

4. МАКРОЕКОНОМІЧНІ МЕХАНІЗМИ

DOI: <https://doi.org/10.32782/mer.2024.103.09>

UDC 338.48:339.138

ANALYSIS OF CHANGES IN SENSORY PREFERENCES OF TOURISTS UNDER MARTIAL LAW

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The study of changes in sensory preferences of tourists under martial law is important both for understanding the impact of military conflicts on people's psychology and behaviour, and for developing strategies for managing the tourism industry in conditions of instability and crisis. The aim of the study is to analyse the changes in tourists' sensory preferences due to the effects of the Russian-Ukrainian war. Two sociological surveys were used to analyse and draw conclusions on the changes in the sensory preferences of tourists in connection with the large-scale invasion of Russia. The first survey was conducted in November-December 2021 and January 2022, the second in September and October 2023, which was a continuation of the first. A chi-squared test was calculated to confirm the hypothesis of a difference in the answers given by respondents before and during the war. Confirmation of the hypothesis allowed to prove that when developing tourism products, companies should take into account changes in the sensory preferences of tourists. The study showed significant changes in the choice of tourist options by travellers under the influence of sensory sensations that were formed during the Russian-Ukrainian war. The cost of travel has become more important, cultural and walking tourism has lost popularity, while extreme and gastronomic tourism has gained popularity. Aromas and tastes have a greater impact on travellers' associative memory, while visual impressions remain important, with historical themes becoming more popular. It was concluded that the sensory preferences and emotional reactions of travellers differ significantly by age. Younger respondents (under 16 years old) prefer food and music the most, while the older group (over 50 years old) prefers cuisine, tastes and appearance. It is clear that tourism businesses need to adjust their services and marketing strategies to take into account these age-specific characteristics and differences in tourists' reactions to sensory stimuli. Tourism businesses can use the findings of this study to adapt their marketing strategies and tourist offerings to the changing sensory preferences and needs of tourists caused by the military conflict. This will allow them to attract and retain customers even in times of insecurity, instability and crisis.

Key words: tourist, sociological survey, sensory system, sensory marketing, tourist trip, chi-squared test.

JEL Classification: D87, M30, Z13, Z33

Problem statement. Military conflicts and global tensions always have a significant impact on all aspects of public life, including the tourism industry. In times of instability and hostilities, not only do political and economic realities change, but so do the sensory experiences of people seeking ways to relax and escape the negative effects of conflict. Therefore, it is necessary to adapt marketing strategies and approaches to attract and retain tourists under conditions of military threat.

Neuromarketing, the study of how the human brain and sensory systems respond to marketing stimuli, is becoming an extremely important tool for analysing and influencing the tourism market in wartime. Neuromarketing is becoming a necessary tool for understanding and adapting to changes in the sensory experiences and preferences of

tourists seeking safe and interesting recreational opportunities during wartime conflicts. By considering this aspect, it is possible to identify the opportunities and challenges that arise in the field of wartime tourism and to develop marketing strategies that correspond to the new reality and satisfy the needs of modern tourists.

Studying the changes in sensory preferences of tourists under martial law is important both for understanding the impact of military conflicts on people's psychology and behaviour and for developing strategies for managing the tourism industry in times of instability and crisis.

This paper analyses the impact of military conflict on the sensory preferences and psycho-emotional state of tourists. Given the small number of studies in this area, this research opens a new area of research in the field of

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tourism, which allows to deepen these aspects in the context of military threats. The study is aimed at identifying opportunities to adapt marketing strategies to changes in sensory preferences and psycho-emotional states of tourists under martial law.

Analysis of recent research and publications. The topic of analysing changes in the sensory preferences of tourists under martial law is becoming relevant in the context of the impact of war on tourism [1] and relations between countries [2]. As noted by researchers (A. Kozłowski [3], K. Tomej et al. [4]), such circumstances can significantly change tourists' choices, preferences and demand for specific types of tourism services and destinations. Research in this area includes an analysis of the impact of military conflict on tourist demand for certain regions [1], changes in their sensory preferences [5], and the identification of possible changes in tourist consumer behaviour due to military circumstances [6]. This type of research takes into account factors such as changes in preferences for holiday destinations, types of tourism, food preferences, choice of active or passive forms of recreation, etc. in the context of military conflict (K. Grunert et al. [6], S. Dolnicar and S. McCabe [7], E. Marijnen [8], L. Plzáková and E. Smeral [9]).

Formation of the objectives of the article (task statement). The purpose of the study is to analyse changes in the sensory preferences of tourists under martial law.

Summary of the main research material. Martial law is not only about military action and casualties, but also has a significant impact on people's daily lives, leading to a drastic change in their way of living and adapting to new realities. Under such difficult circumstances, the needs and priorities of the population are redefined to ensure their own security and survival. One of the visible changes is a rethinking of what is considered most important to a person. Analysing the sensory preferences of tourists in the context of the Russian invasion can help to understand a wide range of factors that influence the tourism and travel choices of people under martial law.

On the basis of two sociological studies, it was analysed and conclusions were drawn about what changes occurred in the sensory preferences of tourists in connection with the large-scale invasion of Russia. The first survey was conducted in November-December 2021 and January 2022 [10; 11], the second in September and October 2023, which was a continuation of the first. The only restriction on the selection of respondents was residence in the Lviv Oblast. The survey was conducted online, the questionnaire was sent to potential respondents via e-mail and social networks.

In order to find the sample size with the required level of accuracy using the random sampling method, in both cases, the Slovin formula was used [12]:

$$n = \frac{N}{1 + Ne^2}, \quad (1)$$

where n is the sample size; N – total population; e is the acceptable error value.

Since the study was conducted in the Lviv Oblast, the population of this region was chosen as the general population, which amounted to 2,476,113 people according to the Ministry of Finance of Ukraine [13]. As for the margin of error, the reliability level was assumed to be 93%, and the margin of error was $7\% = 0.07$.

$$n = \frac{2476113}{1 + 2476113 \cdot 0,07^2} \approx 204 \text{ (respondents)}.$$

us, with a margin of error of 7%, the minimum sample size should be 204 respondents. The first survey involved 234 respondents. The second survey involved 238 respondents.

After receiving the results of both questionnaires, the null hypothesis was put forward that the respondents' answers differed. The chi-squared test was calculated to confirm or reject this statement.

Excel and its built-in CHITEST function were used to perform this calculation, which is used to return a value from the chi-squared (χ^2) distribution with the appropriate degrees of freedom and for statistics. This test is commonly used to determine or verify hypothetical results of an experiment [14].

The chi-squared test calculates the χ^2 statistic according to the Formula 2 [14]:

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e}, \quad (2)$$

where f_o is a set of observed frequencies;

f_e is the generation of a set of expected frequencies.

The chi-squared statistic shows the extent to which the results are consistent with the null hypothesis. In other words, the CHITEST function calculates the probability that the calculated statistical value of χ^2 is as large as the value calculated by formula 1 and could have appeared by chance under the assumption of independence.

The survey questions, respondents' answers, and the results of the chi-squared test are shown in Tables 1-2. Tables 1-2 show how many respondents should have answered the second survey if the results had not differed, but it was already apparent at this stage that the results were different. The calculation of the chi-squared test for each question confirms the previous hypothesis that the data from the two surveys differ significantly, as the test scores are zero or close to zero. This confirms the fact that it is advisable to analyse how tourists' sensory preferences have changed.

According to the results of sociological research, it can be concluded that due to the Russian-Ukrainian war, the cost of a trip has become much more important when choosing a tour (25% more respondents chose this position, while the importance of emotions has decreased). In terms of leisure activities, cultural (-35%) and hiking (-14%) are losing popularity, while extreme (+11%) and gastronomic (+27%) are gaining popularity. When travelling, aroma (+22%) and food (+13%) have become more important to travellers than appearance and tactile sensations. This indicates that the influence of the olfactory and gustatory sensory systems on decision-making when choosing a travel service has increased. Respondents indicated that

Table 1 – Survey results of respondents in Lviv Oblast

QUESTION	ANSWER OPTION	NUMBER OF RESPONSES TO THE QUESTIONNAIRE 1	NUMBER OF RESPONSES TO THE QUESTIONNAIRE 2	ABSOLUTE DEVIATION	RELATIVE DEVIATION, %	PERCENTAGE OF RESPONSES TO QUESTIONNAIRE 1 TO THE TOTAL NUMBER OF RESPONDENTS, %	PERCENTAGE OF RESPONSES TO QUESTIONNAIRE 2 TO THE TOTAL NUMBER OF RESPONDENTS, %	NUMBER OF RESPONSES TO THE QUESTIONNAIRE 2 FOR THE NULL HYPOTHESIS	CHI-SQUARED TEST
What are you guided by when choosing a tour?	tour uniqueness	126	125	-1	-0.43	53.85%	52.52%	135.69	0.0000
	price	108	168	60	25.64	46.15%	70.59%	116.31	
	emotions that a tour can cause	144	112	-32	-13.68	61.54%	47.06%	155.08	
	duration	72	99	27	11.54	30.77%	41.60%	77.54	
	other	18	0	-18	-7.69	7.69%	0.00%	19.38	
What type of recreation do you prefer?	extreme	72	98	26	11.11	30.77%	41.18%	71.75	0.0000
	cultural	234	152	-82	-35.04	100.00%	63.87%	233.19	
	shopping tour	72	97	25	10.68	30.77%	40.76%	71.75	
	hiking	162	127	-35	-14.96	69.23%	53.36%	161.44	
	gastronomic	36	100	64	27.35	15.38%	42.02%	35.88	
What is important to you when travelling and touring?	appearance and design	216	126	-90	-38.46	92.31%	52.94%	189.00	0.0000
	musical accompaniment or sound effects	72	83	11	4.70	30.77%	34.87%	63.00	
	surrounding aromas	54	85	31	13.25	23.08%	35.71%	47.25	
	food and its taste	72	124	52	22.22	30.77%	52.10%	63.00	
	possibility of touch and tactile exploration	162	86	-76	-32.48	69.23%	36.13%	141.75	
	hard to say	0	42	-42	-17.95	0.00%	17.65%	0.00	
What brings you the most positive emotions?	attractive appearance of the hall and its architecture	234	153	-81	-34.62	100.00%	64.29%	225.93	0.0000
	soft background music that adds to the atmosphere	72	97	25	10.68	30.77%	40.76%	69.52	
	pleasant and light aroma	108	85	-23	-9.83	46.15%	35.71%	104.28	
	material and texture of furniture and fabrics	90	71	-19	-8.12	38.46%	29.83%	86.90	
	cuisine	18	98	80	34.19	7.69%	41.18%	17.38	
	landscapes, architecture and design	216	83	-133	-56.84	92.31%	34.87%	219.69	
accompanying aromas	0	56	56	23.93	0.00%	23.53%	0.00		
unique dishes and flavours	18	69	51	21.79	7.69%	28.99%	18.31		
melodies and sounds	0	16	16	6.84	0.00%	6.72%	0.00		
tactile sensations	0	14	14	5.98	0.00%	5.88%	0.00		

Source: compiled and calculated by the authors

Table 2 – Survey results of respondents in Lviv Oblast to identify changes in sensory preferences

Question	Answer option	Number of responses to the Questionnaire 1	Number of responses to the Questionnaire 2	Absolute deviation	Relative deviation, %.	Percentage of responses to Questionnaire 1 to the total number of respondents, %.	Percentage of responses to Questionnaire 2 to the total number of respondents, %.	Number of responses to the Questionnaire 2 for the null hypothesis	xi-squared test
What impressed you the most from what you saw? (visual sensory system)	architecture	234	142	-92	-39.32	100.00%	59.66%	190.98	0.0000
	landscapes	180	138	-42	-17.95	76.92%	57.98%	146.90	
	cultural sights	144	70	-74	-31.62	61.54%	29.41%	117.52	
	room designs	108	112	4	1.71	46.15%	47.06%	88.14	
	historical scenes	36	86	50	21.37	15.38%	36.13%	29.38	
	folk dress	54	69	15	6.41	23.08%	28.99%	44.07	
Do you like music while travelling in transport? (auditory sensory system)	Yes, I do. In any form	72	40	-32	-13.68	30.77%	16.81%	73.23	0.0000
	Yes, I do. If it's a calm tune	36	86	50	21.37	15.38%	36.13%	36.62	
	Yes, I do. If music is playing in the background to create an ambience	126	69	-57	-24.36	53.85%	28.99%	128.15	
	No, I don't like music	0	43	43	18.38	0.00%	18.07%	0.00	
What flavors do you prefer? (taste sensory system)	spiciness	126	83	-43	-18.38	53.85%	34.87%	126.00	0.0000
	salinity	144	169	25	10.68	61.54%	71.01%	144.00	
	sweetness	162	127	-35	-14.96	69.23%	53.36%	162.00	
	sourness	36	68	32	13.68	15.38%	28.57%	36.00	
	astringency	36	71	35	14.96	15.38%	29.83%	36.00	
	balance	108	84	-24	-10.26	46.15%	35.29%	108.00	
Do you like the presence of fragrance in the room? (olfactory sensory system)	bitterness	18	28	10	4.27	7.69%	11.76%	18.01	0.0000
	Yes, I do. I like pleasant smells	90	141	51	21.79	38.46%	59.24%	91.54	
	Yes, I do. I like unobtrusive fragrances	144	55	-89	-38.03	61.54%	23.11%	146.46	
What is a necessary element of touch for you? (touch sensor system)	No, I don't like the presence of any extraneous smells	0	42	42	17.95	0.00%	17.65%	0.00	0.0000
	material from which the product is made	180	111	-69	-29.49	76.92%	46.64%	151.20	
	texture	108	141	33	14.10	46.15%	59.24%	90.72	
	temperature	18	70	52	22.22	7.69%	29.41%	15.12	
	surface	144	56	-88	-37.61	61.54%	23.53%	120.96	

Source: compiled and calculated by the authors

attractive appearance and architecture evoke fewer positive emotions (-34%), while background music (+10%) and cuisine (34%) add more positive emotions. Visuals (architecture and design) are the most memorable, but aromas (24%) and flavours (21%) have significantly increased their impact. From the above, it can be concluded that after a year and a half, the respondents' opinions differ greatly, but their associative memory is still most influenced by visual sensations, while olfactory and gustatory sensations have significantly increased their impact on the traveller's associative memory.

It was analysed which psycho-emotional neuromarketing technologies are most appropriate to use to influence each of the five sensory systems of tourists. In terms of visual technologies, architecture and landscapes are

important to travellers, but historical stories have become much more popular (+21%). Analysing the results of the survey on music, one can say that it is acceptable to all respondents, but according to the second survey, most respondents began to prefer calm melodies. As can be seen from the results, sweetness (71%) and saltiness (53%) are the most acceptable to respondents, followed by balance (35%) and spiciness (34%). Pleasant flavours are liked by the majority, but the second study showed that about a sixth of respondents have a negative attitude to flavours. In addition, the survey showed that texture has become more important, overtaking the choice of product material among respondents.

Figure 1 shows that for respondents under the age of 16, the least important factors are those affecting the

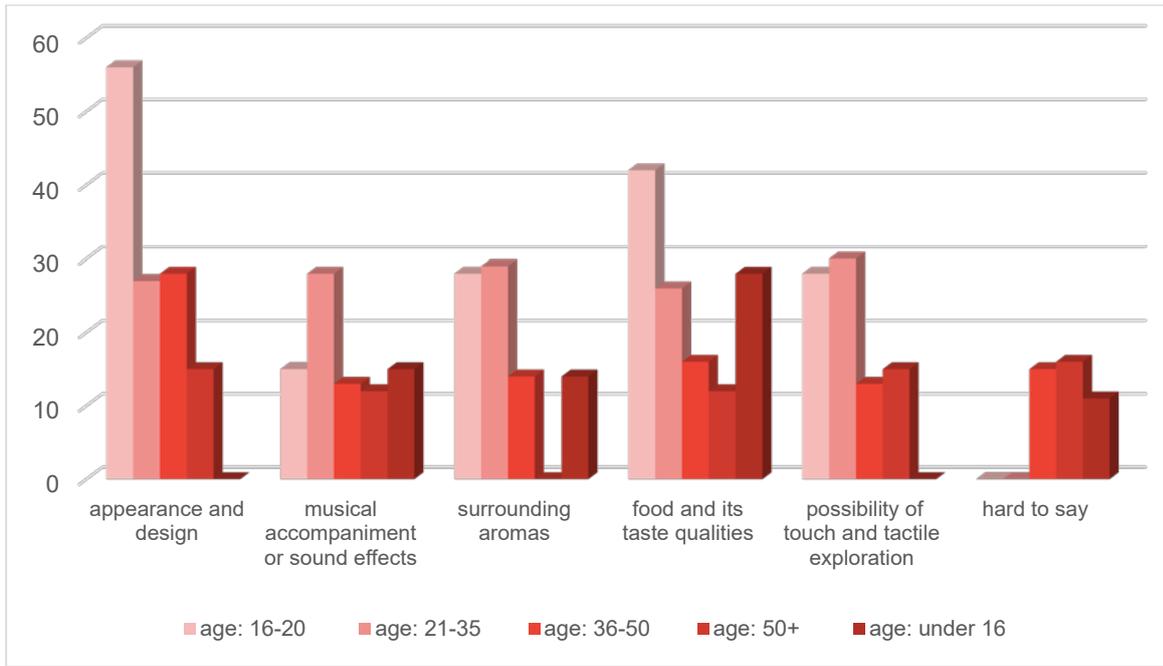


Figure 1 – Distribution of respondents' answers about the components that are important during tourist trips, %

Source: compiled by the authors

visual and tactile sensory systems, and the most important include food. Respondents aged 16-20 highlighted appearance and food as important; 21-35 years old equated all sensations in terms of importance; 36-50 years old highlighted the elements of influence on the visual system the most. Respondents aged 50 and above rated everything at

about the same level, with the exception of aromas, which they did not prefer.

Figure 2 shows that respondents under the age of 16 are most emotionally affected by the kitchen. Respondents aged 16-20 experience the greatest emotional impact from attractive appearance and architecture, followed

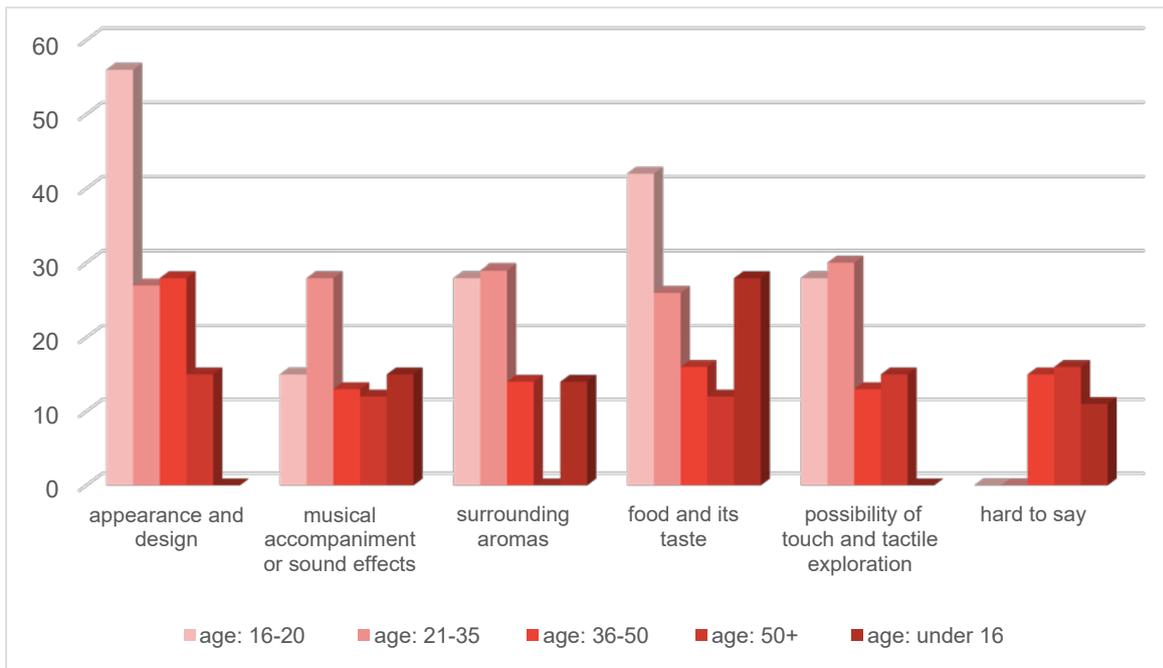


Figure 2 – Distribution of respondents' answers regarding what causes the most positive emotions during tourist trips, %

Source: compiled by the authors

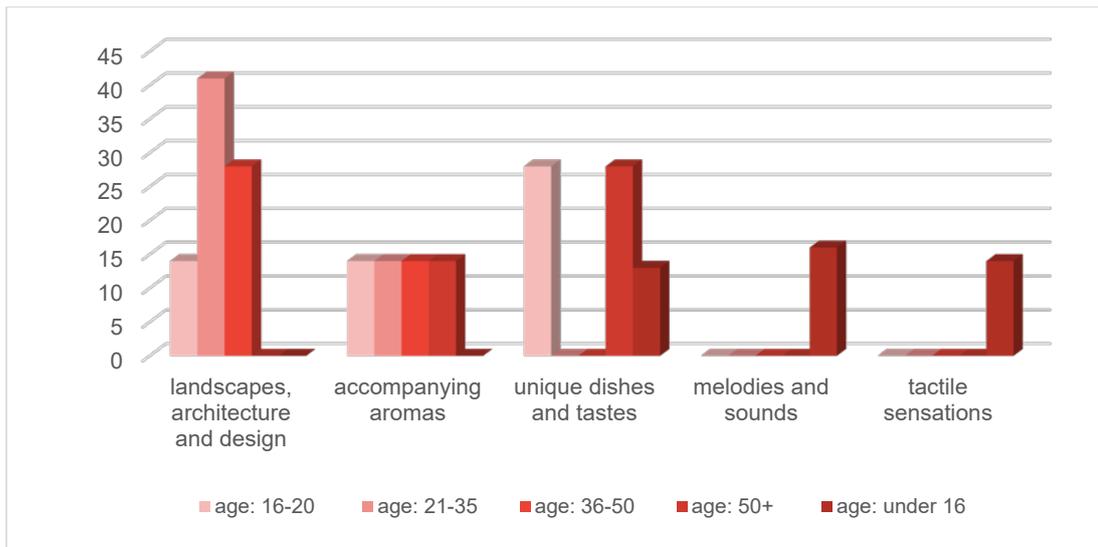


Figure 3 – Distribution of respondents' answers about what was the most memorable during their tourist trips, %

Source: compiled by the authors

by material and texture and cuisine. Respondents aged 21-35 identified elements of technology that affect the visual and auditory systems based on emotional feelings, ignoring the tactile system. People aged 36-50 have the most positive attitude towards architecture, but do not single out cuisine and aroma. Respondents over the age of 50 prefer the cuisine.

Figure 3 shows that aromas are remembered equally strongly by all age groups, except for respondents under 16. Melodies and tactile sensations were chosen only by respondents under the age of 16. Unique dishes and tastes were distinguished by the following age groups: under 16, 16-20 and over 50. Landscapes, architecture and design were most memorable for respondents aged 16 to 50.

The study of sensory preferences and psycho-emotional reactions of tourists during the war revealed important changes in their priorities and wishes. Studying changes in sensory preferences of tourists in the context of military conflicts is key to understanding the impact of such events on the tourism industry, the psychological state and safety of travellers, as well as to developing strategies for managing the tourism industry in times of instability and crisis.

Conclusions. Thus, the study shows significant changes in the choice of travel options by travellers under the influence of sensory experiences that have been formed in the context of the Russian-Ukrainian war. The cost of travel has become more important, cultural and walking tourism has lost popularity, while extreme and gastronomic tourism has grown in popularity. Aromas and tastes have a greater impact on travellers' associative memory, while visual impressions remain important, with historical themes becoming more popular. From the data obtained, it can be concluded that the sensory preferences and emo-

tional reactions of travellers differ significantly depending on the age groups. Younger respondents (under 16 years of age) prefer food and music the most, while the older group (over 50 years of age) prefers cuisine, flavours and appearance. It is clear that tourism businesses should adjust their services and marketing strategies to reflect these age-specific characteristics and differences in how tourists respond to sensory stimuli.

Changes in tourist preferences during the war indicate the need for tourism businesses to adapt to new realities. Businesses should actively respond to these trends by offering more gastronomic and extreme tourism offers, as well as paying more attention to aromas and flavours to create unforgettable experiences. Thanks to neuromarketing and approaches that allow influencing the sensory preferences and psycho-emotional context of tourists, businesses can create more effective and adapted offers that are relevant to the conditions of military conflicts. This can be crucial for the recovery of the tourism industry and ensuring the safety and satisfaction of tourists during their most vulnerable periods.

Tourism businesses can use the findings of this study to adapt their marketing strategies and tourism offerings to the changing preferences and needs of tourists due to the military conflict. This will allow them to attract and retain customers even in times of insecurity. The use of neuromarketing technologies will allow businesses to create more effective marketing campaigns that better match the sensory preferences and psycho-emotional states of tourists. This can increase the success of marketing initiatives and lead to increased profitability. The ability of the tourism industry to adapt to unstable conditions, such as military conflicts and wars, is important.

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АНАЛІЗУВАННЯ ЗМІН СЕНСОРНИХ УПОДОБАНЬ ТУРИСТІВ В УМОВАХ ВОЄННОГО СТАНУ

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Дослідження змін сенсорних уподобань туристів в умовах воєнного стану є важливим як для розуміння впливу військових конфліктів на психологію та поведінку людей, так і для розвитку стратегій управління туристичною галуззю в умовах нестабільності та кризи. Метою дослідження є аналізування змін сенсорних уподобань туристів, зумовлених впливом російсько-української війни. На базі двох соціологічних досліджень проаналізовано та зроблено висновки про зміни, які відбулися в сенсорних уподобаннях туристів у зв'язку з широкомасштабним вторгненням росії. Перше опитування проводилося у листопаді-грудні 2021 року та січні 2022 року, друге – у вересні та жовтні 2023 року, яке стало продовженням першого. Для підтвердження гіпотези про відмінність у відповідях респондентів, наданих до початку війни та під час війни, розраховано хі-квадрат тест. Підтвердження гіпотези дозволило довести, що при розробленні туристичних продуктів компаніям варто враховувати зміни сенсорних уподобань туристів. Дослідження показало значні зміни в виборі туристичних опцій мандрівниками під впливом сенсорних відчуттів, які сформувалися в умовах ведення російсько-української війни. Вартість подорожі стала важливішою, культурний і піший туризм втратили популярність, а екстремальний і гастрономічний туризм зросли в популярності. Аромати та смаки формують більший вплив на асоціативну пам'ять мандрівників, а зорові враження залишаються важливими, зокрема історичні сценки стали популярнішими. Зроблено висновок, що сенсорні вподобання та емоційні реакції подорожуючих значно змінюються залежно від вікових категорій. Молодші респонденти (менше 16 років) віддають найбільше переваги їжі та мелодії, в той час, як старша група (більше 50 років) – кухні та смакам і зовнішньому вигляду. Зрозуміло, що туристичні підприємства повинні підлаштовувати свої послуги та маркетингові стратегії, враховуючи ці вікові особливості та відмінностей у реакціях туристів на сенсорні подразники. Бізнеси в галузі туризму можуть використовувати результати цього дослідження для адаптації своїх маркетингових стратегій та туристичних пропозицій до змін сенсорних уподобань та потреб туристів, зумовлених воєнним конфліктом. Це дозволить їм залучати та утримувати клієнтів навіть під час небезпеки, нестабільності та кризи.

Ключові слова: турист, соціологічне опитування, сенсорна система, сенсорний маркетинг, туристична подорож, хі-квадрат тест.

Стаття надійшла до редакції 15.01.2024

The article was received January 15, 2024

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