

# CREATING OF EFFECTIVE PRODUCT PHOTOGRAPHY FROM THE PERSPECTIVE OF NEUROMARKETING

**Jaromír Tichý, Pavel Rosenlacher, Barbora Slavíková**  
*University of Finance and Administration, Faculty of Economic Studies,  
Department of Finance, Department of Business Management  
jaromir.tichy@vsfs.cz, pavel.rosenlacher@vsfs.cz, 28506@mail.vsfs.cz*

## **Abstract:**

Using neuromarketing in marketing communication can increase its effectiveness in communicating with the customer. By neuromarketing, we try to ascertain as much as possible how the brain works in the process of buying and we try to make marketing activities more effective. The paper focuses on the area of neuromarketing research, especially on the application of the Eye Tracking research method. The aim of the paper is to find the most effective composition of photography by comparing the created photos from the area of jewelry in several different modifications. The photos were tested using the Eye Tracking method and further verbally evaluated by respondents using a questionnaire survey. The output of the testing are so-called "heat maps", which show where the respondents focused their view the most, what attracted their attention, whether the advertising message was successful and where its deaf places were located. The survey shows that the stylization of product photos is very important when presenting the product.

## **Key words:**

Marketing, neuromarketing, effective, photography, eye tracking, marketing Communication

**JEL:** M00, M31

## **1 Introduction: Heading for the introductory chapter**

Corporate marketing uses new approaches and methods, such as neuromarketing. Using neuromarketing in marketing communication can increase its effectiveness in communicating with the customer.

Customer emotions and feelings have a great impact on the customer's decision-making process. By neuromarketing, we try to ascertain how the brain works in the process of buying as much as possible and thus make marketing activities more effective. Neuromarketing can reveal what and how stimulates customer's feelings, what feeling is created in the moment of decision to buy.

The paper focuses on the area of neuromarketing research, especially on the application of the Eye Tracking research method. Neuromarketing is a new marketing discipline that studies sensorimotor, cognitive and emotional responses of consumers to marketing suggestions (Roebuck, 2011). Neuromarketing is a multidisciplinary field of application and interconnection of neuropsychology, cognitive psychology and neuroscience in the area of marketing decision making (Vysekalová, 2014). In sum, neuromarketing can be understood as linking the application of biomedical technology and marketing research (Rosenlacher, 2013). Thanks to this link, e. g. the effectiveness of marketing communication tools before they are launched can be verified, and the potential of the impact of the marketing tool on consumers can be ascertained.

The aim of the paper is to find the most effective composition by comparing the created photos in several different modifications. The photographs were subsequently tested by Eye Tracking method and further evaluated verbally in questionnaire survey by respondents.

The output of the testing are so-called "heat maps", which show where the respondent focused his view the most, where more viewed areas of the advertisement are marked with red shades, while the less-viewed areas are marked with blue color (Hai-Jew, 2015). These outputs can be merged for all respondents and areas, such as those on advertising banners that attract the most attention, can be found. The capture of eye movement senses exactly whether the ad is successful and where its deaf places are.

In addition, it is possible to determine the way of view and the length of attention to a specific location - this determines areas of interest. The Eye tracking method allows us to test a variety of materials. We can measure printed and promotional flyers, photographs, commercials, videos, or even plain text. Using this method, it is possible to determine the "visual behavior" of the respondent and find out which incentives are effective and which are not.

## **2 Method of research**

The Eye tracking research method, complemented by a questionnaire survey, was used to achieve the objectives set in this neuro-marketing survey. The main objective was to find the effectiveness of different photos that varied in colors, stylization or techniques of photography. At first, several variations of the product photos from the jewelry area were created, and these variations of photos with different compositions were tested using a static eye camera and a questionnaire survey.

The Eye tracking method focuses on eye movement analysis to understand consumer behavior (Duchowski, 2008). This method can track the precise movement of human eyes and then record the areas where the respondent looked and how long (Zurawicki, 2010). The graphical output are the so-called heat maps (maps) from which we can trace the places which the person viewed most (Popelka, 2012).

As the outcome of testing in this paper the most monitored sections of the ad are marked with dark centers in the light gray area, while the less monitored areas are marked by dark areas around the light areas on the heat maps. To ensure the best results, it is important to follow the exact procedure for each respondent and to limit the external stimulus to a minimum so that his attention is focused only on ongoing measurements.

### **2.1 Tested photos**

In the course of the investigation, a total of four photographs of jewelry were used, which were targeted with different stylization and composition - these photographs were created only for the purposes of this neuromarketing survey. Camera Nikon D5100 with Nikkor AF 50mm f/1.8 AF-S lens was used to capture photos. During shooting, a tripod and remote trigger was used to eliminate unwanted shocks and to get as many professional photos as possible. The HDR method - high dynamic range was used when shooting. For the resulting quality of photos an integral part of the photo creation is the postproduction in the Photoshop graphics editor.

In all photos, Pandora jewelry is used as a product. For a product like jewelry, the precise presentation with appropriate stylization is important. This product was chosen because there is a wide range of composition or stylization options to acquire these product photos. Specifically, it is a bracelet, which can be supplemented by different pendants. Individual photos were created with different assumptions and expectations. Some photographs were taken with a detail of the jewelry, others with the placement of a jewel in the middle of the photo (the so-called central composition). Each of the photos was accompanied by a variety of decorative items that illustrate the final appearance of the image.

Photo no. 1 (Figure 1) uses a central composition and highlights a bracelet to attract the attention of the customer. The composition is complemented by a green flower and red rose petals. Everything lies on a white background, which should provide purity and elegance in the picture.

**Figure 1: Tested photo no. 1**



*Source: authors.*

Photo no. 2 (Figure 2) captures the detail of the bracelet on a golden background with water drops around. This composition is compiled according to the rules of the so-called third composition. The goal is to make the photo simple and clear for the customer. The golden background can create a sense of luxury and product prestige. This differs from the first picture by adding a company logo.

**Figure 2: Tested photo no. 2**



*Source: authors.*

The third photo (Figure 3) differs in the fact that the bracelet is open. The shadows of flowers are dominant here and the overall colors of the photo are in shades of gray. Along with these shades and the dark touch of the whole photo, it causes a feeling of sadness and gloominess. The sharpness of the photo is focused on the central part.



**Figure 3: Tested photo no. 3**



*Source: authors.*

The fourth photo (Figure 4) forms a glass bowl with a bracelet in the foreground that is the only focused. The composition consists of two red rose flowers, its green leaves and in the background of the composition is a paper bag with a logo. Blurring of other stimuli except the bracelet is deliberate, because otherwise other elements of the composition would most likely attract attention besides the bracelet. The bag with logo is deliberately placed in the line behind the focused bracelet to make it easier and more intuitive to move the view on the logo. A summary of the design and composition of the created photographs is given in Figure 5.

**Figure 4: Tested photo no. 4**



*Source: authors.*

**Figure 5: The design and composition of photographs created for testing**

	Composition	Background	Presumption of action
Photo 1	Center, simple. Other features: distinctive petals of roses, but not in the middle.	White soft background. No logos.	Petals will attract the sight first, not much attention will be paid to them.
Photo 2	A third composition. Only a bracelet detail with three pendants.	Golden glittering background with water drops.	Respondent inspects all three pendants. The logo will be less dominant.
Photo 3	Effect of light shadows. Sharpness primarily on the center of the bracelet. Pendants around the bracelet.	Dark combination of white and black. No logos.	Feeling of gloomy picture. Focused pendants will be more closely viewed.
Photo 4	Composition of the third rule. Part occupied by the bracelet, other parts by the composition elements. The only bracelet is focused.	White background with colorful elements. Logo slightly blurred.	Bracelet, the only sharp feature of the photo attracts the most attention. The logo will also be recorded on the paper bag in the background.

*Source: authors.*

## 2.2 Testing of photos

The prepared photos were presented on a Philips 22 inch Full HD Monitor using Gazepoint 3.4.0. software. Measurement was performed using the static eye camera Gazepoint GP3 Eye tracker, which was attached to the monitor. The 0.3 MP camera used includes a 1/3" Micron MR9V022 CMOS image sensor with 6 µm x 6 µm pixel size, speed of shooting is 60 frames per second (fps) at resolution 752 px x 480 px (Radecky & Smutny, 2014). Testing took place in a quiet and undisturbed room with lower lighting to avoid any interference that could affect the respondents.

The survey was attended by a total of 17 respondents. 12 of these were women and 5 were men with an average age of less than 30 years. Intentionally, a larger proportion of women was chosen in the sample of respondents due to the nature of the product, although men were also selected because a female bracelet could also be a gift for a woman. Respondents were students from the University of Finance and Administration. After giving instructions to respondents and calibrating the eye camera, photographs were presented, each exactly for 4 seconds. Each of the respondents was tested individually to avoid interference. After the completion of data collection with the help of the eye camera, the respondents had to briefly evaluate the individual photos in the submitted questionnaire.

In the tested photographs were highlighted so called "AOIs" (officially "areas of interests") when processing the data by software Gazepoint for which specific viewing statistics were calculated. For example, it was the presented product, logo, or individual parts of decoration. In addition, a "heat map" was created for each photograph showing the degree of viewing of individual parts of the photograph using the color spectrum. Areas of greatest interest are colored in red (the darkest areas).

## 2.3 Evaluation questionnaire

The Eye tracking method was supplemented by an evaluation questionnaire that the respondents filled out immediately after the end of the measurement with the eye camera. This questionnaire was used to supplement the results. In the questionnaire, the respondents were asked to indicate what was the most memorable for them and to select one photograph for positive and one for negative review. On this issue, respondents did not have printed photos available so that the answers could not be distorted or influenced. In the next part of the questionnaire, printed photos were already available on A4-size

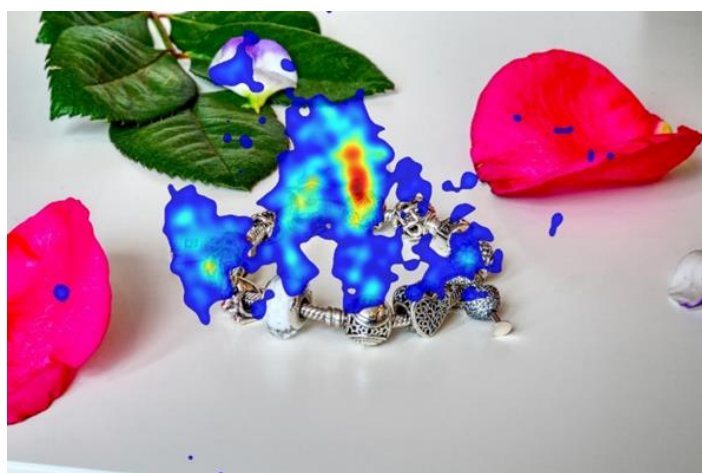
glossy paper. This is because of more memory demanding questions and also because of the order of the presented photos. Printed photos also help to answer questions where respondents should evaluate each photograph overall using a five-step rating scale where 1 = best review.

### 3 Paper results

The data evaluation focuses on areas of attention for individual photos. The length of the respondents' view on individual areas of interest is measured or even the return of the view to the same place.

Figure 6 contains "heat maps" that show the intensity of the views of the respondents on the color scale.

**Figure 6: The resulting heat maps of photo 1**



Source: authors, measured values Figure 7.

The photo above shows that the overall attention of the respondents is focused on the center of the photograph, namely the bracelet itself, but also on the petals above the bracelet. Thanks to the heat maps, it is clear that the respondents viewed the bracelet also along its circumference.

Figure 7 below lists the numerical data for the AOIs that were marked in the photograph. The values indicate that the first recorded area was clearly the white petal, located just above the bracelet. This petal attracted the attention of most respondents, 82 % of respondents surveyed it (14 out of 17) and a total of 52 % of respondents looked back at it. Similarly, the bracelet, which was viewed for 12 % of the time from the available 4 seconds, was also noticeable, while the respondents watched the bracelet along its entire circumference, including the pendants on it. Compared to other stimuli in the photo, 24 % of respondents returned their eyesight to the bracelet, which suggests an interest in the stimuli.

**Figure 7: AOI of photo no. 1**

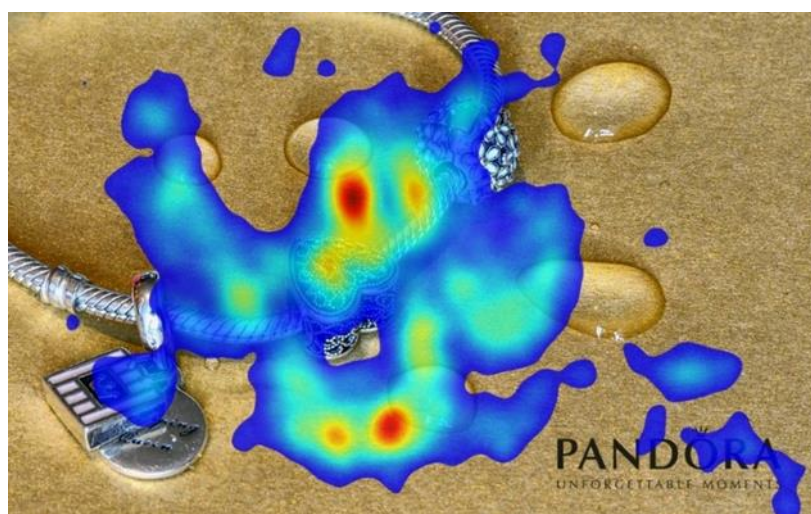
AOI area	Viewers	Average time to 1st view [s]	Average view time [s]	Average view time [%]	Returning of the view
White rose petal	14/17	1.13	0.74	18.46	9
Flower rose on the left	1/17	3.43	0.29	7.20	0
Pandora bracelet	12/17	3.55	0.49	12.23	4
Green leaf of the rose	3/17	3.65	0.19	4.67	0
Flower of the rose on the right	3/17	3.80	0.17	4.27	0

Source: authors.

On the basis of the questionnaire, 11.8 % of respondents reported this photograph as the one that was most interested. The positive rating mainly concerned the graphic design. For the same percentage this photograph was the least appealing, due to a composition that was more pronounced than the bracelet itself. When evaluating the photograph using the rating scale, the median is on the value of 2. This finding differs from the original expectation that the bracelet was arranged as the dominant in the center of the photo.

From the "heat map" visualization of the photo no. 2 (Fig. 8) results that the most striking point of interest was the central part of the bracelet with a heart-shaped pendant. An interesting fact is quite a lot of attention to the drop of water at the bottom. The crown pendant on the left has received very little attention as well as the company logo, which was in the center composition at the right bottom corner.

**Figure 8: The resulting heat maps of photo no. 2**



*Source: authors, measured values Figure 9.*

Figure 9, which provides statistics for individual AOIs, shows that the bracelet as a whole with the pendants caught the attention of respondents first. At the same time, 82 % of respondents focused their view on it. The logo ranked as the penultimate one - respondents focused their attention on it up to 3.18 seconds on average, and only 18 % of respondents monitored it. This may be due to the location of the logo further away from the bracelet in the center composition, but also because of the color of the background where the logo does not stand to the foreground.

**Figure 9: AOI of photo no. 2**

AOI area	Viewers	Average time to 1st view [s]	Average view time [s]	Average view time [%]	Returning of the view
Bracelet as a whole	14/17	1.04	0.30	7.37	0
Heart pendant in the middle	6/17	1.55	0.20	5.07	1
Flower pendant on the right	7/17	2.09	0.21	5.31	0
Logo	3/17	3.18	0.24	5.87	0
Crown pendant on the left	2/17	3.55	0	0	0

*Source: authors.*

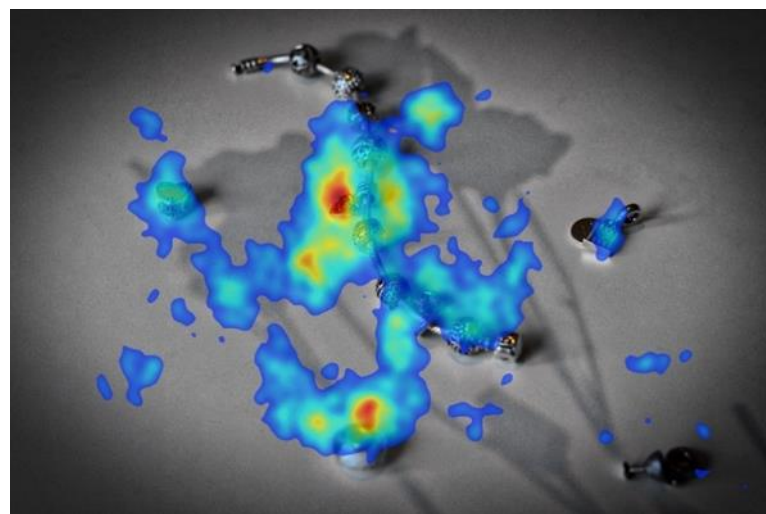


In The questionnaire survey shows that this is the best rated photo. A total of 47 % of respondents directly tagged this photo as the one they were most interested in. The reasoning was the simplicity of the composition, the detail of the bracelet and the pleasant color design. Depending on the weighted average, the photo was rated 1.

Photo no. 3 (Fig. 10) is compositionally simple, but fundamentally different by placing other pendants, even off the bracelet. Color tones are gray in several shades. There is no logo in the photo. By postproduction the photo was blurred along the edges so only center with a bracelet was focused.

From the measured data, it is clear that the area with the most attention is in the focused center of the photograph, that is, on the opened bracelet. Individual pendants despite their slight blurring were also observed. According to the "heat map" it is clear that the eyesight of the respondents focused on almost all the elements placed mainly in the center of the photograph. Surprisingly, the pendants that were not placed directly on the bracelet but close to it were also observed.

**Figure 10: The resulting heat maps of photo no. 3**



*Source: authors, measured values Figure 11.*

However, the blurring of some pendants may be undesirable and may make the viewer too busy in their recognition, in the extreme case the customer could perceive the blur as a technical lack of photography.

**Figure 11: AOI of photo no. 3**

AOI area	Viewers	Average time to 1st view [s]	Average view time [s]	Average view time [%]	Returning of the view
Heart pendant on the top left	2/17	1.05	0.10	2.40	0
Crown pendant on the top right	5/17	1.55	0.23	5.84	2
Bracelet as a whole	11/17	1.90	0.48	12.11	2
Glass pendant at the bottom right	2/17	2.35	0.34	8.40	0
White pendant on bottom left	3/17	2.39	0.09	2.27	0
Center of the bracelet	8/17	3.41	0.22	5.45	2

*Source: authors.*

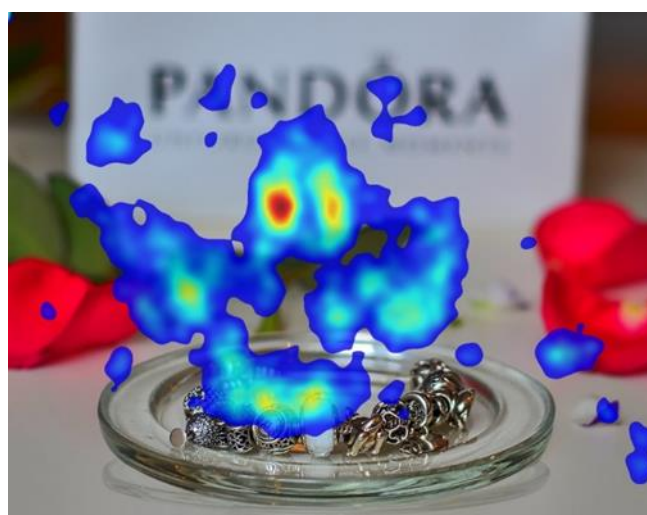


In The Figure 11 shows that all marked AOIs were noticed by respondents, respondents focused their attention at them with different intensity. The most observed stimulus was the bracelet as a whole, which was observed by 65 % of respondents, on average 12 % of the time available. On the other hand, the least observed was the pendant in the bottom right, only 12 % of respondents focused their eyesight on it for 2 % of the time available. This can be caused by the deliberate blur of this part of the photo, and by placing a pendant away from the center of the photo.

Based on the questionnaire, this photo was marked as the least successful by respondents. A total of 41.2 % of respondents tagged the photo as the one which did not attract their attention at all. The reason was mainly the dark backgrounds and gray shades. Overall, 52.9 % of respondents rated the photograph in terms of composition by the mark 5, the worst possible rating. By the weighted average the photograph is rated by the mark of 4.

Heat maps of the photo no. 4 (Fig. 12) prove the original assumption that attention will primarily be concentrated on focused stimuli that are more in the forefront. This is evidenced by the heat maps, which are displayed the least in the case of the rose flowers on the right and on the left.

**Figure 12: The resulting heat maps of photo no. 4**



*Source: authors, measured values Figure 13.*

Figure From the numerical values of the eye camera, the viewer did not return his eyesight to even one of the already observed areas, probably because of the large number of elements in the photograph. Therefore, returning of the view of the selected area is 0. The firstly observed area is the bracelet in the foreground, which is related to its location and its focus as the only item. The second longest observed stimuli was the logo on a paper bag in the background, which was observed by 7.2 % of the time available, even though it was slightly blurred. However, it can be said, that the slight blur can still attract the attention of the respondent if the stimulus is interesting and is in the context.

**Figure 13: AOI of photo no. 4**

AOI area	Viewers	Average time to 1st view [s]	Average view time [s]	Average view time [%]	Returning of the view
Pandora bracelet	10/17	4.05	0.47	11.84	0
Background with green leaves	3/17	4.07	0.25	6.13	0
Logo in background	3/17	4.11	0.29	7.20	0
Rose on the right	3/17	4.25	0.08	1.87	0
Rose on the left	0/17	0.00	0.00	0.00	0

Source: authors.

Even though 29.4% of the respondents rated the photograph as unattractive, the value of the weighted average was 3 in the overall rating. The reasons for the rating were mainly confusing beads and their larger quantities. Still, this photos suggests a possible approach to achieving greater efficiency in product photography.

#### 4 Discussion

Using Eye Tracking method, photographs created in several different modifications were tested. The Eye Tracking method was further complemented by verbal evaluation by respondents using a questionnaire survey. This survey shows that the stylization of product photos is very important when presenting the product. Obviously, the perception of photography is a very subjective matter, yet there are rules that should be followed to achieve the greatest possible effectiveness.

Testing of photographs provided outputs related to selected compositions of the photos. It is possible to determine which compositions were chosen appropriately and which would not be suitable for marketing purposes or it would be necessary to reprocess them.

The research shows that respondents prefer a simple composition where the product is dominant and is not in the background behind other elements of photography. In general, it is very beneficial for product photography to keep the central composition. It is not appropriate to blur the parts of the photo, which is an effort to highlight, because it makes it more difficult for the customer to perceive the advertisement.

It is better to place rather less complementary or decorative items in the photograph. When the photo is overloaded, the respondents quickly move their eyesight from one side to the other and may not capture the key point of photography that should act the most in marketing terms. The customer does not always have much time for detailed product photography examinations, so it is important for the photo to deliver its message clearly and quickly. An important element is the logo, which essentially mediates communication towards consumers to remember both the product and the brand. However, it must be placed appropriately, such as in the photo no. 4 and not in the photo no. 2.

In today's marketing world, where the consumer faces constant advertising pressure from all sides, it is imperative to present his products in the most effective way. Due to this fact, most companies hire specialized companies or photographers to create creative photos of their products.

The use of the photograph is in principle not limited. Utilization of a good photo can be done either in printed form or on social networks and on the internet in general or on advertising billboards. Nowadays, social networks such as Facebook or Instagram are used in a huge scale, where photographs play an irreplaceable role in communicating with consumers.

Acknowledgement:

Authors acknowledge the support of Research project IGA VŠFS Prague No. 7429/2018/05 – „Consumer’s Perceptual Strategies from the Perspective of neuromarketing“, funded by the University of Finance and Administration, Prague. University of Finance and Administration, Prague.

## 5 Bibliography

- [1] Duchowski, A. (2007). *Eye tracking methodology theory and practice*. 2nd ed. London: Springer. DOI: 10.1007/978-1-4471-3750-4.
- [2] Hai-Jew, S. (2015). *Enhancing qualitative and mixed methods research with technology*. Hershey, PA: Business Science Reference, an imprint of IGI Global. p. 351. DOI: 10.4018/978-1-4666-6493-7.
- [3] Popelka, S., Brychtová, A., Voženílek, V. (2012). *Eye-tracking a jeho využití při hodnocení map*. Geografický časopis / Geographical journal, no. 64, p. 78.
- [4] Radecky, M., P. Smutny. (2014). *Evaluating user reaction to user interface element using eye-tracking technology*. In 15th International Carpathian Control Conference (ICCC), pp. 475-480, 28-30 May 2014, ISBN: 978-1-4799-3527-7.
- [5] Roebuck, K. (2011). *Brain-computer interface*. Milton Keynes UK: Lightning Source. ISBN 1743042639.
- [6] Rosenlacher, P. (2013). Využití zdravotnické techniky v neuromarketingu. In: *Ekonomika a management ve zdravotnictví*. 3. vyd. Praha: ČVUT, FBMI. pp. 82 – 86.
- [7] Vysekalová, J. (2014). *Emoce v marketingu: jak oslovit srdce zákazníka*. 1. vyd. Praha: Grada. 289 s. Expert (Grada). p. 140.
- [8] Zurawicki, L. (2010). *Neuromarketing: exploring the brain of the consumer*. London: Springer. p. 51. DOI: 10.1007/978-3-540-77829-5.