

## AN EXPERIMENTAL STUDY ON THE ANALYSIS OF CUSTOMERS' RATIONAL RESPONSES THROUGH EYE TRACKING TECHNIQUE: TORKU INC. CASE

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### ABSTRACT

*Neuromarketing is the practice of measuring and discovering the emotional and unconscious reactions that constitute the perceptions of customers and using these data in marketing. This, in one respect, is the exploration of the purchasing area of the human brain. Experts who are active in a market where no isolation of change exists have to take subconscious elements lying under the body and mind correlation into consideration if they are willing to learn what consumers think, the dynamics that they take into account when they take decisions and the secrets of their decisions. Accordingly, neuromarketing, as a field of study with high reality remote from utopia employing various measuring techniques within the scope of scientific data and statistical calculations and exhibiting futuristic characteristics through providing foresights, besides being the tempting marriage of marketing and science, acting as a window opening into human brain, has been trying to solve this riddle by blending science into marketing research. In the present study, a sample research design was conducted by using eye tracking, which is one of the neuromarketing techniques, to determine where the subjects were attentive to in the advertisement, which parts they were more focused on, and in which order and for how long they watched the visuals. For this purpose, a questionnaire that the researchers created was answered by the participants of the experimental group. The results were interpreted and suggestions were developed based on the findings.*

**Key Words:** Consumer Behavior, Eye Tracking, Neuromarketing

### 1. INTRODUCTION

The human is identified as the main stakeholder that is of vital importance for businesses to continue their existence. Without doubt, pleasing a stakeholder of such vital importance, increasing his level of satisfaction, building sustainable relationships, delivering a solution to the problem of what the human essentially wants from the business and being able to determine marketing strategies and policies regarding these points are among the array of activities that must be performed by businesses that want to be successful. In today's understanding of business management, discovering and understanding human behavior is an imperative for building the sustainability of businesses. For years, it has been considered that human beings make these decisions through rational reasoning within logical standards. The routine in this process has manifested itself as think-perceive-buy/ do not buy. Unfortunately, the process does not function this simple. The most straightforward indicator of this case is consumers' shopping habits. How would you explain the consumer behavior of buying one more pair of shoes although not needed? Or why does the consumer want to change his still-new computer with the newly-introduced one? The understanding which argues that the process routinely reverses stays silent in the face of these questions. That is, these attitude and behaviors show that humans not only are rational creatures, but also act based on their feelings, and their irrational behaviors need to be analyzed. Accordingly, considering the possibility that there are significant differences between what consumers say and do, creating marketing strategies based on only statements through traditional methods would invite significant costs (Girişken, 2015).

Due to these and similar necessities and with the union of neurology and marketing science through technological movements, the term 'neuromarketing' has come to the fore. The aim of the present study, in which eye

movements are examined by means of eye tracking, which is one of the neuromarketing techniques, is to determine which part of the advertisement the attention of the viewers focused on, how long their attention lasted, and which visuals their eyes were mostly fixed on. After the measurements, the statements of potential consumers were also taken, and the correlation between measurement results and statements was also examined. This study differs from other studies in that it analyzes a commercial film to examine purchasing behavior through eye tracking, which is a technique used by the discipline of neuromarketing.

## 2. CONCEPTUAL FRAMEWORK

### 2.1. Neuromarketing

Neuromarketing, which has recently aroused interest by maintaining the focus of the academic community and the business practice on the topic this much, has gained considerable ground in a short time. In the literature, there are various definitions of what neuromarketing is. According to Lee et al., neuromarketing is a methodology based on measurement which combines brain wave movements and clinical psychology to improve the understanding of insightful responses that humans give to products, brands, and advertisements (Lee et al., 2007). Bercea defines neuromarketing as an interdisciplinary field that aims to investigate and understand consumer behavior by studying the brain (Bercea, 2013). According to Babu and Vidyasagar, it is the application of cognitive neurosciences in the field of marketing and marketing research (Babu and Vidyasagar, 2012). Lindstrom views neuromarketing as the key to the subconscious thoughts, feelings, and desires that drive the purchasing decisions we make each and every day (Lindstrom, 2014). Butler states that neuromarketing attempts to understand the biology of human behavior, and in this context, the thoughts and actions of the consumer (Butler, 2008). Taking a different approach to the term, Hubert and Kenning define neuromarketing as just a simple business tool. They describe it as the integration process of the outputs of neuroscience and psychophysiology into the world of marketing, and mainly prefer the term *consumer neuroscience* (Pop and Iorga, 2012). Georges and Badoc define neuromarketing as the knowledge of the human brain information processing mechanisms which can generate ideas for substantiating the decisions of the entrepreneurs that want to communicate with their exchange partners (Pop and Iorga, 2012). Stephen Genco defines neuromarketing as any marketing or market research activity that uses the methods and techniques of brain science or is informed by the findings or insights of brain science (Genco et al., 2013). According to Pepe Martinez, neuromarketing is the integration of neurology, which studies the human brain, with cognitive psychology, which studies the relationship between human mind and behavior, and the science and art that is responsible for developing new concepts for products and services to satisfy consumer needs, and thus maximize profits (Martinez, 2012).

### 2.2. Eye Tracking

Eye tracking provides a real time recording of where visual attention is directed. This real time recording also shows how pupil dilation changes. This measure is a useful indicator of emotional arousal. High resolution video cameras are placed to the sides without obstructing the consumer's eyes. A small non-invasive light guides the camera to track what is being viewed while other cameras capture related information. The studies are generally conducted on stationary subjects. However, additional hardware is needed to track a subject's gaze when moving (Bendle et al., 2015).

The method mentioned above is the one applied by the businesses that have adopted the understanding of today's modern marketing. The special areas which the consumer looks at on visual stimuli, such as Web pages, posters, product packages, supermarket shelves, magazines, and TV adverts are determined. The part of the stimulus object that the consumer looks at and the duration and time of the look are detected. Milliseconds and x-y coordinates provide the data description. These obtained data are turned into graphics and interpreted. For example, in a shelf test study conducted by Hür and Kumbasar using eye tracking, it was determined that 74% of purchasing decisions were made in-store. The effect of product packaging on consumer preferences was found to be 60%. In addition, it was discovered that 50% of the failure in the launch of some products originated from market display (Hür and Kumbasar, 2011).

In his study entitled *Eye Movement-Based Interaction Techniques*, Robert Jacob bases the tracking of eye movements on three main methods (Jacob, 1990: 11-18):

- Recording the response of the pupil by means of a light shone at the eye
- Electronic recording using electrodes placed around the eye
- Activity tracking using contact lenses

### **3. METHODOLOGICAL FRAMEWORK**

In this section, the research methodology of the study is presented under a number of titles. At the first stage, a general introduction of the company whose commercial was examined in the study is provided. Afterwards, the reason for investigating the topic of the research and what is targeted with the results obtained as the result of the study are addressed in the aim of the study section. The contributions of the study to the theory and practice, and the aspects that differentiate the study from similar studies are mentioned in the aim and significance of the study section. In the research method section, it is aimed to provide answers to questions such as how the data are obtained, what the scope and universe of the study are, which questions are solved with this information and how the information is used, and which method and techniques are utilized in this process. The findings are separately analyzed and interpreted.

#### **3.1. Aim and Significance of the Study**

The primary aim of this study, which was conducted in the field of neuromarketing endeavoring to solve the puzzle that when individuals with complex biological structures act based on reason as well as their feelings, this causes them to depart from rationality, is to detect the eye movements of consumers watching advertisements, which play a role in preparing the potential buyers to selling space visits by providing information. In addition to this primary aim, to contribute to the progress of neuromarketing, along with being a very young and distinct field of science, which is a field that needs to be improved and an increase in the awareness for, and at the same time whose applications are costly, both to create a projection for the businesses that desire to minimize their costs by excellently determining the expectations of customers and to provide an awareness to customers for meeting the demands and needs of the consumer at the desired level by scientifically interpreting the obtained data, are among the other aims of the study.

In neuromarketing research studies, genuine results are obtained owing to the measurement of what the consumer actually wants, that is, the sense organs of the consumer do not lie, the consumer gives answers far from worries and prejudices. It is stated that the studies conducted in this field would be factual, scientific, and more reliable. In addition, the aspect of the conducted studies that leads studies resolving ethical worries contributes to the raising of more conscious individuals and to more rational purchasing decisions. The studies conducted in the field of neuromarketing until now, including the present study, and future studies contribute to the national and international literature in the field of neuromarketing and are of significance in that they show that social sciences are also such important for experimental research studies. Besides, this study is of particular importance in that it provides a better comparison and emphasizes the insufficiency of using the traditional survey method based on statement alone in understanding the consumer and it differs from other studies by analyzing a commercial film using eye tracking measurement, which is among the techniques used in the discipline of neuromarketing.

#### **3.2. Research Method**

In the study, the effect of the advertisement on the consumer was measured using the eye tracking technique. In this scope, the commercial film shot for the No:1 Chocolate Wafer product of Konya Seker Inc. Torku special for Fathers' Day was analyzed. Konya Seker, which is a producer cooperative, launched the brand Torku in 2007 with a strategic and visionary perspective. At this step of the study, voluntary subjects were made to watch the mentioned commercial film of the company. While the subjects were watching the commercial, their eye movements were measured. During individual examination, the density of the points looked at in the commercial were measured using the eye tracking device placed around the eye area. The measurements were performed in a studio environment and the subjects were taken to the studio for measurements one at a time. Eye tracking outputs were comparatively analyzed and interpreted by academicians and specialists also taking the statements of the participants into consideration.

### **4. DATA AND FINDINGS**

Although a new model especially in Turkey, eye tracking technique has been implemented in various projects and areas abroad. As mentioned in the conceptual framework of the study, it is the process of determining where and for how long the subject gazes at and focuses on when the looks at/ watches a visual object. It is a technique which determines at which point of the image a subject looks, and in which order and how long they watch the picture. Individuals who regularly consume wafers were selected for the study. A total of 24 subjects consisting of 12 females and 12 males were made to watch the commercial film for the No:1 Chocolate Wafer product of Torku special for Fathers' Day. Of the subjects, 29.1% were from B, 45.9% were from C1, and 25% were from C2 socioeconomic status group. Thirty-seven point five percent of the subjects were in the age range of 18-24, 41.7% were in the age range of 25-35, and 20.8% were in the age range of 36-55. Twenty-nine point two percent of the subjects were married and 70.8% were single.

#### 4.1. Evaluations regarding the Product-Logo-Slogan

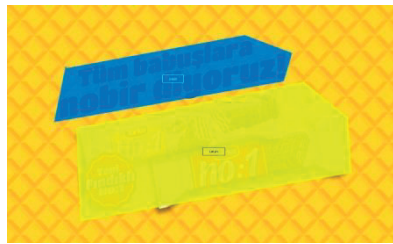


**Figure 1.** Product Visual Heatmap

A heatmap shows the areas that have received the most attention and where the eye is focused, and in this way the places the eye sees are determined. When the visual is examined, it is seen that the attention was focused more on the 'Tüm babuşlara nobir diyoruz' (We're saying what's up to all dads) caption and this part of the visual was gazed for a longer time.



**Figure 2.** Product Visual Cluster



**Figure 3.** Product Visual AOI (Area of Interest)

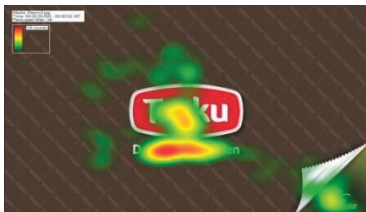
A cluster is converted into percentages by summing up all areas which the participants look at on the frames. In this way, the areas on the frames are grouped and the percentage of the subjects that see these areas is determined. Therefore, the results that have occurred on the visual above represent the percentage of the subjects that see the marked areas.

Area of Interest (AOI) is the detection of the areas that are expected to be particularly examined and on which more thorough graphical findings are sought among the areas existing in the content of the advertisement. While the area covered by the caption is 12.1%, the area covered by the image of the product is 26.7%. That is, the subjects focus more on the area that the image of the product covers.

Participant -% is the percentage of being seen/looked at by the participants. As it can be seen in the graph, the participant percentage of the caption is 85%, whereas the participant percentage of the image is 90%.

The caption covers an area of 12.1%, and the product image covers an area of 26.7% in the whole visual. The caption area was looked at by 85% of the participants, whereas the product area was looked at by 90% of the participants. The area where the participants first looked at on the product visual is mainly the 'Tüm babuşlara nobir diyoruz' area, and at the same time this is the part that has the longest viewing duration on the visual. The subjects focused on this area more compared to the product image. It was observed that the 'Tüm babuşlara nobir diyoruz' statement in this area was often confused with the brand slogan. The product visual was the area that received the most eye fixations per subject. It was found that the interviewees generally looked at this area for a shorter time and with less focus.

For the Logo-slogan visual heatmap, the slogan 'Doğal olarak bizden' (Naturally one of us) was the part where the attention of the subjects focused on. However, the subjects could not remember the slogan when they were asked. It was confused with the statement 'Tüm babuşlara nobir'. These explanations are given in the visual below.



**Figure 4.** Logo-Slogan Visual Heatmap



**Figure 5.** Logo-Slogan Visual Cluster

The Logo-Slogan visual cluster results occurred as follows: The viewers gazed at Cluster 1 at a rate of 19%, cluster 2 at a rate of 100%, cluster 3 at a rate of 81%, cluster 4 at a rate of 54%, cluster 5 at a rate of 46%, and cluster 6 at a rate of 23%. According to the results for the logo-slogan visual AOI given in the figure above, the logo covers 9.3%, the slogan covers 2.5%, and the company name covers 1.8% of the total area.



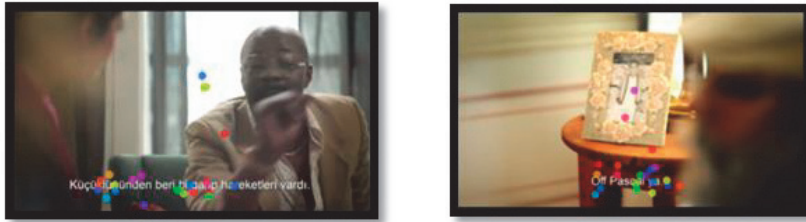
**Figure 6.** Logo-Slogan Visual AOI

As is seen in Figure 6, the results reveal that the brand is seen at a rate of 90%, the slogan is seen at a rate of 95%, and the company name is seen at a rate of 45%.

That is, the logo area takes up 9.3%, the slogan area takes up 2.5%, and the company name takes up 1.8% of the whole visual space. Ninety percent of the interviewees looked at the logo, and 95% looked at the slogan area. The company name section was looked at/seen at a rate of 45%. Although the 'Konya Seker' section is the part first looked at on the visual, it is the section that attracts the least attention. This area ranked the last among all areas of the visual in terms of focusing time and number of eye fixations. While the slogan section received the most focus and was gazed at for the longest period of time, the participants were not able to remember it during face to face questionnaires and confused it with the caption 'Tüm babuşlara nobir diyoruz'.

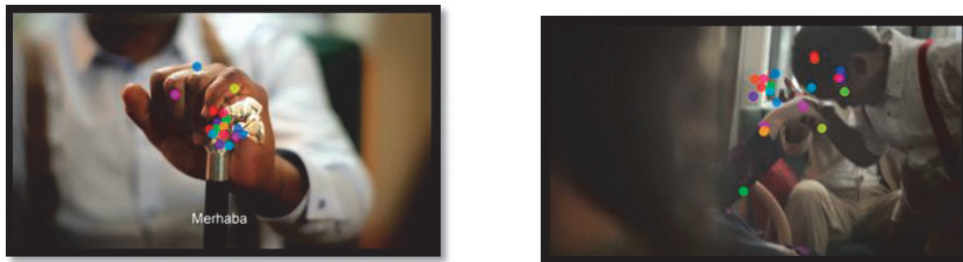
#### 4.2. Evaluations regarding the Commercial

The areas where the attention of the subjects focused on in general were the caption parts.



**Figure 7.** Caption parts that subjects focused on

The frames that the subjects focused their attention on independent of the caption are presented below.



**Figure 8.** Frames the subjects focused attention on independent of the caption



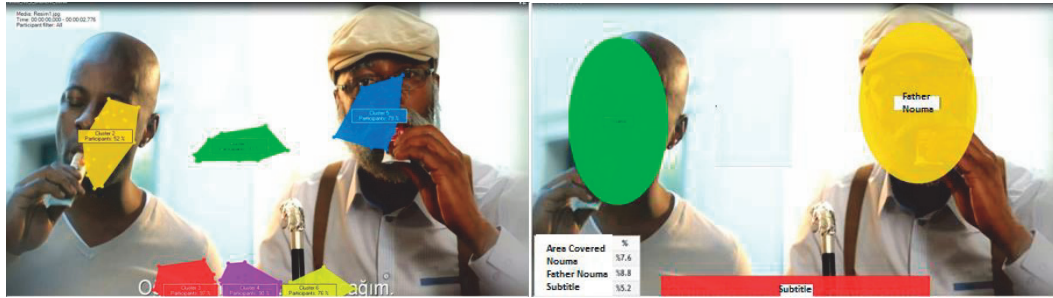
**Figure 9.** Other frames the subjects focused attention on independent of the caption



The following visual shows that the viewers focused more attention on Father Nouma compared to Nouma Jr., and Father Nouma was looked at more. As was for the whole commercial, the caption was the area looked at the most.



**Figure 10.** Nouma Wafer Eating Heatmap



**Figure 11.** Nouma Wafer Eating Cluster

**Figure 12.** Nouma Wafer Eating AOI

These measurements conducted on the commercial show that the logo area covers the 9.3%, the slogan area covers the 2.5%, and the company name covers the 1.8% of the whole visual. Ninety percent of the interviewees looked at the logo, and 95% looked at the slogan area. The percentage of being seen/looked at by the participants was 45% for the company name section. The part which the interviewees focused their attention for the longest time was the captions. In this visual, the regions where the gazes remained for the longest time were again the captions. Father Nouma was the section that received the second highest number of eye fixations after the caption. The part that the viewers first looked at in the frame was Nouma. However, it was also found out that the part where gazes remained for the shortest time and attention was focused on for the shortest time in the frame was Nouma.

## 5. RESULT AND DISCUSSION

Although our intuitive experience tells us that we view everything in the world at a single glance, this is not possible. The vision is focused on a tiny area that we rapidly move around, then the brain fills in the gaps. For example, it is believed that eyes can smoothly be moved across the view seen, but this is not the case. If the eyes are watched, it is seen that they actually make a series of small, fast jumps, called saccades. When the eye performs a saccadic movement the image received by the retina is blurred, that is, a case of blindness is experienced during these visual leaps, although there is no conscious awareness of this. Light enters through the lenses of the eye, which can become more curved or flat depending on its focusing in closer or more distant objects, and cornea. Then, it hits the retina, where there are around 120 million rod cells and around 6-7 million cone cells. The pupils become larger or smaller depending on the condition of the light, but also on the person's emotional interest and cognitive load.

In light of these findings of the present study obtained through eye tracking, the evaluations on the visual of the product show that the caption 'Tüm babuşlara nobir diyoruz' is the part that the participants first focused on. This section is also the one which the interviewees focused their attention on for the longest time. In total, this section was gazed at for 0.79 seconds, which was longer than the time spent to look at the product. It was observed that the viewers looked at the product part for a shorter time and focused less on this part. As for the evaluations on the logo, although 'Konya Seker' was the part that the participants first focused on, it was also the part that attracted the least attention. The logo of the brand received the highest number of eye fixations, yet it was the part that was focused on last. The face-to-face questionnaire study conducted simultaneously with the eye tracking technique also confirmed that the logo was remembered correctly. Regarding the slogan, the statement 'Doğal olarak bizden' was the part that received the highest number of eye fixations and where the subjects focused their attention the most. However, the statements of the participants showed that this slogan was confused with the sentence 'Tüm babuşlara nobir diyoruz'. Regarding the evaluations on the content of the advertisement, it was determined that the areas where the attention of the subjects

focused on in general were the caption parts. The areas that the subjects focused their attention on independent of the caption were the eagle-figured cane, hand kissing scene, eating Turkish omelet, the writing 'Nobiiiiir' on the back of the car, and finally Father Nouma in the scene that Nouma Jr. and Father Nouma take part in. However, although the section that the viewers first looked at was Nouma in the scene that Nouma Jr. and Father Nouma appeared, the subjects mostly focused their attention on Father Nouma.

In conclusion, it would be pertinent for the company to make a more effective commercial planning considering the balance targeted to be achieved between the message aimed to be given through the advertisement and the response expected from the consumer. In addition, since the commercial mainly appeals to men's segment for being shot special for the Fathers' day, it would be for the benefit of the company to adopt a more integrated communication policy that embraces all segments.

## REFERENCES

- Babu, S. Samuel and Thalluri Prasanth Vidyasagar. "Neuromarketing: Is Campell in Soup", **The IUP Journal of Marketing Management**, Vol. XI, No. 2, 2012.
- Bercea, M. D. (2013). "Quantitative Versus Qualitative in Neuromarketing Research", **MPRA Munich Personal RePEc Archive**, 44134, 3, 2.
- Bendle, N. T., Paul W. Farris, Philip E. Pfeifer and David J. Reibstein, **Marketing Metrics The Manager's Guide to Measuring Marketing Performance** [electronic version], USA: Pearson Education, 2015.
- Butler, M.J.R. (2008). "Neuromarketing and the Perception of Knowledge", **Journal of Consumer Behaviour**, 7, 416.
- Genco, S. J., Pohlmann, A. P. and Steidl, P. (2013). **Neuromarketing for Dummies** [electronic version] Canada: John Wiley & Sons Ltd.
- Girişken, Y. (2015). **Gerçeği Algıla**, 2<sup>nd</sup> Edition, Istanbul: Beta Publications.
- Girişken, Y., Giray, C. and Ocak, E. (2014). "Pazarlama Önerilerine Yönelik Tüketici Tepkilerinin Nöropazarlama Yöntemleri ile Ölçülmesi Üzerine Deneysel Bir Tasarım: GSM Operatörlerinin Kurumsal İnternet Sitelerinden Akıllı Telefon Satışı Örneği", **19<sup>th</sup> National Marketing Congress**, Gaziantep: Gaziantep University, 436.
- Hür, Ş. and Kumbasar, S., "Göz Hareketlerine Dayalı Araştırma Çözümleri Eye Tracking Teknolojisi", **Innovations in Research Conference**, 4 May, 2011, [www.ipsos-kmg.com](http://www.ipsos-kmg.com) (Retrieved on 3 June, 2016).
- Jacob, R.J.K. (1990). "What You Look at Is What You Get: Eye Movement-Based Interaction Techniques", **Human-Computer Interaction**, O-89791 -345O/90/0004-0011, pp. 11-18.
- Lee, N., Broderick, A. J. & Chamberlain, L. (2007). "What is Neuromarketing? A Discussion and Agenda for Future Research", **International Journal of Psychophysiology**, 63, 199-204.
- Lindstrom, M. (2014). **Buy-ology Satın Almaya Dair Bildiğimiz Herşey Neden Yanlış**, Ümit Şensoy (trans.), 1<sup>st</sup> Edition, İstanbul: Optimist Publications.
- Lindstrom, M. (2012). **Brandwashed**, Levent Göktem (trans.), 1<sup>st</sup> Edition, İstanbul: Optimist Publications, pp. 97-103.
- Martinez, P. (2012). **The Consumer Mind Brand Perception and The Implication for Marketers** [electronic version] UK and United States: Kogan Page Limited.
- Pop, N. A. and Iorga, A. M. (2012). "A New Challenge for Contemporary Marketing –Neuromarketing", **Management & Marketing. Challenges for the Knowledge Society**, Vol. 7, No. 4, 636.