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Heterogeneity and Emotional Perceptions of the Labelling of Accommodation Services in Tourism

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Abstract: The labelling of tourism accommodation services profoundly influences consumer behaviour and decision-making processes. Many consumers view labelling as a subjective assurance of the quality of services provided and are willing to pay a premium on the basis of the level of quality indicated by these labels. This paper's main goal is to highlight the critical importance, emotional perception, and potential implications of labelling tourism accommodation services within the Slovak Republic's particular context and the V4 countries. Considering this, the research employed a combination of secondary data and field research, incorporating both quantitative and qualitative methodologies. Data analysis utilises fundamental statistical techniques as well as more advanced methods, such as eye trajectory analysis, emotional valence analysis, and emotional arousal analysis. These methods, which fall under the domain of biometric measurement of emotions and consumer neuroscience, are essential for obtaining a comprehensive understanding of the data. The findings indicate that labelling accommodation services significantly affects consumer behaviour and has an important effect on what decisions are made regarding commodities associated with tourism. Providers of tourism services across various countries are continuously searching for effective ways to label accommodation services that are not only uniform and memorable but also perceived as reliable indicators of service quality. The insights gained from this study, achieved through the application of relatively underutilised methods, significantly enhance our understanding of the importance and relevance of accommodation service labelling. They offer valuable information on the emotional responses elicited by different types of signage, identify the intrinsic appeal of various signage elements, and highlight indicators of emotional arousal. Moreover, the study underscores the importance of strategic signage placement within service environments, employing eye trajectory analysis and the creation of heatmaps to demonstrate how prominently displayed signage can influence consumer perception and engagement. This expanded understanding provides practical implications for designing more effective tourism accommodation labels and marketing strategies.

Keywords: biometric measurement; emotional responses; labels; lodgings; neuroscience; travel industry.

1. Introduction. Recent issues caused by the epidemic and the conflict in Ukraine have negatively impacted tourism; however, its significance as a driving force of well-being, income, employment, and economic prosperity remains undeniable (Lyulyov et al., 2023). International tourism has stopped or slowed worldwide, whereas domestic tourism is significantly restricted in several different countries. Tourism's direct GDP contribution has decreased by 1.9 percentage points to 2.8%, and the OECD's service export share, on average, has decreased by 10.6 percentage points (to 9.9%). These outcomes have posed a challenge for many governments, including those of the V4 countries, who should act in concert to promote and strengthen the resilient and sustainable recovery of this industry. The priorities have become the restoration of safe mobility and consumer confidence in the quality of services, which is strongly affected by labour shortages and skills gaps, the innovative promotion of services, and the re-evaluation of hotel classification systems. One of the easiest methods to ensure that hotel services meet predetermined standards and criteria is to standardise their quality (Camelo-Ordaz et al., 2020). Classification is an important tool for consumer protection, guaranteeing quality and distinguishing it from competing offers.

However, the current times call for far more sophisticated ways of declaring quality, particularly in the marketing communication of tourism enterprises. One option is the application of neuromarketing, which offers a new perspective on consumer behaviour and purchasing decisions (Dutta et al., 2022). The view of neuromarketing as a less-discussed scientific discipline used in marketing is controversial (Carr & Sequeira, 2007). Some experts perceive it as a threat, an unwanted intrusion into privacy, whereas others see it as an opportunity or tool that marketers can skilfully use for effective and targeted advertising.

The goal of this contribution is to better understand the conduct and purchase decisions of tourism participants. It provides partial results from financially supported research that is continually being supplemented and refined. The use of neuromarketing in the context of the Slovak Republic's tourism sector has not been scientifically explored. The authors aim to present how neuromarketing functions in branding tourism enterprises, offering a different perspective on consumer behaviour and significantly influencing the creation of new marketing strategies.

This paper emphasises how crucial it is to concentrate on the travel and tourism industry, which is currently being tested for several adverse events of a global nature. The result has been unfavourable economic outcomes. However, these developments have accelerated the development and utilisation of new scientific disciplines that penetrate various fields. The sophistication of tourism participants, internationalisation, and globalisation have influenced purchasing behaviour (Ozkan & Solmaz, 2015), (Rauch & Frese, 2007). Neuromarketing, which provides insights into the minds of customers, is a topic of much debate regarding its use. This paper presents one of the possible applications of neuromarketing in tourism.

The literature review, which highlights important discoveries and gaps in the literature, first provides an overview of the body of research that has been conducted on neuromarketing and how it affects the travel and tourism sector. The study's research design, data collection strategies, and analytical methodologies are then described in the methodology and research methods section. The research's conclusions are then presented in the Results section, which also shows how neuromarketing insights might improve comprehension of traveller behavior. The discussion that follows places these findings in the broader context of tourism marketing and considers how they can affect industry practice and regulation. The study culminates with a synopsis of the principal discoveries and suggestions for further investigation into the utilisation of neuromarketing to enhance tourism marketing tactics.

2. Literature Review. The revival of the tourism industry has created both new and existing challenges (Urban & Wood, 2015). Restoring consumer confidence and corporate operational capability, as well as guaranteeing people's safe travel and offering financial support to enterprises, has been the first priority for supporting and facilitating recovery. Traveller confidence and demand can also be bolstered through the classification of accommodation facilities or innovative approaches to enhancing the profile of services offered (Trends and Policies in Tourism OECD, 2022).

Accommodation facilities are a key segment of the hospitality industry, providing temporary lodging for travelers, tourists, and other visitors (Cardella et al., 2021). They provide a variety of services to guarantee visitors' comfort and content (Della Volpi & Paulino, 2018). Their quality, trust in that quality, availability, and type directly influence tourists' decisions regarding destinations (Bullough et al., 2014), which aligns with their diverse preferences and needs (Hrgovic et al., 2021). The classification of hotels provides crucial information about the quality of the accommodation, enabling guests to immediately understand the types of services and amenities they can expect, thus simplifying the process of choosing and booking their accommodations (Sufi & Shojaie, 2018). The most common grading system uses stars, which serve as an

important marketing and differentiation tool. Most countries worldwide have their own systems, each with specific hotel rating requirements (Verheul et al., 2012). Global technological advancements offer opportunities to gain insights into the quality of accommodation facilities, and digital progress is indisputable in this context (Matusíkova et al., 2023). Facility labelling also helps establish clear, consistent, and transparent criteria for evaluating and grading accommodation facilities. It significantly impacts service quality, customer satisfaction, and market efficiency. This is crucial for several reasons relevant to supply, transparency, comparability, increased trust, and customer satisfaction, as well as demand in the accommodation services market through standardisation, quality improvement, marketing, positioning, regulation, and development (Senkova, 2020). It fosters competitiveness, innovation, and sustainable development within the accommodation services sector (Matusíkova & Sambronska, 2023).

Tourism enterprises must satisfy the growing desires and demands of hotel guests to thrive in industry. This is particularly true in turbulent times, characterised by the sophistication of tourism consumers and the need to guarantee the quality of service, which should be reflected in the appealing content of their websites (Eurolab, 2020; Beresecka, 2018; Beresecka, 2022).

Countries have developed classification systems to differentiate the level of quality of accommodation services provided, which are often supported by legislation. Decree No. 277/2008 Coll., which was enacted by the Slovak Republic, defined classification standards for lodging establishments when they were classified into several groups and classes; however, this decree was repealed in 2021. To enhance the transparency and competitiveness of Slovak accommodation establishments, the country is working to introduce a uniform classification system, the Hotelstars Union, which is already in use in 21 countries, including the V4 countries. The Hotelstars Union aims to create a unified hotel categorisation system so that the stars on hotels across Europe are comparable, transparent, and guarantee quality for guests, thereby strengthening the reputation of the hotel industry (Hotrec, 2021). The Slovak Republic wants to adopt a unified star system that is comparable to those of other European nations and their neighbours, particularly the Czech Republic and Hungary (Hotrec, 2021). On the other hand, Poland maintains its national hotel classification system. The Act of 29 August 1997 on hotel services and the services of tour guides and tour leaders, as well as the Regulation of the Minister of Economy and Labour of 19 August 2004 on hotel facilities and other establishments providing hotel services, define the categories and types of hospitality in Poland. This rule specifies the standards for hotel staff qualifications, equipment and furnishings in establishments, and the range of services—including catering services—that each facility must provide (Ozimek & Kozłowska, 2020).

An important communication and advertising tool for declaring the quality and branding of accommodation services is the website. Websites serve as the primary tool for performing several functions, such as attracting customers and strengthening brand image. Defining the function of a website determines which criteria are key to its effectiveness, such as appealing content, easy searchability, user-friendliness, and appropriate design (Karlícek and Kral, 2011).

This paper aims to highlight the significance, emotional perception, and potential for the branding of accommodation services in the context of the Slovak Republic and the V4 countries. This aim was supported by the formulation of the following hypotheses:

H1: There is a dependency between stays, certification, and branding.

H2: Some websites elicit greater emotional arousal than others do.

H3: Some websites elicit more positive emotional arousal than others do.

3. Methodology and research methods. For this study, various statistical tests were used, including Spearman's rank correlation coefficient, Pearson's chi-square goodness-of-fit test, experiments, emotional arousal analysis (electrodermal activity, EDA), emotional valence analysis, and eye-tracking analysis (Schwarz et al., 2009). The data sources had both quantitative (questionnaire) and qualitative (experiment) characteristics. The research was conducted in two stages. In the first phase, we investigated whether a participant in tourism chooses a hotel on the basis of its branding and whether this branding (certification, brand) influences their choice. On the basis of a sample obtained from a survey consisting of 478 respondents, we determined representativeness by gender. The questionnaire was distributed in a hybrid manner among students from three universities in the Slovak Republic who were enrolled in study programmes related to tourism. The survey was conducted from October 2023 to January 2024. For this study, a question was deliberately selected and processed that directly provides an answer to the first formulated hypothesis. There were 51.1% women and 48.9% men in the sample. Table 1 shows the representative sample, where we look for a dependency between the stays of guests in hotels and their certification or branding (star ratings). To test this hypothesis, we used Spearman's rank correlation coefficient and Pearson's chi-square goodness-of-fit test.

This section describes the procedures for gathering and analysing the data as well as the empirical foundations of the research. When presenting the findings of sociological research, the section ought to contain information on the organisation or individuals participating, the type of research, the period, the data range, the sampling error, and the methods (such as observations, interviews, experiments, and content analysis). It explains the techniques used, evaluates the sufficiency and dependability of the results, and lists databases and other statistical data sources.

Table 1. Representativeness of the ensemble

Test Statistics/criterion	Region	Gender
Chi-Square	3.804[a]	1.496[a]
df	7	1
Asymp. Sig.	0.802	0.221
a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 49.7.		a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 231.3.

Sources: Developed by the authors on the basis of the relationship between the certification and the length of time visitors spend in hotels (2024).

Given that this paper aims to deepen the emotional perception of accommodation service branding and contribute to existing knowledge about the importance of a company's website, various KPIs were established before the neuromarketing analysis of the websites. These included the number of galvanic skin response (GSR) peaks, valence ratings, and gaze distribution. In the second phase, an experiment was created on the basis of knowledge from the field of consumer neuroscience. This experiment was conducted in Q2 2024 under laboratory conditions with controlled temperature, noise, and lighting, capturing both the conscious and unconscious reactions of the research participants. Its objective was to ascertain whether there are discernible variations in how customers perceive various hotels' homepages. A homepage is the first page a person sees when opening a website and typically contains basic information about the site, navigation elements, or content features. Through the Booking platform, we worked with the websites of four hotels, as the Figure 1 shows. The selection criteria were as follows: 5-star hotels in the capital city of a given V4 state, with a customer satisfaction rating of more than 8 out of 10 points (very good) and located near the city centre. These hotels were as follows: Slovakia, the Sheraton in Bratislava; Poland, the Warsaw Marriott in Warsaw; Hungary, the Ritz–Carlton in Budapest; and the Czech Republic, the Julius in Prague. Screenshots of the hotel websites' homepages were the subject of neuroscientific examination. For this purpose, the following hypotheses were established:

H2: Some websites elicit greater emotional arousal than others do.
H3: Some websites elicit more positive emotional arousal than others do.
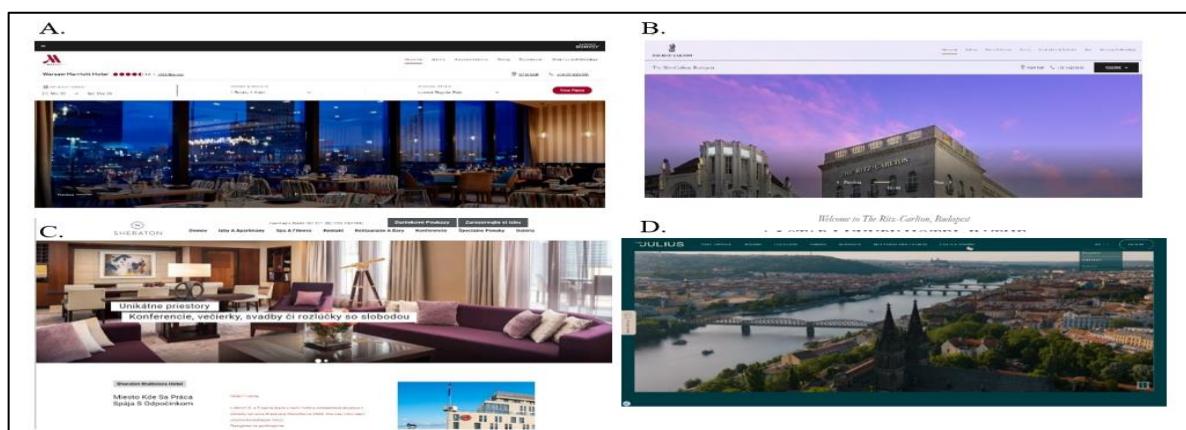

Figure 1. The homepages of the four hotels: Warsaw Marriott in Warsaw, Ritz-Carlton in Budapest, Sheraton in Bratislava and Julius in Prague
Sources: developed by the authors.

The study involved 16 respondents aged between 23 and 25 years. The sample size was determined with consideration of time and financial constraints while maintaining an emphasis on the quality and validity of

data collection, in line with Lawton & Wilson (2010). This method is based on the understanding that a sample size of 15–30 participants can generate statistically significant results, provided that consistency and sample characteristics are maintained, as noted by Mikalef et al. (2017), Brumberger (2022; 2023), and Li et al. (2018). A bibliometric analysis in the field by Alsharif et al. (2021) also indicates that the average number of participants in neuromarketing studies is often fewer than 20.

After an initial briefing, the websites were presented in random order to minimise the effects of first-choice preference, better recall of the beginning and end, or potential participant fatigue during the research. Each website was displayed to the respondent for 1 minute, allowing us to observe the point of interest, indicating when participants stopped studying the pages. A logitch camera was positioned at the top of the monitor and was observed by the participants to record their responses. The participants were also monitored via a SmartEye device for eye tracking and a Shimmer device for measuring skin conductance. All these devices were used to capture various physiological and neural responses.

To measure implicit reactions, a biometric measurement platform, which employs methods such as eye tracking, facial expression analysis, and biometric sensors, was used (Taggart et al., 2016). Multiple methods were employed for the measurements:

Analysis of emotional arousal (EDA) – electrodermal activity (EDA). In behavioural studies, this is a valid indicator of basic emotional arousal. The operation of the sympathetic nervous system (SNS), which is dependent upon physiological and emotional activation that takes place in our subconscious, is reflected in the activity of the EDA (Kołodziej, 2019).

The valence or hedonic tone of an event, thing, or circumstance is the intrinsic appeal or "goodness" (positive valence) or averseness or "badness" (negative valence). The phrase is also used to describe and classify particular emotions. For example, emotions that are typically associated with being "negative", such as fear and wrath, have a negative valence, but joy has a positive value. Positively rated things, occasions, or circumstances elicit favourable emotions. Therefore, valence reveals whether the person was in a happy, neutral, or negative mood when they were looking at the stimuli under study. The validity of our measures might vary from -100--100. A positive valence is more likely to occur when one smiles or raises one's cheeks. Raised eyebrows, frowning, nose wrinkles, upper lip raising, corner lip raising, chin raising, and lip pressing or puckering are among the cues that increase the probability of negative valence. Through the capture of minute facial expressions, these responses can be examined (Rasmussen, 2009).

The process of recording and analysing dynamic eye-tracking data—that is, eye-tracking data obtained in a changing environment—is known as gaze mapping. This allows for the identification of the gaze route and the creation of heatmaps to show the regions of an image that are most often viewed or the use of static areas of interest (AOIs) to extract eye-tracking statistics about the object (Darazs, 2021). With respect to the analysis of the gaze path, different data visualisation methods were used.

The general distribution of gaze points is shown in these visualisations. Usually, they are displayed as a colour gradient overlay over the stimulus or image that is being displayed. The colours red, yellow, and green indicate how many gaze points are focused on various areas of the image, in descending order. Heatmaps offer a straightforward way to rapidly identify which features draw more attention than others do. Heatmaps allow for the comparison of responses from individual participants as well as groups, which helps determine how various demographics could interpret the stimulus differently.

The main objective of this study was to ascertain how customer decision-making and emotional reactions are influenced by branding and hotel website homepages. This stage was split into two primary parts: an experimental study using neuromarketing technologies and a survey-based inquiry. The first section of the study examined how consumer choices for lodging are influenced by hotel branding, including certification (such as star ratings) and well-known brand names. The purpose of the second phase was to investigate how participants' interactions with the homepages of high-end hotels affect their emotional arousal and valence as well as their visual attention patterns. This method allows for thorough research on customer behaviour in the travel and hospitality sectors by addressing both conscious decisions (survey data) and unconscious, biometric responses (experiments).

In the first phase, 478 students enrolled in tourism-related studies at three Slovak universities participated in a survey. Students who were deemed relevant to the tourist business were chosen as responders, guaranteeing that the sample included people who would be interested in or involved in tourism services in the future. To learn more about customer preferences for hotel branding and certification, the survey combined quantitative methodologies (via structured questionnaires) with qualitative observations. The necessity of evaluating the strength and significance of associations between variables such as gender, hotel stays, and the

impact of branding led to the use of Pearson's chi-square goodness-of-fit tests and Spearman's rank correlation coefficient. These statistical instruments were chosen because they work well with ordinal data analysis.

Two theories were examined via biometric measures of emotions. According to an analysis of the combined data, participants first attempted to understand the pages holistically (see Nischal & Behrmann, 2023), but they soon switched to examining the image's constituent elements. The participants scanned the top right corner of each website they investigated, paying particular attention to the logo. They then read the page and its parts down and to the right, following the traditional Western reading pattern. Nonetheless, several noteworthy variations were also noted among the individual pages, and they are best explained via a qualitative analysis of the participants' perceptions of each page.

Several neuromarketing approaches, such as eye tracking, emotional valence assessment, and emotional arousal analysis (using electrodermal activity), were used in the second stage of the experimental study. Sixteen respondents between the ages of 23 and 25 provided data for this stage, which is deemed an appropriate sample size for neuromarketing studies on the basis of previous research in the field. Four preselected hotels – chosen for their 5-star rating, proximity to the city center, and excellent customer satisfaction ratings – were the subjects of participant interaction with their home pages. Using a SmartEye eye-tracking device and a Shimmer skin conductance device, physiological data were recorded in controlled laboratory settings as part of the study design. With the use of these instruments, the study was able to delve deeper than superficial inclinations and uncover subconscious affective and cognitive reactions to visual stimuli.

To ensure a higher response rate and a wider reach, the survey data were collected via a hybrid technique that combined online and in-person distributions. Students from tourism-related programs were chosen because, as future consumers and stakeholders in the sector, their viewpoints are especially important. The questionnaire's questions were specifically crafted to address the study's hypotheses explicitly to reduce bias and guarantee clarity. Enquiries concerning the function of hotel branding and certificates, for instance, provide quantitative data for statistical research in addition to qualitative observations.

For the experimental phase, the data-gathering procedure was designed to capture both conscious and unconscious reactions. Because eye-tracking and biometric techniques can measure emotional involvement and attention in real time, which are important markers in neuromarketing research, they were chosen for use in this research. On the basis of research demonstrating the substantial influence of initial impressions—which occur within seconds after seeing a webpage—on decision-making, the decision was made to display each hotel's homepage for one minute. To prevent prejudice, the homepage display order was randomly assigned, guaranteeing that no website profited from being displayed first or last. Furthermore, the laboratory's controlled atmosphere, which included adjusted lighting, temperature, and noise levels, reduced outside factors that might have had an impact on participant reactions.

4. Results. The following is revealed by the Tourist Trends and Policies Report, a global standard for assessing how well nations are encouraging competition, innovation, and tourist growth: In 2019, tourism in the Czech Republic directly contributed 2.9% to GDP and employed 4.4% of the total workforce. By 2020, this share of GDP is projected to decrease to 1.5%. The Czech Republic's tourism policy is based on its Tourism Development Strategy for 2021–2030, which prioritises "Supporting the Improvement of the Quality of Tourism Services" to move the country from 38th--30th place in the WEF Travel and Tourism Competitiveness Index by 2029 (OECD, 2022). In 2019, tourism in Hungary accounted for 9.5% of the country's workforce and 6.8% of the overall GVA. The nation's updated Tourism Strategy 2.0 highlights several other concerns, such as the need for unified destination branding, customised and targeted marketing channels, and quality enhancement (OECD, 2022).

According to the figures, Poland's tourist business was worth PLN 104.3 billion in 2020, a 26.4% decrease from 2019. When considering both direct and indirect effects, this amounts to an estimated 4.5% of Poland's GDP. The Ministry of Economic Development and Technology has started working on a new tourist strategy document, and the Tourist Development Programme has set goals for 2020.

In the Slovak Republic, the direct economic contribution of tourism has decreased to 1.2% of GDP (down from 2.8% in 2019). The country has revised the Sustainable Tourism Development Strategy 2030, which seeks to balance regional differences, increase the competitiveness of tourism, increase its potential, and generate new jobs (OECD, 2022).

All countries have experienced a reduction in the economic benefits from tourism. Therefore, it is necessary at all levels to leverage existing potential, including through the more aggressive visibility of enterprises and the level of services provided. The way hotels are marked reflects this and their star ratings,

which should be prominently displayed across all communication channels, including the website. To determine whether the choice and subsequently the stays in hotels are influenced by marking, certification, and branding, a hypothesis was defined. The results of the first hypothesis—that there is a dependency between stays and certification or branding—are displayed in the following table (Table 2).

Table 2. The link between stays and certification and brand based on Spearman test

	Criteria	O1certified	O2brand		Criteria	O1certified	O2brand
Stays abroad	Correlation Coefficient	0.027	0.045	Friends stay	Correlation Coefficient	0.030	0.033
	Sig. (2-tailed)	0.554	0.326		Sig. (2-tailed)	0.520	0.465
	N	478	478		N	478	478
Stays in SR	Correlation Coefficient	0.055	0.111*	Work stays	Correlation Coefficient	0.078	0.194**
	Sig. (2-tailed)	0.233	0.015		Sig. (2-tailed)	0.090	0.000
	N	478	478		N	478	478

Sources: Developed by the authors on the basis of respondents' stays (2024).

The relationship between the quantity of time spent overseas and whether certification ($p = 0.554$) or branding ($p = 0.326$) is important to respondents was not confirmed. The number of stays abroad does not influence whether certification or branding is important to respondents. There is low dependency (correlation coefficient = 0.111) between the number of stays in the home country (Slovakia) and branding ($p = 0.015$) and between the number of works stays (correlation coefficient = 0.194) and branding ($p = 0.000$). This finding indicates that the more stays at home and work-related stays respondents have, the more important branding becomes to them. The dependency between the number of stays with friends ($p = 0.520$) and work stays ($p = 0.090$) and the certification of the facility was also not confirmed.

For Page A, the maximum number of GSR peaks per minute recorded was 6, indicating low to moderate emotional activation. This maximum consistently occurred approximately halfway through the interaction with the page. In terms of emotional valence, Page A induced a real shift in the positive spectrum twice overall, although the magnitude of these shifts suggests that they were only very slight. Thus, the participants experienced positive emotions, but only mildly. Interestingly, as shown in Figure 2, positive emotions were followed by an increase in recorded GSR values, indicating that participants interacted with something that caused a smile on their faces and subsequently stronger emotional activation at an unconscious level. The recorded data, which the iMotions system assessed as signs of engagement (defined as a state where an individual shows positive emotional, cognitive, and behavioural connections with a specific activity, task, or overall environment), suggest that participants were most engaged at the beginning and again at the end of the interaction with the page, reflecting their interest throughout the interaction. This finding is corroborated by attention metrics, which, in essence, show sustained attention throughout the interaction period.

Figure 2. Monitored indicators for page A-from top: Valence, Recorded GSR peaks, Engagement, Sentimentality, Attention
Sources: developed by the authors.

For Page B, Figure 3 shows that emotional valence was negligible throughout most of the interactions with the homepage of Hotel B. The participants did not show any significant emotions, whether negative or positive, during the interaction. However, towards the end of the interaction, emotional valence increased significantly, indicating that participants exhibited very positive emotions toward their faces after the

interaction with Page B. Similarly, the level of engagement also rose during this period. These positive reactions were preceded by a brief display of sentiment, which may have triggered subsequent reactions that were assessed as positive on the basis of the idea that sentiment can be associated with positive emotions (Kim et al., 2013).
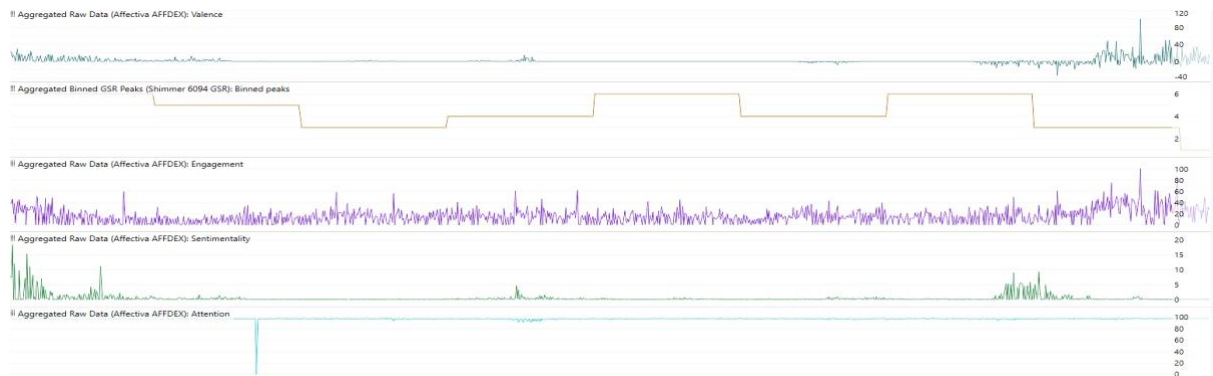

Figure 3. Monitored indicators for page B- from top: valence, recorded GSR peaks, engagement, sentiment, attention.
Sources: developed by the authors.

It can be seen in Figure 4 that when this positive sentiment and emotion were recorded, most of the participants interacted with the hotel's brand, the hotel's name displayed on its façade, or the hotel building itself. This opens a discussion about the potential positive impact of the brand and its representation concerning the hotel's architecture. The importance of brand knowledge and the impact that architecture has on consumer perception are both highlighted by this research. Strategic architectural design may improve brand identification and loyalty, according to the link between good emotional responses and a company's representation—whether through its name, logo, or physical presence (Boudreaux et al., 2019; Wiklund et al., 2019). The idea that architecture can serve as a nonverbal communication tool to reinforce brand identification and impact consumer behaviour is supported by several studies. It may create an experience that is more memorable and engaging for their guests by incorporating branding aspects into the structural architecture. Further research into hospitality marketing tactics is necessary since customer happiness and brand attachment may be significantly impacted by the alignment of brand architecture and aesthetics.
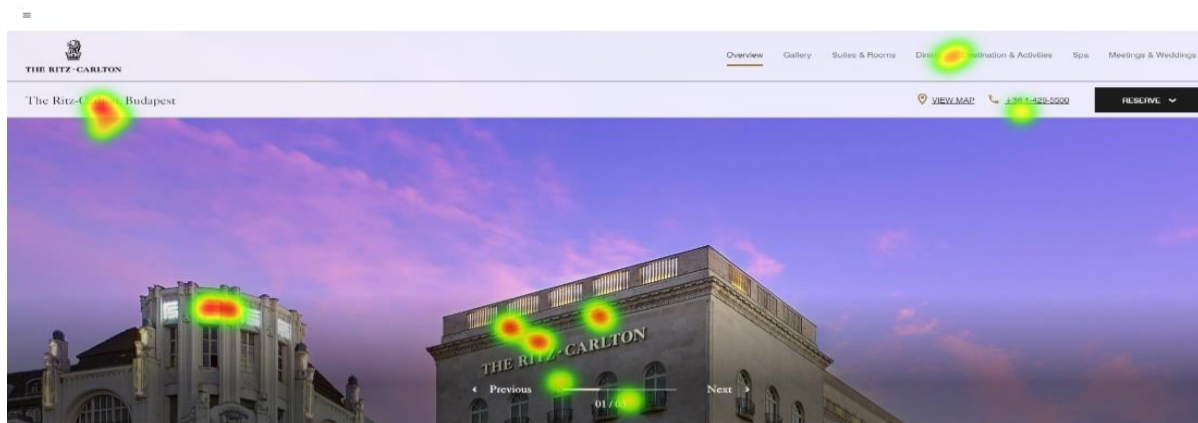
Welcome to The Ritz-Carlton, Budapest

Figure 4. Distribution of research participants' perspectives at moments when positive emotions were experienced
Source: Developed by the authors on the basis of heatmaps (2024).

For Page C, Figure 5 shows that engagement with the Hotel C website was very similar to that with website B, but there was no positive activation at the end of the interaction. In contrast, the values of emotional valence and the peaks of GSR were significantly different for website C. For website C, the maximum number of GSR peaks per minute was 25% greater, indicating stronger emotional activation on an unconscious level.
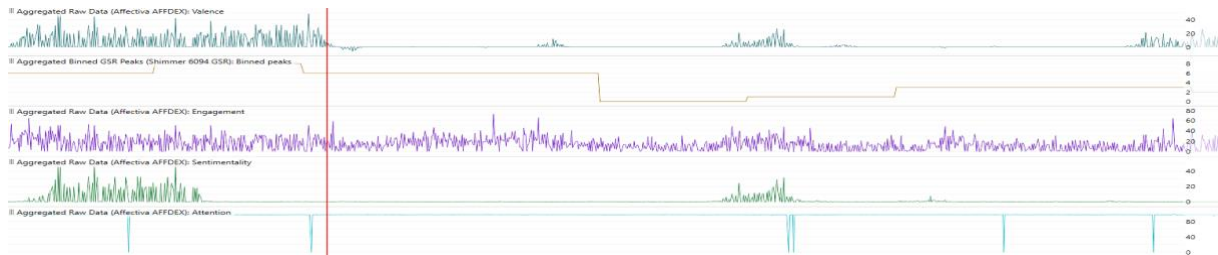

Figure 5. Tracked metrics for page C of mountain: Valence, recorded GSR peaks, engagement, sentiment, attention
Sources: developed by the authors.

The emotional valence values for website C were also significant, occurring in the first quarter of the interaction, which corresponds to the time when the maximum GSR peak values were recorded. Additionally, notable sentiment was observed at the beginning of the interaction. The participants reacted very positively to website C and this strong reaction tapered off approximately a quarter of the way through the interaction.

This pattern indicates that although participants were enthusiastic about Hotel C's website at first, as the interaction continued, they became less emotionally engaged. Both positive valence and GSR peaks show elevated emotional activity in the early stages, which could be interpreted as an attractive first impression that was not maintained throughout the encounter. Despite the initial strong response, this decline in positive activation may indicate that the website's design or content did not maintain users' interest or pleasure throughout the engagement.

The outcomes of website interaction D, as shown in Figure 6, appear particularly interesting. Similarly, significant emotional activation was represented by the GSR peak curve, as seen with website C, but this peak occurred not at the start of the interaction but at the end, followed by another similarly significant peak.

Figure 6. Monitored metrics for page D-mountain: Valence, recorded GSR peaks, engagement, sentiment, attention
Sources: created by the authors.

Website D elicited the most pronounced emotional activation, highlighting the importance of positive emotions displayed through both emotional valence and the engagement curve. Users' interaction with the hotel website D had a significant impact on their emotional activation. The strongest emotional responses were recorded at the end of the interaction, suggesting that the final elements of the website (e.g., content, visuals, or calls to action) may be key to a positive emotional impression. Positive emotions and high levels of engagement (involvement) were also shown to play a critical role in creating a strong emotional experience. Thus, it is important for hotel website design to focus on the closing sequences and on creating positive emotions throughout the interaction.

On the basis of the analysis of gaze distribution, we created heatmaps that reveal additional insights into the first 5 seconds of interaction with the websites.

It can be seen in the Figure 7, that the booking system on Page A captured the participants' attention significantly, and it was the only booking system present on that page. The participants were also drawn to the furniture depicted in the interior, which caused gaze distribution across the entire area.
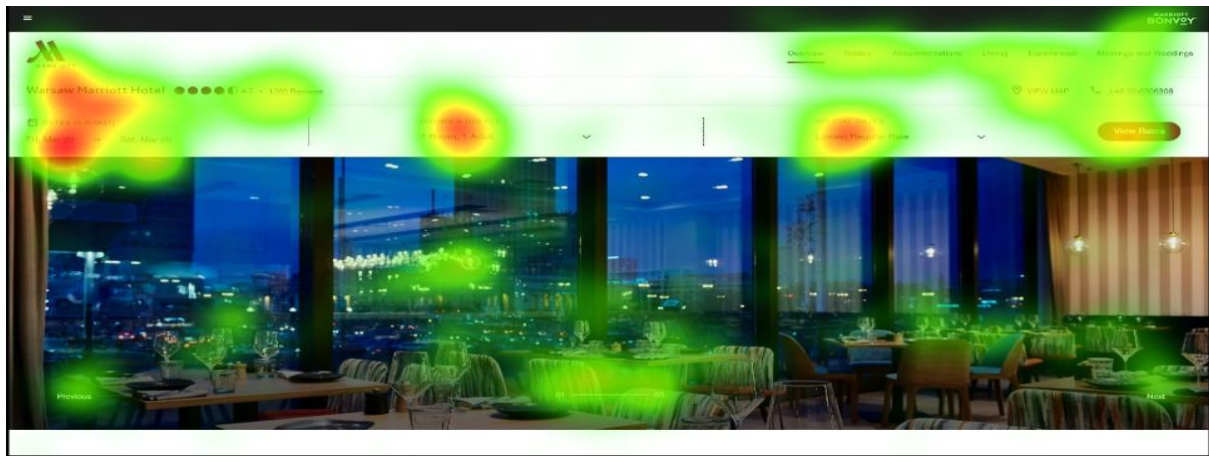

Figure 7. Heatmap of page A after five seconds of interaction
Source: Created by the authors on the basis of heatmaps (2024).

On Page B, as Figure 8 shows, we observe the clearest link between gaze and the hotel's brand, which can be considered very positive. Apart from a brief exploration of the interface, participants primarily engaged with the hotel and its brand in the first few seconds, which may have had a significant impact on recall. Interestingly, respondents were also attracted to visual and textual elements that directly communicated the hotel's values and identity, supporting the importance of strategically placing branded elements on the website. This strategy can have a positive impact not only on brand perception but also on visitors' emotional engagement.

Figure 8. Heatmap of page B after five seconds of interaction.
Sources: developed by the authors on the basis of heatmaps (2024).

For Page C, as Figure 9 shows, we identify similar behaviour, with the distribution of gaze not indicating any particular area that participants focused on more intensively. This phenomenon may suggest several possible conclusions: absence of visually dominant elements, lack of content hierarchy or low user engagement. Based on these observations, it would be advisable to re-evaluate the design of page C to identify elements that could take on a more visually dominant role, improve the content hierarchy to aid navigation and user focus, and add elements that would be more emotionally and visually impactful to visitors if the goal is to increase engagement.

Figure 9. Heatmap of page C after five seconds of interaction.
Sources: developed by the authors on the basis of heatmaps (2024).

It can be seen in the Figure 10, that the Page D heatmap results indicate that the distribution of gaze does not suggest any specific area where participants focused more intensely. The analysis of the heatmaps can be complemented by the observation that, in all the cases from Heatmaps A–D, the research participants focused primarily on the logo in the top right corner. This finding is noteworthy and has practical implications for designing websites for businesses, not only in the tourism sector.
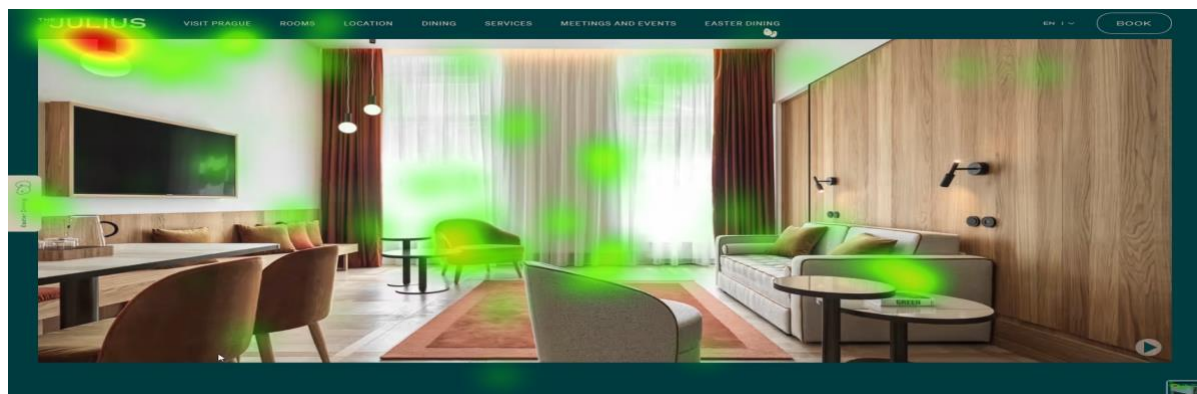

Figure 10. Heatmap of page D after five seconds of interaction.
Sources: developed by the authors on the basis of heatmaps (2024).

The heatmap analysis revealed interesting differences in how users responded to individual pages. It showed that a design that can effectively draw attention to specific elements has a big impact on how people remember and respond emotionally to a page. These findings only confirm how important it is to get the layout of content and visual elements right in order for a website to best serve its purpose.

5. Discussion. This paper seeks to answer questions about whether the choice of hotel accommodation depends on the accommodation's labelling through the number of stars, certification, or other indicators perceived as a guarantee of quality. It also explores how potential guests make decisions regarding accommodation selection, what is important to them, and what influences their consumer behaviour. To investigate customer responses, we utilised neuromarketing tools. Is this approach correct? Some experts believe that probing into customers' minds is unethical (Puchovsky & Kohoutova, 2015). Others argue that relying on traditional methods to gauge consumer opinions, which significantly depend on respondents' answers, is outdated. The responses obtained in this way cannot eliminate high levels of subjectivity, which is influenced by respondents' current attitudes, emotions, and other factors (Fugate, 2007). Renvoise & Morin (2007) suggested that it is necessary to replace conventional marketing methods with neuromarketing to answer questions about what customers want and prefer. The use of neuromarketing has been documented

concerning brands such as Christian Dior (Sasikova, 2013) and Coca-Cola (Kusa et al., 2014), among others. While the application of neuromarketing in marketing practice has been widely published and is largely focused on theoretical knowledge and brand-related applications, its use in tourism remains underexplored, making it difficult to generate discourse and comparisons on this topic. To contextualize the findings of this study, it is essential to compare them with insights from previous research. The results, which demonstrate that hotel branding—including star ratings and certifications—has a significant impact on consumer choice, align with existing literature on the influence of quality labels on consumer behavior. Soriano (2002), for example, discovered a positive correlation between hotel star ratings and customer expectations and satisfaction levels. This finding is consistent with our observation that visitors frequently view certification as a guarantee of quality. Furthermore, a 2003 study by Chon & Sparrowe (2003) highlights the notion that reputable branding and certifications increase consumer confidence in the hotel sector and emphasises the significance of these labels in decision-making processes.

Our study also shows how well neuromarketing techniques, including eye tracking and emotional arousal analysis, capture unintentional reactions from customers on hotel websites. This aligns with studies conducted by Vecchiato et al. (2011), which demonstrated that neuromarketing techniques may measure consumer responses to visual stimuli more precisely than conventional surveys. Research conducted in 2005 by Kenning & Plassmann highlighted the benefit of using neuromarketing to identify respondents' unconscious preferences that they may not be able to express. Even while our research adds to this expanding body of knowledge, it is still largely unexplored in the travel industry, which emphasises how new our method of using neuromarketing techniques for hotel branding is.

Furthermore, whereas neuromarketing has been widely used in industries such as consumer goods and fashion (Sasikova, 2013; Kusa et al., 2014), there is little evidence of its use in the travel and tourist industry. By concentrating on the tourist industry, our study broadens the application of neuromarketing's significance beyond product branding to service-oriented sectors such as hospitality and contributes to the scant literature on the topic. According to Renvoise & Morin (2007), neuromarketing gives advertisers a better grasp of consumer preferences and enables them to adjust their tactics in light of subliminal behaviour. The comparative research demonstrates that while neuromarketing in tourism is still emerging, our findings suggest that it holds enormous potential for improving marketing strategies and enhancing customer involvement in this industry.

6. Conclusions. The dependence between guests' stays in hotels and certification or branding (stars) using Spearman's rho and Pearson's chi-square tests of goodness-of-fit was not confirmed. In our neuromarketing study, we observed participants' responses to different websites to understand their emotional and cognitive processes during interactions. We employed various metrics, including the number of peaks in the GSR, valence ratings, and gaze distribution on the pages. We found that participants initially made a concerted effort to process the content holistically and then moved towards a more detailed analysis of individual components. The logo in the upper-right corner of the screen was the main focus of attention, moving rightward and downwards, corresponding with the typical reading direction in Western culture. Different reactions were recorded for each page. Page A elicited only mild emotional activation and slightly positive emotions. Page B did not evoke significant emotions on participants' faces for most of the interactions, although relatively strong indicators of emotional activation were recorded at an unconscious level. In contrast, Page B elicited very positive responses towards the end of the interaction. Page C caused significant emotional activation, but this reaction gradually decreased during the interaction. Page D prompted very strong emotional activation, although this occurred only towards the end of the interaction. The gaze distribution varied between pages, with some elements, such as the logo or specific design features, attracting more attention. For example, the reservation system on Page A and the hotel brand on Page B drew more attention from participants. These results show that different websites evoke different user reactions, which has important implications for design and marketing strategies. To determine which page was most successful in terms of evoked emotions and implicit reactions and their relationships, we compared these qualitative findings by averaging the obtained values. From these results, we can conclude that Page B elicited the most significant positive reactions on participants' faces and the strongest emotional activation of all the examined pages. Considering the close link between positive reactions and strong connections with the brand, the recorded emotions are even more significant. The second 'winner' of this experiment, on the basis of averaged data, was Page D, which evoked similar responses but to a lesser extent. Page C would be ranked third, having also evoked significant responses but only in the first quarter of the interaction, whereas Page D would be ranked last, as it engaged

participants with its booking portal but did not trigger an emotional response, suggesting a more rational reaction, which opens a discussion about the importance of emotions in brand connection.

The the selection and visit of hotels are not dependent on the number of stars or other ratings for tourism businesses. Potential tourism participants who choose accommodations through website visits base their decisions emotionally on the site's design. This is evidenced by the results, as the website for The Ritz-Carlton in Budapest, Hungary, was the most successful among the V4 countries' hotel websites in terms of evoked emotions and implicit reactions. It elicited the most significant positive reactions on participants' faces and the strongest emotional activation of all the examined websites. This insight opens up possibilities for employing new trend-based approaches in website design. On the basis of these early results, neuromarketing is important in the tourism industry since it can affect social and economic factors. While the social component focuses on producing and evoking a powerful emotional experience even before a visit, which can either directly or indirectly support sales, the economic component is concerned with the efficacy and efficiency of developing tourism business websites. Both the economic and social dimensions are significantly interrelated and complement each other.

Despite these contributions, it is critical to recognise this study's limitations. There is a lack of studies on neuromarketing and its use in the travel industry. The qualitative study focused on an in-depth understanding of participants' unique responses, paving the way for further research. Future studies could quantitatively validate these initial findings and explore their applicability to a broader population, potentially beyond Slovakia. Our findings are not universal and cannot be applied to the entire population without further investigation. The results may be influenced by specific contexts and participants' personal experiences, so caution should be exercised in generalising them. Nevertheless, this study adds a great deal to our current understanding and can provide a strong basis for further research in this field.

Using statistical techniques such as Spearman's rho and Pearson's chi-square tests, this study sought to ascertain whether certifications, such as star ratings, have an effect on hotel customers' decisions. No significant correlation between these qualifications and guest stays was found in our research. On the other hand, neuromarketing research has yielded valuable information regarding participant behaviour on hotel websites. Metrics such as emotional valence, gaze distribution, and the galvanic skin response were used to gauge emotional and cognitive reactions. The results of the investigation revealed that different website designs caused distinct emotional reactions. The most positive responses were produced on Page B (Ritz–Carlton, Budapest), followed by Page D. This suggests that rather than objective quality indicators such as star ratings, consumers' judgments may be more impacted by website design and emotional connection.

The tourist and hospitality sectors may be significantly affected by these findings. el companies should make their websites' emotional appeal a top priority as a fundamental component of their digital marketing strategy. Rather than depending exclusively on conventional branding or certification programs, investing in website design with an emphasis on emotional activation and the user experience may prove to be more successful. Policymakers in the tourist sector should think about promoting digital innovation in the sector and pushing hotels to use neuromarketing insights to improve their online presence. Additionally, as part of quality control procedures in the hotel industry, rules could be created to support emotionally charged website designs. Although our research advances knowledge about how tourists behave, several issues need to be taken into consideration. First, the findings' generalisability is hampered by the small sample size and narrow geographic emphasis (limited to Slovakia and a few chosen hotels). To confirm these preliminary findings, larger populations and various geographic settings should be investigated in future studies. Furthermore, as neuromarketing is still in its early stages in the travel sector, further studies could be conducted to evaluate its long-term effects on consumer behaviour and business success. Future studies should examine whether incorporating neuromarketing insights into online design is cost-effective from an economic and social perspective. Specifically, they should look into how emotionally charged digital content promotes long-term customer happiness and loyalty. The expansion of these findings may lead to more complete knowledge of the connection between social engagement and economic efficiency in tourism marketing.

Conflicts of interest: The authors declare that they have no conflicts of interest.

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Гетерогенність та емоційне сприйняття маркування туристичних послуг щодо розміщення
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Маркування послуг розміщення в туризмі має значний вплив на поведінку споживачів та процес прийняття рішень. Багато споживачів розглядають маркування як суб'єктивну гарантію якості наданих послуг і готові платити преміальну ціну, орієнтуючись на рівень якості, зазначений на цих маркуваннях. Основною метою цієї статті є висвітлення критичної важливості, емоційного сприйняття та потенційних наслідків маркування туристичних послуг розміщення в контексті Словацької Республіки та країн Вишеградської четвірки (V4). У дослідженні було використано поєднання вторинних даних та польових досліджень із застосуванням кількісних і якісних методологій. Аналіз даних включав як основні статистичні методи, так і більш складні, такі як аналіз траєкторії погляду, аналіз емоційної валентності та аналіз емоційного збудження. Ці методи, що належать до галузі біометричного вимірювання емоцій споживачів і нейронауки, є ключовими для отримання комплексного розуміння даних. Результати дослідження свідчать про те, що маркування послуг розміщення суттєво впливає на поведінку споживачів і має важливе значення для прийняття рішень щодо товарів, пов'язаних із туризмом. Постачальники туристичних послуг у різних країнах постійно шукають ефективні способи маркування послуг розміщення, які були б не лише уніфікованими та запам'ятовуваними, але й сприймалися як надійні індикатори якості послуг. Отримані в цьому дослідженні результати, досягнуті завдяки застосуванню відносно маловикористовуваних методів, значно розширюють розуміння важливості та значущості маркування послуг розміщення. Вони надають цінну інформацію про емоційні реакції, викликані різними типами позначень, визначають внутрішню привабливість різних елементів маркування та висвітлюють індикатори емоційного збудження. Крім того, дослідження підкреслює важливість стратегічного розміщення маркування у сервісному середовищі, використовуючи аналіз траєкторії погляду та створення теплових карт для демонстрації того, як помітно розміщене маркування може впливати на сприйняття та залученість споживачів. Це розуміння надає практичні рекомендації для розробки більш ефективних маркувань послуг розміщення в туризмі та маркетингових стратегій.

Ключові слова: біометричне вимірювання; емоційні реакції; маркування; розміщення; нейронаука; туристична індустрія.