
Neurotourism and national tourism promotion: a thematic analysis of the Turkish tourism market based on neuroscience

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Abstract: Given the complex biological structure, people act with their emotions and minds. Understanding emotions, neuromarketing focuses on the problem of capturing rationality. This study aims at determining the symbols and music enabling creation of the ‘Turkey’ brand in tourism, revealing these symbols effects and music in tourists’ mind within this rationality framework. Accordingly, electroencephalography (EEG) and eye tracking devices from neuroscience tools and 21 themed tourism promotion films prepared by Turkish Republic Ministry of Culture and Tourism were analysed considering view number on different dates. Results revealed that music, human figures, and symbols used in promotional films affect people’s attention. The limited number of experimental studies on the subject in Turkey and high cost of experimental studies concerning the neuroscience tools are the main constraints for the researchers in the field. In this respect, the related study is of high importance.

Keywords: neurotourism; neuromarketing; eye tracking; EEG; electroencephalography; tourism promotion.

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1 Introduction

The tourism sector makes great contributions to power generation in the economy. Supply providers in the sector have tended to understand the wishes and needs of tourists to push the tourists, who are consumers for themselves, to purchasing behaviour. The way to convey that they understand the wishes and needs of the consumer is through

promotional films. The most important difference between touristic products and products that come off the production line is that they are consumed where they are produced. While marketing touristic products, in a sense, dreams and expectations are sold to tourists. In general, it is difficult to sell dreams and expectations to consumers and to achieve this, promotional films are supported.

Kotler, while conveying the transformation of marketing, expresses the process as product-oriented (1.0), consumer-oriented (2.0), and person-oriented (3.0). We are currently living through the value-based marketing 3.0 process, which defines the consumer as an individual (people with a soul, heart, and mind). Understanding the ‘individuality’ of the consumer is possible by reaching his mysterious “black box”, that is, the depths of his brain. The brain creates behaviours by processing the stimuli it receives from the five sense organs within its system with certain encodings. The way to learn which behaviours are triggered by the data received from these senses is to read the brain. This reading is possible with neuroscience tools. Neuroscience tools are the way to reveal the real effect of promotional films aimed at stimulating subconscious thoughts and emotions that will push consumers to purchase touristic products (Kotler, 2011, p.16; Lindstrom, 2008, p.13).

In this study, the most watched ‘This is Maximum Istanbul!’ and “Turkey’s Turquoise Coast from the Air” were analysed using neuroscience tools. The effects of these promotional films on tourists in Turkey’s branding process were examined. In the experiment performed with electroencephalography (EEG) and eye tracking devices, It is aimed to determine the visual impact of two videos prepared by the T.C. Ministry of Culture and Tourism for the promotion of Turkey, to determine which regions of the visuals prepared for the promotion of Turkey by the volunteer participants are most focused on, and to determine the effect of the visuals on the participants. For this purpose, the points that tourists focus on in their promotional films and the electrical currents in their brains during this focus were examined. With these examinations, the behaviours of the tourists were interpreted, interpreted and evaluated, and concluded, and suggestions were made as a result of the situations encountered during the research process and the results obtained.

2 Conceptual framework

2.1 Neuromarketing

Neuromarketing is a new approach that has gained the function of creating a marketing strategy by using neuroscience techniques. Neuroscience references neural networks to explain the complexity of certain mental phenomena (memory, perception, information processing, cognition, etc.). Neural networks are divided into dendrites, which receive information from other nerve cells, that is, learn it, and axons, which are sources that transfer information to other nerve cells. However, all nerve cells are involved in information transmission (Utkutuğ, 2014, p.61). Neuromarketing benefits from psychophysiology along with neuroscience. Psychophysiology, in its most general definition, is a discipline located at the intersection of psychology and medical science

that reveals the relationship between the human brain and body (Adasal, 1977, p.107). In neuromarketing research, psychophysiology helps to understand the type of relationship between mental and bodily processes by measuring the physiological responses of the consumer as a result of their physiological control (Oyman, 2020, p.61).

Neuromarketing is defined as the equivalent of marketing in brain processes, that is, the path to the consumer's black box, the brain (Yücel and Çubuk, 2014). According to another definition, it is a tool that tries to reveal what consumers think when they encounter a product or brand (Lindstrom, 2008, p.14). Neuromarketing is the method used to analyse and understand consumer behaviour with neuroscientific techniques (Lee et al., 2007). Neuromarketing is a method that uses brain-related clinical information to detect what happens inside the brain, called a closed box (Fugate, 2007, p.385).

According to marketing researchers, the measurement of an internal response to an external stimulus is limited, and verbal and behavioural measurements can yield dubious results. In traditional research methods, focus groups and survey studies provide important information, but in these methods, participants may be reluctant to share information. This situation prevents the provision of real information in terms of the results of the data (Utkutuğ, 2014, p.63). At this point, neuromarketing goes beyond consumer narratives and responses to surveys and enables consumers to reach what they do not share. This means reaching the consumer's black box, which is difficult to reach with traditional marketing methods.

Neuromarketing tries to understand the reactions of consumers at the level of consciousness and subconscious with various techniques. For this, it uses cerebral (neurometric) and physiological (biometric) measurement techniques, and these two techniques should support each other (Erdemir, 2015). Techniques used in neuromarketing; techniques that measure metabolic activities in the brain, techniques that measure electrical activity, and techniques that measure activity outside the brain (Bercea, 2012, p.2).

In Young's study (2002), one of the pioneering studies in the literature on neuromarketing, an attempt was made to measure reactions to television advertising applying EEG. The aim of this study is to shed light on the contribution of certain moments in advertising to brand awareness. The left frontal cortex of the brain is responsible for memory and information processing. The activation taking place in this region is observable in advertising. It has been found that this activation contributes to brand awareness. A similar study was conducted by Ambler et al. (2004) using the MEG device (magnetoencephalography). Their study demonstrated how cognitive and emotional advertising triggers activity in different cortices of the brain. These studies are of significance on account of depicting different aspects of advertising triggering activity in different regions of the brain, and therefore, differences in the potential recall and effectiveness of advertising can occur. One of the interesting studies is conducted by McClure et al. (2004), in which they attempted to measure consumer preferences for Coca-Cola and Pepsi, similar in content. In the study in question, the first data was collected from the subjects stating that they preferred Coca-Cola to Pepsi. Accordingly, they showed that Coca-Cola elicited activation in the hippocampus and dorsolateral prefrontal cortex, areas of the brain measuring emotion and interest/attention. However, in the same study, they also conducted blind tests and concluded that blind tests

illustrated no similar results. This situation reveals the complex nature of decision-making.

2.2 *Neurotourism*

This increasing interest in neuromarketing research has also affected tourism researchers and some researchers conducted conceptual studies on the relationship between neuroscience and tourism in 2010. In this process, some tourism researchers have used the concept of neurotourism instead of neuromarketing (Sop, 2018, p.320).

Neurotourism examines the neural mechanism underlying the behaviours exhibited by individuals participating in tourism activities (Ma et al., 2014). In another study, neurotourism was defined as “the use of neuroscience tools and techniques to measure tourist satisfaction and behavioural intent” (Panyik and Gonçalves, 2017).

Neurotourism is the adaptation of marketing concepts to tourism, in which neural mechanisms are investigated to understand the decision-making processes of touristic product consumers (Akgül and Sezgin, 2019).

Emotional responses to marketing stimuli are important in touristic destination marketing, but emotions are difficult to measure. (Bastiaansen et al., 2018), using neuroscience techniques, tried to reveal the preference potential of the destination by monitoring the brain movements of the experimental participants in destination-related images. In the study, visuals from Bruges and Kyoto were shown. Before the visuals from these cities were shown, Group 1 was shown an excerpt from the 2008 movie *In Bruges*, in which the main tourist attractions of Bruges were portrayed positively, and Group 2 was shown an excerpt from the 2011 movie *The Rum Diary*, in which no visuals of Bruges were included. Afterwards, destination visuals were shown to the groups and an early emotional response was obtained in Group 1, which watched an excerpt from the movie *In Bruges*. In this sense, it is concluded that studies utilising neuroscience techniques are a useful technique for evaluating the effectiveness of destination marketing and that popular movies have a positive impact on destination image.

2.3 *Functions of brain regions in studies carried out with neuroscience technicians*

In the studies in the field of social sciences carried out using neuroscientific techniques, knowing the brain regions and the functions of these regions is of great importance in terms of evaluating the research findings. The brain consists of two hemispheres and four parts: temporal, frontal, occipital, and parietal.

Temporal regions: especially play an active role in memory. The right region contains visual memory and the left region contains verbal memory. These lobes, which are referred to as the hearing region, are located at the level of both ears. The back parts are; take part in evaluating movements and reactions. Dominant Temporal lobes; while it plays an active role, especially in object names and the interpretation of words, the non-dominant temporal regions largely process data on visual memory (Yücel and Çubuk, 2014, pp.136–137).

Frontal region: motor skills, such as speech, as the control of voluntary muscles. It is shown as the area where complex answers such as decision-making, thinking, planning

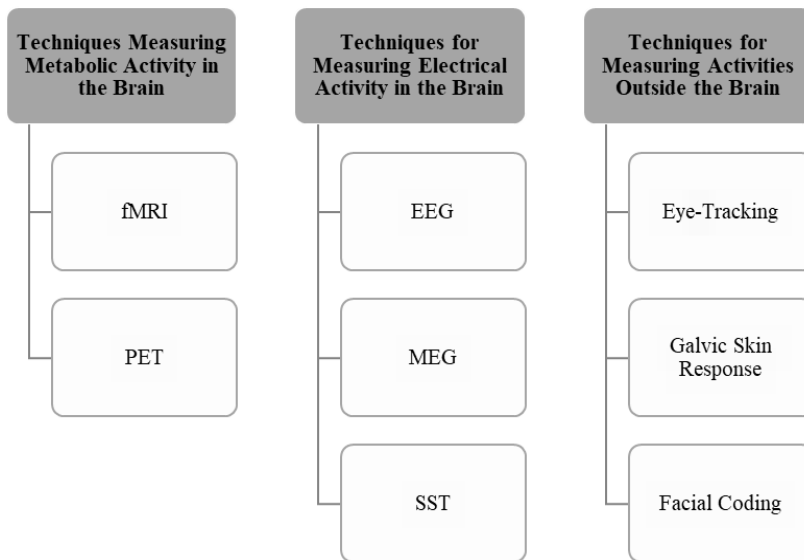
movements, joy, happiness, calmness and grief originate (Yorgancılar, 2015, p.146). The arousal in these regions, in other words, the increase in the number of amplitudes, shows the level of visual effect on the individual.

Occipital region: In this region is located the visual cortex. The visual fields in the area are located above the two protruding bones in the back. These regions are located in the back of the brain. The occipital region is the region where the image is interpreted and provides vision. The left occipital lobe allows us to see the right and the right occipital lobe allows us to see the left.

Parietal region: The parietal region starts from the apex of the head and continues towards the right and left lobes. These lobes provide the evaluation of vision, hearing, motor, and sensory signals. The parietal region processes data from the sense organs. It also plays a role in the interpretation of objects and figures (Yücel and Çubuk, 2014, pp.136–137).

Different techniques are used to measure the activities of metabolic, and electrical species in the relevant brain regions and activities outside the brain (Bağcı and Bostan, 2022, p.34). These techniques are shown in Figure 1.

Figure 1 Techniques used in studies carried out with neuroscience devices



Source: Bağcı and Bostan (2022, p.34)

3 Method

Today, neuromarketing research is mostly based on EEG (Aldayel et al., 2020; Lin et al., 2018; Ohme et al., 2009; Ohme et al., 2010; Yücel and Simsek, 2019; Yücel et al., 2015) and eye monitoring (Khushaba et al., 2013; Yücel and Coskun, 2018; Yücel and İnan, 2020). Promotional films prepared for Turkey every year are shot by private companies. Initially, we wanted to analyse these films in order to reveal the differences in the annual promotional films that are regularly published annually, but these films could not be

accessed through the Turkish Ministry of Culture and Tourism, and since copyright issues arose as a result of interviews with the companies that produced the films, it was decided to analyse the promotional films produced by the Turkish Ministry of Culture and Tourism, which do not have copyright issues. In addition to the copyright problem being effective in this decision, the fact that the themes in the promotion of the country were determined and the promotional films were prepared in line with these themes was also effective. The idea that promotional films are thematised in order for potential tourists to see their personal wishes more clearly while performing touristic activities motivated the researcher to choose these films for the study.

The number of views of 21 Themed Promotional Films prepared by the Ministry of Culture and Tourism was obtained in three different periods within a year. According to these viewing numbers, the most watched and the second most watched themed promotional films were determined to be shown to the volunteer participants. These films are;

- Most viewed: Go Turkey – This is Maximum Istanbul! (The promotional film, which started to be released on 01/08/2019, has over 26 million views).
- Second, most viewed: Go Turkey – Turkey's Turquoise Coast from the Air (The trailer, which began airing on 07/30/2015, has over 6 million views).

In determining the promotional films in this category;

- the number of views on Youtube and other video sites directed by the Ministry of Culture and Tourism through the Go Turkey website has been taken into consideration
- themed promotional films deal with specific destinations as content. Views vary according to these destinations.

The promotional films were screened in terms of content, duration, and shooting quality in order not to distract the 30 participants of the experiment and not to get bored while watching. After these operations, the promotional films were assembled by leaving a 5-second dark screen (gap) between the two films and made ready for the experiment. The screening time of the promotional films finalised for use in the study was 169 s.

A 5-second gap is left for brain function to return to normal as it moves from one promotional film to another. When the field is examined, it is seen that there are studies that leave a space of 20 s for this process, but it has been observed that this period is long in the test shots and causes the formation of an artefact known as signal distortion in the shots (Oyman, 2020, p.107; Yücel et al., 2015).

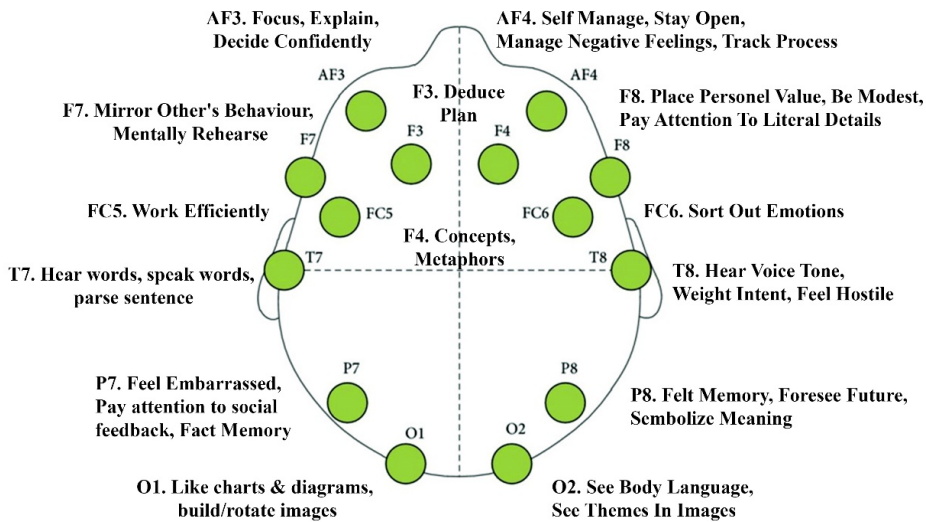
Since the experiments were conducted during the covid-19 pandemic, various difficulties were encountered in finding volunteer subjects. The study was carried out with 30 volunteers consisting of students, academicians, and civil servants, mostly foreign students. According to the participants' statements, it is known that there are no known mental and physical health problems and that there are no various harmful substance addictions. In experimental studies (EEG method, eye monitoring method), it is seen that groups between 30–40 people reach the result with an error margin of less than 1% (Sands, 2009; Yücel and Coşkun, 2018).

After the final arrangements for the promotional films were made, EEG shots were taken of 30 volunteer participants and their eye movements were monitored with an eye-

tracking device. In experimental studies (EEG method, Eye Tracking method), it is seen that groups between 30–40 people reach the result with a margin of error of less than 1% (Sands, 2009). Before the experiment, volunteer participants were informed about the study. Participants were made to fill out a voluntary participation form.

EEG shots were performed with a 14-channel, 128 Hz frequency Emotiv-Epoc device designed according to the international 10–20 system (Khushaba et al., 2013). This high-resolution device defined as Emotiv EPOC; collects data at a frequency of 2048 Hz per second. The EEG device transmits the collected data to the computer via a wireless network within a sample of 128 Hz frequency (Anderson et al., 2011). The data measured by the EEG device called Emotiv Epoc reveal the emotional responses of the volunteer participants who participated in the measurement within certain algorithms (Sourina and Liu, 2011). The functions of the connection points of the EEG electrodes are shown in Figure 2.

Figure 2 Duties of connection areas of 14-channel EEG electrodes. The points where the 14-channel EEG device electrodes are connected in the brain and the tasks of these points are included (see online version for colours)



Source: Adapted from Bağcı and Bostan (2022) by the author

Figure 2 contains the data for the 32-channel EEG device. In 14 Channel Emotiv, data is obtained from AF3, AF4, F3, F4, FC5, FC6, F7, F8, T7, T8, P7, P8, O1, O2 regions.

The study also used an eye-tracking device operated with the Licensed Tobii Pro Lab program. The Tobii Pro eye-tracking device has four eye-tracking cameras. Licensed Tobii Pro Lab program. It is a program that runs the Eye Tracking device and records the data. It performs eye monitoring with light reflection from the cornea, double eye, and dark pupil techniques. By following eye movements, it transfers data to the computer environment with the Tobii Pro Lab program. Thus, it can be measured which points the volunteers participating in the experiment focus on the most in the promotional films they watch and for how long.

4 Results

4.1 EEG data

Two videos prepared for the promotion of Turkey were shown to 30 volunteer participants. The film used in the research. The first video (53 s) and the second video (1 min 56 s) totalled 2 min and 81 s.

When the EEG data of 30 people for the first video was examined; a total of four people (13.3%), 5th, 8th, 23rd, and 30th volunteer participants, did not react; the remaining 26 (86.7%) reacted. In this video, it was seen that the activity rate was high in 'T8' electrodes, especially in the temporal region. However, activity in the Frontal region 'F7' and the Occipital region 'O1' has been observed. In other regions, reactions were found to be absent or low. The brain regions with activity during watching the video were usually identified as Temporal and Frontal regions.

However, when the EEG data for the first video is evaluated separately as 'male and female'; one of the men (participant 23) did not react. In general, activity was observed in the electrodes 'Temporal T8', Frontal 'F7' and 'O2' in the Occipital region. On the other hand, three of the women (5, 8, and 30. Participants) did not react and activity was observed in the electrodes 'T8' in the Temporal "T8", Frontal region "F7", "AF4" and 'O1' in the Occipital region. When we look at gender-oriented activities, it is determined that there is no big difference and similar reactions are given.

When the EEG data of 30 people for the second video was examined; 4, 5, 12, 16, and 22 were. A total of five people (16.6%), including volunteer participants, did not react; the remaining 25 (83.4%) reacted. In this video, it was seen that the activity rate was high, especially in the Frontal Region 'AF3, FC6, F7' and Occipital Region 'O2' electrodes. In other regions, reactions were found to be absent or low. The brain regions with activity during watching the video were usually identified as Frontal and Occipital regions.

However, when the data for the second video are evaluated separately as male and female; four of the men (4th, 12th, 16th, and 22nd respondents) did not react. In general, activity was observed in the electrodes 'FC6, F7, F3, AF3' Parietal 'P7, P8' in the Frontal region and 'O2' in the Occipital region. On the other hand, one of the women (the fifth participant) did not react and activity was seen in the electrodes 'AF3, FC6', Temporal "T8" and 'O1, O2' in the Occipital region. When gender-oriented activities are examined, activity is seen in the Frontal and Parietal regions of men; activity in the Frontal, Temporal and Occipital regions of women was determined. Significant differences were found in the reactions of men and women toward the second video.

When the above information is evaluated; the first video is about Temporal and Frontal regions; the second video Frontal Region 'AF3, FC6, F7' with Occipital region "O2". In the 3rd video, activity was observed in the Occipital, Frontal and Parietal regions. Seeing activity in the temporal and frontal regions in the first video can be interpreted as the music used in the promotional video triggering the reaction. It can be said that the fact that there is more dynamic music compared to the music used in the second video activates the temporal and frontal regions of the volunteer participants. In the second video, the activation observed in the frontal region and occipital region shows that people watch the promotional video to understand it. It can be said that the melodic lower tempo of the music used in the second video enabled the participants to focus on the visuals in the video.

A total of 45 responses were received in the first video, and 16 of these responses were obtained from the T8 point. The temporal region is the centre of speech, memory, and hearing in general. T8 data is obtained by placing the electrodes on the right ear. It is seen that the moving music in the first video affects the activation in this region. As a result of the activation evaluation in T8 in the second video, we can say that the effect of music comes to the fore because the total number of activations of the same subjects in T8 in the second video is two. This shows that the music used in the videos is important in creating a sensory and emotional effect in promotional videos. Again in the first video, seven reactions were detected in the frontal region. The frontal region is the region known as the centre of conscious thinking. This data shows us that music and visuals penetrate the minds of the subjects. The EEG data obtained from the subjects for the two promotional films are summarised in Table 1.

Table 1 EEG data table

<i>Brain regions reaction points</i>		<i>Video 1</i>		<i>Video 2</i>	
		<i>Female</i>	<i>Male</i>	<i>Female</i>	<i>Male</i>
Frontal	AF3 (Interpretation)	1	2	3	4
	AF4 (Directing negative emotions))	2	1	1	1
	F3 (Conclusion)	0	2	1	2
	F4 (Classification)	1	1	0	0
	F7 (Inference)	4	3	2	2
	F8 (Caring about personal values)	0	0	2	0
	FC5 (Work efficiency)	0	0	0	0
	FC6 (Sorting emotions)	1	0	3	4
<i>Total</i>		9	9	12	13
Parietal	P7 (Verbal reasoning)	1	0	1	1
	P8 (Nonverbal reasoning)	1	2	3	0
	<i>Total</i>	2	2	4	1
Occipital	O1 (Creating images)	2	2	2	1
	O2 (Visual processing)	0	3	0	4
	<i>Total</i>	2	5	2	5
Temporal	T7 (Memory space of verbal and visual data)	0	0	0	0
	T8 (Sensory memory space)	8	8	1	1
	<i>Total</i>	8	8	1	1
<i>General Total</i>		21	24	19	20

Source: It was created by the author as a summary of the experimental data

4.2 Eye tracking data

The first video (53 s) and the second video (1 min 56 s) for the promotion of Turkey are licensed by Tobii Pro Lab. loaded into the program. After the videos were uploaded, the participants were seated in front of the computer screen and the Eye-Tracking device was placed on the computer. After setting the appropriate distance (65 cm) between the

participant and the computer, the necessary calibration process was performed. After obtaining the appropriate calibration, the videos prepared were started to be watched by the participants in order.

The first video (53 s) and the second video (1 min 56 s) for the promotion of Turkey were watched for a total of 2 min and 81 s. In addition, slides with a (+) sign on a 3-s white blank page were added between each video. By adding these blank slides, it is aimed to prevent the participant from focusing on the centre of the screen and to obtain reliable data. The data obtained after the end of the research. Taken from the licensed Tobii Pro Lab program and interpreted. Licensed Tobii Pro Lab program. It is a program that runs the Eye Tracking device and records data.

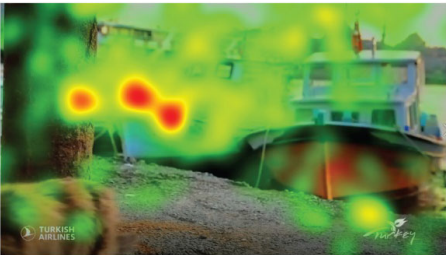
Two promotional films prepared for the promotion of Turkey were watched. EEG and eye-tracking analysis methods were applied to the participants in a synchronised way. First of all, the responses were determined in line with the data obtained as a result of the EEG analysis method, and since the rapid visual transitions on the video watched were too many, the images in the seconds to which the response was given were determined. Then, the heat map data of these detected images were taken. In line with this information, six visuals were for the first promotional film (53 s). A total of 13 visuals, seven of which were selected for the second promotional film (1 min 56 s). Two images were selected for each video out of 13 images, and the details of the analysis are given below.

Visual 1 1. Promotional Film 1. Visual. The collage, which includes 4 pictures in the image, was created from the first image receiving the most reaction from the 1st promotional film. In this collage, the image in the upper left is the raw form of the image. The upper right image shows the heat maps of all experiment participants. The image on the lower left shows the heat maps of the female participants. In the lower right image, the heat maps of male participants are indicated (see online version for colours)

1. Promotional Film 1. Visual



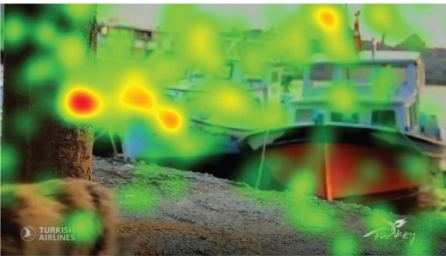
1. Promotional Film 1. Visual Head Map (All Participants)



1. Promotional Film 1. Visual Head Map (Female)



1. Promotional Film 1. Visual Head Map (Male)



In Visual 1, when the first visual of the first promotional film is examined. There are two boats on the beach, the ‘Turkey’ logo in the lower right corner and the ‘TURKISH AIRLINES’ text and logo in the lower left corner. On the left side of the boat, there is the inscription “UFUK”, the image of the mosque in the background and two minarets.

When the heat map of the first image of the promotional film is examined. It was observed that the volunteer participants mostly focused on the ‘UFUK’ lettering on the boat. In addition, female participants focused on the ‘Turkey’ logo in the lower right part of the image, while male participants focused on the mosque image on the back right. However, the attractiveness of its logo with the inscription ‘TURKISH AIRLINES’ at the bottom of the image remained in the background.

When the fifth visual of the first promotional film is examined in Visual 2. There is graffiti on a wall and the graffiti is used as a background, with the inscription ‘MAXIMUM ISTANBUL’ in the foreground.

Visual 2 1. Promotional Film 5. Visual. The collage, which includes 4 pictures in the image, was created from another image that received the most reaction from the 1st promotional film. In this collage, the image in the upper left is the raw form of the image. The upper right image shows the heatmaps of all experiment participants. The image on the lower left shows the heatmaps of the female participants. In the lower right image, there are heat maps of male participants (see online version for colours)

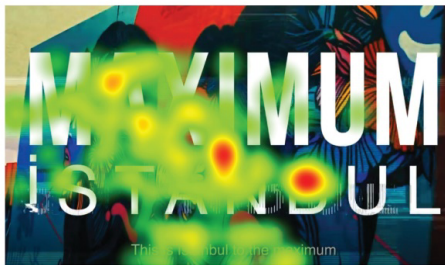
1. Promotional Film 5. Visual



1. Promotional Film 5. Visual Head Map (All Participants)



1. Promotional Film 5. Visual Head Map (Female)



1. Promotional Film 5. Visual Head Map (Male)



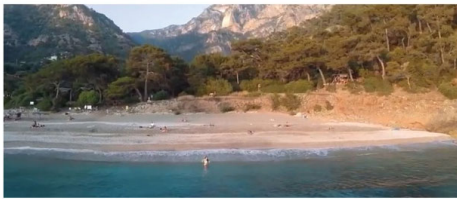
When the heat map of the fifth image of the first promotional film is examined. It was observed that the volunteer participants mostly focused on the letter “X”. In addition, female participants focused on the bird figure in the graffiti in the background of the paper. Graffiti is generally drawn in dark and cool-toned colours. The wing of the bird is painted light-toned yellow. For this reason, it is normal for it to attract attention to the image. Male participants paid more attention to these colour differences and concentrated on all colours except the colours used predominantly in graffiti. In addition, while female

participants almost did not notice the light pink tones used in graffiti, it was observed that male participants concentrated on these areas. However, while the logos positioned in the lower left and right corners of the other images did not attract attention, the text “This is Istanbul to the maximum” in the middle of this image was relatively noticeable. This shows that positioning the slogan in the appropriate place in the images in the video creates the desired effect.

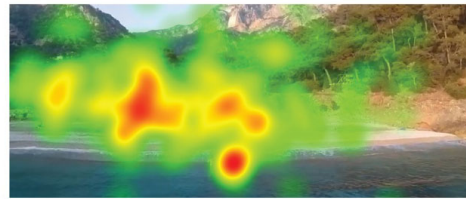
In the third image of the second promotional film in Visual 3. There are a sea, beach, trees, and mountains. In addition, people can be seen in the sea and on the beach. When the heat map of the third image of the second promotional film is examined. It was observed that the volunteer participants focused on the people on the beach and the areas where the beach meets the trees.

Visual 3 2. Promotional Film 3. Visual. The collage, which includes 4 pictures in the image, was created with a visual selected from the most reactionary visuals obtained from the 2nd promotional film. In this collage, the image in the upper left is the raw form of the image. The upper right image shows the heatmaps of all experiment participants. The image on the lower left shows the heatmaps of the female participants. In the lower right image, there are heat maps of male participants (see online version for colours)

2. Promotional Film 3. Visual



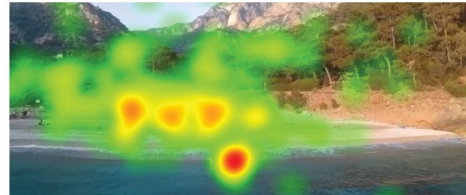
2. Promotional Film 3. Visual Head Map (All Participants)



2. Promotional Film 3. Visual Head Map (Female)



2. Promotional Film 3. Visual Head Map (Male)



While the female participants mostly focused on the empty areas where the beach and trees intersect, the male participants focused on the female vacationer swimming in the sea in the middle right. While the female vacationer swimming in the video starts with a close-up, the image then moves away from her. In the approximately 5-second image, it was observed that as the visual zoomed out, the male participants focused on the vacationer in the sea, but also on the other vacationers nearby. In addition, it can be said that the intersections of the beach and the wooded area were not noticed by the male participants. In the image, the distributed structure of the heat map is limited to the area where people are. This means that the use of holidaymakers in the image draws attention.

In Visual 4, the fifth visual of the second promotional film; is a mountain, sea, and a female vacationer sitting in a sea pergola. When the heat map of the fifth image of the second promotional film is examined; The video starts with a close-up of the mountain image and then moves on to the sea gazebo. As the gazebo enters the frame, the mountain

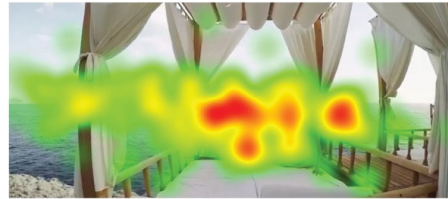
remains in the distance. It was observed that the volunteer participants focused on the mountain in front of them. In the image, it is seen that the focus is on other areas that enter the image, provided that the focus remains the same as you move away from the mountain. It is seen that male participants focus on the back of the head of the woman sitting in the sea pergola. Although it is thought that there is no image when viewed as a photograph, there is an empty gazebo on the white stony field that enters the frame as you move away from the mountain. Mainly male participants focused on this gazebo and the white stone area below it. On the other hand, the focus of the female participants remained on the mountain image seen in the photo opposite.

Visual 4 2. Promotional Film 5. Visual. The collage, which includes 4 pictures in the image, was created with another visual selected from the images that received the most response from the 2nd promotional film. In this collage, the image in the upper left is the raw form of the image. The upper right image shows the heatmaps of all experiment participants. The image on the lower left shows the heatmaps of the female participants. In the lower right image, there are heat maps of male participants (see online version for colours)

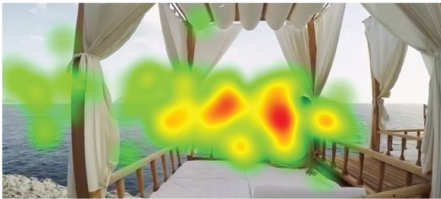
2. Promotional Film 5. Visual



2. Promotional Film 5. Visual Head Map (All Participants)



2. Promotional Film 5. Visual Head Map (Female)



2. Promotional Film 5. Visual Head Map (Male)



4.3 Comparison of EEG and eye tracking data

In the EEG electrode data, odd numbers next to the regions represent the left region of the brain, and even numbers represent the right region of the brain. Generally, the left area of the brain is known as the logical area, and the right area is known as the emotional area. In other words, net results, reasoning, and mathematical calculations are odd-numbered fields, and emotion-oriented fields such as intuition, empathy, and compassion are even-numbered fields. In the first video, eight responses were received from the left lobes in women and nine in men. In the right lobes, 13 responses were obtained from women and 15 from men. With the most general information, it is possible to say that men approach the first video more emotionally.

According to EEG data, the first video got 45 reactions and the second video got 39 reactions. When we look at the data in general, activation was observed mostly in the frontal region. A more intense response is observed in the right frontal regions of women.

The left frontal region is the area used for skills that require a license, while the right frontal area is the area used for skills that do not require a license. The frontal region is called the “brain of the brain”. Therefore, it is expected that the most intense reactions will be in that region. Receiving reactions from the right side of the women in this region shows that they watch the videos with behavioural effects. In addition, no response was observed in the F3, F8 and FC5 frontal regions of women. On the other hand, it was observed that the left lobe reacted more intensely in the frontal region of male participants. This shows that a plan and a design were made while watching the video. The video has been watched in a logical framework.

In the first video, it is also seen that the temporal region responses are intensified. The temporal region is involved in the perception of sound and smell and the processing of complex spaces or faces. It is the point where auditory learning and long-term memory are controlled. As can be seen from these data, the music used in the 1st video has attracted a lot of attention. Looking at the Eye Tracking data of the video, the findings obtained from the EEG data are supported. With Eye Tracking, six remarkable images were obtained from the first video. When the video was watched, it was seen that there was a change in the melody of the music at the transition points of the visuals or an additional instrument to the ongoing instruments.

In the first video, it was seen that male participants reacted more in the occipital region. The occipital region is the area where visual information is processed. This shows that male participants can dominate the post-video content more. It can be said that female participants are relatively less able to process visual data. Eye Tracking data also supports the data from EEG. When the male and female heat maps of the six images are examined, the male shows that the participants focus on more areas in the visuals. Four images from the first video are included in Image 4. The raw version of the image in the upper left, which attracts the visual focus, is given in the upper right, the heat map of all participants. The heat maps below belong to male and female participants. The intensity of the red area in the heatmap and the intensity of the colour fluctuations around it can be explained by the activity of the male occipital region.

When the second video EEG data is examined, it is seen that brain activities are concentrated in the frontal region. While the responses were concentrated in the left frontal region of the male participants, equal responses were observed in the right and left frontal regions of the female participants. However, when the areas where the reaction was taken are evaluated in terms of their duties, there are differences between the areas where the reaction was received between the male and female participants. In addition to the second video being a more static video in terms of content, transitions between images are felt. This causes the images in the video to be remembered more. This is also the reason why the reactions of male and female participants are more common in AF3, one of the areas where the electrodes are located. In this region, visual data is filtered and recorded. In the second video, no movement was observed in the P8 regions of male participants. The second video’s slower and smoother visuals compared to the first video and the stagnant course of the music caused different reactions with the first video. Equal response was observed in the P7 brain regions of male and female participants. The reaction in this region is due to the paper “Turkey’s Turquoise Coast From The Air”, which starts at the 28th second of the video and ends at the 33rd second. In addition, the visual transition time, which affects the response levels of the participants, was kept within a reasonable time. Therefore, the participants were given the opportunity to read the paper completely. When the eye tracking data of the related inter-second responses

are examined, it is seen that the results supporting the EEG data are obtained. According to the second video EEG data, it was observed that male participants received more signals from O2 brain regions, while no response was observed in the same brain region of female participants. The overreaction of the male participants in this region is evident on the 33–40 of the video. It is due to the visual in seconds.

5 Conclusions and recommendations

Touristic product consumers do not act with pure logic when choosing products and services. As in general consumer behaviours, consumer preferences in touristic product consumers' behaviours are also affected by consumers' emotions (Shaw and Hamilton, 2016). In this study, which is carried out with the neuromarketing research method, which tries to remove the veil on the emotions of the consumers, it is aimed to investigate the effect of tourism promotional films on consumers. EEG and Eye Tracking techniques were used to achieve this goal. The results obtained as a result of the researches made with these techniques are presented below in general terms;

As a result of the EEG research, especially the first promotional video affected the electrical currents in the brain more than the second promotional video. When the brain region activities of male and female participants are evaluated, the number of activities in the right lobes of female participants is higher than the number of activities in the left lobes. In the first video of male participants, the number of activities in their right lobes is higher than the number of activities in their left lobes. Especially in the first video, a significant density is seen in the right lobe. The right lobe of the brain deals with visual and auditory issues in general. When the visuality of the promotional videos is excluded from the evaluation, the difference between the two videos is due to the rhythms of the music used in the promotional films and the differences in instruments. Bozoklu and Alkibay (2014) evaluated emotional reactions to three TV commercials with different values in their study, and it was concluded that melancholic, Turkish classical music placed in advertisements with negative emotional content was an effective stimulus. In this sense, the related study and the study of Bozoklu and Alkibay (2014) reached similar results.

In the second video, there was a slight difference in the number of responses between the right and left lobes of female participants, while equal responses were received from the right and left lobes of male participants. The reason for this is that the transition interval of the visuals in the promotional films is relatively longer and the music is more stable. When evaluated in terms of emotional impact, the first promotional film had more impact than the second promotional film. As a result of the Eye Tracking research, it is seen that the 'Turkish Airlines and Turkey' logos are not in the focus of the participants in terms of evaluations for promotional films. In both promotional films, it was observed that male participants focused on the visuals with a wider angle. The female participants focused on a basic point and almost did not see the remaining area of the visual in the promotional film. The data obtained from the heat map of the images, in everyday life, "Women look at the details, men are superficial." supported his argument in a way. In fact, men focus on the broader frame while women focus on the narrower frame, a single point in the field.

It has been observed that the symbolic figures of Turkey in the promotional films attract more attention by women (For example: Bosphorus Bridge, Galata Bridge). On the

other hand, it has been observed that men focus more on the areas in the symbol cells that are reacted within the same promotional film. Yücel et al. (2017) reveal what cities are associated with symbols in people's minds, where they try to reveal how the world's leading communities are perceived by users who do not have the opportunity to live, visit that city and see that city. This shows that symbols are important in city marketing. Similar results were obtained with the study related to this center.

It has been observed that if the slogan is included in the promotional films for at least 4 s, they concentrate on the slogan under the management of men and women. It has been observed that in the case of including the slogan for 5–6 s, the areas of male behaviour other than the slogan are concentrated. Yaman et al. (2018) revealed that the recall rates of advertisements for text and visual usage were high during the periods they tried to measure the recall criteria and results of advertisements of online news and magazine sites. The slogan, whose relevant records were placed on the images, was determined by drawing attention in a similar way and similar results were obtained with this study. In Turkey's promotional films, in areas where the 'sea' theme is intense, a large part of the sea's entrance into the room was used in the settlement included in the image. While the 'sea' alone does not attract attention, the presence of a boat, sailboat or a tourist draws attention.

In terms of originality/value, staying with the existing research methods in studies conducted to understand consumer behaviour in tourism, i.e., not using alternative research methods using neuroscience tools, will lead to falling behind in the literature. In order to catch up with the future, it is necessary to utilise the aforementioned alternative methods (Pourfakhimi et al., 2019).

According to the stages of the study and the findings;

- In the promotional films to be prepared, the transition between images should be at least three to 4 s.
- It is correct to include the symbols and events of Turkey in the videos, however, other points that are desired to be promoted are given with a slogan in the areas where these landmarks and events take place.
- The music to be used in promotional films should be high rhythm and presented with cultural musical instruments.
- In the case of using the sea theme, building and human figures are included in the area that will be included in the image.
- Inserting a short phrase or slogan in Turkish from the voices of the iconic figures of Turkey, among rhythmic music.
- Preparing promotional films in both feminine and masculine versions.
- Not using any data that is defined as 'noise' in communication in promotional films, which distracts from the main focus.
- If crowds of people are to be included in promotional films, keeping the visual transition period long.
- Conducting a study similar to the study on the sample group before the films are broadcast after the promotional films are prepared.

- Organising incentives for neuromarketing studies.
- It is recommended that the amount of funds that support researchers be increased for neuromarketing research.

In addition, at the beginning of the study, it was thought that people's cultural background could change their touristic preferences, but as a result of the experiments, it was observed that people were only divided into 'men and women' in their perception towards marketing. It is thought that forming experimental groups based on this preliminary data for future experimental studies to be carried out with neuroscience tools will contribute positively to the process. However, making evaluations by taking into account the anthropological processes of men and women may contribute to obtaining more reliable results.

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