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ENVIRONMENTAL PERCEPTION

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SUMMARY

Geography contribution to environmental studies is solved at theoretical, experience and applied levels. The term 'environment' is discussed, its social determination is stressed. Process of environmental perception, its psychic, social, spatial attributes and their synthesis is given in accordance with evaluation, social relevance. The role of mental maps in environmental studies is emphasized. They portray environment, literally human environment as socially determined category with intersection of natural and societal processes as perceived by people. The case study of environmental perception was implemented. Residents and some visitors of Boskovice town, mid-west Moravia, Czechoslovakia, were interviewed and asked to sketch a map of town. The results show the image of town, spatial organization of environmental perception: environmental functional segments, a centre and periphery of perception, as well as a quality of the environment can be recognized. The research is intended for environmental management, adjustment, planning, decision-making and education.

INTRODUCTION

Among the themes examined in Czechoslovak geography is environmental perception very rare one, the papers of V. Ira and J. Paulov (1976), J. Oťahel (1980) and P. Radváni (1983) are the exceptions. Despite a number of geographical studies in some countries our geographers by contrasts with ecologists, psychologists and sociologists who took part in MAB project No. 13, are in doubt about relevance of environmental perception. They emphasize in discussions a strong psychological content of perception and formulate objections to its significancy in geography.

Our investigation on environmental perception started in 1978 within the framework of environmental studies including the task of environmental education, landscape ecological research (A. Hynek, 1981). Two studies were published (A. Hynek, J. Hynková, 1979, A. Hynek, J. Hynková, 1980) another is in press (A. Hynek, Folia series), here is a comprehensive survey with reference to our papers where the tables, graphs, diagrams, maps and mental maps-sketches are enclosed.

Great interest in environmental studies, typical for Czechoslovak geography, starting in the 70's is coming on, but especially in physical geography, linked with nature conservation, and regional geography while socioeconomic geography has been underestimating environmental variations in responses of individuals and social groups.

Our inquiry on environmental perception shows relevant social context and for

geography significant spatial attributes. As a result, this topic is a part of our integrated geographical studies with particular regard to landscape/environment research and environmental adjustment even environmental education.

ENVIRONMENT

With reference to P. Haggett (1975, 11) by the environment geographers mean the sum of total conditions that surround (literally, environ) man at any point on the earth's surface. Systems specialist G. Sommerhoff (1976, 155) by 'environment' understands those surroundings conditions which affect the organism or the results of its actions. And economist A. V. Kneese (1977, 13) says that 'the human environment be fairly regarded as the whole set of surrounding conditions in which human being lives and over which he has relatively little individual control other than moving to a different location with other environmental characteristics'.

All the same, the term 'environment' was defined at the beginning of general systems theory development by Hall and Fagen (1956) who introduce to environment those objects being in interaction with a certain system. In our case a system is man/human society and its environment is not so extraneous as it is treated above.

The effect of environment on society is transformed by socially determined means and if society effects upon environment it is also socially determined. Therefore 'human environment' is a socially determined category, with intersection of natural and societal processes integrated by social laws. Man is a part of nature, but his essence is social and it dominates upon his biotic nature.

The hopeful specifications, after B. Dvořák (1977) include among others both conceptual and operational effective delimitation of the six interactive circles:

- subject (man/society)
- material components
- components attributes
- factors as components with active attributes
- levels, i.e. subject and factors junction, environmental quality
- aspects as a kind of effect upon the subject.

In this way we do not reject other specifications in keeping with the opinion saying that the man/environment interaction is multilateral and thus also the multiformity of approaches ensues. We cannot forget that, in spite of number of experiments, an environmental theory at general level has not been formed yet to be the basis for all the practical purposes. So we witness the success of environmental management praxis to be greater than that of the general theory, which — at the same time — is very needful. We must not be amenable to the delusion of some technical interventions, though successful, when improving the environmental quality. Of course, we cannot do without technology, but technology itself cannot solve the interaction. Comprehending the substance of man/environment relationship is the matter. Technology is a part of production within the socioeconomic formation.

As a basis for understanding the interaction there is the Marx-Leninist conception of subject/object relationships, materialistic/dialectical explanation of man/society/environment interaction at philosophical level, all the same linked with environmental management.

ENVIRONMENTAL PERCEPTION

Human environment conception evokes a relevant aspect and level of man/environment interaction-perception. Its relevance was underlined even by Man and Biosphere Program incorporated there as Project No. 13. Why so? The man/environment interaction depends also on the ways people perceive the environment, on aims, goals, objectives, purposes, use, transformation in functional sense. When inquiring interaction it is not sufficient taking the real environment into account, portrayed by environmental sciences, but also its subject perception, its state as well as the process of reaching certain goals by the subject. There is a basic research hypothesis: the environment is objectively differentiated and organized into a number segments perceived by various people in different ways. Even a single segment may be perceived in various ways by different people.

In geographical literature of the 70's perception is given special attention within the framework of so called behavioral geography developed in the Anglo-American sphere. So R. M. Downs (1970) regards it as a more realistic and adequate description of man. He sets forth the spatial behaviour is dependent upon individuals evaluation and relative assessment of the environment. Perception studies concentrate on man's cognitive understanding the environment, the image of real world, the influence of image on spatial behaviour, links between man and his environment, effect of images on decisions in dynamic aspect through time and across different groups of people. He considers studies of geographic space perception for a logical step in the attempts to understand man/environment relationships. Three approaches are applied: structural, evaluative and preferencial. Orientation and image identify and structure space perceptions, they relate the evaluation to decision-making and to behaviour on a scale of preference with relation to some specified behaviour objective.

But the conception of behavioral geography has its weak points: it reduces man's cognition and activity to behaviour, overestimates psychic feature of perception, it does not regard to other attributes of the real world, focusing only on its reflection in people's minds, omits social relations that determine human knowledge and activity.

The investigation of environmental perception, or let us say its spatial attribute, is also a geographical problem. It regards to its substance, to forming the image of the real world, relationships between the image and the reality, the process of transforming the environment into image, the influence of environmental image to decision-making. It has its temporal dynamics, territoriality and differences according to social groups.

Yi-Fu Tuan (1974) regards the perception as both the senses response to external stimuli and intentional activity relating to a certain phenomenon in coordination with the system of values. It concerns biotic and social needs, reflects human attitudes based on experience, objectives, social relations, cultural level, world view. From the psychologist point of view it expresses kinesthetic relation between special physical forms and human senses. It covers the universal idea of the centre and periphery in space organization, has its abstract level, symbolic rationalization and objects segmentation. Various approaches of people, caused by physiological, social, cultural and aesthetic variations appear in individual perception. Spatial environmental perception is a part of the

living style, active response, reflecting of spatial arrangement of activities, objects, landscape, settlement. It appears as spatial activity in the real world, orientation, decision-making, mental space organization, environmental evaluation, various states of environment use, preference of certain objects. Yi-Fu Tuan (1974) means under perception responses of senses to external stimuli and purposeful activity. It has value for us — biotic survival and certain satisfactions.

The aim of studies on spatial environmental perception consists in space identification, structuralization and organization, its functional arrangement for various activities. Contemporary anthropic impact upon the environment changes rapidly it in its components and the wholes, spatial complexes. The forms of environment use are also changing in dependence on socioeconomic development. More and more distinctly we apprehend man's impact on environmental quality, chain processes/responses of nature adjustment. Therefoe we have to recognize natural resources renewable, nonrenewable altered or destroyed, available for recycling, the importance of landscape/environmental diversity.

The output of spatial environmental perception inquiry is an information relevant within the framework of environmental adjustment/management. We evaluate environmental segments in relation to social, groups or individual goals and objectives, not only for present, but anticipating the future development.

Inquiring the perception of architectural environment I. I. Serediuk (1979, 192) emphasizes the role of a priori information on perceived object, the non-linear process of judgement as comparison and decision-making on perceived object and dependent also on recipient's alphabet.

In keeping with J. Linhart (1976, 86) we regard perception as a specific form of human cognitive activity, the more and/or less adequate image of reality, people's reaction on objects, their experience and transformation. In his 'Theses on Feuerbach' K. Marx formulated the principle of the unity of knowledge, object and activity, according to which man does not recognize the nature directly, immediatelly, only by intuitive seeing, but gets acquainted with its qualities indirectly through the individual and societal practice. The source of human creativity genius is in labour activity, the basis of which is perceptional and sensorial learning based on reflex processes. Perceiving is the specific from of sensorial activity fulfilling the function of cognitive activity. The rise of perceptive pictures and images is qualified by functional attributes of things, by recognizing the function the object has in human activity.

Perception becomes more dynamic when linked with concern of human activity with needs of practice, anticipation of future situations. Images of environment involve the image of an objective situation, the image of activity course and means, the image of activity results, that means aiming at a certain objective linked with certain needs. The image of an object is not only a sensual reflection of reality but a construction originating in complicated transitions from sensorial activity to perceiving. This construction is at the same time the reflection of objects of the world as well as the process we form conceptual objects of our knowledge in. This concept of perception is the basic process of the objective world recognition and identification and also the controlling component of human activity.

Perceptive processes are also conditioned by social life, new forms of materia life, civilization and cultural values, giving rise to new perception form They point to influencing objects, problems solving, to the activity that

J. Linhart (1976, 21) defines in accordance with Leontiev — to be the process controlled by nervous system of man's effect on his environment, transforming it from the viewpoint of individual and societal life needs. It is mediated by psychic reflection of reality, brings information and gives people orientation in the surrounding world. It becomes objective reality mediated by psychic reflection of reality, the aimed, managed process. Human activity acquires the character of action by its tenacity of purpose. Behaviour stands for all forms of subject activity knowledge inquiring both operations with models and operations with objects. A significant role in man/world relation is played by values.

Thinking of differentiated environmental segments we cannot omit their meaning as a composition of wider relations, and then that relevance concerning their evaluation of utility from the viewpoint of goals-seeking in practical activity, needs satisfaction. Needs and central activation determinants involve among others psychological determinants as colours, tones and other senses stimuli, ecological variables joined with life conditions in certain environment. They enable human needs satisfaction — surviving, appeasing hunger, thirst, social and cultural needs. Informative variables, such as subject's environment informative reflection, e.g. novelty, arrangement, pattern, complexity, etc. not less important (J. Linhart, 1976, 64).

As far as evaluation and values are concerned, value can be defined, by J. Světlý (1977, 21) at dialectical materialism interpretation as the relationship of human subject and object. Man is the active factor in the subject/object relation. At the same time values are products of human activity, independent consciousness and praxis as the way of human existence, of objective activity. Values specifity, human subject/object relation consist in the meaning human object has for the purpose of creating man himself. Value is human relation to the thing itself and to man, in which the thing ceases being only a nature phenomenon and becomes a social object. Certain qualities of the object are values evoking certain way of adopting them. Being value means to have human meaning. All the values have their origin in objective activity of subjects. Their valuability acquires objective character by other subjects being adopted and becoming components of real social life process based on labour activity. The consequence of man's socially determined activity is recognizing, feeling, creativity and values appreaciation.

Evaluation is understood by J. Velehradský et al. (1978, 11) as a specific form of reality reflection, a form of abstraction that enables getting acquainted with deeper background, sense and meaning of reality man is in interaction with. It participates significantly in forming active relation of man and environment, it is the precondition and one of the means relevant controlling it. It becomes evident in activities/expressions of man's existence, in creative genius, goal-seeking, objectives. Knowledge, evaluation and praxis are joined inseparably. Evaluation becomes evident in choice, sense recognition, preference or indifference or even antipathy when solving problems, decision-making. By means of evaluation man forms differentiated attitudes and approaches reality, also social one. On their basis a tendency arises to certain activity societal. Man/environment interaction is a screen for activity needs, goals, ideals projection. Evaluating them in the process of motivation leads to intentionality, to forming value attitudes, that means to certain tendency of knowledge, cognition, feeling, beliefs, certain objects and phenomena of reality as personally justified and acting accordingly.

Personality characters become quite evident in this tendency. Turning back to Dvořák's specification quality effects the environmental essence, values, relevance.

MENTAL MAPS

The difference in the ways cartographers and users perceive the space on topographic, general and thematical maps is showing difficulties in understanding maps by users. This difference becomes evident if we succeed in getting personal picture, an image of space, its reflection, response, the way of seeing or observing space organization, spatial perception at map sketches, mostly simply illustrating functioning, built up in mind, dynamically changeable system of information about spatial attributes of environment people are in interaction with. They are called mental maps and their relevance can be shown in following case.

Observing the large residential areas in our cities built-up in the 70's we can meet a number of plans, maps giving much more information for specialists than for laymen. Information content rises if maquettes and models are at disposal. Suppose the housing estate is built: then its real perception is different from maps and maquettes. And lastly, it is perceived in another way by the people who live there than by those who don't. And yet plans, maquettes are the same, it is perception that is changing. There keeps to be a question whether probable perception after finishing the building can be predicted as early as over the maps.

Environmental mental maps show how man reflects the space he lives in and is in interaction with. If we extend Yi-Fu Tuan's approach (1975), then mental maps have the following functions:

— to prepare us to communicate spatial information effectively

— they allow practice, make it possible to rehearse spatial behaviour in the mind serving a definite function

— they help to know locations

— they are a means to structure and store knowledge

— they are imaginery worlds, the image is a creative construction. Fundamental problem is the process of construction.

THE CASE STUDY: ENVIRONMENTAL PERCEPTION OF BOSKOVICE-TOWN MID/WEST MORAVIA, CZECHOSLOVAKIA

Inquiring the environmetal perception we concentrated not only on theory, but also toward experience and applied studies. In the initial stage we made a choice of 127 environmental spatial elements of Boskovice town and its periphery for 290 persons to perceive them. There were 3 groups of individuals at the age of 12—15 years: 160 respondents, 16—19 years: 80 respondents and 25—60 years: 50 respondents.

The task consisted in ranking of 127 environmental segments in the from of choice 15 positive and 15 negative ones. We ordered segments according their ranks assigning value 15 to rank 1, value 14 to rank 2 ... value 1 to rank 15. Each respondent disposed with 120 positive values and 120 negative values. How they were used is given in Tables 1 and 2. The output: 94 % used positive values and 56 % used negative values is showing very good environmental

Table 1. Total positive and negative values of spatial environmental segments perception, Boskovice town

Social group	Number of persons	Positive values potential	Applied	
			Positive values	Negative values
pupils	180	38,400	18,045	14,026
students	80	19,200	9,305	1,556
adults	50	12,000	5,517	3,929
total	290	69,600	32,867	19,511

Table 2. Environmental perception of Boskovice town: distribution of positive and negative spatial segments

Environmental segments	Number of segments	%	Values	% after interference
strictly positive	22	17	+7,974	19.8
controversial	95	75	+18,841	46.8
			—10,399	25.8
strictly negative	10	8	—3,060	7.6
total	127	100	40,274	100.0

quality of Boskovice town. All the same 75 % environmental segments received both positive and negative values, but after interferention nearly 47 % environmental segments are positive, total nearly 67 %!

We grouped 127 spatial environmental segments into 20 classes acording to their social function in the environment and calculated their positive or negative values. The result reflects the image of Boskovice town by 290 residents, see Table 3.

After this stage we investigated mental organization of Boskovice town as environmental space. The objective was to get spatial segmentation of environment, its mental organization, value system identification in appreciating environment, preferences, the way of decision-making in environment. Both the stages are only partial approaches and procedures, techniques for environmental inquiry finding out its quality, adjustment.

With reference to Lynch (1960), in P. Haggett (1975, 531) residents and some regular visitors (journey-to-work) were interviewed and asked to sketch a map of Boskovice town, to comment upon the selected parts of the city and to list the most distinctive ones. The research output is showing the public image of town on mental maps. We organized common elements of mental maps to the town plan and in the form of table expressed classes of perceived spatial environmental elements.

Table 3. Positive and negative perception values, Boskovice town, 290 respondents

Segments classes	Positive values	%	Negative values	%	Total	%
cultural facilities	5,713	17.4	641	3.3	+5,072	+25.0
sportsgrounds	4,585	13.9	579	3.0	+4,008	+19.7
historical objects	6,552	19.9	4,093	21.0	+2,459	+17.1
services	3,839	11.7	1,815	9.3	+2,024	+10.0
forests	1,640	5.0	0	0	+1,640	+8.1
residential areas	1,661	5.1	234	1.2	+1,427	+7.0
parks	1,194	3.6	33	0.2	+1,161	+5.7
natural sceneries	1.801	5.5	650	3.3	+1,151	+5.7
schools	1,974	6.0	1,566	8.0	+408	+2.0
gardens	363	1.1	31	0.2	+332	+1.6
square	561	1.7	238	1.2	323	+1.6
shops	526	1.6	257	1.3	+269	+1.3
arable land	54	0.2	18	0.1	+36	+0.2
energy facilities	13	0.0	56	0.3	—43	—0.6
transport facilities	1,078	3.3	1,747	9.0	—669	—9.6
cemetaries	141	0.4	870	4.4	—729	—10.5
works	1,007	3.1	1,883	9.6	—876	—12.6
warehouses	50	0.2	1,233	6.3	—1,183	—17.0
water facilities	115	0.3	1,538	7.9	—1,423	—20.5
waste deposition	0	0	2,029	10.4	—2,029	—29.2
total	32,867		19,511		+20,304 —6,952	

An approach was organized on choosing 200 pupils of the basic school in Boskovice town, there were 4 groups of pupils from 6th to 9th class, each of them consisting of 50 pupils. We were also interested in the address of each respondent. According to this we divided the pupils into 15 groups: A—P. 11 of them are in the Boskovice city territory, 4 cover the villages within Boskovice town. We omitted 3 housing estates because the number of pupils living there was under 3.

The respondents were asked to draw a simple map sketch of Boskovice town and surroundings entering those they come into contact with, those which are relevant for them, which have a specific function in their environment — it means segment identification was the matter. We told them examples: buildings, streets, residential areas, playgrounds, roads, sceneries, works, etc. giving them chance of optimal solution. The samples of mental map sketch are given in study of A. Hynek, J. Hynková (1980) and in A. Hynek (in press, Folia series).

200 respondents delimited 227 spatial environmental segments at their mental maps. Their grouping into functional classes and percentage share on total perception is given in Table 4. The relation of the centre and periphery in environmental perception can be seen in the graph showing the relation between segments frequency and a number of respondents using lognormal scale (A. Hynek, J. Hynková, 1980).

Potentially each respondent could sketch 227 segments, it means there could be 45,400 frequencies. In fact 2,953 frequencies were sketched, i.e. about

Table 4. Percentage share of perceived segments groups, Boskovice town, 200 pupils

Segments groups	% share
streets, square	23
shops	15
suburban landscape	11
other services	10
transport	10
schools, hospital, post-office, library	9
parks, woods	4
works	4
historical objects	4
sportsgrounds	3
week-end houses, gardens. cemetaries	3
cultural facilities	2
agricultural landscape	1
warehouses	1

15 frequencies in one mental map, which means 93.5 % or 15.4 fold reduction! There are 56 % frequencies coming to the first most frequent 25 spatial environmental segments, 66 frequencies to 1 segment is a mean. Median: 1,476 frequencies are rank 20, that means the first 20 segments had the same frequency at mental maps as the remaining 207 ones. It is the centre that is evidently shown: the first 6 segments, rank 1—6, had 24 % frequencies, the rest being periphery from the perceptional point of view.

Children's mental map of Boskovice town mostly catch streets, square, roads, facilities, suburban sceneries with water, woods, areas for playing games, places with high diversity. The are 78 % together. Among highly perceived segments we can find pupils' school, main town square in spite of problems with its reconstruction, the hospital regular medical care, modern facilities and pleasant surrounding, cinemas both the all-season and the open-air ones.

But the dominant of Boskovice town: the old castle is perceived only after two self-service shops! It proves the castle being more a visual townscape scenery than anything else, all the same its surrounding is a recreational forest. Historical and cultural facilities and buildings, except cinemas, are even in further sequence after traffic communications, as well as woods and works, nevertheless their real frequency is low.

In segments choice there is an evident modality of segments ranks 1—8 and individuality of 80 segments with two transitional frequencies to modality and/or individuality.

CONCLUSION

In spite of fact that these are only 2 stages of experiments with environmental perception and mental maps inquiry, ladened with the initiators and respondents mistakes, with problems of significance level, choice and its relation to standard level, we gained, in our opinion, a valuable basis both for environmental management, adjustment, planning, decision/making and for environmental edu-

cation. Environmental perception is indisputably relevant in man/society/environment interaction. Mental maps give clearly very significant spatial information on perception and consequently on environment as it is portrayed in man's mind. We continue in studying environmental perception and the 3rd stage is closed, the results are in press, the 4th stages is coming on. We assume that after discussions over general questions of environmental studies further investigation is very hopeful, first of all links between image, attitudes, values and persons activity. We could notice some differences and causal analysis can find the reason why.

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