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EYES DO NOT LIE. INVESTIGATION OF THE EFFECTIVENESS OF OUTDOOR ADVERTISING INSTRUMENTS: AN APPLIED NEUROMARKETING RESEARCH WITH EYE-TRACKING TECHNIQUE

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Abstract: Traditional techniques of market research and information gathering to meet business needs fail because they cannot always produce the desired results. This has necessitated the use of new techniques and methods for gathering information. Companies frequently resort to advertising activities for the promotion of a new product or to increase sales of an existing product and want to be compensated for the expenses incurred in these activities. It is necessary to measure the effectiveness of advertising in order to know how the response to the advertisement is after its publication. A questionnaire and an eye tracker were applied to 32 participants to investigate the communication effectiveness of 25 outdoor advertisements. As a result, it is obtained that the survey method is not fully sufficient to provide the real data needed by the company. The recognition method reflects the truth: real data can be obtained from the participants with the neuromarketing method and it has been determined that the company can achieve the real data it needs.

Keywords: advertising, neuromarketing, eye tracking, survey, recognition method

Los ojos no mienten. Investigación de la eficacia de los instrumentos de publicidad exterior: una investigación de neuromarketing aplicada con la técnica de seguimiento ocular

Resumen: Las técnicas tradicionales de investigación de mercado y recopilación de información para satisfacer las necesidades de las empresas fracasan, porque no siempre pueden producir los resultados deseados. Ello ha hecho necesario el uso de nuevas técnicas y métodos para recoger la información. Las empresas recurren con frecuencia a actividades publicitarias para la promoción de un nuevo producto o para aumentar las ventas de un producto ya existente y quieren que se les compense por los gastos realizados en estas actividades. Es necesario medir la eficacia de la publicidad para saber cómo es la respuesta al anuncio después de su publicación. Se aplicó un cuestionario y un rastreador ocular a 32 participantes para investigar la eficacia de la comunicación de 25 anuncios en exteriores. Como resultado, se obtiene que el método de encuesta no es totalmente suficiente para proporcionar los datos reales que necesita la empresa. El método de reconocimiento refleja la verdad: se puede obtener datos reales de los participantes con el método de neuromarketing y se ha determinado que la empresa puede alcanzar los datos reales que necesita.

Palabras clave: publicidad, neuromarketing, seguimiento ocular, encuesta, método de reconocimiento

Olhos não mentem. Investigação da efetividade de instrumentos de propaganda ao ar livre: uma pesquisa de *neuro*-marketing aplicada com a técnica do rastreamento do olhar

As técnicas tradicionais de pesquisa de mercado e coleta de informações para atender às necessidades comerciais fracassam porque nem sempre podem produzir os resultados desejados. Isto exigiu o uso de novas técnicas e métodos para a coleta de informações. As empresas freqüentemente recorrem a atividades publicitárias para a promoção de um novo produto ou para aumentar as vendas de um produto existente e querem ser compensadas pelas despesas incorridas nessas atividades. É necessário medir a eficácia da publicidade a fim de saber como é a resposta ao anúncio após sua publicação. Um questionário e um rastreador de olhos foram aplicados a 32 participantes para investigar a eficácia da comunicação de 25 anúncios ao ar livre. Como resultado, obtém-se que o método de pesquisa não é totalmente suficiente para fornecer os dados reais necessários para a empresa. O método de reconhecimento reflete a verdade: dados reais podem ser obtidos dos participantes com o método de neuromarketing e foi determinado que a empresa pode obter os dados reais de que necessita.

Palavras chave: propaganda, neuromarketing, rastreamento de olhar, levantamento, método de reconhecimento

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Introduction

The rapid change in recent years has been increasing its intensity day by day and deeply affects the social, economic and cultural life. The rapid change has forced the enterprises to keep up with the necessary changes in both production strategies and marketing activities. As competition becomes more and more evident in every field, the assets of businesses are endangered, it became necessary to examine and understand the changes in depth and develop the necessary strategies. Businesses provide competitive advantage with the resources they allocate for research and development, their efforts to increase their innovation and quality. As a result of this rapid change, radical changes have occurred in the field of marketing and moving from a period where the customer has no choice, to a period that gives more importance to the demands and needs of the customers. In an environment where it is easier to reach the desired data by using internet, it has become important to understand the opinions of consumers and how they arrive at decisions.

Data obtained using classical research techniques cannot always guide businesses, take a lot of time and sometimes they can be too costly. The desire of businesses is to produce the most suitable product with the lowest cost and to market it with the lowest cost. Traditional market research and information gathering techniques have become unable to meet the needs of businesses. Since it cannot always produce the desired results, it has become necessary to use new techniques and methods to collect the required information.

Neuromarketing

It is thought that the effect of advertisements on consumers cannot be measured sufficiently and fully with the survey studies conducted using verbal criteria. Trying to explain an emotional response with the cognitive process can cause the process to be misinterpreted and the desired information cannot be obtained*(1)*. Emotion is essentially not based on a word-based experience, and expressing emotions requires a cognitive effort*(2)*. In addition, such assessments are criticized for not reflecting the process between the formation of affect and behavioral outcome*(3)*. Because of these limitations and inadequacies, marketing research requires criteria that reflect the mechanism of the human mind more deeply and comprehensively than verbal and behavioral measures*(4)*. Psychophysiology is a field of study in which the relationships between physiological manipulations and their reactions are measured to better understand the relationship between mental and bodily processes of humans*(1)*.

Psychophysiological criteria determine the autonomous responses that occur involuntarily. For this reason, psychophysiological criteria are thought to provide a very basic, impartial and sensitive evaluation of an individual's response to a stimulus*(5)*. These stimulants can be seen as examples such as product, packaging, advertisement, shelf system, store atmosphere etc. in the context of marketing research. In advertising research, the advertisements used as stimulants may vary depending on the media tool or the advertising message content. As a result of exposure to these stimulants, cognitive or affective reactions occur in the mind of people. Cognitive process; It includes everything related to obtaining, processing, keeping the information in the minds of the consumers, and reusing the data from where it is stored*(6)*.

Access to information has become easier in the information age however, whether the information obtained is reliable or not is an issue that remains in question. The desire to reach the right information is important in identifying new opportunities. As a result, market information is a very important for businesses. Uncertainty is one of the main elements that make market information important. From time to time, the cost of mistakes made as a result of decisions taken with out-of-date or inaccurate information can be heavy. For this reason, business managers want to act based on information in the decision-making process and they always want the information to be used in the decision-making process to be correct information.

Marketing managers obtain the data they will use in decision making by two methods. These are traditional research techniques (secondary data screening, survey, observation, experimental setups) and neuromarketing techniques (there are 10 psychophysiological techniques used in pub-

lished advertising research. These techniques are examined in 3 groups*(7)*: central, autonomic and somatic nervous system measurement techniques) generally device-based techniques (Functional Magnetic Imaging Device, Eye Tracking Techniques, Skin Conductivity, Brain Waves Analysis, Magnetoencephalography, Positron Emission Tomography Device, Steady State Probe Topography)

Neuromarketing, which is the joint field of neurology and marketing; It is the equivalent of marketing in the human brain and it is a gateway to the consumer's brain*(8)*. Neuromarketing finds the way to the buy button in the brain. Neuromarketing as a field of study can simply be defined as the application of neuroscientific methods to analyze and understand human behavior in relation to markets and marketing exchanges*(9)*. The goal of neuromarketing is to study how the brain is physiologically affected by advertising and marketing strategies. In order to evaluate the effectiveness of these strategies, brain activity resulting from viewing an advertisement is monitored and measured using neuroimaging techniques such as functional magnetic resonance imaging (fMRI) and electroencephalography (EEG)*(10,11)*.

The axioms that occur in the human brain are measured with neuromarketing techniques*(11)*. Thus, it is aimed to learn and understand how consumers react to marketing stimuli. Neuromarketing focuses on improving marketing methods by examining the neural mechanisms in the human brain and tries to learn and understand how consumers make purchasing decisions in real life conditions. Neuromarketing guides researchers in understanding and analyzing consumer behavior using neuroscientific methods and it also allows marketing researchers to use new methods by moving away from traditional methods that do not meet their needs*(12)*.

With neuroscience, consumer decision-making and measurement of brain waves can be obtained simultaneously. It allows a more objective measurement of the consumer*(13)*. Neuromarketing tries to measure three important parameters such as attention, emotional commitment and retention of the consumer. Therefore, the purpose of neuromarketing is to better understand, explain and predict the behavior of individuals, groups and organizations regarding the market*(9)*. Neuromarketing is generally applied in areas such as measurement of advertising effectiveness, product attractiveness, product design in brand, logo selection*(14)*, new product development, film industry, architecture, politics, web page design and etc.*(2)*. Data that cannot be obtained by traditional methods can be obtained by neuromarketing methods. Consumers' preferences can be determined based on electrical movements in the human brain. With fMRI measurements, consumers' favorite tastes, favorite music and desire to buy, etc. can be measured. The benefit of neuromarketing techniques is more than traditional techniques. The most commonly used methods in neuromarketing; biometric measurement techniques, pupil movements, facial movements, galvanic responses can be listed as measuring the electrification and sweating in the skin*(15)*. However, new methods can also be used.

Measuring the effectiveness of advertisement

Businesses frequently use advertising activities for the promotion of a new product or to increase the sales of an existing product, and they want to receive compensation for the expenditures made for these activities. It is necessary to measure the effectiveness of the advertisement in order to learn how the feedback is after the advertisement is published.

It is the communication and sales effects of the advertisement that are involved in measuring the effects of the advertisement. The high number of variables that affect the measurement of the sales effects of the advertisement makes it difficult to investigate the sales effects of the advertisement. The sales effects of advertising are more difficult to measure than the communication effects. Sales; It is under the influence of many factors such as the product's features, price and availability, and the behavior of competitors. The fewer factors affecting sales, the easier it will be to measure the impact of sales.

The first condition of effective advertising is that the target audience sees the advertisements. It will be impossible for the consumer who does not see the advertisement to perceive the advertisement,

to process the message contained in the advertisement in her mind and to exhibit the buying behavior.

The role to be assigned to advertising should be a communication task and no duties should be assigned outside its borders. The communication purposes of the advertisement must be clearly and precisely defined. In this way, the effects of advertising can be measured.

The purpose of advertising is to perform a communication task to a certain extent for a defined audience, in a certain time period. Once the communication purposes of the advertisement are clearly defined, it becomes possible to measure the communication effects of the advertisement. The question that should be emphasized here is the question of what the indicators and criteria will reveal the effects of communication. In the face of the difficulties of directly measuring the effect and contribution of advertising to sales, the researchers turned to a series of criteria that will reveal the effects of advertising in this area, starting from the point where the advertisement fulfills a communication function. The most important of these intermediary indicators, which are considered to indicate the effects of advertising, can be given the following examples*(16)*:

- Number of people who saw (or heard) the advertisement
- Number of people who remember the advertisement,
- Change of attitude caused by advertising,
- The credibility of the advertisement,
- The degree of understanding of the advertisement,
- The image that the advertisement creates on the target audience,
- Advertising's interest and attention level,
- The degree of information transmission of the advertisement.

With the help of the intermediary variables listed above, it is aimed to measure and evaluate the effects of communication without facing the difficulties of directly determining the contribution of advertising to sales. It is assumed that there is a positive correlation between these intermediary variables used in measuring the communication effects of advertising and sales*(17)*: It is based on measuring the effectiveness of the advertisement, showing the advertisement to the subjects and measuring the reactions of the subjects by considering certain criteria. Studies to measure the effects of advertising are conducted by displaying advertisements to subjects under natural or artificial conditions and measuring the reactions of the subjects. Measurements are regularly recorded by mechanical means or by interviewers / observers.

The methods used to measure the effects of advertising are recognition method (method used in research), reminder method, method of determining thoughts and attitudes, application method, projection techniques and test method (used to measure the sales effects of advertising).

Recognition method

Advertising content research was conducted first by Dr. George Gallup. Prof Daniel Starch, from Harvard University, made advertising research more popular by establishing a company that measures the number of readers of advertisement text. The most important practitioner of the recognition method is Daniel Starch. Daniel Starch founded the Advertising Reading Service organization in 1932. He monitored the number of readers of the advertisements in magazines and newspapers and to what extent they were read. It has made the method famous and standardized by regularly reporting its results*(18)*:

The recognition method known as "readership studies"*(19)* in the field of advertising is a method aimed at determining the number of consumers reading the advertisements and to what degree they read the advertisements.

The first step in evaluating the effectiveness of the advertisement with the recognition method is to determining how many people saw and read the advertisement. In order for an advertisement to have an impact on the target audience, it must

be seen, read and perceived. In the recognition method, it is asked whether the consumers who are contacted with the advertisement have seen the advertisement before. If the answer is "yes", it is assumed that the consumers have seen and recognized the advertisement before and such consumers are considered to be those who know or read the advertisement. Thus, it is determined whether the consumers have seen the relevant advertisement or not. By asking additional questions to the consumers who say they know the advertisement, the reading level of the advertisement is tried to be determined. The results obtained by the recognition method are compared with the results of other advertisements, data on the relative effectiveness of the advertisement are obtained. Thus, information is provided to shed light on the content of future advertisements and the places to be published.

Recognition method is a method mostly used in post advertisement research and it is more easily applied with advertisements in print advertising tools*(20)*. Various criticisms were directed to the results obtained by the recognition method. One of the most important criticisms directed to the method of recognition is related to the number of false recognition (those who say that they see or recognize advertisements that are not actually seen or found to be unrecognizable). Research has shown that the number of respondents who say what they see and recognize despite not seeing an advertisement is very high, and even those who give false statements are as many as those who make the correct statements. In this case, it has been determined that the results obtained by the recognition method (especially in cases where false statements are high) decrease the power to reflect the truth and the method cannot always accurately measure what it should measure*(20-22)*.

There are various reasons for the false recognition that occurred during the application of the recognition method*(20)*. These are;

- Mixing the advertisement in the research with other ads,
- In cases where it is not sure whether the advertisement has been seen or not, the respondent makes predictions based on his memory or reading habits,
- Conclusion that the advertisement is recognized due to the recognition of the material surrounding the advertisement,
- Anxiety about loss of prestige,
- Desire to please the interviewer and make a good impression on him/her.
- Estimating that the advertisement is recognized due to the recognition of the product subject to the advertisement,
- The effects of the advertising channels where the advertisement takes place,
- The respondent misunderstands the statements made by the interviewer,
- It is the attitude of the interviewees about their behavior and whether they will help to recognize.

Application

Method

It is the communication and sales effects of the advertisement that are involved in measuring the effects of the advertisement. The high number of variables that affect the measurement of the sales effects of the advertisement makes it difficult to investigate the sales effects of the advertisement. In this study, the measurement of the communication effects of advertising was investigated and the recognition method was used among these methods.

The most important advantage of the recognition method is that it offers the opportunity to research under natural conditions. In the study, the communication efficiency of outdoor advertisements was measured by having the subjects watch videos with the help of a video containing 25 outdoor advertisements on a determined route in Uşak province. It was tried to create a natural environment with the video that was shown to the subjects for advertising research. The same method was used in the study titled "The Effect of New Year Banners on Purchasing Intention: An Experimental

Table 1. Features of Outdoor Advertisements in the Study

Company	Advertisement Type by Geographical Status	Where the Outdoor Billboard is on the Road	Time to Appear in Research (Second)
Opel Arden Automotive	International	Same	12
Yurt Gaz	Local	Same	9
Opet Aygaz-1	National	Opposite	12
Sarar Clothing	International	Same	8
Özdilek AVM	National	Same	10
Burger King	International	Same	6
Festiva	Local	Same	9
Pizza Pizza	National	Same	6
Nadide Dormitories for Girls	Local	Opposite	12
Güven Security Services	Local	Opposite	13
Sarar Blanket	Local	Same	6
Ayaz Medical	Local	Same	6
Medical Park Hospital	National	Same	20
BP	International	Opposite	10
Opet Aygaz-2	National	Same	25
Vakıfbank	National	Same	8
Shell	International	Same	19
Bosch Service	International	Same	4
Silverline	National	Same	3
Seramiksan	National	Same	15
Alpino Furniture	National	Same	20
Kingg Pizza	Local	Same	9
Aran Blanket	Local	Same	20
Bellona Furniture	National	Same	5
Kelebek Furniture	National	Same	22

Study" conducted by Özmen etc. in 2018. Özmen et al. In his study, the effect of visual posters (2018 New Year posters of thermal hotels in Afyon) on the behavior of the target audience was examined with Neuro Sky Mobile Brain Wave Sensor, which is one of the neuromarketing methods. The study was carried out by showing five different posters on a 21" monitor in order to create a natural environment for the participants*(23)*. Also, Sophie etc. used eye tracker in their study to create a natural environment. In their study eye tracker was attached to a 22" screen that was placed 23 to 32 inches from the participant*(24)*. For this purpose, a similar application was used in our research to measure the communication efficiency of the advertisement.

Two methods were used together as data collection method in the study. Sophie et al also used the eye tracking technique and questionnaire method in their study (Using Eye Tracking to Understand the Effects of Brand Placement Disclosure Types in Television Programs) published in 2015*(24)*. The mixed method was used because their study was similar to our study.

First of all, 32 subjects participating in the study were shown a 5-minute video with 25 outdoor advertisements on the route. Subsequently, the ques-

tionnaire was applied to the subjects. The features of the 25 outdoor advertisements on the specified route are given in the table below.

With the recognition method, how many people saw the advertisement and to what extent it was read. By comparing the results with the results of other advertisements, information is provided to shed light on the decisions regarding the relative effectiveness of the ad and the content and place of publication of future advertisements.

In order to eliminate the biggest criticism directed to the recognition method that measures the communication effects of the advertisement, the accuracy of the data obtained from the subjects with the questionnaire method (determination of whether the video prepared for the research was actually seen by the subjects) was checked with an application made with an eye tracker. In addition, it was investigated whether there is a significant difference between the data obtained by two applications (questionnaire and eye tracker). After analyzing the data obtained by two methods, erroneous data were removed. Debugging the data is done as follows.

The two methods complement each other. With the survey technique, it was determined whether each advertisement was seen or not, and if so, the degree of understanding of the ad advertisement. The biggest deficiency of the survey method (false statements of the subjects) was corrected by the eye tracking technique. The video used in the research was shown to the subjects on a computer with an eye tracker. The reactions of the subjects while watching the video were recorded through the "Bandicam" program. The accuracy of the answers given by the subjects to the questionnaires was confirmed in this way.

Table 2. How Erroneous Data Were Removed

Traditional Research Technique "Survey"	Neuromarketing "Eye Tracking"	Descriptions
Declared that he saw.	He didn't look at the advertisement.	The data obtained from the subject through the questionnaire was changed to "not seen".
Declared that he didn't saw.	He looked at the advertisement.	The data obtained from the subject via questionnaire was changed to "Those who declared that they did not see in the survey and looked at the advertisement in the video". The reason for this is explained as follows; The human eye is constantly making foveal movements in daily life. With fovea movements, people can also see things that they cannot see. The eye scans continuously. For this reason, its subconsciouses the objects and events around them in daily life. However, the human remembers a very small amount of what is subconsciously stored by the foveal movements of the eye.

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The standard minimum sample of completed interviews on the magazines included in the Starch Advertisement Rating Service is 300 interviews, 150 with men and 150 with women*(19)*.

32 subjects (16 men and 16 women) participated in the study due to reasons such as the Covid-19 outbreak, the difficulty of conducting a survey during this period due to the measures taken against the epidemic, the difficulty of the mixed method used for the study (use of questionnaires and eye trackers) and the long duration of the study. Participation in the study was completely

Table 3. Demographic Characteristics of the Subjects

n = 32		n	%
Gender	Female	16	50,00
	Male	16	50,00
Marital Status	Married	20	62,50
	Single	12	37,50
Age	…. - 25	4	12,50
	26 - 30	7	21,88
	31 - 35	3	9,38
	36 - 40	11	34,38
	41 - …	7	21,88
Education Status	Primary education	0	0,00
	High School	3	9,38
	2-year University	8	25,00
	University	18	56,25
	Postgraduate	3	9,38
Which types of advertisements attract your attention?	Internet	17	53,13
	TV	10	31,25
	Radio	0	0,00
	Outdoor Advertisements	4	12,50
	Newspaper / Magazine	1	3,13

voluntary and the subjects were determined by the convenience sampling method.

The reliability analysis of the questionnaire used in the study: the Cronbach's Alpha coefficient is 0.833 and it was understood that the questionnaire has a high degree of validity.

The demographic characteristics of the subjects participating in the study are given in the table below.

Results

The aim of the research is to determine the rate of seeing 25 outdoor advertisements in Uşak and to what extent the viewers understand the advertisement. In addition, it is to determine whether there is a difference between the data obtained by the survey method (classical research method) and the data obtained by the eye tracking technique (neuromarketing method). The question of whether the survey method, which is generally used in marketing research, provides real data that businesses need, is answered with this research.

6 hypotheses were investigated in the research.

The H1 hypothesis (whether there is a significant difference between the data collected by the survey method and the data collected by eye tracking technique in order to measure the effectiveness of the advertisement) was investigated using the data obtained from the subjects for each advertisement by two methods. Whether the answers given by the subjects for each advertisement were consistent or whether there was a statistically significant difference between the answers given was investigated with the Wilcoxon Test, since the data did not show normal distribution. The results obtained are given in the table below.

12 (the advertisements in the line of 9,11,12,15,16,17,19,20,22,24,25) were found to be consistent with the answers given by the subjects or there was no statistically significant difference between the answers given by the subjects. The most consistent of the responses given by the subjects (those with

Table 4. H1 Hypothesis Results for Each Advertisements

No	Company	1*	2*	3*	4*	H1 Hypothesis Result
1	Opel Arden Automotive	22	3	6	1	Accept
2	Yurt Gaz	18	5	8	1	Rejection
3	Opet Aygaz-1	21	2	1	8	Rejection
4	Sarar Clothing	17	7	7	1	Rejection
5	Özdilek AVM	11	9	12	0	Rejection
6	Burger King	14	10	7	1	Rejection
7	Festiva	6	14	11	1	Rejection
8	Pizza Pizza	14	10	8	0	Rejection
9	Nadide Dormitories for Girls	2	25	3	2	Accept
10	Güven Security Services	4	14	12	2	Rejection
11	Sarar Blanket	3	18	3	8	Accept
12	Ayaz Medical	12	13	2	5	Accept
13	Medical Park Hospital	28	0	4	0	Rejection
14	BP	14	7	2	9	Rejection
15	Opet Aygaz-2	28	1	1	2	Accept
16	Vakıfbank	2	23	4	3	Accept
17	Shell	29	1	2	0	Accept
18	Bosch Service	5	13	11	3	Rejection
19	Silverline	0	28	2	2	Accept
20	Seramiksan	12	15	4	1	Accept
21	Alpino Furniture	17	3	12	0	Rejection
22	Kingg Pizza	10	10	9	3	Accept
23	Aran Blanket	20	2	10	0	Rejection
24	Bellona Furniture	18	10	1	3	Accept
25	Kelebek Furniture	27	0	2	3	Accept

1*: Survey (declared seeing the ad.) / Eye tracking (detected that looking at the ad.)
2*: Survey (declared not seeing the ad.) / Eye tracking (detected that not looking at the ad.)
3*: Survey (declared not seeing the ad.) / Eye tracking (detected that looking at the ad.)
4*: Survey (declared seeing the ad.) / Eye tracking (detected that not looking at the ad.)

an error rate of less than 10%) are Opet Aygaz-2 and Shell outdoor advertisements. The most inconsistent advertisements for the answers given by the subjects (those with an error rate greater than 35%) are Özdilek Shopping Mall, Festiva, Güven Security Services, Bosch Service, Alpino Furniture and Kingg Pizza. The advertisements with the most incorrect answers are Güven Security Services (43.75%) and Bosch Service (43.75%).

The H2 hypothesis (whether there is a significant difference between the rate of seeing the advertisement obtained by the survey method and the rate of the advertisement obtained by eye tracking technique) was investigated by applying the test of the differences between the two matched groups (since the data showed normal distribution). As a result of the analysis, a statistically significant difference was found between the appearance rates of the advertisements obtained by applying the survey method and the rates obtained by eye tracking technique. If one of the businesses involved in the research had a survey to measure the effectiveness

of the advertisement, the data obtained would be far from real data. It has been determined that there is a statistical difference between the rate of seeing the advertisements obtained by the survey method and the rate of the advertisements obtained by eye tracking technique. In order to eliminate the biggest criticism directed to the recognition method that measures the communication effects of the advertisement, the accuracy of the data obtained from the subjects with the questionnaire method (determination of whether the video prepared for the research is actually seen by the subjects) was provided by the application made with an eye tracker. After analyzing the data obtained by two methods, the erroneous data was removed. Debugging the faulty data is mentioned above.

The H3 hypothesis (whether there is a significant difference between male and female subjects of outdoor advertisements on the route) was investigated using the data cleared from errors. In order to determine whether there is a significant difference between the rate of seeing the advertisements of male and female subjects, a test was used to determine the differences between two independent groups (as the data show normal distribution). As a result of the analysis, no statistically significant difference was found between the rate of seeing the advertisements of male and female.

The H4 hypothesis (whether there is a relationship between the answers given by the subjects to the questions of gender, marital status, age, educational status and which types of advertisements attracted the attention of the subjects and the wrong answers they gave in order to measure the effectiveness of the advertisement.) was investigated by correlation analysis. As a result of the analysis, no statistically significant relationship was found between the subjects' gender, marital status, age, educational status, and their favorite advertising instruments and their erroneous answers.

The H5 hypothesis (whether there is a significant relationship between the time advertisements appear in the video that the subjects watched and the rate at which the advertisements are seen by the subjects) was investigated by correlation analysis. As a result of the analysis, it was determined that there is a positive relationship between the time advertisements appear in the video that the subjects watched and the rate of seeing the advertisements were seen by the subjects.

The H6 hypothesis (whether there is a significant relationship between the types of advertisements, the location of the advertisements and the rate of seeing the advertisements were seen by the subjects) was investigated by correlation analysis. As a result of the analysis, it was determined that there was no significant relationship between the type of advertisements, their position in the video that the subjects watched and the rate of seeing the advertisements were seen by the subjects.

Conclusion

As a result of the application made with the recognition method in order to measure the communication efficiency (rate of appearance) of the advertisement:

- The survey method is not sufficient to provide the real data that the business needs.
- The biggest criticism (the wrong answers of the subjects) made to the recognition method reflects the truth.
- It was determined that real data could be obtained from the subjects with the neuromarketing method.
- Problems encountered in practice.
- The application of the neuromarketing method is long and difficult.
- Neuromarketing method requires special equipment and training is needed for the personnel performing the application to use the devices.
- The device needs to be calibrated before each application for the subjects,
- It was determined that participation in the survey was insufficient due to the application taking 10 minutes.
- After correcting the data obtained by the survey method, the rate of seeing the advertise-

ments was calculated. According to the results obtained.

- Highest seen advertisement: Medical Park Private Hospital (100%).
- Lowest seen ad: Silverline (6.25%).
- The most read and understood ad by the subjects: Opet Aygaz-2 (87.5%) and Kelebek Furniture (87.5%).
- The least read and clearly understood advertisement by the subjects: Güven Security Services (0%) and Silverline (0%).
- Advertisements by appearance rate; Medical Park Hospital (%100), Shell (%96,88), Aran Blanket (%93,75), Opet Aygaz-2 (%90,63), Alpino Furniture (%90,63), Kelebek Furniture (%90,63), Opel Arden Automotive (%87,5), Yurt Gaz (%81,25), Sarar Clothing (%75), Özdilek AVM (%71,88), Opet Aygaz-1 (%68,75), Pizza Pizza (%68,75), Burger King (%65,63), Kingg Pizza (%59,38), Bellona Furniture (%59,38), Festiva (%53,13), Güven Security Services (%50), BP (%50), Bosch Service (%50), Seramiksan (%50), Ayaz Medical (%43,75), Sarar Blanket (%18,75), Vakıfbank (%18,75), Nadide Dormitories for Girls (%15,63), Silverline (%6,25).

It has become necessary to use new techniques and methods for collecting the required information because traditional market research and information gathering techniques have become unable to meet the needs of enterprises and cannot always produce the desired results. As a result of the application, it is understood that the survey method is not sufficient by itself for advertising researches. The biggest criticism made to the survey method is that the subjects presented incorrect data. Almost 35% of the survey data obtained from the application was found to be inaccurate. The weakest link of the survey method (the wrong answers given by the subjects) can be eliminated with the techniques and devices used in the field of neuromarketing and the opportunity to reach the real data required by the enterprises is provided. In this way, business managers can make their decisions with real data.

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