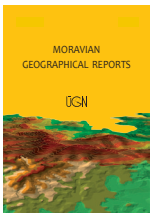

MORAVIAN GEOGRAPHICAL REPORTS

sciendo

Institute of Geonics, The Czech Academy of Sciences

journal homepage: http://www.geonika.cz/mgr.html

doi: 10.2478/mgr-2018-0024

The role of landscape preferences in the travel decisions of railway passengers: Evidence from Hungary

Bence SOMOGYI [a], János CSAPÓ [b *]

Abstract

When surveying the motivation side of travel and tourism, we can state that tourists consider in their travel decisions, certain landscape preferences – to a certain extent. It also seems to be evident, however, that the objective evaluation of a landscape is a hard task for researchers for numerous reasons. In recent decades, several attempts have been made to create such methods but it seems that, in Hungary at least, this topic is rather neglected. The aim of this study is to provide an evaluation method for the landscape preferences of passengers travelling on Hungarian railway lines, demonstrating how the landscape around the railways could become an attraction during the travel. We survey what types of landscape appearance would be needed in order to generate travel decisions for tourists and also how the travel experience itself could become a tourism product.

Keywords: *landscape preferences; railway transport; evaluation method; railway passengers; travel decisions; Hungary*

Article history: *Received 15 July 2017, 25 July 2018, Published 31 December 2018*

1. Introduction

From the Antiquities, the need to travel can be traced back to the recognition of the beauty of the natural world. Any judgments about the beauty of a landscape, however, is a segment of landscape geography rather associated with subjectivity (Frank et al., 2013; Horváth, 2008; Howley, 2011). This is especially true of the evaluation of the scenery, aesthetics and preferences of landscapes from the point of view of tourism, since – although we can make some generalisations – the aesthetic experience of various landscapes appears differently to each individual (Mezősi, 1990; Frank et al., 2013). Numerous works and reports have been published in the international literature with authors aiming to create the most objective evaluation methods possible for landscapes (Csorba et al., 2004; Frede et al., 2002; Galambos, 1989; Joly et al., 2009, Lóczy, 2015, Marosi and Szilárd, 1985, Möller and Steiner, 2002). These attempts could not sufficiently overcome nor justify individual subjectivity, however.

Nevertheless, it is evident that an objective evaluation of a landscape is a difficult task for several reasons. A subjective judgement of a landscape depends on the individual's personality, permanent living environment, geographical position and the environment of daily routines, but also on the family, friends, colleagues and instructions perceived in the media (Buijs et al., 2009; Sevenant and Antrop, 2010). Thus, a landscape and especially a landscape we consider beautiful is nothing but the result of our cognitive imagination (Bodnár, 2008; Sevenant and Antrop, 2009; Dachary-Bernard and Rambonilaza, 2012). For those who come from a residential district of blocks of flats, the scenery of a garden suburb residential neighbourhood can almost act as a close-to-nature environment, but at the same time, for an individual coming from an undisturbed area it shows signs of high urbanisation, which may make the area repulsive (Garre et al., 2009; Rogge, Nevens and Gulinck, 2007).

The aim of our study is to provide an evaluation method for the landscape preferences of passengers travelling on Hungarian railway lines, demonstrating how the landscape around the railways could become attractive during the travel. We do not intend to evaluate the landscape but the tourism potential based on landscape preferences. Of course, we are aware that landscape character itself is not responsible entirely for attracting tourist travel, as wider geographical contexts have their role as well in the travel decisions. We realise that measuring landscape preferences is a complex and challenging task, since the process involves both objective and subjective elements

[a] Doctoral School of Earth Sciences, University of Pécs, Hungary

[b] Institute of Marketing and Tourism, Faculty of Business and Economics, University of Pécs, Hungary (*corresponding author: J. Csapó, e-mail: *csapo.janos@ktk.pte.hu*)

(Frank et el., 2013). Our methodology was objective, but the ratings of the travellers were subjective, based on the individuals' complex social and psychological characteristics. Thus, during our research we investigated the subjective landscape preferences of the travellers on the Hungarian railways and, based on these data and ratings, we mapped the visual assessments of the travellers. We believe that this important topic should be researched as part of travel motivations. We survey what kind of landscape appearance would be needed in order to generate travel decisions for tourists, and how the travel experience itself would become a tourism product. The study is based on the exploration of the relationship between the subjective value appraisal of railway passengers and objective indicators of land use.

2. Theoretical background

Although we can find a much higher ratio of objectivity in the pattern of landscape elements, such patterns also influence the aesthetic values of the area. As long as the spectacle of a crowded highway in an urbanised, strongly disturbed area is not outstanding at all, in a rural region we can define it as a spatial element strongly dissecting the landscape, causing significant disharmony (Garre et al., 2009). The appearance of transport elements in a landscape also provides an important factor for the evaluation processes, since these are the elements that most directly carve up the uniform natural environment into pieces. The development of transport elements has changed the landscape texture of post-industrial societies to such a degree that, in landscape evaluation, it is reasonable to consciously use the concept of transport landscape (Nita and Myga-Piatek, 2014).

When considering the broader framework of the topic, we have to acknowledge research on the relationship between landscape and tourism, as well as the decision aspects of human behaviour in general. In this context, the earliest works dealing with travel behaviour, in fact creating the term Behavioural Geography, can be dated back to the 1970s (Aldskogius, 1977; Bunting and Guelke, 1979; Sitwell and Latham, 1979). In the 1980s, this topic was further elaborated, focusing on the complex relationships between spatial choice, different environmental backgrounds and travel behaviours (Desbarats, 1983; Timmermans, 1981). In the 1990s, researchers further expanded and elaborated on modern aspects of the topic (Van der Zee, 1990; Golledge, 1997), whereas in the 2000s newer approaches appeared, such as attitude theory for understanding travel behaviour (Dijst, Farag and Schwanen, 2008).

Another important part of the research problem in theoretical terms is the survey and investigations in Landscape Ecology. The first comprehensive work on landscape ecology was published in 2001 by Turner, Gardner and O'Neill (Landscape Ecology in Theory and Practice). Because landscape ecology had grown rapidly during the last 15 years, this seminal work was republished in 2015 with the same title, adapting to enhanced understanding of the topic (Turner and Gardner, 2015). The topic also generated scientific journals, such as Landscape Ecology or Current Landscape Ecology Reports. The importance and popularity of the topic is demonstrated by one of the most recent comprehensive publications, since it responds to practical and training demands (Gergel and Tuner, 2017).

Another increasingly popular field of study is the multidisciplinary framework of Landscape Aesthetics. One of the earliest works in this context was published by Shafer et al. (1969). In this paper, the authors intended to analyse the interrelationships between the natural features of a landscape and public preferences, using a methodology employing factor and multiple regression analyses. Among early research using such approaches, we note works dealing with aesthetic factors of landscapes such as rivers (Leopold, 1969), river valleys (Zube et al., 1974), and general perceptions of the natural environment (Shafer, 1969; Zube, 1974).

Realising the importance of the approach from a practical point of view, Daniel and Boster (1976) developed the Scenic Beauty Estimation Method (SBE), which provides quantitative measures of aesthetic preferences for alternative wildland management systems. In their work, based on extensive experimentation and testing, they concluded that SBE proved to be an efficient and objective means for not only assessment of the scenic beauty of public forests and wildlands but also the prediction of the aesthetic consequences of alternative land uses. At the end of the 1980s, Bourassa (1988) argued that the use of aesthetics should not be limited to objects of art but involve, for instance, the evaluation of the physical conditions of the landscape as well, presenting empirical observations supporting cultural and biological theories and implications for landscape planning.

As the currency of the topic continued to increase from multidisciplinary perspectives, especially from the point of view of the quality of landscape and of life, numerous authors presented conceptual frameworks and suggestions for an appropriate methodology in order to provide a basis for landscape preferences. Van der Jagt et al. (2014) introduced a preference matrix as a measure of landscape aesthetics, as a new tool for studying scenic quality. Vizzari (2011) created a spatial model in order to assess potential landscape quality based on the most important physical-naturalistic, historical-cultural and social-symbolic elements. Several researchers have used pictures or GIS images in order to capture people's landscape preferences (Jeanloz, 2016; Pardo-García, 2017; Martin et al., 2016; Wang et al., 2016).

In his comprehensive review, Scott (2006) pointed out that seeking to assess public perceptions of and preferences for landscapes faces major conceptual, methodological and institutional challenges, both for academics and policy-makers. Nevertheless, by the mid-2000s, considerable development and progress has been witnessed in the study of this complex topic. Scott, emphasizing the practical side of the investigations, identified those methods that later were used in policy making.

Another emergent theme in landscape aesthetics is the investigation of relationships between agriculture, rural areas and landscape aesthetics (Van Zanten et al., 2016b). Researchers in this field basically intended to create a valid system of indicators, such that an objective evaluation could be carried out in terms of landscape preferences. This was achieved, for instance, among agricultural experts and stakeholders (Rosley et al., 2013; Vouligny, 2009) and among members of the general public (Barroso et al., 2012; Frank et al., 2013; Howley et al., 2011; Junge, 2015; Swanwick, 2009). Such models included demographic or economic variables as independent variables influencing people's landscape preferences (Kalivoda et al., 2014; Tagliaferro et al., 2016; van Zanten, 2014; Wang et al., 2017). Other types and forms of landscape, such as urban areas (Peterson et al., 2012) and mountainous regions (Riechers

et al., 2016; Schirpke et al., 2013) also provided important questions for surveys of landscape aesthetics and landscape perceptions.

These various theoretical approaches and methods were then tested at the regional level. Understandably, we find the highest number of publications investigating the perceptions of the local population or of the visitors of a particular area. To give some examples, the aesthetic aspects of landscape were investigated in: Switzerland (Junge et al., 2015); the Mediterranean context (Barroso et al., 2012); and Holland (van Zanten et al., 2016a). In addition, there is much research outside Europe, including Faggi et al. (2015) investigating water as an appreciated feature in the landscape in Buenos Aires, and De La Fuente De Val and Mühlhauser (2014) surveying the South American Mediterranean landscape of the Andean foothills east of Santiago (Chile).

Given the focus of the present article, the last aspect of our literature review looked at Landscape Perceptions and Landscape Preferences in Tourism. In recent decades, when landscape perceptions and preferences have been investigated, tourism issues have not been in focus. As a new theme, it started to appear in studies after 2000. One of the earliest works, however, was published by Fabos (1971), who introduced an analysis of environmental quality ranking systems related to recreation. Subsequent research provided a theoretical background for this new domain of enquiry, aiming to discover how to determine the beauty of a landscape, while introducing new methods for landscape evaluation for tourism and recreation from a general perspective (Liu, 2015; Kirillova et al., 2014; Knudsen et al., 2007; Ode et al., 2008; Tveit et al., 2007; Fornal-Pieniak, 2014), as well as introducing methods using GIS (Varjú et al., 2014) or photo-based research (Jacobsen, 2007). After the appearance of the theoretical works, local examples and regional investigations were reported. For some recent examples, see: Beza (2010), who investigated the aesthetic value of the Mt. Everest Trek; Fyhri et al. (2009), who surveyed tourists' landscape perceptions and preferences in a Scandinavian coastal region; Jaszczak and Žukovskis (2011), who studied a German region, Ostfriesland from a rural tourism perspective; Yoshihara et al., (2017), who investigated the psychological evaluation of tourism landscape images in Hiroshima from the perspective of Korean tourists; and Nikolaishvili et al. (2012), who evaluated the touristic potential of Georgia's landscapes.

Although landscape scenery (the relief and morphology of a landscape) influences tourism flows and behaviours, we have to handle incidental overrating circumspectly (Cocean, 2010). In the evaluation method of Phillips et al. (2010), for instance, the spectacle of a landscape is not included as one of the strongly influencing factors for tourism flows and behaviours. Horváth (2008) directly cautions that we should not overrate the role of the beauty of the landscape among the influencing factors for travel decisions. This statement appears to be valid in that the experiences of the sights become products, influencing tourists' attitudes only due to the services created around them: for example, the majority of the most important look-out towers in Hungary can be visited for free, so practically we do not have any objective measures about their actual numbers of visitors (Horváth, 2008).

In recent developments of tourism, landscape can be seen as having a double role. On the one hand, due to urbanisation processes, among the cognitive needs of individual tourists, visits to authentic physical environments appear to an increasing extent (Chua et al., 2015; Gyuricza and Ambrus, 2008). On the other hand, since modern post-industrial tourists primarily seek more dynamic experiences, they will find these places attractive not only due to the scenery but by getting involved in different forms of active and adventure tourism (Buckley, 2003). As a result, landscape appears as a background element for leisure activities (Cocean, 2010). We also have to mention anthropogenic, strongly disturbed landscapes as well, since they also carry the possibility of the appearance of tourism services (Myga-Piatek and Jerzy, 2008).

The appearance and strengthening of panoramic (road) routes and the scenic railway routes, serving to display landscape scenery, emerged in parallel with the increased mobility of people (Denstadli and Jacobsen, 2011; Page, 2009). Moreover, this trend overlapped with the cutback of the railway networks in Europe, which – from the point of view of the travellers – had a direct consequence in an increasing need for scenic railway routes (most remarkably in the Alps, but we can find Hungarian examples in the Bakony Mountains as well) (Jade et al., 2015). As a result of the rapid development of panoramic roads and railways, travel itself became an attraction (Halsall, 2001). Using the train, the traveller mostly meets permanent elements. During a longer trip, the travel companions usually do not change and – except for very long travels – the crew remains the same as well, together with the technical infrastructure of the railway. The only remarkable variation is supplied by the change in landscape, and thus the landscape itself provides the real dynamics for the travel experience.

3. Data and methods

In this research project, we intended to avoid any form of subjectivity, as much as possible, during the landscape evaluation process. Based on this principle, we decided to survey tourism supply and demand at the same time, and to evaluate these two components using mathematical methods. Supply is based on relief characteristics and surface cover. From previous research, these two factors influence primarily tourism behaviour, and it was plausible to evaluate them. For landscape features, we took the Hungarian physical geographical macroregion classification as a base, and classified the railway lines as plain, hilly and mountainous types. Of course, this approach also carries a certain amount of subjectivity, since a given railway line can have different relief features. During the evaluation process, we always took into consideration the exact landscape surrounding the railway line section, without reference to what kind of landscape features can be seen from the train window: for instance, the Füzesabony–Hatvan railway section is definitely allocated in a plain landscape; however, from the train we can see the imposing relief of the Mátra Mountains. For a general view of the rail network, see Figure 1.

For the determination of land cover, we used the CORINE database. During the analysis, based on the physical characteristics of Hungary, we selected the following land cover forms: agricultural areas; industrial, commercial and transport units; urban fabric, artificial, non-agricultural vegetated areas; wetlands; and forests (see Tab. 1). We believe that this classification is necessary since the traveller can see the land from the train – not in detail, but as a complex system.

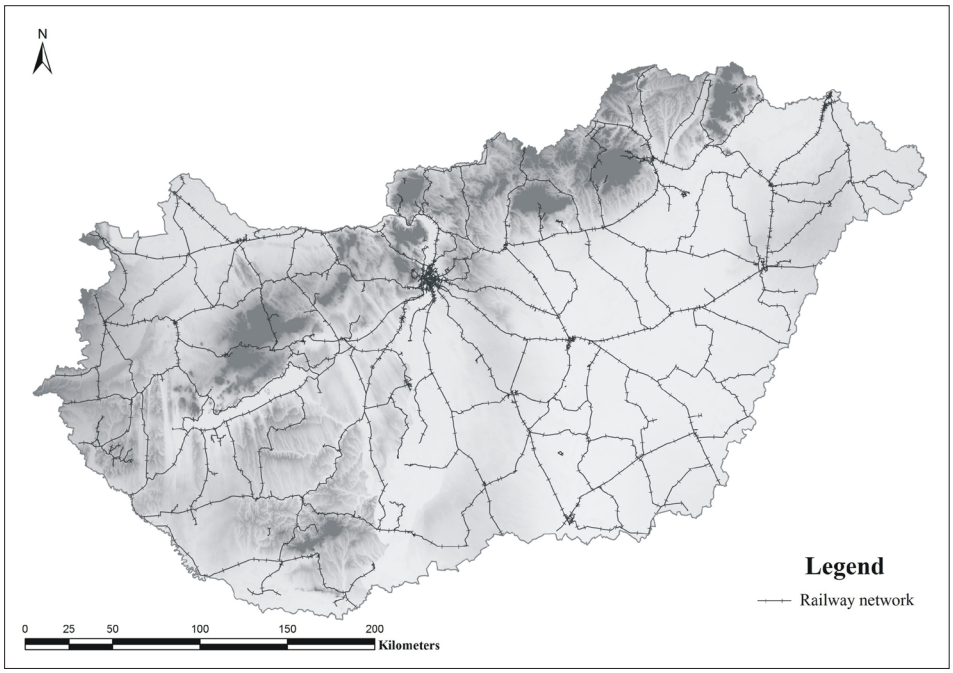

Fig. 1: The railway network and relief of Hungary
Source: authors' elaboration

Category	CORINE category
Agricultural areas	Non-irrigated arable lands
	Rice fields
	Vineyards
	Fruit trees and berry plantations
	Pastures
	Complex cultivation patterns
	Land principally occupied by agriculture, with significant areas of natural vegetation
Industrial, commercial and transport units	Industrial or commercial units
	Road and rail networks and associated land
	Mineral extraction sites
	Dump sites
	Port areas
	Airports
Urban fabric, artificial, non-agricultural vegetated areas	Continuous urban fabric
	Discontinuous urban fabric
	Green urban areas
	Sport and leisure facilities
Wetlands	Inland marshes
	Peat bogs
	Water courses
	Water bodies
Forests	Broad-leaved forest
	Coniferous forest
	Mixed forest
	Transitional woodland-shrub

Tab. 1: The selected land cover forms and categories from CORINE
Source: Based on CORINE Land Cover (CLC) nomenclature

We carried out the analysis of the demand side with a questionnaire survey. Given that we assumed that a certain age and maturity was needed to evaluate travel decisions, respondents 15 years of age and older were defined as potential respondents. The survey was carried out directly on trains and train stations and online, in the course of which n = 166 questionnaires were filled out.

Our questions first of all asked for gender, age and education level data, then we said that we were focusing on the relation between the railway and the environment. In a 1–5 scale we asked the travellers to evaluate the following topics:

1. According to your opinion, how much can railway travel contribute to the preservation of landscape and environmental values?
2. How would you rate the importance of the surrounding landscape during your railway travel?
3. During your travels, how much time do you usually spend on looking at the landscape?
4. During your travels, how are you impressed with the following landscape types? (Mountainous; hilly areas; plain areas; forests, woody areas; agricultural land; waterside areas; urban areas; industrial areas)

The landscape evaluation of railway lines was carried out using the following formula, which also supported the exact assignment of the locations of the rail experience trips:

$$V = [(\sum N \times a) \times r] \times t$$

where, *V* is the landscape aesthetic value of the railway section, *N* is the sum of the frequency of landscape types, *a* is the land use weight, calculated from the results of the questionnaire survey, *r* relief weight, which is based on a particular railway section's position within the physical macro regions and *t* is tourism weight, which is based on the mean number of commercial accommodations of the railway section per settlement.

Since tourism potential involves inbound tourist flow as well, we also carried out weighting with the accommodation structure because we assumed that the number of commercial accommodations is related to the visitor numbers of the area. The landscape as a potential basis for tourist utilisation of rail transport is only valuable for tourism when a certain amount of touristic expenditure is experienced.

The determination of spatial weight factors was conducted from the results of the questionnaire survey, where our investigations included the subjective appraisal of the individual. We asked the respondents, based on their personal preferences, how they would rate landscape types on a 1–5 scale. The preference value of landscape types means the weighted mean value of the received values. During our calculations we only highlighted the values above the average, with values of 2 (forest landscape) and 3 (waterside landscape); the values below the average did not receive weights (weight 1).

The classification into relief landscape forms was carried out by physical geographical macroregions. We identified three railway line types:

1. Railway lines in upland or mountainous areas: railway lines along the Transdanubian Mountains and the North Hungarian Mountains;
2. Railway lines in hilly areas: Railway lines along the pre-Alps Region and the Transdanubian Hills; and
3. Railway lines in plain areas: the Little Plain Region and the Great Hungarian Plain.

Here the calculation of the weight value was also carried from the weighted mean value of the preference values and the number of the respondents in the questionnaire survey, so the mountain railway lines received the value of 3, hilly areas 2 and plain areas 1 (hence, the latter was not weighted). Here we note that relief factors do not always follow the course of the railway lines, so in certain sections different landscape types can appear. This presents a measure of subjectivity to the research but, at the same time, the major relief types can be well separated for each type of railway section.

The calculation of the tourism weight was based on the volume of registered commercial accommodation capacities in the concerned settlements on the railway line. The basis of the calculation was provided by the mean commercial accommodation bed places per the mean number of stations on one railway section. During the project, we had to make the averaging with the mean value of the railway stops since certain sections have different lengths, which would skew the calculations. Taking all these notions into consideration, the designation of the preferences and the weight values are presented in Table 2. This table exemplifies the results of the questionnaire survey as well.

As mentioned above, during the elaboration of the methodology we intended to reduce the amount of subjectivity as much as possible. We could not completely achieve this goal, however, due to the following risks and issues:

1. Only a very small amount of train travels are directly associated with leisure. The railway as a means of transport is much more associated with business traffic, especially in the larger cities with more significant amounts of travelling (consuming) potential;
2. As mentioned earlier, tourists do not necessarily or even primarily travel because of the landscape values but because of the tourism experiences at their destinations. This disinterest in the landscape can distort results;
3. Land use and relief characteristics and their classifications reflect the subjective appraisal of the researchers. For instance, the complex terminology of agricultural land can cover only orchards, or grape-covered areas, or we can classify the scenery of the pastures into this category as well. We believe, however, that unfolding the landscapes into elements is not reasonable because of the dynamics of the system described earlier;
4. The classification based on relief characteristics can also carry a certain amount of subjectivity, since although the railway as a man-made network follows physical geographical limitations, landscape classification cannot define it precisely enough; and
5. Landscape preferences are influenced by human factors as well. The mental state of an individual influences opinions about the landscape, so a highly attractive mountainous landscape could arouse negative sensations and, conversely, plain or urban areas could carry positive messages. The socio-cultural background of the individual is also important, as subjective opinions about landscapes derive from the social development of the individual. Someone who spent her or his life in a lowland environment will very likely evaluate the plain areas with a higher preference, while hilly or mountainous areas could carry negative aspects for this individual. In this context, the environment of the present residence of travellers, as well as the evaluations and opinions of peers, can also influence positively or negatively

	Weighted average	Calculated weight
Land use weight based on the results of the questionnaire survey		
Waterside	4.423	3
Forest landscape	4.147	2
Settlement	3.404	1
Agricultural landscape	3.110	1
Industrial landscape	2.252	1
Relief weight based on the results of the questionnaire survey		
Mountains	4.564	3
Hilly areas	4.130	2
Plain regions	2.988	1
Tourism weight based on the average of the commercial accommodation rooms per 1 station		
Values above the 3rd quartile	437.292 – 7103.877	3
Values between the 1st and 3rd quartiles	64.352 – 437.291	2
Values beneath the 1st quartile	0 – 64.351	1

Tab. 2: The land use, relief and tourism weights
Source: authors' survey and calculations

notions about a certain landscape. The mathematical description of all these factors is not the objective of this investigation, which is why the authors elaborated on the received personal opinions of the travellers.

Ultimately, we can hypothesise that tourist utilisation of landscape characteristics of the railway network depends on the preferences of the travellers' cognitive consciousness, on the physical land use and on the tourism supply in the respective areas.

4. Results and discussion

The results of the questionnaire survey, the thematic evaluation of the CORINE database, and the characterisation of the railways capable of integration into tourism, based on landscape preferences, are discussed in this Section.

4.1 Results of the questionnaire and thematic surveys

The questionnaire survey covering the demand relations included the cognitive relations of landscape preferences with numerous questions. Its results are presented in Table 3. During the research, we analysed the relations of age and education to attitudes connected to landscape preferences. Although this work demonstrated only marginal features in relation to travelling by train and landscape geography, it provides important information from the point of view of the market segmentation of railway tourists.

For the question 'How much time do you spend on investigating the landscape during your travel?', we can see a slightly greater value for male respondents. Based on the age structure, our earlier statements are valid here, since middle-aged and elderly age groups were more interested in the scenery of the landscapes than the younger generations. According to level of education, we can also see – although to a smaller extent – the dominance of the higher educated groups.

Based on the Pearson's correlation coefficient, Table 4 represents the existence (or absence) of the correlational relations of the importance of certain relief types and land use landscapes with respect to gender, age and education level. For this purpose, the analysed social factors needed to be quantified: gender, males = 1, females = 2; age groups coded 1–4; education groups coded 1–3. One can see from the

Viewpoints of the survey	The importance of the scenery of the landscape	Time spent by viewing the landscape
Weighted mean value	4.356	3.759
Male	4.383	3.810
Female	4.340	3.731
15-29 years old	4.107	3.607
30-44 years old	4.516	3.778
45-59 years old	4.500	3.929
60-75 years old	4.414	3.931
With basic level of education	4.300	3.667
With secondary level of education	4.196	3.538
With higher level of education	4.440	3.776

Tab. 3: The cognitive relations of landscape preferences by various questionnaire groups
Source: authors' survey and calculations

table that most important social indicators have no or only a very small correspondence with landscape preferences. We can see some emerging correlations, however, which could help in identifying tourists in the segmentation of the rail tourism market.

We can see that basically there are minimal correlations between aesthetic perceptions of a landscape and respondent social characteristics. As far as gender is concerned, we can detect a slightly moderate amount of inverse proportions (i.e. male respondent preferences) in mountainous and industrial landscapes. As for age, we detected that in the case of hilly and agricultural landscapes an increase in age is associated with preferences, but for the senior age group there is less liking for more dynamic and wild mountain areas. Perhaps, preferring the scenery of the more relaxed hilly areas can be correlated with the more relaxed psychic features of the elderly. Based on the educational groups, there is also an increase in interest for the hilly areas, meaning perhaps that the better-educated groups are somewhat more interested in gentler relief forms.

For the supply side of the issues, Table 5 shows railway landscape preferences based on the frequency of the landscape types analysed. In the table, the three most frequent landscape types can be seen. The results reflect the physical and social geographical characteristics of Hungary and provide no new and substantive results. Based on the spatial limits of rail tourism, however, it is worth highlighting.

As mentioned above, the train travellers taking part in the questionnaire survey favoured waterside and forest landscapes. The geographical allocation of waterside landscapes in Hungary is obvious due to the topographical features of Lake Balaton. At the same time, however, in the case of forest landscapes, the railway lines crossing the Bakony Mountains (north of Lake Balaton) are missing from the top of the list. Instead, we find a majority of the Northern Hungarian railway lines in this respect. Since, based on the survey, a major part of train travellers preferred hilly regions, railway lines in the northern areas of Hungary are in favourable positions concerning rail tourism. This is obviously caused by the physical geographical features, since only a certain part of the railway lines crossing the Transdanubian areas run in woodland and mountain areas, unlike the northern Hungarian lines.

The urban environment is implicitly the most relevant along the railway lines in the agglomeration zones of the capital; moreover, the south western agglomeration zone of Budapest is overrepresented. The representation of the industrial zones can be connected to larger towns or cities (Tiszaújváros, Pécs, the industrial settlements of Northern Transdanubia). Agricultural landscapes appear mostly in the plain areas, especially in the south eastern parts of the country.

4.2 Characterisation of the railway lines

Figure 2 shows the ten most valuable railway sections based on our methodology. The figure illustrates these highest-ranking railway lines both by the data weighted with tourism factors and without the tourism factors (only landscape values). We considered it important to visualise both results, since the spatial pattern of the most aesthetic and beautiful landscapes and the service capacity of tourism differ from each other. As long as the waterside and mountain areas dominate in the cognitive consciousness of the travellers, the capacity of tourism is connected to major destinations and larger cities, which can only be found in mountainous environments in the rarest of cases.

Viewpoints of the survey	Gender	Age	Education	Weighted average
Mountains	– 0.165	0.120	0.060	4.564
Hilly areas	– 0.026	0.162	0.212	4.130
Plain areas	– 0.128	0.104	– 0.105	2.988
Forested areas	0.008	0.055	0.096	4.147
Agricultural landscape	– 0.145	0.229	0.010	3.110
Waterside landscape	– 0.040	0.097	– 0.065	4.423
Settlement, urban	– 0.078	0.011	0.014	3.404
Industrial landscape	– 0.194	– 0.005	– 0.095	2.252

Tab. 4: The correlational relations of the importance of certain relief types and land use landscapes and gender, age and education level groups. Source: authors' survey and calculations

Viewpoints of the survey	1.	2.	3.
Forest, scrubland	Vác–Drégelypalánk (60.715%)	Eger–Szilvásvárad (55.797%)	Somogyszob–Gyékényes (50.812%)
Agricultural landscape	Orosháza–Mezőhegyes (90.768%)	Püspökladány–Biharkeresztes (90.584%)	Gyomaendrőd–Vésztő (90.358%)
Waterside	Csajág–Balatonfüred (49.663%)	Fonyód–Siófok (48.277%)	Balatonszentgyörgy–Fonyód (45.989%)
Urban	Érd–Pusztaszabolcs (17.157%)	Fót–Vác (15.754%)	Érd–Székesfehérvár (14.149%)
Industrial	Nyékládháza–Tiszaújváros (9.864%)	Szentlőrinc–Pécs (6.558%)	Tatabánya–Komárom (6.060%)

Tab. 5: The supply side of the railway landscape preferences based on the frequency of the landscape types analysed Source: authors' survey and calculations

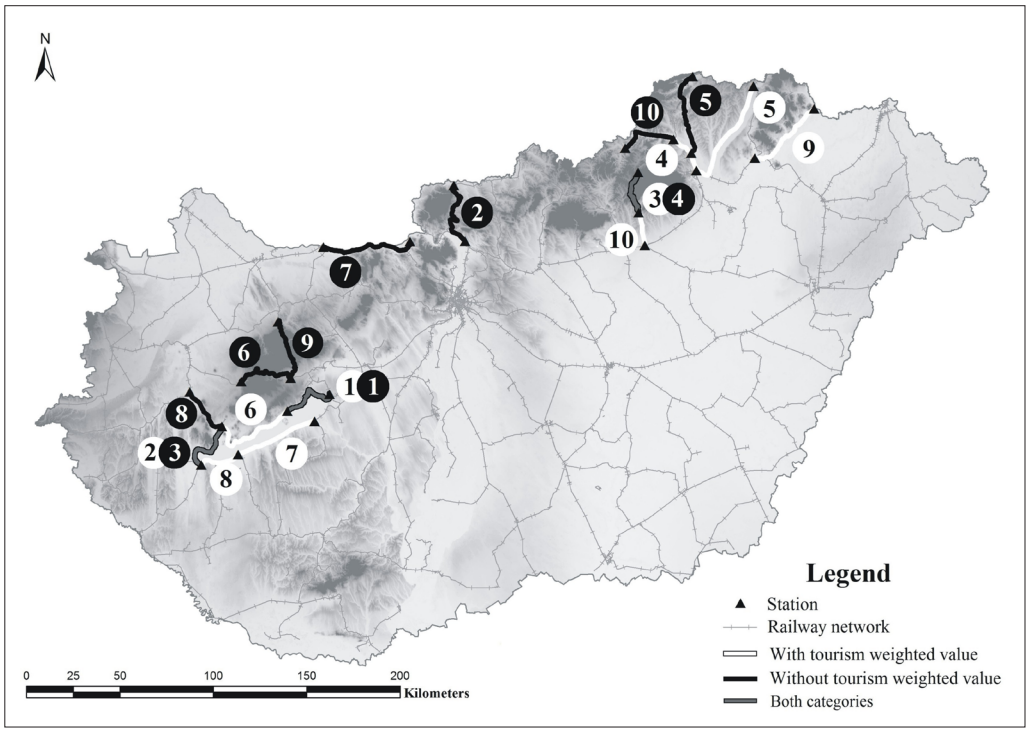

Fig. 2: The map of the top railway sections with and without tourism weighted values
Source: authors´ elaboration

No.	Without tourism weighted value	Value	With tourism weighted value	Value
1.	Csaják–Balatonfüred	613.011	Csaják–Balatonfüred	1839.033
2.	Vác–Drégelypalánk	474.786	Tapolca–Balatonszentgyörgy	1404.504
3.	Tapolca–Balatonszentgyörgy	468.168	Eger–Szilvásvárad	1370.790
4.	Eger–Szilvásvárad	456.930	Miskolc–Kazincbarcika	1260.981
5.	Sajóecseg–Tornanádaska	427.122	Miskolc–Hidasnémeti	1170.594
6.	Veszprém–Ajka	426.732	Balatonfüred–Tapolca	1152.684
7.	Esztergom–Komárom	425.787	Fonyód–Siófok	1124.736
8.	Tapolca–Ukk	425.118	Balatonszentgyörgy–Fonyód	1095.144
9.	Veszprém–Bakonyszentlászló	424.572	Szerencs–Sátoraljaújhely	1060.146
10.	Kazincbarcika–Ózd	422.499	Füzesabony–Eger	1038.222

Tab. 6: Further data of the top railway sections with and without tourism weighted values
Source: authors' survey and calculations

Taking into consideration the landscape features, the major role of the northern railway lines at Lake Balaton is indisputable. The results confirm our observation that those waterside lines provide the most aesthetic and impressive landscapes for the train travellers, where the landscape meets with woodland mountainous areas. Such sections can be found on the northern shores of Lake Balaton between Balatonakarattya and Balatonfüred, and between Tapolca and Balatonszentgyörgy. Besides Lake Balaton, we can detect the most desirable railway lines at the Esztergom–Komárom section, where the railway follows the River Danube along the northern slopes of the Gerecse Mountains. At the same time, the other railway sections in the list can be found in exclusively mountainous woodland areas. Here we can find the railway lines of the Bakony Mountains in Transdanubia and the Börzsöny and Bükk Mountains in Northern Hungary, along with railways lines in the valleys of the Gömör-Torna Karst affording an excellent view of the mountains.

When considering the tourism weight we obtain rather different results. On the one hand, the railway lines along Lake Balaton result in a less important role, including the line along the southern shores as well. On the other hand, the railway lines of the mountainous areas in Central Transdanubia disappeared, while the regions in Northern Hungary received more favourable positions. The reasons can be found in the spatial structure of Hungary. While in the central areas of Transdanubia in the mountainous areas, the destinations with significant amounts of services industries are missing along the railway lines, in the northern Hungarian mountainous areas we find two major cities, Eger and Miskolc, with important tourism supply and demand indicators. At the same time, in the case of the Bakony Mountains, only the Lake Balaton region is adequate to supply a reasonable amount of tourists to the tourism-based railway travels.

The results also show some of the barriers to the possible integration of rail travel landscape preferences

and tourism. For the Hungarian railway lines, based on the symbiosis of landscape and travel, we can obviously take into consideration those where waterside, mountainous or woodland regions/landscapes or their combination is provided together with adequate tourism capacity. These are the sections between Csajág and Balatonfüred, Tapolca and Balatonszentgyörgy, Eger and Szilvásvárad. Since all of these lines are associated with already functioning tourism destinations, we cannot expect any spatial expansion of tourism. Of the listed railway lines, six belong to the comprehensive network, and so the branch lines and feeders are present only to a limited extent. Based on tourism weight, the only line where a thematic tourism product could be established is found between Eger and Szilvásvárad.

In the tourism-related symbiosis of railway travel and landscape values, we can only see strong progress when already functioning, successful destinations could be defined as regions for railway travel with integrated tourism purposes. Based on their physical geographical (landscape) and cultural supplies, the most appropriate basis for successful tourism integration is provided by the Lake Balaton region, Eger and Miskolc.

5. Conclusions

This research project has highlighted several factors in the complex system between rail travel and tourism, and we believe we were able to contribute to the domain of geographical tourism research with new results and interpretations.

The theoretical background has demonstrated that the relationships between travel motivations and landscape preferences are highly complex. The recognition that landscape preferences could influence travel motivations created new avenues for geographical research, such as seen in behavioural geography and applications of attitude theory for understanding travel behaviours. Since both this topic and our survey involve several subjective factors, a purely mathematical description is hardly possible, mainly because of the human factors. The authors do believe, however, that the role of the human psyche and behaviours makes these investigations more and more interesting and up-to-date. That is the reason why this article involved the preferences of the travellers in the investigations with a questionnaire survey.

Our earlier knowledge about rail tourists was further clarified. Resulting from the data obtained in the questionnaire survey, the most typical person buying a tourism package based on rail travel in Hungary would be a well-educated male, 45 years of age or older. Understanding the positions of rail travels and Hungarian and international leisure-oriented travels, we can state that the exploitation of the leisure opportunities of the rail system should be considered as a niche market segment, which cannot act independently but together with other, more attractive product elements.

We can conclude from our results that the integration of rail travel into tourism can promote the spatial expansion of tourism purpose, mobility and behaviour only to a limited degree. Railway lines and sections that can be associated with landscape preferences, can be found in the vicinity of already existing and functioning tourism destinations and in their background areas. In Hungary, we can rely on the railway lines running around Lake Balaton (especially in the northern regions) and along the foothills of the Bakony Mountains. From our results we can conclude that in general in unfavourable weather conditions at the high season or in the off-season period, the target group of the Balaton region can be involved in tourism purpose rail travels. In Northern Hungary, we should highlight one of Hungary's most spectacular railway lines between Eger and Szilvásvárad, connecting areas with a high number of visitors and ecotourism services (Bükk National Park). The tourism opportunities of the railway lines from Miskolc to the Bükk Mountains and in the Gömör-Torna Karst (the upper sections of the Sajó and Bódva Rivers) area should be considered in Northern Hungary. In addition, in this respect we can also highlight the importance of the Vác-Drégelypalánk section around the capital city in the Danube Bend.

Leisure travel by train per se can act only in rare cases as a product-motivating tourism behaviour. As a niche market, it can only enter the market together with other types. The scenery of railways in natural environments can be adequate to disperse soft tourism behavioural forms, such as obtaining a deeper knowledge of the railways and trains and their infrastructure – in other words, their industrial heritage, and / or the cognition of natural values.

Based on this project, we see further research potentials for such railway lines in or in the vicinity of national parks. Of these lines in Hungary, the most important ones are along the Balaton Highlands National Park, the Bükk National Park and the Aggtelek National Park.

Finally, we also have to take into consideration that, in Hungary, leisure types of rail tourism offer only generate same-day trips. Based on the size of its territory, the country possesses no adequate positions for long travels spanning several days. Because of the niche characteristics of rail tourism, it can capture the attention of tourists only as a marginal attraction. As a consequence, rail tourism would not be economically viable even in already-existing tourism destinations, and especially in socio-economic peripheries since there would be no well-functioning tourism products present in those regions. As a consequence, the introduction and management of the services of leisure-based rail tourism in Hungary would only be possible with professional and competent preparation, effectuation and with the help of further research.

References:

ALDSKOGIUS, H. (1977): A conceptual framework and a Swedish case study of recreational behavior and environmental cognition. Economic Geography, 53(2): 163–183.

BARROSO, F. L., PINTO-CORREIA, T., RAMOS, I. L., SUROVÁ, D., MENEZES, H. (2012): Dealing with landscape fuzziness in user preference studies: Photo-based questionnaires in the Mediterranean context. Landscape and Urban Planning, 104(3–4): 329–342.

BEZA, B. B. (2010): The aesthetic value of a mountain landscape: A study of the Mt. Everest Trek. Landscape and Urban Planning, 97(4): 306–317.

BOURASSA, S. C. (19888). Toward a theory of landscape aesthetics. Landscape and Urban Planning, 15(3–4): 241–252.

BUCKLEY, R. (2006): Environmental Inputs and Outputs in Ecotourism: Geotourism with a Positive Triple Bottom Line? Journal of Ecotourism, 2(1): 76–82.

BUIJS, A. E., ELANDS, B. H. M., LANGERS, F. (2009): No wilderness for immigrants: Cultural differences in

images of nature and landscape preferences, Landscape and Urban Planning, 91(3): 113–123.

BUEHLER, R., NOBIS, C. (2010): Travel behavior in aging societies, comparison of Germany and the United States. Transportation Research Record: Journal of the Transportation Research Board, 2182: 62–70.

BUNTING, T. E., GUELKE, L. (1979): Behavioral and perception geography: a critical appraisal. Annals of the Association of American Geographers, 69(3): 448–462.

CHUA, B., SANGHYEOP, L., HUFFMAN, L., CHOI, H. (2015): The Role of Physical Environment in Leisure Service Consumption: Evidence From a Ski Resort Setting. International Journal of Hospitality & Tourism Administration 4: 375–407.

COCEAN, G. (2010): The tourist role of relief as landscape background. Romanian Review of Regional Studies, 6(1): 79–90.

CSORBA, P., LÓCZY, D., MEZŐSI, G. (2004): Recent landscape research in Hungary. BELGEO – Revue Belge de Geographie, 2–3: 289–300.

DACHARY-BERNARD, J. RAMBONILAZA, T. (2012): Choice experiment, multiple programmes contingent valuation and landscape preferences: How can we support the land use decision making process? Land Use Policy, 29(4): 846–854.

DANIEL, T. C., BOSTER, R. S. (1976): Measuring Landscape Esthetics: The Scenic Beauty Estimation Method. USDA, Fort Collins, CO. USDA Forest Service Research Paper No. RM-167.

DE LA FUENTE DE VAL, G., MÜHLHAUSER S. H. (2014): Visual quality: An examination of a South American Mediterranean landscape, Andean foothills east of Santiago (Chile). Urban Forestry & Urban Greening, 13(2): 261–271.

DENSTADLI, J. M., JACOBSEN, J. S. (2011): The long and winding roads: Perceived quality of scenic tourism routes. Tourism Management, 32(4): 780–789.

DESBARATS, J. (1983). Spatial choice and constraints on behavior. Annals of the Association of American Geographers, 73(3): 340–357.

DIJST, M., FARAG, S., SCHWANEN, T. (2008): A comparative study of attitude theory and other theoretical models for understanding travel behaviour. Environment and Planning A, 40(4): 831–847.

FABOS, J. G. (1971): An analysis of environmental quality ranking systems in recreation. In: Recreation Symp. Proc. (pp. 40–55). Northeastern For. Exp. Stn., USDA For. Serv., Upper Darby, PA.

FAGGI, A., BREUSTE, J., MADANES, N., GROPPER, C., PERELMAN, P. (2013): Water as an appreciated feature in the landscape: a comparison of residents' and visitors' preferences in Buenos Aires. Journal of Cleaner Production, 60: 182–187.

FORNAL-PIENIAK, B., ŻARSKA, B. (2014): Methods of landscape evaluation for tourism and recreation. Acta Scientiarum Polonorum – Formatio Circumiectus, 13(2): 3–9.

FRANK, S., FÜRST, C., KOSCHKE, L., WITT, A., MAKESCHIN, F. (2013): Assessment of landscape aesthetics—Validation of a landscape metrics-based assessment by visual estimation of the scenic beauty. Ecological Indicators, 32: 222–231.

FREDE, H. G., BACH, M., FOHRER, N., MÖLLER, D., STEINER, N. (2002): Multifunktionalität der Landschaft – Methoden und Modelle. Petermanns Geographische Mitteilungen, 146: 58–63.

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.

GALAMBOS, J. (1989): New concepts in landscape assessment: a dynamic landscape assessment. In: Pécsi, M. [ed.]: Geomorphological and geoecological essays (pp. 87–97). Budapest, Akadémiai Kiadó.

GARRE, S., MEEUS, S., GULINCK, H. (2009): The dual role of roads in the visual landscape: A case study in the area around Mechelen (Belgium). Landscape and Urban Planning, 92: 125–135.

GERGEL, S. E., TUNER, M. G. [eds.] (2017): Learning Landscape Ecology. A Practical Guide to Concepts and Techniques. New York, Springer-Verlag.

GOLLEDGE, R. G. (1997): Spatial behavior: A geographic perspective. Guilford Press.

GYURICZA, L., AMBRUS, T. (2008): An attempt at the quantitative evolution of the natural endowments of tourism. In: Matei, E. [ed.]: Sustainable Tourism Development in the Carpathian Mountains: The First International Carpathians Tourism Conference (pp. 42–65). Bucuresti, Universitara Housing Press.

HALSALL D. A. (2001): Railway heritage and the tourist gaze: Stoomtram Hoorn-Medemblik. Journal of Transport Geography, 9(2): 151–160.

HORVÁTH G. (2008): Természeti, táji értékek számszerű minősítése. In: Csorba, P., Fazekas, I. [eds.]: Tájkutatás – tájökológia (pp. 73–85). Debrecen, Meridián Alapítvány.

HOWLEY, P. (2011): Landscape aesthetics: Assessing the general public's preferences towards rural landscapes. Ecological Economics, 72: 161–169.

JACOBSEN, J. K. S. (2007): Use of Landscape Perception Methods in Tourism Studies: A Review of Photo-Based Research Approaches. Tourism Geographies – An International Journal of Tourism Space, Place and Environment, 9(3): 234–253.

JADE, R., MOLKOVÁ, T., KVIZDA, M. (2015): Role of railways in empowering travelers: A case study from the Czech Republic. Journal of Rail Transport Planning & Management, 5(2): 31–49.

JASZCZAK, A., ŽUKOVSKIS, J. (2011): Landscape valuation in development of rural tourism: case study of Ostfriesland (Germany). Management theory and studies for rural business and infrastructure development, 5(29): 89–95.

JEANLOZ, S., LIZIN, S., BEENAERTS, N., BROUWER, R., VAN PASSEL, S., WITTERS, N. (2016): Towards a more structured selection process for attributes and levels in choice experiments: A study in a Belgian protected area. Ecosystem Services, 18: 45–57.

JOLY, D., BROSSARD, T., CAVAILHES, J., HILAL, M., TOURNEUX, F. P., TRITZ, C., WAVRESKY, P. (2009): A quantitative approach to the visual evaluation

of landscape. Annals of the Association of American Geographers, 99(2): 292–308.

JUNGE, X., SCHÜPBACH, B., WALTER, T., SCHMID, B., LINDEMANN-MATTHIES, P. (2015): Aesthetic quality of agricultural landscape elements in different seasonal stages in Switzerland. Landscape and Urban Planning, 133: 67–77.

KALIVODA, O., VOJAR, J., SKŘIVANOVÁ, Z., ZAHRADNÍK, D. (2014): Consensus in landscape preference judgments: The effects of landscape visual aesthetic quality and respondents' characteristics, Journal of Environmental Management, 137: 36–44.

KIRILLOVA, K., FU, X., LEHTO, X., CAI, L. (2014): What makes a destination beautiful? Dimensions of tourist aesthetic judgment. Tourism Management, 42: 282–293.

KNUDSEN, D. C., SOPER, A. K., METRO-ROLAND, M. (2007): Commentary: Gazing, Performing and Reading: A Landscape Approach to Understanding Meaning in Tourism Theory. Tourism Geographies – An International Journal of Tourism Space, Place and Environment, 9(3): 227–233.

LEOPOLD, L. B. (1969): Quantitative comparison of some aesthetic factors among rivers. Geol. Survey Circ. 630: 1–16. USD1 Geological Survey, Washington, DC.

LIU, B. (2015): Quality Evaluation and Structure Optimization of Tourism Landscape (pp. 267–270). International Conference on Management Science and Innovative Education (MSIE 2015).

LÓCZY, D. (2015) [ed.]: Landscapes and Landforms of Hungary. Dordrecht, Springer Science+Business Media B.V.

MAROSI, S., SZILÁRD, J. (1985): Landscape topology and evaluation of the Balaton 'Riviera'. In: Pécsi, M. [ed.]: Environmental and dynamic geomorphology: case studies in Hungary: contribution to the First International Geomorphological Conference, Manchester, (pp. 141–145). Budapest, Akadémiai Kiadó.

MARTÍN, M., ORTEGA, E., OTERO, I., ARCE, R. M. (2016): Landscape character assessment with GIS using map–based indicators and photographs in the relationship between landscape and roads. Journal of Environmental Management, 180: 324–334.

MEZŐSI, G. (1990): Versuche zur Determination der ästhetischen Werte der Landschaft. Acta Universitas Szegediensis, Acta Geographica, 28–30: 51–66.

MYGA-PIATEK, U., NITA, J. (2008): The scenic value of abandoned mining areas in Poland. Acta Geographica Debrecina, Landscape & Environment Series, 2(2): 132–142.

NIKOLAISHVILI, D., DONADZE, T., MELADZE, G., TRAPAIDZE, V., DVALASHVILI, G., SHARASHENIDZE, M., TIGISHVILI, T. (2012): Evaluating the touristic potential of Georgia's landscapes. Forum geografic. Studii şi cercetări de geografie şi protecţia mediului, 11(2): 145–154.

NITA, J., MYGA-PIATEK, U. (2014): Scenic values of the Katowice – Częstochowa section of national road No. 1. Geographica Polonica, 87(1): 113–125.

ODE, Å., Mari, S., TVEIT, M., FRY, G. (2008): Capturing Landscape Visual Character Using Indicators: Touching Base with Landscape Aesthetic Theory. Landscape Research, 33(1): 89–117.

PAGE, S. J. (2009): Transport and tourism global perspectives. London, Pearson, Prentice Hall, Harlow.

PARDO-GARCÍA, S., MÉRIDA-RODRÍGUEZ, M. (2017): Measurement of visual parameters of landscape using projections of photographs in GIS, Computers, Environment and Urban Systems, 61, Part A: 56–65.

PETERSON, M. N., THURMOND, B., MCHALE, M., RODRIGUEZ, S., BONDELL, H. D., COOK, M. (2012): Predicting native plant landscaping preferences in urban areas. Sustainable Cities and Society, 5: 70–76.

PHILLIPS, M. R., EDWARDS, A. M., WILLIAMS, A. T. (2010): An incremental scenic assessment of the Glamorgan Heritage Coast, UK. The Geographical Journal, 176(4): 291–303.

RIECHERS, M., BARKMANN, J., TSCHARNTKE, T. (2015): Perceptions of cultural ecosystem services from urban green. Ecosystem Services, 17: 33–39.

ROGGE, E., NEVENS, F., GULINCK, H. (2007): Perception of rural landscapes in Flanders: Looking beyond aesthetics. Landscape and Urban Planning, 82(4): 159–174.

ROSLEY, M. S. F., LAMIT, H., RAHMAN, S. R. A. (2016): Perceiving the Aesthetic Value of the Rural Landscape through Valid Indicators. Procedia – Social and Behavioral Sciences, 85: 318–331.

SCOTT, A. (2006): Assessing public perception of landscape: past, present and future perspectives. CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources, 1(041).

SEVENANT, M., ANTROP, M. (2009): Cognitive attributes and aesthetic preferences in assessment and differentiation of landscapes, Journal of Environmental Management, 90(9): 2889–2899.

SEVENANT, M., ANTROP, M. (2010): The use of latent classes to identify individual differences in the importance of landscape dimensions for aesthetic preference. Land Use Policy, 27(3): 827–842.

SHAFER, E. L., HAMILTON, J. F., SCHMIDT, E. A. (1969): Natural landscape preferences: a predictive model. Journal of Leisure Research 1: 1–19.

SHAFER, E. L. (1969): Perception of natural environments. Environment and Behavior, 1(1): 71–82.

SCHIRPKE, U., TASSER, E., TAPPEINER, U. (2013): Predicting scenic beauty of mountain regions, Landscape and Urban Planning, 111: 1–12.

SITWELL, O. F. G., LATHAM, G. R. (1979): Behavioural geography and the cultural landscape. Geografiska Annaler B, 51–63.

SWANWICK, C. (2009): Society's attitudes to and preferences for land and landscape. Land Use Policy, 26: 62–75.

TAGLIAFIERRO, C., BOERI, M., LONGO, A., HUTCHINSON, W. G. (2016): Stated preference methods and landscape ecology indicators: An example of transdisciplinarity in landscape economic valuation, Ecological Economics, 127: 11–22.

TIMMERMANS, H. (1981): Spatial choice behaviour in different environmental settings: an application of the revealed preference approach. Geografiska Annaler. Series B. Human Geography, 63(1): 57–67.

TURNER, M. G., GARDNER, R. H. (2015): Landscape Ecology in Theory and Practice. Pattern and Process. New York, Springer-Verlag.

TURNER, M. G., GARDNER, R. H., O'NEILL, R. V. (2001): Landscape Ecology in Theory and Practice. Pattern and Process. New York, Springer-Verlag.

TVEIT, M., ODE, Å., FRY, G. (2007): Key concepts in a framework for analysing visual landscape character. Landscape Research, 31(3): 229–255.

VAN DER JAGT, A. P. N., CRAIG, T., ANABLE, J., BREWER, M. J., PEARSON, D. G. (2014): Unearthing the picturesque: The validity of the preference matrix as a measure of landscape aesthetics. Landscape and Urban Planning, 124: 1–13.

VAN DER ZEE, D. (1990): The complex relationship between landscape and recreation. Landscape Ecology, 4(4): 225–236.

VAN ZANTEN, B. T., VERBURG, P. H., SCHOLTE, S. S. K., TIESKENS, K. F. (2016a): Using choice modeling to map aesthetic values at a landscape scale: Lessons from a Dutch case study. Ecological Economics, 130: 221–231.

VAN ZANTEN, B. T., ZASADA, I., KOETSE, M. J., UNGARO, F., HÄFNER, K., VERBURG, P. H. (2016b): A comparative approach to assess the contribution of landscape features to aesthetic and recreational values in agricultural landscapes. Ecosystem Services, 17: 87–98.

VARJÚ, V., SUVÁK, A., DOMBI, P. (2014): Geographic Information Systems in the Service of Alternative Tourism – Methods with Landscape Evaluation and Target Group Preference Weighting. International Journal of Tourism Research, 16(5): 496–512.

VIZZARI, M. (2010): Spatial modelling of potential landscape quality. Applied Geography, 31(1): 108–118.

VOULIGNY, É., DOMON, G., RUIZ, J. (2009): An assessment of ordinary landscapes by an expert and by its residents: Landscape values in areas of intensive agricultural use, Land Use Policy, 26(4): 890–900.

WANG, R., ZHAO, J., LIU, Z. (2016): Consensus in visual preferences: The effects of aesthetic quality and landscape types. Urban Forestry & Urban Greening, 20: 210–217.

YOSHIHARA, T., NISHINA, D., TANAKA, T., KAWASE, K., TAKAGISHI, H. (2017): A Study on the Psychological Evaluation of Tourism Landscape Images in Hiroshima – A Psychological Evaluation by Korean Subjects. Journal of Asian Architecture and Building Engineering, 16(1): 223–229.

ZUBE, E. H. (1974): Cross-disciplinary and intermode agreement on the description and evaluation of landscape resources. Environment and Behavior, 6(1): 69–89.

ZUBE, E. H., PITT, D. G. ANDERSON, T. W. (1974): Perception and measurement of scenic resources in the southern Connecticut River Valley. Institute for Man and His Environment, PubI. R-74-1. Amherst, Mass.

Please cite this article as:

SOMOGYI, B., CSAPÓ, J. (2018): The role of landscape preferences in the travel decisions of railway passengers: Evidence from Hungary. Moravian Geographical Reports, 26(4): 298-309. Doi: 10.2478/mgr-2018-0024.