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Impact of visit on visitors' perceptions of the environments of nature-based tourism sites

Abstract

The goal of this paper is the assessment of the impact of personal experience on visitors' perceptions of the environments of selected tourist attractions. The cognitive paradigm of environmental perception research was chosen and the Mehrabian-Russell general measure of information rate was used. Students from the University of South Bohemia from three different study programmes (faculties) were used to represent three segments: eco-tourists, neutral and mass-tourists. The research was undertaken on three tourist sites with different types of occurrences of water in their landscapes – pond, river flood plain and peat bog. All three localities are situated within the UNESCO biosphere reserve and landscape protected area of "Třeboňsko" (Třeboň area), Czech Republic. Particular sites were selected with regard to the accessibility of these sites for visitors and to their importance for the concentration of visitors. The measurements took place three times – before visit, on-site and after visit. Explanatory factor analysis revealed three factors of perception – spaciousness, novelty and complexity. These factors differ among localities and each site had a different impact on the site perception of visitors. In the case of spaciousness, it was found that the visit had no impact on visitor perception. Visitation influenced the perception of novelty in the same way at two of the sites– both localities, after visitation, were perceived as being more novel. Visitation also influenced perception of complexity; this time, however, in different ways that were dependant on the uniqueness of each site.

Keywords:
tourism; experience; perception; environment; Třeboň basin; Czech Republic

Introduction

Nature attractions constitute a basis for the competitiveness of a destination (Ritchie & Crouch, 2003). However, these localities are also important from the scientific or social-cultural point of view and are, hence, very often protected by society. Consequently, it means that management of such environments must meet two contradictory requirements: to contribute to the limiting human impact on these environments and to make them accessible for visitors (Marion & Reid, 2007).

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The situation of tourism is, however, different from that of e.g. industrial activities, because "[t]he world's tourism and recreation industry provides considerable benefits to protected areas and the communities adjacent to or within them" (Bushell, & McCool, 2007, p. 12). On the other hand, "tourism can contribute to the deterioration of cultural landscapes, threaten biodiversity, contribute to pollution and degradation of ecosystems. . . " (Bushell & McCool, 2007, p. 12). Tourism activities act upon its environment through a wide scale of impacts (Geneletti & Dawa, 2009; Heydendael, 2002; Marion & Leung, 2001; Nepal & Nepal, 2004), and the degree of impacts is dependent upon a wide spectrum of environment properties, recently comprehensively reviewed by Pickering (2010). Therefore, only planned and managed tourism can bring about real benefits to the environment (Bushell & McCool, 2007; Monz, Marion, Goonan, Manning, Wimpey & Carr, 2010). Visitors to such environments are the keystones of the appropriate planning management (Goeldner & Ritchie, 2009; Veal, 2002) because "without visitors, without satisfied visitors, parks and protected areas will cease to exist" (Bushell, Staiff & Eagles, 2007).

Particularly, it is so in the case of waters that co-create the landscape's character (Gabr, 2004) and its appearance is crucial to the way in which visitors perceive the value of the nature attraction (Real, Arce & Sabucedo, 2000; Sundstrom, Bell, Busby, & Asmus, 1996). Nature attractions also serve as a refuge for those biotopes being endangered by human activity (Chytrý, Kučera & Kočí, 2001) and for species of organism related to those biotopes (Kučera, 2005). These reasons help to make specific forms of water occurrences in mountainous landscapes a sought after destination for visitors. Opening up accessibility is, however, quite regularly in violation of the interests of nature and landscape protection (Christ, Hillel, Matus & Sweeting, 2003).

Visitors to the different types of tourism destinations (Ritchie & Crouch, 2003) are motivated to visit for a variety of different reasons (Bansal & Eiselt, 2004). Groups behave, thereafter, in the visited environment in different ways (Horner & Swarbooke, 1996). A stay in the ambience of large protected areas is, most often, motivated by the possibility to stay in undisturbed nature and to experience the feeling of being in an undisturbed environment. Nature-based tourism is conditional on the existence of a natural environment – i.e. particularly protected areas of nature and above all national parks. It is, thus, of importance for every form of tourism in which activities are linked to the natural environment. It is, however, usually the case in natural landscape protection, that support is only given where the tourism meets certain conditions of sustainability and which are devoid of negative impacts on that environment (Dudek & Kowalcyk, 2003). Ecotourism differs from mass nature-based tourism, above all in a protectionist aspect, as the tourist becomes, instead of a passive visitor, an active contributor to the sustainable exploitation of a tourist attraction (Sjøholt, 2000). Another condition of ecotourism is in using resources in a way which is advantageous for local communities (Epler Wood, 2002) and, also, in increasing a visitor's motivation to get some knowledge about the place he/she has visited (Dudek & Kowalczyk, 2003); particularly to understand the cultural and natural history of the visited site (Epler Wood, 2002).

The aim of the presented paper is to contribute to the enlargement of our knowledge on forming assumptions for the environmentally friendly behaviour of tourists in the destination. The importance of such a work consists in a generally accepted premise that an informed tourist is always more likely to ask for a nature-based destination and a detailed knowledge of the structure of tourists' relations to the partial elements of landscape can enable such sustainable management as it is advantageous for the landscape, nature, culture and tourism (Geneletti & Dawa, 2009).

Perceptions and previous experience

Perception of the environment is one of the above-mentioned elements and, in tourism, represents one of the factors in building the destination image (Naoi, Airey, Iijima & Niininen, 2006), which is "formed through the consumer's rational and emotional interpretation" (Royo-Vela, 2009, p. 420). It manifests itself analogically through the 'wants' (Naoi et al., 2006), which are a 'manifestation of needs' (Naoi et al., 2006). Thus, they affect also the motivation to visit (Gnoth, 1997; Goossens, 2000). Both image and motivation were identified to be key elements of satisfaction with a visit (Bigné, Sánchez & Sánchez, 2001; Chen & Tsai, 2007; Lee, Lee & Lee, 2005; Qu & Ping, 1999; Yoon & Uysal, 2005). This is crucial in the process of the maintenance of visitor rate; above all, for reason of an identified connection with the further behaviour of customers – a satisfied visitor comes back and/or gives positive word-of-mouth feedback to others (e.g. Gupta, McLaughlin & Gomez, 2007; He & Song, 2009; Jang & Feng, 2007; Oppermann, 2000; Wu & Liang, 2009).

Perception of the environment is, however, also important during the visit itself, because it represents a form of opportunity for quality assessment. "Quality is conceptualized as a measure of a provider's output" (Baker & Crompton, 2000, p. 787) and "evaluations of the quality of performance are based on visitors' perceptions of the performance of the provider" (Baker & Crompton, 2000, p. 787). Perceived quality in tourism studies is, in almost all cases, linked with the assessment of perceived quality of services (e.g. Baker & Crompton, 2000; Chen & Tsai, 2007; He & Song, 2009; Petrick, 2004a). However, in nature-based attractions there are often no services on offer and quality as 'performance of provider' could be understood as the action of the environment on the visitor as a whole. Thus, perception of environment could be understood as perception of quality, because the place itself, or the scenery, is what visitors want to see, which is a common theme identified in landscape planning literature when discussing this issue (e.g. Palmer & Hofmann, 2001). Quality, also, is another important point affecting the visitor's satisfaction (Baker & Crompton, 2000; Chen & Tsai, 2007; Duman & Mattila, 2005; He & Song, 2009; Petrick, 2004b).

In the study of perception of environment, a large number of paradigms are accepted (Taylor, Zube & Sell, 1987; Uzzell, 1991). However, the most relevant approaches in tourism follow the psychophysical and cognitive paradigms (Fyhri, Jacobsen & Tømmervik, 2009). Research within the cognitive paradigm was focused first on the finding out of the structure of elements participating on the evaluation of the environment, especially utilizing the information rate measure developed by Mehrabian and

Russell (1974). In perception, novelty plays an important role in the cross-fade of two elements: preference-for-prototypes and preference-for-differences (Peron, Purcell, Staats, Falchero & Lamb, 1998). Among other most common goals of studying perception of environment we find identification of factors of perceived aesthetical values (e.g. Real et al., 2000). Generally considered to be more interesting or more beautiful are those places with an abundance of natural or close-to-nature landscape elements (e.g. Fyhri et al., 2009) ; picturesque scenes connected with landmarks of any type; as well as the harmony between natural and cultural substances of the environment (Gabr, 2004).

The impact of visitation on a visitor's site or destination perception has been previously studied, especially within the branch of research of image formation (e.g. Hsu, Wolfe & Kang, 2004). A review of this topic has recently been made by Tasci and Gartner (2007, see table 2 on p. 419) with the conclusion that results of particular studies diverge, but researchers, altogether, "agree that visiting results in more realistic images due to a firsthand experience of the product" (Tasci & Gartner, 2007, p. 418).

Therefore, we can, also, consider perception of the environment to be important for the visit rate in case of the nature-based destinations, because perception is, among others, influenced by the visitor's experience with the site. The goal of this paper is, therefore, the assessment of the impact of experience on the perception of the tourist attractions' environment. Our hypothesis is: The impact of experience manifests itself differently in different environments.

Methods

STUDY AREA

The impact of a visit on perception of a tourism site was assessed in three localities within the area of the Třeboň Basin in Southern Bohemia (Czech Republic), close to the border with Austria. The Třeboň Basin is a relatively upland (400–500 m a. s. l.) plane with a border of hilly country. It has, through its climate, character and landscape exploitation a markedly submontane character. With regards to its soil (acid non-productive substrate created largely by Cenozoic lake sediments) and hydrological conditions (lot of mineral poor sources; peat-bogs; large wetlands in place of slowed-down run-off, ameliorated into the numberless quantity of ponds) it remains and continues to be an economically marginal area with low population density. Due to these conditions, a unique and extensive cultural landscape has survived here, which is designated as a protected landscape area and UNESCO Biosphere reserve. Two large Ramsar localities are also situated here – Třeboň Peatbogs and Třeboň Ponds. For this reason, it is considered as an important tourism area of national significance. In the perception of visitors, the Třeboň area is predominantly a region of ponds and undisturbed natural environments (Navrátil, 2008). As the 'undisturbed state' is preserved, particularly by the existence of wetlands, we have chosen to achieve our goal in the following environments – ponds, peat bogs and wetlands, which are important elements of the area's image (Navrátil, 2008). Particular sites were selected with regard to the

accessibility of these sites for visitors and to their importance in terms of the concentration of visitors.

- Locality 1: observation point towards a filling hollow after the extraction of peat, with the following succession: water – submerged mosses – bushy vegetation; which is framed from all sides by a *Pinus rotundata* bog forest in the National natural reserve Červené blato and is accessible due to an educational trail.
- Locality 2: view of a large water level of the pond Svět (in English 'The World') from the pond's dam, close to the town-centre of Třeboň. This place belongs to the main rest points for the town's visitors and makes a part of two educational trails – the cycling one called 'Round the town Třeboň' and the footpath 'Round the pond Svět'. Svět pond is ranked, next to the biggest pond Rožmberk, among the most widely known in the Czech Republic and it is one of the icons of the area (Navrátil, 2008).
- Locality 3: view of a large flood plain of the river Lužnice, a winding river with mosaic of wetland willow carr with undergrowth of high sedges and rushes, and with occurrence of water birds. The view point is situated at the so called 'Novořecká dam', close to three large protected areas (National natural reserve Stará řeka, Natural reserve Novořecké močály, Natural reserve Meandry Lužnice). The Novořecká dam is an important tourist route between southern and northern parts of the Třeboň tourist region.

A further reason why these localities were chosen is that they are often represented in promotional materials of this area. This enables, also, the use of the results of this research to create a visual presentations of the destination (Hunter, 2008).

SELECTION OF RESPONDENTS

This area is predominantly visited by those who are motivated by seeking a rest in the form of a stay in an undisturbed 'natural' environment. A high number of these visits are to environmentally important sites and these visitors are, also, largely motivated by a desire to gain more knowledge of these areas (Navrátil, 2008). That is why the three groups of respondents were selected – with regards to the coverage of the customer continuum in relation to the 'natural' fundamental of the visited ecosystems and its crucial importance for the visit rate of such an important tourist area.

It is usual in analogical tests that students are exploited for the research – see e.g. analysis of Palmer and Hofmann (2001) – this is also the case in tourism (Chhetri, Arrowsmith & Jackson, 2004). The correspondence in opinions between students and other groups has been demonstrated in previous studies (Palmer, 2000). So, university students from different study programmes within the University of South Bohemia were chosen for our research: (1) students of business studies representing 'mass-tourists', (2) students of ecology representing 'eco-tourists' and (3) students of agriculture representing the 'neutral'. The selection of students of different orientations of study is usual in order to achieve diversity in results (ten Klooster, Visser & de Jong, 2008).

RESEARCH APPROACH

The cognitive paradigm was chosen in order to achieve the defined aim, because it starts from the fact, that "humans are thinking creatures who do not merely respond passively to environmental stimuli, but select aspects of the landscape that have value to them" (Taylor et al. 1987, p. 375). The Mehrabian-Russell general measure of information rate is used in our study because it "is a measure of how much information (or environmental load) is perceived to exist in an environment" (Amato & McInnes, 1983, p. 113). The 14 seven-point semantic differential scales are employed, as corrected by Donovan and Rossiter (1982).

The ratings on the Mehrabian-Russell scale were based on photographs of each locality as this is one of the basic tools for studying perception of environment (Fairweather & Swaffield, 2001); photographs serve to act as a stimulus for the respondent (Naoi et al., 2006). The subject for discussion is the reliability and validity of such measurements (Palmer & Hofmann, 2001); however, this has been confirmed several times in previous studies (e.g. Brown & Daniel, 1987; Pitt & Zube, 1979). "The evidence suggests that respondents correctly interpret photographs presented to them as indicators of the 'real' landscape, and make their evaluation on that basis" (Fairweather & Swaffield, 2001, p. 220).

Respondents were first called to decide, via an electronic questionnaire during March 2010, how they perceived photographs of three selected sites (1600 x 1200 px) – the scales mentioned above were used for the assessment. During the second half of April and first half of May 2010, students visited, in groups of approximately 20 respondents and under the guidance of the first author, the three localities where the photographs were taken. Each group visited all three localities within the same day. On arrival at each locality, students were acquainted with the concrete site (its history, tourism, economic, environmental and cultural importance) and they were asked before their departure to complete a questionnaire. Finally, respondents had to send a completed electronic questionnaire, which was identical to that completed prior to the excursion, within 5 days following the excursion. In total, 125 respondents were asked and 79 completed questionnaires were returned from all three groups.

To explain variability of the data, which issued from respondents themselves, the behaviourist segmentation criteria were employed (Goeldner & Ritchie, 2009) – environment protection in the lifestyle, typical recreation activities exercised when travelling and belonging to a group of watermen and fishermen. The tool for measuring environmental awareness was constructed based on the results presented by Ballantyne, Packer, and Hughes (2008) asking respondents to rate how closely a list of attitudes and practices described them on a five-point scale ranging from 1 (does not describe me at all) to 5 (describes me perfectly). Four categories were used: I use environmentally friendly products; I recycle at home; I do volunteer work for groups who help the environment; I actively search for information about environmental conservation. The same statements and the same scale were used for the statements 'I am a waterman'

and 'I am a fisherman'. The tool for measuring recreational activities (participation on activities) was taken from Navrátil, Pícha, and Hřebcová (2010). The implication in recreational tourism activities was measured on a five point Likert-type scale where 1 = not participate, 5 = definitely participate. The list of activities consists of 9 items: wellness or spa; sightseeing (castle, chateau, etc.); visiting museums, art gallery, festivals, etc.; shopping; to enjoy myself; resting; wildlife watching; recreational cycling; recreational sport activities. The questionnaire was completed with questions on respondent's sex and relationship to the history of the sites (Navrátil et al., 2010).

DATA ANALYSIS

To test the hypothesis, the overall variation pattern in answers of all respondents from all measurement made on the Mehrabian-Russell information rate scale has to be ascertained. The dataset forms a seemingly incomprehensible and impenetrable mass of information in which we wanted to uncover the relationships (if there were any) of perception items. Multivariate data analysis techniques were considered to evaluate this state (Podani, 2000). Thus, the overall variation pattern is performed by gradient analysis and by looking for the greatest variability that could be visualized using the ordination diagrams (ter Braak & Šmilauer, 2002). Principal components analysis (PCA) performed by CANOCO 4.5 package (ter Braak & Šmilauer, 2002) was used. No transformations were made before the analysis.

Factors of site perception were identified by explorative factor analysis. The principal components analysis method was employed and only the factors with an eigenvalue greater than 1 were assessed, and the results were varimax rotated (Robinson, 1998). Reliability for each multi-item factor was obtained using the calculation of Cronbach's alpha coefficient (Peterson, 1994). Then, for each of the factors for each locality and each measurement (before visit, on site, after visit) the composite mean was calculated, i.e. average value for the factor from values of items loaded at least with value of 0.6 on this factor (Chen & Tsai, 2007).

As it is a matter of three repeated measurements (before a visit, during the visit and after the visit), the differences were first tested in the run of factor values for particular factors among localities using repeated measures analysis of variance (RMANOVA). The values for factors of perception on each locality obtained from measurements before the visit and after the visit were tested with the null hypothesis stating that there is no difference in site perception for each locality, using the Student's t-test for two dependant groups (Robinson, 1998).

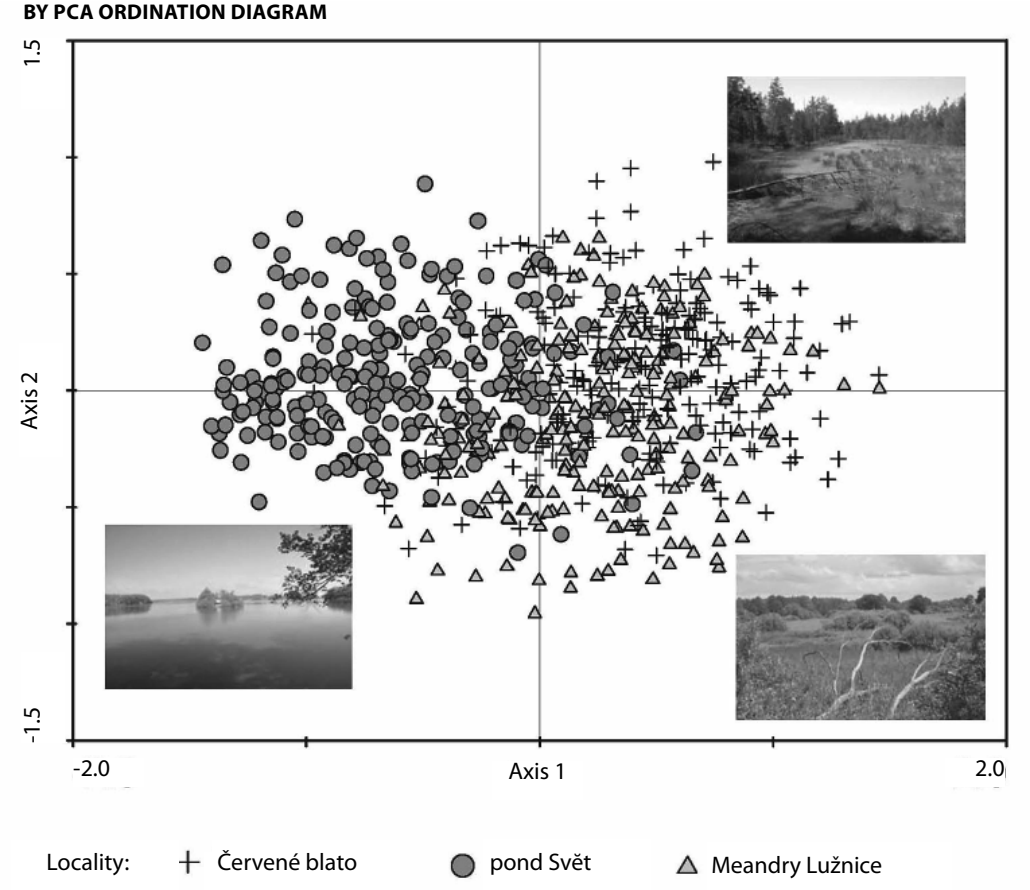
Then, for each factor the difference between composite mean for this factor obtained after the visit and before the visit was calculated. These differences were considered as dependent variables influenced by the type of visitor. The selection of visitors' characteristics was decided by means of the multiple linear regression (Nusair & Hua, 2010) using the forward selection method for selection of independent variables (characteristics of visitors). First run of forward selection was performed and then the data were purged from outliers. Consequently, the process of forward selection was repeated.

The model was assessed based on the partial regression graphs and partial residual graphs and the method was assessed by means of F-test of importance of a regression model (Meloun & Militký, 2006). Factor analysis, reliability tests, RMANOVA and Student's t-test were calculated using STATISTICA 8.1 software package.

Results and discussion

The first two axes in PCA of the complete dataset explain most of the variability in data (49.5%, Figure 1). We can see that the first gradient is by far the longest one, explaining about 38.3 % of the total variability in perception of localities by respondents. This main gradient can be interpreted as the environments of localities, because the locality 'pond Svět' (with predominating water level) was separated along this axis from the two remaining localities (with predominating wetland vegetation). Existence of water is one of the main factors influencing the preference in an environment. Separated from each other along the second axis were 'Meandry Lužnice' and 'Červené blato'. The main variability in data is, thus, given by localities and not by the way of measuring.

Figure 1
OVERALL PATTERN OF PERCEPTION OF STUDY SITES BY RESPONDENTS DESCRIBED BY PCA ORDINATION DIAGRAM



The employed scale is pertinent to achieving the defined objective as all characteristics of Mehrabian-Russell's general measure of information rate were loaded with the value

of at least 0.5 on any factor. In our sample, four factors of environment perception (Table 1) were revealed, that are quite consistent with the three dimensions discussed by Mehrabian and Russell (1974). The results could be, however, influenced by the selection of respondents, as students have been assessing the environment within their obligatory lessons. Therefore, an impact of respondents' polarization could manifest itself in the continuum, screeners – non-screeners (Mehrabian, 1977).

Table1
FACTORS OF SITE PERCEPTION

Items	Factors			
	Spaciousness	Novelty	Complexity	Size
Sparse-dense	0.848			
Uncrowded-crowded	0.833			
Redundant-varied	0.671			
Simple-complex	0.663			
Homogeneous-heterogeneous	0.608			
Usual-surprising		0.733		
Familiar-novel		0.749		
Common-rare		0.715		
Distant-immediate		-0.573		
Continuous-intermittent			0.833	
Patterned-random			0.763	
Symmetrical-asymmetrical			0.666	
Similar-contrasting			0.538	
Small scale-large scale				0.813
Eigenvalue	5.278	1.529	1.245	1.024
% Total Variance	37.703	10.924	8.890	7.313
Cronbachs alpha	0.849	0.756	0.779	-

This is perhaps the reason that the most important factor – first with eigenvalue of 5.28 and 37.7 % variance explained – is not 'novelty' as expected but 'spaciousness', because most of the spaciousness items were loaded onto this factor (sparse-dense, uncrowded-crowded, simple-complex) as well as two of the 'complexity' factors (homogeneous-heterogeneous, redundant-varied), which have the character of 'variety' (Donovan & Rossiter, 1982). The second factor is identical to Mehrabian-Russell's 'novelty' factor (Donovan & Rossiter, 1982), because the items usual-surprising, common-rare, and familiar-novel were loaded on this factor with factor loading greater than 0.6. The third factor is very similar to Mehrabian-Russell's 'complexity' factor (Donovan & Rossiter, 1982) with items of continuous-intermittent, patterned-random, and symetrical-asymmetrical loaded on this factor. Similar to results of Donovan and Rossiter (1982), the single item of 'size' was found in our fourth factor on which the item small scale-large scale was loaded.

Only items distant-immediate and similar-contrasting were not loaded on any factor with value greater than 0.6. This is the case also in Donovan and Rossiter's (1982) work. They concluded that "these information-rate measures may not by appropriate

measures of information rate in retail environments because subjects may be applying the different adjectives to quite different and specific aspects of the situation" (Donovan & Rossiter, 1982, p. 48). However, that is not the case here. In case of the distant-immediate item, the reason could consist of a different perception of 'distance' – in the absolute or relative sense (Knox & Marston, 2001). The problem of the similar-contrasting item is in its pure relativity and the uncertain expression of 'to what are we comparing the similarity?' The reliability of the first three factors is greater than 0.7 (Table 1), so they are useful for further analysis.

Between-subject effect (localities), within-subjects effect (measurements), as well as between-subject *within-subjects effects (measured sequences for localities) of RMANOVA were significant for all three factors (Table 2). The character of a locality has, therefore, an impact on the differences in perception of all three main dimensions used when perceiving the environment (Donovan & Rossiter, 1982) in the field and from photographs before and after the visit. Differences in the between-subject analysis confirmed, in the case of all factors, the results of PCA. Differences in the sequence of measurement (within-subject effect) are mostly caused by dissimilarity in the measurement of perceiving photographs and of perception in the field. However, we cannot see in this result a low validity of measurement of perceiving photographs and of perception in the field, but rather we see the impact of environmental character, because the changes in perception do not act in the same way in particular localities across particular factors (compare measurement among factors in Figure 2). Despite this, the impact of the difference between a photograph and confrontation with a real site plays a certain role. This difference is indicated in the factor of 'spaciousness'. No difference was found in the case of the locality 'Červené blato', i.e. locality with a horizon enclosed from all sides by the barrier of forest in a relatively short distance and with a rich mosaic of vegetation cover. On the contrary, the highest difference was measured in the case of 'pond Svět' with a dominant large homogenous water level, which is disturbed only by a small island. Here, the impact of the difference in line of vision between a camera and the naked human eye was manifest as, in the field, the locality was significantly more greatly perceived as being more space-differentiated. No differences, for any locality, were found in the perception of "spaciousness" before and after the visit (Table 3).

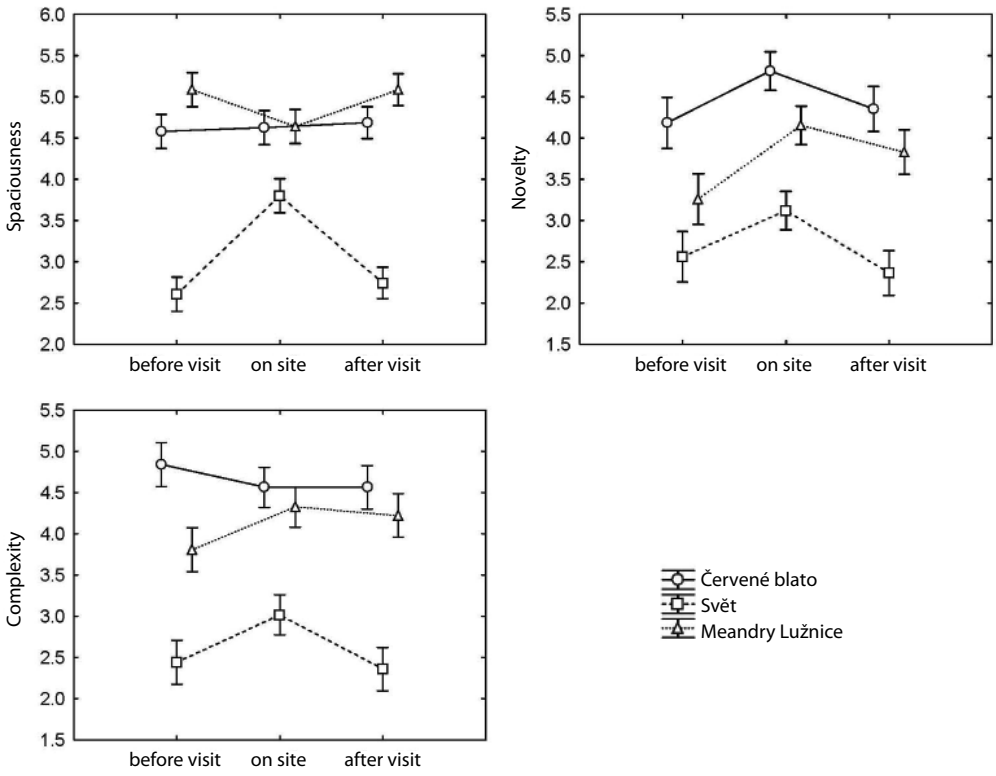
Table 2
DIFFERENCES AMONG FACTORS OF PERCEPTION –
RESULTS OF RMANOVA, F-VALUES WITH LEVELS OF SIGNIFICANCE

	Spaciousness		Novelty		Complexity	
	F	p	F	p	F	p
Between-subject effect	157.929	0.000	68.630	0.000	110.443	0.000
Within-subjects effect	9.250	0.000	33.992	0.000	6.763	0.001
Between * within effect	36.755	0.000	3.278	0.011	7.842	0.000

There is a different situation in case of the factor 'novelty'. Between-subject *within-subjects effects (measured sequences for localities) of RMANOVA for all three loca-

lities is significant, but it does not differ for the localities 'Meandry Lužnice' and 'Červené Blato' (RMANOVA, F = 1.710, p = 0.183). In case of both these locations, a high level of surprise was measured, which manifested itself even in the evaluation of the 'novelty' after the visit – in case of 'Meandry Lužnice' the difference noted before and after the visit was identified as significantly important. Although it is shown that there was a decrease (statistically not important) in the case of the 'pond Svět', we can see in the change expressed for both 'Meandry Lužnice' and 'Červené Blato' the impact of awareness of the importance of these localities on the visitors' level of surprise. Respondents were acquainted within their visit with functions of these localities in the ecosystem and with their importance for preserving the biodiversity. This is information which most respondents did not have at the moment of evaluation when perceiving a photograph before the visit to the pictured place. It was, for respondents, a photograph of a locality with an unknown importance and it was evaluated purely visually (compare the results of Kent & Elliott, 1995, p. 347). The impact of visitors' awareness on their environmental consciousness (although statistically not significant for both localities) was, thus, confirmed.

Figure 2
MEANS AND 95% CONFIDENCE INTERVALS FOR EACH MEASUREMENT FROM EACH LOCALITY FOR EACH PERCEPTION FACTOR



The measurements of 'complexity' factor led to mixed results. The perception of 'pond Svět' resulted in a similar pattern to the measurement of 'spaciousness'. The impact of the visit on the perception of 'complexity' was proved in case of both 'Meandry Lužnice' and 'Červené blato' (Figure 2, Table 3). This impact cannot be (and there is

no reason it should be), however, caused by the awareness, because the visit led to the decrease of 'complexity' perception in case of 'Červené blato' but to the increase in case of 'Meandry Lužnice'. The degree of the change is, thus, instigated by the environment of the destination itself, which is globally different from that of the photograph.

Table 3
DIFFERENCES IN FACTORS OF PERCEPTION BEFORE AND AFTER VISIT

	Mean ± S.D.		t-value
	Before visit	After visit	
Spaciousness			
Červené blato	4.58 ± 1.02	4.69 ± 0.94	-1.056
Pond Svět	2.61 ± 0.87	2.74 ± 0.81	-1.703
Meandry Lužnice	5.86 ± 0.90	5.86 ± 0.84	0.000
Novelty			
Červené blato	4.19 ± 1.50	4.35 ± 1.20	-1.102
Pond Svět	2.56 ± 1.20	2.38 ± 0.12	1.169
Meandry Lužnice	3.26 ± 1.46	3.83 ± 1.33	-3.339 **
Complexity			
Červené blato	4.84 ± 1.16	4.57 ± 1.23	1.986 *
Pond Svět	2.44 ± 1.04	3.35 ± 0.91	0.686
Meandry Lužnice	3.81 ± 1.37	4.22 ± 1.36	-2.529 *

** $p < 0.01$
* $p < 0.05$

Segmentation criteria that could be obtained with regard to the respondents' origins have no fundamental impact on the difference of composite means of revealed factors before and after the visit. The result of multiple linear regression is, in all cases, significant indeed, but the percentages of the explained variability are relatively low ('spaciousness': $F = 5.53$, $p < 0.01$, adjusted $R^2 = 0.04$; 'novelty': $F = 4.16$, $p < 0.05$, adjusted $R^2 = 0.01$; 'complexity': $F = 10.08$, $p < 0.001$, adjusted $R^2 = 0.10$). Only in case of complexity was there found a higher importance of segmentation criteria. After visiting particular localities, those respondents who have a better relation to the history ($b = -0.26$, $t = -2.57$, $p < 0.05$), do more cycling ($b = 0.37$, $t = 4.37$ $p < 0.001$) than hiking ($b = -0.38$, $t = -3.77$ $p < 0.001$), perceive these localities as more complex. Analogically (although less importantly), looking at the predictors of assessment of 'spaciousness' – its values have also increased for respondents with a higher interest in history ($b = -0.16$, $t = -2.35$, $p < 0.05$), but shows lower participation on the observing of nature ($b = -0.14$, $t = -2.41$, $p < 0.05$). Respondents who are characterized by a better relation to the history and prefer cycling more than hiking are recording responses which are nearer to those of the mass-tourists than eco-tourists. These respondents assess these localities, based on a visit to the localities, to be more diverse, more complex and more incoherent – in that we could see the impact of the acquired knowledge of the basics of the localities, which was not known for them at the moment of their first assessment. The research has demonstrated the impact of knowledge on the visitor's higher environmental consciousness and, therefore, we can conclude that there will also be a contribution to the development of sustainability in tourism.

Conclusions

Our study examines the effect of a visitation to a tourist site on visitor perception of that site, as previous research found mixed results (Tasci & Gartner, 2007). The effect was studied on three water-enhanced attractions employing Mehrabian-Russell's general measure of information rate (Donovan & Rossiter, 1982). Students were subjects for this research and the measurements of site perception were conducted three times – through photograph before visit, on-site during visit and through photograph after the visit. Adequacy of the employed scale was verified by extraction of the anticipated factors of spaciousness, novelty, and complexity.

Differences in the impact of visit have been found for different factors of perception. The visit to the locality has no impact on perception of spaciousness. As particular localities differed one from another in the difference of values found for photographs and on-site evaluation, this factor could be used as a tool to assess the degree of adequacy of using photographs instead of on-site research. Based on our research, the degree of disparity in evaluation of photographs and on-site evaluation is given by the distance of horizon.

Differences in perceiving the environment before and after the visit were found in the cases of 'novelty' and 'complexity'. The impact of visitor's awareness on the perception of the attraction, concretely through the factor of 'novelty', was confirmed. On the contrary, the factor 'complexity' is a factor of perception, which is influenced by the visit and a visitor's own evaluation of the site.

The most important finding of our study for destination management is the possibility to influence visitors' awareness of the importance of the locality. An informed client is able to assess the diversity of the environment and build up such relations with the sites which predetermine future environmentally friendly behaviour. This is a fundamental for a sustainable use of protected areas for tourism, which is one of the main objectives of the management of visits to protected areas. In order to disseminate information on the importance of protected areas of nature, information boards are mostly used. Their impact is, however, very low. It is usual to visit a chateau, castle, ruin, museum or gallery being led by a guide. However, in the case of natural monuments, such offerings are still very limited; visitors do not consider it usual for a guide to be present in sites with natural monuments and, therefore, do not ask for them and do not widely use such a service (Navrátil, 2008).

The presented research has, however, also certain limitations that are related, first of all, to the research methodology. The main limitation results from the sample of respondents that is represented by students of a public university. The selection of respondents was limited only by one criterion – relation to the environment represented by a study programme frequented by respondents. It does not enable us, therefore, to evaluate the impact of in-tourism-common segmentation criteria on the structure of changes in tourists' experience. Another limitation in the possibility to generalize the results consists in the selection of locations for questioning. In case of perception in tourism, it is important to keep in mind that its impact was tested based on the experi-

ences of respondents originating from Central Europe in locations of Central Europe and, therefore, in a landscape which is common to them. The results are thus restricted to one cultural environment. It should be acknowledged that analyzed locations are small from the geographical point of view and they cannot match with the analogical elements acting as self-existent tourist attractions (e.g. at random Yellowstone park or Okavango).

Results achieved through our research could, however, constitute a basis for consecutive research within the defined topic. Probably the most interesting seems to be a test of the impact of the visit on the structure of perception of the environmental importance of nature-based tourist attractions by their visitors. With regard to the fact that the impact of home landscape on the perception of environment is generally accepted, the study of these cultural specifics is a further possible field of any consecutive research.

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References

Amato, P.R. & McInnes, R. (1983). Affiliative behavior in diverse environments: A consideration of pleasantness, information rate, and the arousal-eliciting quality of settings. *Basic and Applied Social Psychology, 4*(2), 109-122.

Baker, D.A. & Crompton, J.L. (2000). Quality, satisfaction and behavioral intentions. *Annals of Tourism Research, 27*(3), 785-804.

Ballantyne, R., Packer, J. & Hughes, K. (2008). Environmental awareness, interests and motives of botanic gardens visitors: Implications for interpretive practice. *Tourism Management, 29*(3), 439-444.

Bansal, H. & Eiselt, H.A. (2004). Exploratory research of tourist motivations and planning. *Tourism Management, 25*(3), 387-396.

Bigné, J.E., Sanchez, M.I. & Sanchez, J. (2001). Tourism image, evaluation variable and after purchase behaviour: inter-relationship. *Tourism Management, 22*(6), 607-616.

Brown, T.C. & Daniel, T.C. (1987). Context effects in perceived environmental quality assessment: scene selection and landscape ratings. *Journal of Environmental Psychology, 7*(3), 233-250.

Bushell, R. & McCool, S.F. (2007). Tourism as a tool for conservation and support of protected areas: Setting the agenda. In R. Bushell & P.F.J. Eagles (Eds.), *Tourism and protected areas: Benefits beyond boundaries, The Vth IUCN World Parks Congress* (pp. 12-26). Wallingford: CABI.

Bushell, R., Staiff, R. & Eagles P.F.J. (2007). Tourism and protected areas: Benefits beyond boundaries. In R. Bushell & P.F.J. Eagles (Eds.), *Tourism and protected areas: Benefits beyond boundaries, The Vth IUCN World Parks Congress* (pp. 1-11). Wallingford: CABI.

Chen, C. & Tsai, D. (2007). How destination image and evaluative factors affect behavioral intentions? *Tourism Management, 28*(4), 1115-1122.

Chhetri, P., Arrowsmith, C. & Jackson, M. (2004). Determining hiking experiences in nature-based tourist destinations. *Tourism Management, 25*(1), 31-43.

Christ, C., Hillel, O., Matus, S. & Sweeting, J. (2003). *Tourism and biodiversity. Mapping tourism's global footprint*. Washington and Paris: Conservation International and UNEP.

Chytrý, M., Kučera, T. & Kočí, M. (Eds.) (2001). *Katalog biotopů České republiky*. Praha: AOPK ČR.

Donovan, R.J. & Rossiter, J.R. (1982). Store atmosphere: An environmental psychology approach. *Journal of Retailling, 58*(1), 34-57.

Dudek, A. & Kowalczyk, A. (2003). Turystyka na obszarach chronionych – Szanse i zagrożenia. *Prace i Studia Geograficzne, 32*, 117-140.

Duman, T. & Mattila, A.S. (2005). The role of affective factors on perceived cruise vacation value. *Tourism Management, 26*(3), 311-323.

Epler Wood, M. (2002). *Ecotourism: Principles, practices and policies for sustainability*. Nairobi: UNEP.

Fairweather, J.R. & Swaffield, S.R. (2001). Visitor Experiences of Kaikoura, New Zealand: an interpretative study using photographs of landscapes and Q method. *Tourism Management, 22*(3), 219-228.

Fyhri, A., Jacobsen, J.K.S. & Tømmervik, H. (2009). Tourists' landscape perceptions and preferences in a Scandinavian coastal region. *Landscape and Urban Planning, 91*(4), 202-211.

Gabr, H.S. (2004). Perception of urban waterfront aesthetics along the Nile in Cairo, Egypt. *Coastal Management, 32*(2), 155-171.

Geneletti, D. & Dawa, D. (2009). Environmental impact assessment of mountain tourism in developing regions: A study in Ladakh, Indian Himalaya. *Environmental Impact Assessment Review, 29*(4), 229-242.

Gnoth, J. (1997). Tourism motivation and expectation formation. *Annals of Tourism Research, 24*(2), 283-304.

Goeldner, C.R. & Ritchie, J.R.B. (2009). *Tourism: Principles, Practices, Philosophies*. New York: Wiley.

Goossens, C. (2000). Tourism information and pleasure motivation. *Annals of Tourism Research, 27*(2), 301-321.

Gupta, S., McLaughlin, E. & Gomez, M. (2007). Guest satisfaction and restaurant performance. *Cornell Hotel and Restaurant Administration Quarterly*, *48*(3), 284-298.

He, Y. & Song, H. (2009). A mediation model of tourists' repurchase intentions for packaged Tourism services. *Journal of Travel Research, 47*(3), 317-331.

Heydendael, A. (2002). Sustainable tourism within the context of the ecosystem approach. In F. di Castri & V. Balaji (Eds.), *Tourism, biodiversity and information* (pp. 25–44). Leiden: Backhuys Publishers.

Horner, S. & Swarbrooke, J. (1996). *Marketing tourism, hospitality and leisure in Europe*. London: International Business Press.

Hsu, C.H.C., Wolfe, K. & Kang, S.K. (2004). Image assessment for a destination with limited comparative advantages. *Tourism Management, 25*(1), 121-126.

Hunter, W.C. (2008). A typology of photographic representations for tourism: Depictions of groomed spaces. *Tourism Management, 29*(2), 354-365.

Jang, S.(S.) & Feng, R. (2007). Temporal destination revisit intention: The effects of novelty seeking and satisfaction. *Tourism Management, 28*(2), 580-590.

Kent, R.L. & Elliot, C.L. (1995). Scenic routes linking and protecting natural and cultural landscape features: a greenway skeleton. *Landscape and Urban Planning, 33*(1-3), 341-355.

Knox, P.L. & Marston, S.A. (2001). *Places and regions in global context: human geography*. New Jersey: Prentice Hall.

Kučera, T. (Ed.) (2005). *Red book on habitats of the Czech Republic*. Retrieved October 24, 2010, from http://www.usbe.cas.cz/cervenakniha/eng.

Lee, C., Lee, Y. & Lee, B. (2005). Korea's destination image formed by the 2002 world cup. *Annals of Tourism Research, 32*(4), 839-858.

Marion, J.L. & Leung Y.-F. (2001). Trail resource impact and an examination of alternative assessment techniques. *Journal of Park and Recreation Administration, 19*(3), 17-37.

Marion, J.L. & Reid S.E. (2007). Minimising visitor impacts to protected areas: The efficacy of low impact education programmes. *Journal of Sustainable Tourism, 15*(1), 5-27.

Mehrabian, A. (1977). Individual differences in stimulus screening and arousability. *Journal of Personality, 45*(2), 237-251.

Mehrabian, A. & Russell, J.A. (1974). *An approach to environmental psychology*. Cambridge: MIT Press.

Meloun, M. & Militký, J. (2006). *Kompendium statistického zpracování dat*. Praha: Academia.

Monz A.C., Marion, J.L., Goonan, K.A., Manning R.E., Wimpey J. & Carr, C. (2010). Assessment and monitoring of recreation impacts and resource conditions on mountain summits: Examples from the Northern Forest, USA. *Mountain Research and Development, 30*(4), 332-343.

Naoi, T., Airey, D., Iijima, S. & Niininen, O. (2006). Visitors' evaluation of an historical district: Repertory Grid Analysis and Laddering Analysis with photographs. *Tourism Management, 27*(3), 420-436.

Navrátil, J. (2008): Vodní komponenta krajiny v přírodně orientovaném venkovském cestovním ruchu na příkladu Třeboňska. *Acta Universitatis Bohemiae Meridionales*, *11*(1), 73–82.

Navrátil, J., Pícha, K. & Hřebcová, J. (2010). The importance of historical monuments for domestic tourists: The case of South-western Bohemia (Czech Republic). *Moravian Geographical Reports, 18*(1), 45-61.

Nepal, S.K. & Nepal S.A. (2004). Visitor impacts on trails in the Sagarmatha (Mt. Everest) National Park, Nepal. *AMBIO: A Journal of the Human Environment, 33*(6), 334-340.

Nusair, K. & Hua, N. (2010). Comparative assessment of structural equation modelling and multiple regression research methodologies: E-commerce context. *Tourism Management, 31*(3), 314-324.

Oppermann, M. (2000). Tourism destination loyalty. *Journal of Travel Research, 39*(1), 78-84.

Palmer, J.F. (2000). Reliability of rating visible landscape qualities. *Landscape Journal, 19*(1/2), 166-178.

Palmer, J.F. & Hofmann, R.E. (2001). Rating reliability and representation validity in scenic landscape assessments. *Landscape and Urban Planning, 54*(1-4), 149-161.

Peron, E., Purcell, A.T., Staats, H., Falchero, S. & Lamb, R.J. (1998). Models of preference for outdoor scenes: some experimental evidence. *Environment and Behavior, 30*, 282-305.

Peterson, R. (1994). A meta-analysis of Cronbach's coefficient alpha. *Journal of Consumer Research*, *21*(2), 381-391.

Petrick, J.F. (2004a). First timers' and repeaters' perceived value. *Journal of Travel Research, 43*(1), 29-38.

Petrick, J.F. (2004b). The roles of quality, perceived value and satisfaction in predicting cruise passengers' behavioral intentions. *Journal of Travel Research, 42*(4), 397-407.

Pickering, C.M. (2010). Ten factors that affect the severity of environmental impacts of visitors in protected areas. *AMBIO: A Journal of the Human Environment, 39*(1), 70-77.

Pitt, D.G. & Zube, E.H. (1979). The Q-sort method: Use in landscape assessment research and landscape planning. In G.H. Eisner & R.C. Smardon (Eds.), *Our national landscape* (pp. 227–234). Berkeley: USDA Forest Service.

Podani, J. (2000). *Introduction to the exploration of multivariate biological data*. Leiden: Backhuys Publishers.

Qu, H. & Ping, E.W.Y. (1999). A service performance model of Hong Kong cruise travellers' motivation factors and satisfaction. *Tourism Management, 20*(2), 237-244.

Real, E., Arce, C. & Sabucedo, J.M. (2000). Classification of landscapes using quantitative and categorical data, and prediction of their scenic beauty in north-western Spain. *Journal of Environmental Psychology, 20*(4), 355-373.

Ritchie, J.R.B. & Crouch, G.I. (2003). *The competitive destination: A sustainable tourism perspective*. Oxon: CABI Publishing.

Robinson, G.M. (1998). *Methods and techniques in human geography*. Chichester: John Wiley and Sons.

Roya-Vela, M. (2009). Rural-cultural excursion conceptualization: A local tourism marketing management model based on tourism destination image measurement. *Tourism Management, 30*(3), 419-428.

Sjøholt, P. (2000): Eco-tourism and local development. Conceptual and theoretical framework and problems in implementation. Empirical evidence from Costa Rica and Ecuador. *Fennia, 178*(2), 227-241.

Sundstrom, E., Bell, P.A., Busby, P.L. & Asmus, C. (1996). Environmental psychology. *Annual Review of Psychology, 47*, 485-512.

Tasci, A.D.A. & Gartner, W.C. (2007). Destination image and its functional relationships. *Journal of Travel Research, 45*(4), 413-425.

Taylor, J.G., Zube, E.H. & Sell, J.L. (1987). Landscape assessment and perception research methods. In R.B. Bechtel & R.W. Marans (Eds), *Methods in environmental and behavioral research* (pp. 361–393). New York: Nostrand Reinhold.

ten Klooster, P.M., Visser, M. & de Jong, M.D.T. (2008). Comparing two image research instruments: The Q-sort method versus the Likert attitude questionnaire. *Food Quality and Preference, 19*(5), 511-518.

ter Braak, C.J.F. & Šmilauer, P. (2002). *CANOCO reference manual and CanoDraw for Windows user's guide: software for canonical community ordination Version 4.5*. Ithaca: Microcomputer Power.

Uzzell, D. (1991). Environmental psychological perspectives on landscape. *Landscape Research, 16*(1), 3-10.

Veal, A.J. (2002). *Leisure and tourism policy and planning.* Oxon: CABI Publishing.

Wu, C.H.-J. & Liang, R.-D. (2009). Effect of experiential value on customer satisfaction with service encounters in luxury-hotel restaurants. *International Journal of Hospitality Management, 28*(4), 586-593.

Yoon, Y. & Uysal, M. (2005). An examination of the effects of motivation and satisfaction on destination loyalty: a structural model. *Tourism Management, 26*(1), 45-56.

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