationship between humans and the environment in psychology and lists selected theoretical concepts that are studied by the current conservation psychology. The relationship between humans and the Nature is outlined in the five-dimension model of J. Krajhanzl (2006). The study also discusses two components of the relationship between humans and the Nature - human emotional reaction to the Nature and the amount of human experience with the Nature. It tests hypotheses about the differences in these two characteristics in school-age children who regularly attend Scout clubs and in those who do not attend these clubs. The study uses the comparison data acquired from the "Research into Increasing Alienation between Humans and the Nature" from 2004 - 2005 (National Research Program of the Ministry of the Environment): Countryside and Settlements of Future, Project No. IC/4/40/04). The acquired results support the previously established hypotheses. There were discovered differences in the more positive emotional reaction and in the larger experience with the Nature exhibited by children from the Scout clubs. Scout club members have larger experience especially with activities developing their outdoor skills, they more frequently come into contact with wild animals and they also more frequently participate in environmentally-oriented educational activities. The study describes how the Scout clubs could contribute to the development of the children's relationship to the Nature and it also notes the limitations placed on such a development.

Keywords: conservation psychology, environmental education, relationship between humans and the Nature, Scout clubs

¹ For the complete text of this report see: http://is.muni.cz/th/42121/fss_b/BP_Kulhavy_2008_psy_vychodis-ka.pdf

Introduction

Sustainability² of human activities on the planet Earth turns out to be a problem with a rather complex, integrated and difficult solution. It deeply affects the arrangement of the contemporary human society and re-evaluates the principles it is based on (e.g. an-thropocentrism, consumerism and post-modernism). Whether a sustainable development of this civilization is possible at all is a question studied by specialists from many fields. The issue of the non-sustainable development impacts not only the fields that are closely related to it, such as environmental sciences, ecology, politics, economics, sociology, pedagogics and philosophy. It is increasingly related also to other fields, such as chemistry, physics, biology, etc. It is possible to say that you could hardly find an area of human knowledge which would have nothing to say about the sustainability issue. The multi-disciplinary character of this problem requires coordination among many fields of human activities and an establishment of a common thought model for its solution.

It seems that psychology has not managed to fully use its potential to contribute into this discussion. Nevertheless, the questions in front of us are of an absolutely fundamental significance. Stephen R. Kellert asks: *"Humans will survive the extinction of many forms of life and they will also resist water, air and soil contamination. But will these disturbed conditions provide for healthy physical, emotional, intellectual and spiritual development?"* (Kellert, 1996a, quote in Kahn, 1997, page 11; author's translation)

The research into the relationship between humans and the Nature and into the human ontogenetic development thus becomes a current and required task for psychology; the fulfillment of this task may contribute to a better understanding of the causes of the environmental crisis and it could potentially help in its solution. From the development viewpoint it will be interesting to focus on the early development stages of human life.

It was the purpose of the presented study to perform a comparative survey considering two characteristics of the relationship with the Nature - an emotional reaction of a child to a contact with the outdoors and the extent of a child's experience with the outdoors. This research follows the project "Children and the Nature: Experiencing and experiences" which was performed as a part of the "Research into Alienation of Humans from the Nature" realized in 2004-2005. This Research studied a relationship between children and the Nature from the differential psychology's viewpoint among students of several elementary schools in Prague and Hradec Králové (Krajhanzl et al., 2004; Strejčková, 2005; Strejčková, 2006).

1. Theoretical Solutions

The following report is based on the concepts of the so-called conservation psychology³, a discipline studying two wide fields of knowledge: a) human motivation towards environmentally considerate behavior, b) a call for greater interest in the natural

² The report of the World Environmental Commission called *Our common future* (1987) contains the following definition of a sustainable development: *"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."*.

³ This term was translated into Czech as "nature-protection psychology" but the more easily comprehensible term "ecopsychology" is used more frequently (Krajhanzl, 2006).

environment and human role in this environment (Saunders, 2003). "The relationship between humans and the Nature" seems to be the key term.

1.1. Relationship between Humans and the Nature

A relationship between humans and the Nature⁴ is a blurry term with many side meanings. It is based on the tradition of the environmental psychology, which understands it in a rather limited way - as an interaction between an individual and his/her immediate surroundings. This understanding emphasizes the influence of the environment as a part of socialization (the impact of the environment on humans), but it doesn't include the individual's relating to the beyond-human world. According to the current state of knowledge it is possible to declare that the relationship towards Nature is a complex concept including "...mutually interconnected psychical phenomena, processes, states and characteristics which are related to the Nature within human experiencing and behavior." (Krajhanzl, 2004).

If we want to investigate how people differ in their relationships with the Nature, we have to first describe and classify this relationship with the Nature. One of the possible structures is described by Krajhanzl (2004, page 3; also In Strejčková et al., 2005, page 38-45; 2006). The relationship between humans and the Nature is studied from the viewpoint of their interindividual differences and identifies the so-called *basic characteristics* of a relationship towards the Nature and *partial characteristics* belonging into one of the basic characteristics.

There are proposed five basic characteristics which are based mostly on the ideas of general psychology, social psychology and personality psychology (according to Krajhanzl, 2004; 2008b):

1. A need for contact with the Nature

- A frequency and quality of a contact with the Nature preferred by an individual.
- Motives for contacts with the Nature, a preferred form of contact.
- Strategy of coping with the need for contacts with the Nature.

A person with a higher need for contacts with the Nature spends more time outdoors and searches for ways how to spend more time outdoors. If this need is frustrated, such an individual exhibits somatic-psychical symptoms, such as lack of concentration, agitation and imagining being outdoors.

2. Outdoor Skills⁵

• These are physiological, motor, sensor-motor, intellectual, emotional-volitional abilities and skills of humans to stay outdoors and manipulate natural items.

⁴ "Nature is understood here as phenomena evoking in an individual experiences of a beyond-human world, *i.e.* a world without people, not created and not influenced by people, a world beyond non-material beings not connected with the world of the Nature through their existence." (Krajhanzl, 2006, page 7)

⁵ Should we understand this field wider as a competence for staying outdoors we would have to include not only the abilities but also knowledge, skills and habits (author's note)

From the general psychology's viewpoint it follows the processes of learning, sensory processes and the emotions theory. It applies the knowledge of the developmental psychology about the cognitive and emotional development, motor activity development and the development of basic abilities and skills in various periods of life.

A human adapted to a contact with the outdoor environment can easily move about outdoors, knows about potential hazards and is able to take care of himself/ herself (starting a fire, food preparation, spending a night in the open).

3. Environmental Consciousness

- Includes the concepts of morality as related to the environment, consequences of one's own acts and acceptance of a responsibility for such acts.
- Perception of environmental hazards both at local and global levels.
- · Motivation concerning the protection of the Nature

It is based on the theory of human moral development (Piaget, Kohlberg), concept of accepting responsibility - in a narrower sense a concept of environmental responsibility. It also refers to the motivation resources of humans, strategies of coping with environmental consciousness (see, for example, the theory of defense mechanisms).

A person with high environmental consciousness deliberately acquires habits that help eliminate his/her environmental path, perceives the consequences of human activities in the environment. At the emotional level he/she feels sympathy for the Nature clashing with the Culture, he/she may express fears about the future development.

4. Attitude to the Nature

• Adopting attitudes to the Nature - the natural environment evaluated as dangerous, unknown, beautiful, rich, pleasant and unpleasant.

This term refers to the theory of attitudes and their affective, behavioral and cognitive components. It also studies modifications in attitudes and impacts of emotions on their modifications due to the influences of the culture. An important area of the attitude theory, considering the relationship towards Nature, is the projection of attitudes into an individual's behavior (e.g. the Fishbein's and Ajzen's theory of justified behavior and the conflict between an attitude, intention to behave in a certain way and the observed behavior).

Continuums of submission-dominance and alliance-animosity could be considered to be the subdimensions of this attitude; on the basis of these continuums there have been selected some general attitudes, e.g. master, partner or administrator. The attitude reflects how a human understands his/her relationship towards the Nature.

5. Environmental Sensitivity

- An ability to focus on the natural environment, attentiveness, empathy.
- Sensual perception of the Nature.

This characteristic is based on the assumption of general psychology about the consciousness and its functions (e.g. the cognitive processing of information, watching the surroundings and oneself with the purpose of creating precise mental representations), more specifically on the perception theory (organization of the perception field, cognition, perception of movement, cognitive styles) and on the empathy theory (Rogers, Bateson).

Environmental sensitivity refers to the deepness of experiencing the contact with the natural environment. People apparently differ in the degree to which they pay attention to the Nature and take a notice of details, live creatures, sounds, smells, etc. This sensitivity could consist of intellectual, esthetic and spiritual levels.

The total description of our relationship with the Nature consists of the above listed components (see Figure 1). Together they make a total image but you can also study each of these components independently.



Figure 1: Relationship between humans and the Nature - five-dimension model Source: Krajhanzl, 2006 (adopted)

It is possible to draw the five-dimension model in a different way as well. The dimensions are mutually independent but it is possible to identify section properties that interact with each of them - from psychological viewpoint these are, for example, emotional experiencing, from the pedagogics' viewpoint this is ecoliteracy. The section properties could be described as behavioral, cognitive and emotional aspects of each of the basic characteristics.



Figure 4: Relationship between humans and the Nature - five-dimension model with section properties Source: Krajhanzl, 2008a

Two partial characteristics were selected for the purpose of this survey considering the relationship between children and the Nature.

The first one is "an emotional reaction" of a child to a contact with the natural environment. As stated above, emotions sectionally influence all five dimensions of the model. Experiencing pleasure or displeasure in various situations in the outdoors therefore interacts with the attitudes of the child to the outdoors (a description of the child's environmental thinking⁶ - a biocentric or homocentric orientation), with his/her skills and abilities for staying outdoors, environmental awareness, need for contacts with the Nature and environmental sensitivity. In connection with emotional reactions Krajhanzl et al. (2004) refers to the research by Bixler and Floyd (1999) that operates with the concept of disgust to the Nature. The emotional reaction at the pleasant-unpleasant scale is more frequently described as "pleasure-displeasure" in the Czech Republic. The above-mentioned "disgust" could be therefore considered to be an expression of extreme displeasure in this context. According to Bixler and Floyd a negative emotional reaction is expressed by the feelings of "disgust" and it is connected mostly with contacts with rotten food, some animals (e.g. invertebrate), contacts with soil, rotting vegetation, some reptiles, amphibians and animal internal organs or body fluids. Fear, aversion and discomfort were identified as the three basic negative emotional reactions in this context.

"The amount of experience with the natural environment" acquired by a child in the course of ontogenesis is the other partial characteristic. This characteristic corroborates the validity of concepts dealing with the global decline of direct experience with the Nature (extinction of experience - Kellert, 2002), loss of special places (Nixon, 1997; Pyle, 2002; Sobel, 1993) that would provide for spontaneous children's activities in non-structured natural environment and the hypothesis of the environmental generation amnesia (Kahn, 1997, 2002). The presented survey investigated whether a child acquired, in the course of his/her ontogenesis, specific experience with the outdoors as identified by a group of specialists.

⁶ This term is not established in the Czech terminology, the original term is "environmental reasoning".

1.2 Summary of Theoretical Solutions and Research Question

Current development, as described in eco-psychological literature, draws attention to children's declining contact with the natural environment and to the possible consequences of preferring mediated experience with the Nature to direct experience. Also the evidence supporting the environmental generation amnesia hypothesis could have serious consequences as this hypothesis deals with the decline in the perceived standard of "healthy and undisturbed" environment.

This survey assumed that if a child attends, beyond a common school which is not directly focused on immediate contacts with the outdoors, also additional extracurricular activities that provide such an experience, his/her emotional reactions to the natural environment and the volume of experience should be different. A sample of respondents was acquired from an organization that considers the relationship with the Nature to be one of the cornerstones of its educational mission⁷.

Research Question:

Are emotional reactions to the natural environment and the volume of experience with this environment in school-age (8-16 years) children attending a Scout club different from the emotional reactions and the volume of experience of children who are not members of such a club?

One of the presumptions of this research consisted in the fact that the Scout educational program, which includes "staying outdoors", offers children more contacts with the natural environment (experience with the Nature - see also the concept of Kellert, 2002). The other presumption expects that children attending a Scout club react to the natural environment emotionally more positively; this could refer either to the effects of the Scout education program performed outdoors or to a special trait of children attending Scout clubs. These presumptions were established as hypotheses:

Hypothesis 1: Children that regularly attend a Scout club react emotionally more positively to the natural environment then children that do not attend such a club.

Hypothesis 2: Children that regularly attend a Scout club have more experience with the outdoors then children that do not attend such a club.

2. Research Methodology

The respondent sample aged 8-16 years was selected from a population of children attending Scout clubs operating in the city of Brno. 56 children from seven Brnobased clubs participated in the research. In smaller clubs, all the children present at

⁷ The author cooperated, in the course of this survey, with Junák - the Union of Scouts of the Czech Republic. Junák is an organization with a tradition exceeding 100 years in this country. The so-called "scout method" is the means of developing the Scout movement members. The "relationship with the Nature" is one of its components. Many Scout club activities are performed outdoors, either around the club facilities, during weekend- or multiple-day trips or at summer camps.

a common club meeting in a specific week in the course of the research period (March - April 2008) participated in the survey. In case of larger clubs one of the meetings of each age category was randomly selected. All contacted club leaders agreed with their participation in the survey.

2.1 Research Set

The following table contains basic characteristics of the set of children from Scout clubs (N=56) and children from the reference survey at elementary schools (N=286):

Characteristic	Average	Median	Stand.Dev.	
Age	11.93	12.00	2.552	
		Absolute Fre- quency	Relative Fre- quency	
Age Category	Junior (8-11 years)	25	45.5 %	
	Senior (12-16 years)	30	54.5 %	
		Absolute Fre-	Relative Fre-	
		quency	quency	
0 1	Boys	22	40 %	
Genuer	Girls	33	60 %	

Table 2: Characteristics of the respondent set - Scout clubs

Note: Age Category classifies the respondents into a junior age category (Little Wolves - boys, Fireflies - girls, ages 8 - 11) and a senior age category (Scouts - boys, Scouts - girls, ages 12 - 16).

Characteristic	Average	Median	Stand.Dev.	
Age	12.33	13.00	5.31	
		Alessleits Des	Dalation Fra	
		quency	quency	
Age Category	Junior (8-11 years)	114	39.9 %	
	Senior (12-16 years)	172	60.1 %	
		Absolute Fre-	Relative Fre-	
		quency	quency	
Candar	Boys	149	52.1 %	
Gender	Girls	137	47.9 %	

Table 3: Characteristics of the reference respondent set - elementary schools

Source: Krajhanzl et al., 2004

The methods used for selecting the sample were used with the purpose of comparing results with the conclusions of a survey performed by Krajhanzl et al. (2004). Therefore the respondents come from an approximately identical age category (8-16 years) and they live in a city. Unfortunately, we were unable to include a more balanced ratio of boys and girls into the research set.

Considering the representative value of the selected set, the survey results could be generalized in a limited way only to Brno-based Scout clubs.

2.2 Survey Tools

As survey tools we used the *Experience Inventory* of H. Vostradovská et al. (in Strejčková, 2006) and the questionnaire *Trip v. 1.3* of J. Krajhanzl et al. (2004).

- *Questionnaire Trip v. 1.3*: Children were presented with scales for only 17 situations in which they were supposed to express their emotional reactions. Instructions were presented verbally, as well as the story, which was read to the children aloud. The story text itself was left out from the questionnaire due to the risk of children's lower concentration (focus on the text instead on the contents, paging forward and backward). Scales were magnified for better clarity and each of them had descriptions of limit values. Scales for Question No. 20 were also marked with extreme values.
- *The Experience Inventory questionnaire*: Questions asking about demographic data (these were acquired in the course of filling in the Trip questionnaire) and questions for a qualitative analysis of children's responses were left out. Version "I don't know" for Questions No. 21 to 89 was added.

The following analyses were performed in the course of the statistical processing:

- comparison *emotional reactions of children to the Nature* between the Trip questionnaire items from Scout club and elementary-school children a comparison of averages for the individual items, raw scores, average raw score, age- and gender- conditioned differences (correlation coefficients)
- comparison *volume of acquired experience* between the Experience Inventory questionnaires from Scout club and elementary school children raw scores, average raw scores, age- and gender- conditioned differences (correlation coefficients)

Descriptive statistical methods (frequency analysis - absolute and relative frequencies, medium values) were used for a basic comparison of children's answers to the individual items of the Trip and Experience Inventory questionnaires.

Using statistical analyses including hypothesis testing is of problematic value in this survey. As noted above, it is impossible to consider the survey set to be representative (i.e. it doesn't make it possible to use statistical inferences on the parameters of the Scout club population in Brno). Moreover, the survey set of the reference survey by Krajhanzl et al. (2004) doesn't represent the population of elementary school students in Prague, either. As noted by Urbánek (2008), statistical significance tests are meaningful if the selection of the survey set was performed according to probability procedures. Due to the above-listed limitations, the *statistical testing of hypotheses* was used to compare groups (by gender, age) according to their medium values (raw scores of both questionnaires, raw scores of the individual questionnaire items). A *two-sided t-test* (pa-

rametric) at the significance level of α =0.05 was used for testing zero hypotheses about the absence of differences in case of normally distributed variables⁸. When normality was disturbed, we used the alternative non-parametric *Mann-Whitney test*. Besides the tests of statistical significance we used also the calculation of the *effect size* Cohen's *d* accompanying the calculations of the t-test significance.

Considering validity, the survey results were influenced by a lack of equivalence between the surveyed groups, due to the maturation of the respondents and probably also due to their family backgrounds (relationship with the Nature of their parents, for example)

3. Selected Quantitative Results

The following paragraphs describe selected descriptive statistics (average scores for the individual questionnaire items, relative frequencies of responses) for Scout clubs and for elementary schools.

3.1. Emotional Reaction to the Nature

Considering the emotional reactions of children, there were analyzed responses of the respondents at the scale from "very unpleasant" (value 1) to "very pleasant" (value 6) from the Trip questionnaire. The following table lists significant average values for the individual items.

Variable	Average Scouts	Average Schools	M-W test (p)	Effect size (Cohen d)
V_1: No going outdoors	2.88	2.63	0.00	0.13
V_5: An idea of a ,,cultivation" of greenery	2.49	2.77	0.00	0.13
V_6: A detour due to partridges	3.68	3.79	0.00	0.07
V_7: Swimming in a muddy lake	4.5	3.76	0.03	0.35
V_8: Eating a candy that had fallen into a moss and needles	4.38	3.46	0.00	0.45
V_9: A friend throwing garbage around	1.47	2.02	0.00	0.24
V_10: Falling asleep in high grass	5.55	4.85	0.00	0.37
V_13: Picking up rotten apples with bare hands	4.15	3.45	0.01	0.38
V_15: Enjoying oneself alone in a forest	5.65	5.35	0.03	0.16
V_16: Sleeping under the open sky	6.05	5.75	0.02	0.19
V_17: Going to a department store next time	2.84	3.77	0.00	0.43

Table 1: Average values of the individual items in the Trip questionnaire - comparison between Scout clubs and schools

Note: N(Scouts)=54, N(schools)=286; $\alpha = 0.05$;

Statement:

Both elementary school and Scout children evaluate the following as the most attractive ideas: sleeping under the open sky (V_16), offer of an excursion with an expert (V_14), enjoying fun in a forest alone (V_15), falling asleep in high grass (V_10) and walking barefoot in dew-covered grass (V_2). No difference between the average

⁸ Testing at the significance level of α =0.01 was used in specific situations (marked in the text)

values of answers and the order of items exceeds 0.5 point. Preference for these five items was confirmed also by a verification analysis of the answers to Question No. 18 *"Which three moments of this trip will you remember best?"*.

Also the five least pleasant ideas were evaluated in a similar way: a friend throwing garbage around (V_9), defecating outdoors (V_11), the idea of not going outdoors (V_1) and the idea of "cultivating" the greenery (V_5). Preference for these five items was confirmed also by a verification analysis of the answers to Question No. 19 "Which three moments of this trip will you remember least?".

The following were more positively (the difference of at least 0.5 point), on average, assessed in the Scout clubs: swimming in a muddy lake (V_7, difference 0.74), eating a candy that had fallen into a moss and needles (V_8, difference 0.92), falling asleep in high grass (V_10, difference 0.7) and picking up apples with bare hands (V_13, difference 0.7).

Scout club children achieved a lower average with a greater difference only in the item "go to the department store next time" (V $_17$, difference 0.93).

Interpretation:

A discovery that there is no difference between the most preferred and least preferred items in both groups is not surprising. It seems that children follow a general trend of preferring "clean" activities (sleep, excursions, dew-covered grass) to "dirty" ones (garbage, rotting stuff, defecating) when staying outdoors. For Scouts there are more significant differences in the pleasantness of the "dirty" activities - this could be caused by a more frequent contact with the outdoors and by the declining importance of the difference between "clean" and "dirty". That the idea of a subsequent trip to a department store was evaluated by Scouts as less attractive seems to be an interesting discrepancy with the largest difference. This result could demonstrate a preference for outdoor activities but also the effects of examples given by their leaders/parents (an attitude to such a spending of leisure time) or a higher social desirability of such a reply among Scouts.

3.2. Comparison of the Emotional Reaction Average Raw Score

A raw score (hs_v) was calculated for each respondent from the average scores of replies to the Trip questionnaire items. An average raw score for the Trip questionnaire for the whole survey set was acquired by the arithmetic average method from the raw scores (HS). The following table lists average raw scores for the complete set of elementary schools and Scout clubs⁹.

⁹ Results of the survey by Krajhanzl et al. (2004) do not imply any significant difference between the individual schools in the average raw scores from both questionnaires. There is therefore listed only the average HS for children from all three elementary schools.

Variable		Scouts	Standard dev.	Schools	Standard dev. t-test (p)		Effect size (Cohen d)
Average Trip	HS	80.54	12.70	75.68	12.75	0.011	0.38

Table 2: Comparison of the average raw score for the Trip questionnaire - Scout clubs, schools

Note: N(Scouts)=56; N(schools)=286; $\alpha = 0.05$;

Statement:

The table above implies that the average raw score for children from Scout clubs is about 5 points higher; this fact is corroborated by the statistical significance test (*p*-value < 0.05). The difference approximately equals one half of one standard deviation. Considering its rather high value, though, the difference doesn't have to be of decisive importance (reliability intervals overlap for the averages under comparison) - this is also corroborated by the effect size calculation.

Interpretation:

The survey performed by Krajhanzl et al. (2004, page 16) found minimum differences in the emotional reactions of children in the individual surveyed schools. The result was strengthened also by the fact that it wasn't influenced by the environmental specialization of any one of the elementary schools. There was also discovered no dependence of the emotional reaction on the presence of a natural environment around the place of residence or school. Subsequently there was conceived a hypothesis claiming that emotional reactions are not determined either by an environmental focus of the school or by the occurrence of a natural environment in the surroundings of the place of residence or school.

There is probably a difference in the emotional reaction of the Scouts, though. I can only guess what the determinant of this difference is. As implied by the differences in average scores of the individual Trip questionnaire items, the image of the natural environment could be perceived by children as less threatening (less "dirty"). This hypothesis could be also supported by the difference in the amount of experience with the outdoors.

3.3. Experience Volume

The children's volume of experience was compared by means of the Experience Inventory questionnaire. For significant results see below.

Table 3: Absolute and relative frequencies of "YES" replies in the individual items of the Experience Inventory questionnaire - a comparison between Scout clubs and schools

Variable	Relative frequency	Relative frequency	chí-quadrate	
	Scouts	Schools	(p)	
Z_21: Watching a bird of prey during flight	87.50%	76.60%	0.010	
Z_24: Listening to a woodpecker	91.10%	79.70%	0.010	
Z_25: Listening to a cuckoo	83.90%	78.30%	0.010	
Z_27: Watching a firefly	80.40%	70.50%	0.031	
Z_32: Picking up a frog	78.60%	55.80%	0.001	
Z_33: Picking up a snake	57.10%	41.10%	0.036	
Z_35: Walking barefoot along fir-needles	53.60%	33.60%	0.003	
Z_36: Walking barefoot in a stream	98.20%	88.30%	0.032	
Z_37: Defecating outdoors	69.90%	40.20%	0.000	
Z_39: Walking across a ploughed field	80.40%	61.70%	0.001	
Z_43: Collecting herbs for one's own use	50.00%	34.20%	0.003	
Z_46: Gathering blackberries	94.60%	89.90%	0.015	
Z_47: Collecting fossils	46.40%	33.60%	0.006	
Z_48: Planting a tree	66.10%	49.70%	0.007	
Z_52: Resting in the moss	71.40%	58.70%	0.029	
Z_56: Participating in collecting garbage outdoors	51.80%	19.20%	0.000	
Z_58: Spending a night outdoors in a tent	92.90%	79.00%	0.007	
Z_59: Spending a night outdoors under the open sky	76.80%	56.50%	0.006	
Z_61: Feeding an animal in the ZOO	57.10%	40.40%	0.005	
Z_68: Fishing	46.4%	67.70%	0.006	
Z_72: Forcing one's way through bushes	92.90%	81.10%	0.016	
Z_73: Hiking in a protected area	75.00%	52.10%	0.000	
Z_74: Opening fire outdoors	75.00%	42.00%	0.000	
Z_77: Chopping and cutting wood	92.90%	73.40%	0.001	
Z_78: Gathering meadow flowers	75.00%	66.40%	0.024	
Z_79: Sorting garbage	94.60%	74.80%	0.001	
Z_81: Binding a small wreath from flowers	66.10%	54.50%	0.017	
Z_82: Preparing food on fire outdoors	75.00%	53.10%	0.001	
Z_84: Picking lice from hair	32.10%	15.80%	0.005	
Z_86: Cutting objects from bark	71.40%	57.30%	0.020	
Z_89: Getting lost in a forest	66.10%	46.20%	0.000	

Note: N(Scouts)=56, N(schools)=286; $\alpha = 0.05$;

Statement:

The results imply that there are certain differences between Scout club and elementary school children. The Scouts generally featured higher scores, only in a few items they were exceeded by school children in their volume of experience.

Over 15 % difference (in bold font) was discovered in the following items "Picking up a frog" (Z_32), "Picking up a snake" (Z_33), "Walking barefoot along fir-needles" (Z_35), "Defecating outdoors" (Z_37), "Walking across a ploughed field (Z_39), "Collecting herbs for one's own use" (Z_43), "Planting a tree" (Z_48), "Participating in collecting garbage outdoors (Z_56), "Spending a night outdoors under the open sky" (Z_59), "Feeding an animal in the ZOO" (Z_61), "Hiking in a protected area (Z_73), "Opening fire outdoors" (Z_74), "Chopping and cutting wood" (Z_77), "Sorting garbage" (Z_79), "Preparing food on fire outdoors" (Z_82), "Picking lice from hair" (Z_84) a "Getting lost in a forest" (Z_89).

The amount of experience of schoolchildren was higher only in several cases, statistically significant differences were found only in "fishing" (Z_68, difference of 21 %). Statistically insignificant differences were found in the experience with "planting bushes" (Z_49, difference 7 %), "treating an injured or sick animal" (Z_69, difference 10 %), "taking care of an injured or sick animal" (Z_64, difference 8 %) and "making whistles from brushwood" (Z_80, difference 6 %).

Interpretation:

The discovered differences imply that Scout club children differ from elementary school children especially in the numbers of contacts with live creatures that you can meet in the outdoors (woodpecker, hedgehog, firefly, frog, earthworm and beetle). The differences also point to certain activities performed by the Scout club children during their trips outdoors and at summer camps (herb gathering, sleeping under open skies, feeding animals in the ZOO, visiting protected natural areas, opening fire outdoors and cooking there, cutting and chipping wood, getting lost in the forest). The differences in garbage sorting may follow from the requirements on the summer camps, from the established rules in Scout club rooms or from common practice in outdoors-oriented families of the club respondents.

School children achieved higher scores only in several items. These differences are small, though, they could be explained by a selection error and they didn't prove to be statistically significant. Nevertheless, should I try to interpret these results somehow, I would say that the differences were found mostly in hobby activities replacing direct contacts with the Nature (taking care for a domestic animal, fishing, making whistles from brushwood, planting bushes). There could also be other explanations - e.g. local differences and opportunities to get into contact with the outdoors.

3.4. Comparing Average Raw Scores for Experience Volumes

Just like in case of the Trip questionnaire, raw scores (hs_z) were calculated here as well. Average raw score for the Experience Inventory questionnaire for the whole survey set was acquired by the arithmetic average method from the raw scores. The following table lists average raw scores for the set of elementary schools and for the Scout clubs¹⁰.

¹⁰ Results of the survey performed by Krajhanzl et al. (2004) do not imply any significant differences among the schools in the average raw scores of the experience volumes.

Table 4: Comparison of the average raw score for the Experience Inventory questionnaire - Scout clubs and schools

	Scouts	Stand. Dev.	Schools	Stand. Dev.	M-W test (p)	Effect size (Cohen d)
Average HS Inven- tory	48.95	10.5	43.89	9.15	0.00	0.53

Note: N(Scouts)=56, N(schools)=286; $\alpha = 0.05$;

Statement:

An analysis of the average raw scores implies that there is a five-point difference between Scout club and elementary school children. This difference was statistically corroborated by the non-parametric test (p-value < 0.05).

Interpretation:

Just like in case of the Trip average raw score, even here the Scouts achieved higher scores. For a more detailed analysis of these differences see the results by the individual determinants (age, gender, period of the Scout club attendance). The results could also point to the mutual influence between emotional reactions and the volumes of experience (the more experience the more positive emotional reaction and vice versa - for details see the correlation analysis).

The survey also included an analysis of the determinants of the emotional reaction and the volume of experience; respondent's age, gender and period of attending a Scout club were selected to be such determinants. Correlation analysis was also performed. Results of this part are summarized in the following discussion. For more detailed analysis see the complete text of the report¹¹

4. Discussion

4.1. Emotional Reaction to the Nature

Hypothesis 1: Children that regularly attend a Scout club react emotionally more positively to the natural environment then children that do not attend such a club.

A comparison of average scores for the individual items implies that considering the emotional reaction there are certain differences between the Scout club children and the elementary school children. These are statistically significant but they do not achieve high values and could be considered to be a consequence of a non-systematic influence (selection error). The significant results imply that Scouts are less concerned about "dirty" outdoor activities and this could be related to their more frequent stays outdoors. A proposition to go to a department store instead of going outdoors was a different value with the highest difference value. For children from Scout clubs this idea was

¹¹ For complete text see: http://is.muni.cz/th/42121/fss_b/BP_Kulhavy_2008_psy_vychodiska.pdf

less attractive, on average. It is also worth noting that scores of the most positively and the least positively evaluated items were identical for both groups - Scout club children don't seem to have radically different preferences.

The difference of the *average raw score* of the Trip questionnaire, measuring the emotional reaction, was found to be 5 points (i.e. about 6.5 percent) between the Scouts and the schoolchildren - it is possible to say, therefore, that this value is slightly higher for the Scouts.

The analysis of the determinants of the emotional reactions to the Nature, for which the child age, gender and, in case of the Scout clubs, also the period of attendance, were selected, brought rather interesting results.

Considering the *age* the results pointed to a possible positive trend in the development of emotional reactions in children from the Scout clubs. The emotional score hardly changed with age in case of the schoolchildren. This result is to be considered a key point confirming the first hypothesis. The emotional reaction is not only higher in children from the Scout clubs of the same age, but it slightly increases with age. This relationship is also confirmed by a statistically significant correlation which didn't appear for the elementary-school respondents. It should also be possible to verify a hypothesis that positive emotional reactions to the Nature by the Scouts increase along with their skills providing for their outdoor activities. Another hypothesis, which could be verified in connection with age, is the Kellert's (1996a) concept of the growing biocentric thinking between the second and fifth grade of the elementary school and its integration with homocentric thinking. It seems that Scout clubs could specifically support this process.

An analysis of the relationship between the *period of attending a club* and children's emotional reactions didn't bring any results that could be reliably interpreted. It might also confirm the positive trend but the low degree of saturation of the club attendance categories doesn't make it possible to make any precise conclusions. Even though a correlation calculation resulted in statistically significant findings, we suppose that the age variable interferes here.

More significant differences were found when analyzing *gender*; when comparing boys from both samples the Scouts score by about 10 points higher (about 14 percent). For example Scouts found it much more unappealing if they couldn't go outdoors, when a "wild" piece of country would be cultivated and they also reacted more negatively to throwing out garbage outdoors and to a possibility of going to a department store instead of a trip outdoors.

The final findings about the *correlation* between emotional reactions and experience volumes didn't bring results different from those of the elementary school children sample. The relationship between these variables is identical but Scouts have larger experience and they react to the Nature in a slightly more positive way.

From the fact stated above it is possible to conclude that Scout club children really react to the natural environment emotionally more positively then children that do not attend these clubs. Therefore, the first hypothesis is not denied and it is supported by the acquired data.

4.2. Experience Volume

Hypothesis 2: Children that regularly attend a Scout club have more experience with the outdoors then children that do not attend such a club.

When comparing the scores of the individual items between Scout club children and elementary school children, it seems that the Scout club children's experience volume is higher for most items. Besides higher numbers of contacts with common animals living in the open the Scouts achieved higher scores in activities developing their skills for surviving outdoors (cooking on open fire, cutting and chipping wood, spending a night outdoors in a tent or under the open sky) and in environmentally-educational activities (participation in collecting garbage outdoors, hikes in protected areas, herb gathering).

The same feature of Scouting is noted also in Palmberg and Kuru (2002), who, in their survey, draw attention to the fact that Scout clubs use the so-called learning-by-doing methods and purposeful stays outdoors as educational methods (Kulhavý, 2006). It seems that the results could confirm the significance of these approaches. It is necessary to note here, though, that despite the fact that these approaches are parts of the Scout method, they are used in various ways in the individual Scout clubs. The "New Educational Program" currently strives for a certain methodological anchoring of the outdoors education. It is based on a competence model that includes also competences developing a child's relationship to the Nature (Klápště, 2008). It is also necessary to draw attention to the personalities of leaders working with the children in the clubs and to the functions of educational courses for Scout leaders. It would be also worth discussing how the Scout leaders perceive the natural environment - is it a place where they escape from the city, is it a background for the Scout program, or is it perceived as an environment where it is possible to purposefully develop a child's personality? Personally I suppose that the significance of the outdoors for the emotional and cognitive development of a child is still underestimated.

It also seems that the Scouts are better experienced in moving outdoors (forcing one's way through the bushes, walking across a ploughed field, walking barefoot on firneedles, resting in the moss). This could be explained by the fact that moving outdoors (both at day and at night) is a common activity at the Scout summer camps and trips.

A vast majority of children from the surveyed clubs (93 percent) have experience with sorting garbage - this could be a consequence of the requirement to sort garbage at the summer camps or of the common sorting of garbage in the Scout club rooms and also of the growing environmental awareness of the wider society.

A comparison of the *average raw scores* between the Scout club children and the elementary school children points to a statistically significantly higher volume of experience of the Scouts (by about 11 percent).

Additional findings were revealed by an analysis of the experience volume determinants - age, gender and the club attendance period.

Considering the *age*, a growth of the experience volume between the younger and the older is an important finding. There is not only a growth of the experience volume from younger to older children from the clubs (i.e. inside the group), and this could be connected with the maturing process, but also a comparison with the corresponding age group of the elementary school students points to a significant difference. It seems, then, that the Scout club children have larger experience with the outdoors and this relationship is not caused by the age only.

In connection with the growing outdoors experience along with growing age there has been proposed a hypothesis that an immediate contact with the outdoors makes it possible for children to adjust their images of the Nature acquired through mediated experiences. As described in Kellert (2002), a child acquires simplified representations of the natural world by means of symbolic, metaphoric or stylized information. In a similar way Pyle (2002) writes about the natural literacy, which had been inherent in people since it was necessary for their survival in the natural environment. If the program of the Scout clubs includes purposeful stays outdoors, it is possible to assume that the children will be exposed to a larger volume of direct experience and that they will establish more realistic images of the Nature. I expand the proposed hypothesis in the sense that the Scout club children tend to be more positive towards the Nature (they improve their emotional reactions) as they learn new outdoor survival skills. Putting it simply, if a child doesn't have to care whether he/she gets dirty or lost, he/she can better perceive the surroundings (environmental sensitivity) and connect the stay outdoors with pleasant feelings. The results are not unambiguous about this relationship, though, because it wasn't possible to reliably interpret the relationship between the Scout club attendance period and the scores in the questionnaires.

For this discussion it is interesting to mention the Kahn's (1997) idea stated in his concept of the environmental generation amnesia. He emphasizes that children should be introduced to undamaged natural environments - i.e. that children should get a chance to compare damaged and undamaged environments. This could be an important task for the Scout clubs - use the natural environment not only as a place for developing cognitive and emotional characteristics but also as an educational means in a globalized world with declining natural environment.

An analysis of the relationship between the *period of attending a club* and the experience volume didn't bring any results that could be reliably interpreted just like the children's emotional reactions. For more precise results it would be necessary to acquire more relevant data concerning the periods of the Scout club attendance.

Considering *gender*, there was discovered a statistically significant difference in the volume of experience - especially between boys from the clubs and from the elementary schools (about 10 percent) - these differences consisted especially in their outdoor skills and contacts with wild animals. This difference appeared also between girls but it was smaller (about 8 percent) - differences were identified especially in items related to closer physical contacts with the outdoors and also to practical outdoor skills.

Correlation analysis found a correlation between the number of months of the club attendance and the volume of experience but this could be also interpreted as a result of the age. This doesn't confirm a correlation between the age and the average raw scores in the Inventory, though. The correlation found for the Scout club children wasn't found for the schoolchildren. It seems therefore that when considering the volume of experience, the connection with the period of the club attendance is confirmed.

In harmony with the fact stated above it is possible to state that even the second hypothesis cannot be denied and that it is confirmed by data. The volume of experience with the outdoors was higher for children from the Scout clubs.

The above-described relationships cannot be separated from the influence of the family proper. It is possible that children acquire some of the habits in their home environment, other influences could penetrate the family from the outside along with the growing environmental awareness of the society (for example the above-mentioned garbage sorting). It is necessary to note, though, that a Scout club (or any other organization) has only very limited time options to develop a child's relationship with the Nature. It would be apparently ideal to influence this relationship with the Nature in all five specified dimensions (Krajhanzl, 2008). Here we come across a problem how to apply such a complex and systematic approach. It would be interesting to cooperate, as a part of such a program, with schools, as formal educational institutions, and with the child's family. Scout clubs seem to be a good means for acquiring direct experience with the outdoors and outdoor skills. Let's return now to the model of a relationship between humans and nature presented in the theoretical section - the Scout clubs can support this development especially in the dimensions of contacts with the outdoors, outdoor skills and environmental sensitivity. On the other hand, schools can take an advantage of their ability to expand environmental literacy and global thinking (see the dimension of the environmental awareness). The role of the family is then cross-sectional and it is connected, for example, with the lifestyle, free-time spending, attitudes and values conveyed to the child. Pyle (2002) draws attention to one of the barriers hindering outdoor education. Families are currently rather worried about the children's safety when away from home. A child could be threatened either by the dangers of the street (traffic, socialpathological phenomena, gangs) or by the dangers of the "wild" forest. Here it rather depends on the relationship between the parents and the outdoors and whether the parents consider the forest to be an environment potentially more dangerous than city streets.

If Peter Kahn (2002) is right and humanity faces the problem of environmental generation amnesia, I can see the significance of the Scout (or similarly oriented) clubs for the development of a relationship to the Nature in the following:

- they provide children with physical contacts with the natural environment acquisition of direct experience with the outdoors (Kellert, 2002) and they help to create a more realistic image of the Nature
- they introduce children to natural environments less affected by humans and provide for a comparison with the natural environment where the children commonly stay
- from an environmental-educational viewpoint they support systematic thinking and orientation of children in complex eco-systematic relations
- they equip children with skills and knowledge necessary for staying outdoors
- they use natural environments rich with challenges to educationally affect the children, providing them with space for experimenting, investigating, learning by doing and creating
- they help, especially at the junior school age, to establish moral thinking in children and thus integrate homocentric and biocentric elements (Kahn, 1997);
- they make it possible to experience a stay outdoors as safe and interesting

Conclusion

Eco-psychological concepts listed as theoretical solutions refer to a current trend in limiting direct contacts between children and the outdoors and possible distortions of the Nature's image resulting in the lack of interest in the protection of the environment. And still the significance of the natural environment for the emotional and cognitive development of a child and, in general, for the sustainability of human activities on this planet, is of decisive importance. Educational activities are frequently focused on partial components of our relationship with the Nature without analyzing what these components represent. A more complex understanding of the development of our relationship with the Nature is a challenge for the future of the environmental education. One of the contributions of psychology, which could help to achieve this goal, could be an establishment of a general model of the relationship between an individual and the Nature, with a special focus on establishing this relationship at an early age. Using knowledge from development psychology, social psychology and personality psychology, which would be integrated into the general model, we could better focus the education and subsequently cover fields that are beyond the scope of the traditional environmental education. Such theoretical solutions could be useful also in the out-of-school environment for processing methodical materials applicable in the development of children's relationship with the Nature.

An analysis of data from the Scout clubs and data from elementary schools yielded results that support the hypotheses about the existence of differences between these groups of children. If we accept the assumption that the used survey tools really measure emotional reactions and experience volumes, then we could declare, under the above-listed limitations, that children from the Scout clubs have generally larger experience with the natural environment and that they also demonstrate more positive reactions to this environment. I consider important the finding that the volume of acquired experience with the Nature increases faster in children from the Scout clubs then in children from elementary schools. The main differences were found in the numbers of contacts with wild animals, acquiring outdoor skills and participation in environmentally-educational activities. It has been also demonstrated that the emotional reactions of the Scout club children become more positive in the course of time while the trend for schoolchildren seems to be quite opposite - this could be connected with the above-mentioned increasing numbers of contacts with the natural environment.

At the end I present a quote from Stephen Kellert summarizing the significance of similar surveys in the future: "Human society, established on plundering Nature, cannot maintain its economic and cultural prosperity continually... We have to realize the mistake of the modern times that human society doesn't need diversified and satisfying connections with non-human world anymore." (Kellert 1996a, page 216-217 quote in Kahn, 1997, page 11)

PSYCHOLOGICKÁ VÝCHODISKA ENVIRONMENTÁLNÍ VÝCHOVY

Abstrakt: Práce se zabývá oblastí environmentální psychologie, nověji tzv. conservation psychology, jejíž koncepty nejsou zatím v českém prostředí rozšířeny. Studie vychází z teze, že psychologie má významný potenciál přispět k řešení globálního problému neudržitelnosti lidských aktivit. Z pozice conservation psychology, která hledá způsoby, jak působit na environmentální chování člověka, se práce zabývá některými složkami vztahu dětí školního věku k přírodě. Je stručně nastíněn vývoj zkoumání vztahu člověka a životního prostředí v psychologii a jsou uvedeny vybrané teoretické koncepty, kterými se zabývá současný výzkum v conservation psychology. Vztah člověka k přírodě je konceptualizován pětidimenzionálním modelem J. Krajhanzla (2006). Práce se dále zabývá dvěma složkami vztahu člověka k přírodě – jeho emoční reakcí na přírodu a množstvím zkušeností s přírodou. Jsou ověřovány hypotézy o odlišnosti těchto dvou charakteristik u dětí školního věku, které pravidelně navštěvují skautské oddíly, a dětí, které tuto možnost nevyužívají. Práce využívá srovnávacích dat získaných v rámci "Výzkumu odcizování člověka přírodě" z let 2004-2005 (Národní program výzkumu MŽP: Krajina a sídla budoucnosti, číslo projektu IC/4/40/04). Výsledky podporují stanovené hypotézy. Byly zjištěny odlišnosti jak v pozitivnější emoční reakci, tak v množství zkušeností s přírodou u dětí ze skautských oddílů. Skauti mají více zkušeností zejména s aktivitami rozvíjejícími schopnosti pro pobyt v přírodě, častěji přicházejí do kontaktu s volně žijícími zvířaty a častěji se účastní environmentálně-výchovných aktivit. Práce uvádí, jakým způsobem mohou skautské oddíly přispívat k rozvíjení vztahu dětí k přírodě, a zároveň upozorňuje na omezení, kterým čelí.

Klíčová slova: conservation psychology, environmentální vzdělávání, vztah člověka k přírodě, skauting