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Knowledge, Attitudes, and Environment Oriented Behaviours for 7-8 Year Old Children

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Abstract: The theme of the risk, as a public problem, is rarely debated in Romania. In the world, the research related to the risk perception, especially the environment risk, started 59 years ago, on the grounds of the nuclear danger. The environment-risk perception at children depends on the prior perceptions acting as decoding filters, nonetheless it can be influenced by the targeted environment oriented education, correcting the false perceptions and aiding the children to form a set of perennial values and to digest healthy behaviours. The work presents the results of the study made on 446 pupils in the primary classes, in three schools from Cluj-Napoca, Romania, with the purpose to encourage environmental friendly behaviours by combining previous strategies (modifying the attitudes and the values towards the environment) with the consecutive strategies (of recompense for the pro-environment behaviours). The study demonstrates the role and the importance both of the school, and the parents' level of instruction, in building and consolidating the environment consciousness at children.

Keywords: Environmental risk; Children; Behaviours; Positive reinforcement; Antecedent and consecutive strategies.

Introduction

The beginning of the research related to the risk perception can be traced back in the '60, in the period of the debates on the nuclear danger [1].

The human behaviour towards a dangerous situation is conditioned by the perception that the individual has on this situation. On its turn, the perception is influenced by the prior conceptions and attitudes, acting like decoding filters, transforming the information provided by preventive messages [2]. The risk perception is a phenomenon still in search for explanations [3,4]. There are many sociological or psychological approaches on this phenomenon, occupying a central position in the political agenda of many countries, and which is crucial to understand the human behaviour towards the environment [5].

There is a poor culture of risk in Romania, especially the environmental risk, which determined a low and sporadic presence of the risk fear as a public problem [2]. In order to understand this interesting phenomenon, the researchers proposed more objectivist and constructivist patterns [2].

The objectivistic patterns stipulate that the perception of dangerous information shall determine the individual behaviour towards the danger (risk). The perception depends on each individual's capacity to evaluate the characteristics and the sizes of a danger as an abstract concept [6]. Individual differences issue from this, as a result of the psychological sensitiveness, stable for the individual, however variable between the members of a community. For instance, transposed in the public area, people, even if they know the manner HIV is transmitted, have a risk behaviour however, as they do not evaluate correctly the risk of the situation, as they have a false perception

on it, as they deny the possibility that "something bad could happen to them", as the idea of a fatality is very far from them (especially if they are very young).

The constructivist patterns underline the role of the social context the individual comes from, his/her lifestyle, his/her own risk portfolio. People analyze the received information, however they interpret them on frameworks structured on the social experiences they are involved in and the culture of the group they are coming from [7-9].

On a larger range, the risk perception means to become conscious that the environment (or an environmental factor) is dangerous, and to develop an interpretation in accordance with the other references schemes, which are used. The risk as perceived by individuals is not identical with the risk calculated (evaluated) by the experts, although it largely depends on the latter one [1,10].

Another factor, which can influence the risk perception, is the previous experience, which places the danger closer to or further from the individual [11,12]. Generally, risk is perceived as being higher for the general population and lower for the family and the individual, even when this is involved in a risky conduct. This is named "risk denial", also called "unrealistic optimism". The difference between the personal risk, perceived as low, and the general risk (high) can be explained by the degree of control people have on dangers, the limit they consider they can protect against [1].

A theory trying to explain the risk perception is the psychometric pattern launched by Fischoff [13], which is based on a series of variables, such as new old, voluntary-involuntary, moral-immoral, natural-artificial, etc. In accordance with this theory, old (chronic), voluntary, moral, familiar or natural dangers are seen less risky than the acute, catastrophic, involuntary, immoral, unfamiliar or artificial ones.

Another theory is the cultural one, initially elaborated by Mary Douglas and A. Wildavsky in 1982 and prepared to be operational for quantitative studies by Dake [14,15]. The theory, also called *grid-group* analysis, classifies people on four types, depending on the two dimensions, the social groups create their internal hierarchy (*grid*) and external limitation (*group*) in relation with other groups [16-19]. *Grid* represents the manner the social life interactions are regulated (i.e: egalitarian/hierarchic; by rigid/negotiated rules). *Group* means the level of integration in a group, the consistence towards other groups.

The four groups of individuals shall „choose" to be concerned on different types of dangers [20,21]:

- Egalitarian type (sectarian): technology and environment (weak grid, strong group)
- Individualist type: war and other current menaces (weak grid, weak group)
- Hierarchic type: law and order (strong grid, strong group)
- Fatalist type: no danger (strong grid, weak group)

The social context of a person is supposed to govern the values and attitudes, therefore the risk perception. Attitude represents the temptation of the individual to evaluate an entity and is genetically conditioned (?), by sensorial inputs or it can be learnt [22,23]. Values represent a wider concept and include the goals or life standards of a person, culture or religion. They are based on collecting specific related attitudes, unified by abstract principles, giving them a general/moral value.

However, in many real situations, there is a big discrepancy between attitudes and behaviour, or, else, some people believe something, but behave oppositely, in other words, attitudes are not predictive on certain behaviour [24]. The concordance between attitude and behaviour varies on many factors, among them, to be accessible (in case of drugs), sacrifice the comfort and satisfaction (smoking, alcohol), direct and personal involvement, written personal engagement, ambiguity of the messages, the general character of attitudes. A general attitude like „yes, I am usually for the protection of the environment" does not warrant a specific attitude „I never thrown waste down", which leads to a consequent behaviour [24].

Modelling human behaviours represents a hard to achieve goal, as some behaviours, once adopted, turn into habits, in the everyday life, and end by being considered „normal". That is why it is important the intervention on population groups who merely begin to learn different behaviours [25].

Our study is part of a research project tempting to implement in a young school children a pattern of encouraging environmentally responsible behaviours, by combining two types of

strategies: antecedent (prior) and consecutive (posterior). The project approaches the environmental education in a complex manner, by associating the strategies of attitudes and values change with the strategies of positive reinforcement, encouraging such environmental friendly behaviours.

Material and Method

A cross-sectional study was conducted in 2008 among students aged 7-8 years old from three schools of Cluj-Napoca. Two of the schools, named *A* and *B*, were situated downtown, while the third one, named *C*, was situated in a peripheral neighbourhood of the town. The consent to participate was received from school administration (a standard procedure in Romania). All second grade and third grade classes of the school were included in the study. The students from these classes were asked to fill in an anonymous questionnaire, which assessed their environment related knowledge, attitudes and behaviours. All the students presented in the day of assessment fill in the questionnaire; no refusal of participation was recorded.

The questionnaire, based on several data from literature, comprised 23 items and assesses different knowledge, attitude and opinions of students with regard to environment. Some of items aimed to identify the presence of acceptable risk notion, the tendency of imitate known or public persons and the role of positive reinforcement in encouraging pro-environmental behaviour.

Mean scores and standard deviations were calculated for all the items described above. ANOVA variance analyses were used in order to compare children' knowledge, attitude and behaviour with respect to the environment based on their gender, school enrolment and educational level of their mother and father.

In order to gain deeper insights into factors associated with environmental friendly behaviour of children linear regression analyses was also performed. The depended variable was one main environment related behaviour investigated in the study, namely the habit of not throwing away wastes on the street (littering); the independent variables were socio-demographic items (gender, educational level of parents, school enrolment) as well as the items regarding knowledge and attitudes of students with respect to the environment.

Results

The final sample consisted of 446 questionnaires (225 from the second grade and 221 from the third grade). The percent of boys was greater (55%) than girls, in all investigated schools (table 1). Most of the children come, as expected, from urban environment (96%).

Table 1. Student's distribution

	High school A			High school B			School C		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
2nd grade (n=225)	58	39	97 (43.1%)	25	37	62 (27.6%)	25 (NR=4)	37	66 (29.3%)
3rd grade (n=221)	56	42	98 (44.3%)	24	20	45 (20.4%)	41	37	78 (35.3%)

NR=non-respondents

Globally, slightly over 50% of children have more educated father, while the mothers of 57.5% children have middle education (high school). Compared on schools, most of the parents at *A* (63% of the mothers and 70% of the fathers) are higher educated.

The problem of the environment is present in the discussions with the children, either at home, or at school: more than 90% of the children discussed about the environment, however the percentages are lower for the 2nd grade. The parents' studies are important, as all the children in the 3rd grade coming from families with higher studies heard about environment. At the 2nd grade the percentage is higher for the children whose parents are only educated at the high school level.

Table 2 showed that children, both boys and girls, have good knowledge regarding the environment. They received good scores with respect to their knowledge about what the

environment is, what the wastes means and what kind of objects could be considered wastes. Girls' had higher knowledge than boys with respect to the definition of wastes did.

With respect to their attitudes regarding the environmental protection, generally children agreed that the environment must be clean, that people can do a lot of things in order to protect the Earth and that if the environment is not protected a lot of problems can appear into the future; no statistical significant differences were noticed between boys and girls with respect to this issues. Moreover, children declared that they know what should be done in order to protect the environment and again, similar results were obtained both for boys and girls. At the same time, many children and especially girls, considered that when somebody is throwing away rubbish this is a bad thing and disagree that they do not care about this. Nevertheless, fewer children declared they are really acting when somebody is throwing away rubbish by telling them that this is not good or by collecting the rubbish by themselves and dispose it in a proper way. Children, also receive high scores with respect to their declared ability in not following the bad example of a famous person who is not behaving correctly and throw away rubbish on the street. At the same time, many children recognized that if the schoolyard is clean this discourage them form throwing away rubbish; girls receive higher scores with respect to this issue. Children scored quite high their disponibility of behaving correctly in report to environmental protection if they would receive a prize/reward.

Table 2. Gender differences

	Female		Male		P value
	Mean	SD	Mean	SD	
Knowledge					
Q1	2.73	0.65	2.58	0.75	0.025
Attitudes					
Q2	0.01	0.09	0.03	0.19	0.043
Q3	2.74	0.65	2.59	0.77	0.012

Q1 = A waste is any dirty thing or used thing which can not be used anymore [a]
Q2 = When somebody is throwing away rubbish, this does not bother you [b]
Q3 = If the schoolyard is clean, you have the feeling that you should not throw away rubbish [c]

a. Possibility of answer: No (1), I do not know (2), Yes (3)
b. Possibility of answer : No (0), Yes (1)
c. Possibility of answer: Yes (1), I do not know (2), No (3)

Regarding the children' behaviour, we notice that some behaviours such as not throwing away wastes is more incorporated into children' life, while other environmental friendly behaviours such as going to school by foot or by bicycle instead of going by car as well as water protection by taking a shower instead of a bath are less popular among Romanian children. No significant differences were noticed between boys and girls with respect to their behaviour.

Table 3 underline that several differences exist between children, depending on their school affiliation. The children from periphery neighbourhood received higher scores with respect to their knowledge regarding the definition of wastes, having negative attitude regarding the persons who throw away rubbish on the street as well as on acting by collecting this rubbish by themselves.

Table 3. Differences according to school enrolment

	School A		School B		School C		P value (comparing the schools A and B)	P value (comparing school A with school C)	P value (comparing school B with school C)
	Mean	SD	Mean	SD	Mean	SD			
Knowledge									
Q1	2.46	0.83	2.70	0.68	02.88	0.41	0.013	0.000	0.011
Attitudes									
Q2	0.89	0.30	0.85	0.35	0.73	0.44	NS	0.000	0.029
Q3	0.63	0.48	0.66	0.47	0.78	0.41	NS	0.002	0.032
Q4	2.95	0.29	2.98	0.19	2.89	0.42	NS	NS	0.052
Q5	2.04	0.90	2.23	0.96	1.89	0.92	NS	NS	0.006
Behaviour									
Q6	1.49	0.94	2.60	1.44	2.97	1.39	0.000	0.000	0.041

Q1 = A waste is any dirty thing or used thing which can not be used anymore [a]
Q2 = When somebody is throwing away rubbish, this is a bad thing [b]
Q3 = When somebody is throwing away rubbish, you collect the waste by yourself [c]
Q4 = You know what to do in order to protect the environment [d]
Q5 = If you would receive a present/prize you would not throw away rubbish [e]
Q6 = Which means of transport do you use to go to schools? [f]

a. Possibility of answer: No (1), I do not know (2), Yes (3)
b. Possibility of answer : No (0), Yes (1)
c. Possibility of answer : No (0), Yes (1)
d. Possibility of answer : No (1), I do not know (2), Yes (3)
e. Possibility of answer: No (1), I do not know (2), Yes (3)
f. Possibility of answers: By car (1); By public transportation (2); By bike (3); By foot (4)

NS = not statistical significant

The children from the peripheral neighbourhood also recognized higher confidence in their knowledge about how to protect the environment. They also received better scores with respect to one environmental friendly behaviour, namely going to school with less polluting transport means. Differences were noticed also between the two schools from the central neighbourhood and the main items discriminating the two groups were those, which were mentioned previously.

Table 4 and 5 presents the results of the comparisons between children with respect to environmental knowledge, attitudes and behaviour, based on their mother and father education. It shows that children of more educated mothers are more conscious about the dangers which could appear if the environment is not protected. With regard to environmental friendly behaviours, children whose mothers are more educated take more often a shower instead of a bath, but go more frequently to school using more polluting ways of transport. The differences between children based on their fathers' education are obvious for some items. With respect to their attitudes regarding people who throw away wastes the differences are not conclusive; children of more educated people received higher scores on two items: they do not care when somebody is thawing away things and, on the other hand, some of them declared that they involve themselves more in cleaning after these people. Children of more educated people seem to have lower confidence in resisting to the influences of famous people, but are less sensitive to prizes/awards.

Discussions

At the 7-8 year-old children (2nd and 3rd grades), the general level of knowledge regarding the environment is satisfactory, especially at the girls, and as the originating environment is better, nonetheless, there are many lacks of perceptions, erroneous perceptions, or insufficient information on this subject.

Table 4. Differences according to mother educational level

	Mother has medium education		Mother has higher education		P value
	Mean	SD	Mean	SD	
Knowledge					
Q1	2.88	0.42	2.96	0.20	0.013
Q2	2.72	0.66	2.58	0.78	0.045
Behaviour					
Q3	1.32	0.47	1.42	0.49	0.037
Q4	2.54	1.41	1.81	1.26	0.000
Q5	3.63	0.55	3.73	0.44	0.026

Q1 = If we do not take care of the environment, serious problems can appear in the future [a]
Q2 = If the schoolyard is clean, you have the feeling that you should not throw away rubbish [b]
Q3 = Do you generally take a shower or a bath? [c]
Q4 = Which means of transport do you use to go to schools? [d]
Q5 = Do you throw away rubbish? [e]

a. Possibility of answer: No (1), I do not know (2), Yes (3)
b. Possibility of answer : No (1), I do not know (2), Yes (3)
c. Possibility of answer: Bath (1), Shower (2)
d. Possibility of answers: By car (1); By public transportation (2); By bike (3); By foot (4)
e. Possibility of answers Always (1); Very often (2), Rarely (3); Never (4)

Table 5. Differences based on father educational level

	Father has a medium education level		Father has a high education level		P value
	Mean	SD	Mean	SD	
Attitudes					
Q1	0.00	0.09	0.04	0.19	0.029
Q2	0.52	0.50	0.68	0.46	0.001
Q3	2.98	0.160	2.91	0.37	0.019
Q4	2.57	0.790	2.77	0.62	0.003
Q5	1.91	0.930	2.17	0.92	0.003

Q1 = When somebody is throwing away rubish, this does not bother you [a]
Q2 = When somebody is throwing away rubish, you tell him/her that this is a bad thing [b]
Q3 = If a famous people is throwing away rubbish, you have the feeling that you can do the same [c]
Q4 = If the schoolyard is clean, you have the feeling that you should not throw away rubbish [d]
Q5 = If you would receive a present/prize you would not throw away rubbish [e]

a. Possibility of answer : No (0), Yes (1)
b. Possibility of answer : No (0), Yes (1)
c. Possibility of answer: Yes (1), I do not know (2), No (3)
d. Possibility of answer : No (1), I do not know (2), Yes (3)
e. Possibility of answer: No (1), I do not know (2), Yes (3)

At the district school, although the socio-cultural level of the children is lower, there is a better pro-environmental education, as children are more disciplined and more conscious on the need to preserve our life environment unaltered, suggesting the role of the school in outlining the environment consciousness.

The level of instruction of the parents, especially the mother, significantly conditions the perception of the environmental factors and risks among children, the cultural level of the family being important for the general knowledge of the children in the early years of their life.

The risk considered as acceptable by children is very low, as they are more tolerant with anything that sounds dangerous for their health. Generally, children appreciate any situation in white and black, and are tempted, when the word "dangerous" appears, to manifest themselves against it. The obtained results allow us to say that they begin to become conscious on the fact that certain substances in the environment become dangerous as they exceed certain limits that are considered tolerable.

The capacity to create an abstract image and to have a perspective view is present in more than 90% of the children, however few of them still believe that people cannot influence the future of the planet (especially the girls in the 3rd grade). Most of the children who cannot evaluate the future of the planet become from families with middle education.

From the point of view of the preservation of the natural resources, a shower is more indicated than a bath, but the choice between the two, in most of the cases, is not dictated by the

environment consciousness. More than half of the children prefer the bath, perhaps due to some cultural characteristics in Romania.

In our study, few children walk to school, and even fewer come by bus, most of them coming by car, with their parents, especially in the families with higher education. The very low preference for the bicycle (which is very benefice for health) is explained by the very high risk involved by this, as there are few dedicated tracks in Romania, and Cluj being a city with very high road traffic. In the 3rd grade, the percentage of children walking to school increases at all the three schools. The number of children transported by car is higher in the families with higher education, reflecting the social and economic status rather than the environmental consciousness.

Anti-environmental behaviours (throwing papers down) are more frequent in *A* and in boys, which is on inverse proportion to their parents' education.

It is well known that there is a very frequent tendency to imitate either a beloved sportsperson or a famous and admired actor. In our study, children are conscious (at the affirmative level, at least) that bad conducts shall not be imitated, however 2,2% of the 2nd grade ones (most of them from*A* and *B*) still believe that they can imitate what a public person does, even if this is a bad conduct. The percentage of those who imitate the inappropriate conducts decreases in the 3rd grade, but this was noted at the same school (*A*) and exclusively on the children from modest families.

The existence of the precedents is important, many people being reluctant in throwing down their garbage in a very clean yard, for instance. It is true, for most of the children, in our study only 20% of the pupils in the 2nd grade are not worried in being the first to dirty a clean place. The percentage is higher for the boys, and, again, is higher at *A*. As the age increases, this attitude becomes more expressed for both genders, which justifies the usefulness of the environmental education at very early ages. Again, for the same aspect, the situation is better at *C*, where children seem more disciplined and more respectful for the environment, especially if they come from families with higher education.

The gratification of the environmental friendly behaviours seems to impress the children from all the three schools included in the study, which gives an impulse to continue the initiated project, and aiming to encourage environmental friendly behaviours by offering material gratifications.

Pro-environmental education is therefore necessary, for children, as they represent a very malleable segment of the population, assimilating much of the received information, and the appropriation of environmental friendly behaviours has the chance to establish permanently.

The risk perception in children depends of the prior conceptions acting as decoding filters, however it can be influenced by a targeted education to the environment, correcting the false perceptions and helping the children (who are, generally, very opened to the environmental issues, very malleable and very avid for knowledge) to create a set of perennial values and adopt healthy behaviours.

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