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Marketing and Neurosciences - A Future Winning Tandem

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Abstract

The technologies used in neuromarketing research, which is less known in Romania, have recorded a spectacular development worldwide in the last few years, thus, in addition to miniaturization, they increase the degree of versatility and automatically the number of research projects. This material aims to show how, with the help of neuromarketing technologies, primary positive and negative responses can be obtained, unaltered by other factors, at the emotional level that allow their value measurement. In this case study, we tested through a technology such as emotion measurement technology, a total of 11 respondents aged between 33 and 52 years, having an average age of 39.8 years. The objective of the demonstration study was to find out to what extent viewing a short one minute video, that features several tourist locations, can trigger emotions strong enough to lead to the decision to include them as points tourist interest in a future vacation.

Keywords

Neuromarketing, neuroscience, neuromarketing technologies, the classification of emotions

JEL Codes: M31, D87

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1. Introduction and literature review

Marketing has shown that it has certain limitations especially when collecting the respondents' answers by organizing focus groups. In recent years there has been an awareness of neuromarketing research and more than that, how exactly the results of these researches can be used. The parent of the term neuromarketing and the creator of the concept at the same time is prof. dr. Smidts Ale, at that time (2002) being a professor of marketing research at "Rotterdam School of Management", also conducting research in the fields of neurosciences and neuroeconomics. The researcher defined neuromarketing as research on brain mechanisms to understand consumer behavior, aiming to improve marketing strategies (Orzan *et al*., 2012). We meet professor Smidts, ten years later in 2012, presenting perspectives for research, development and integration of neuromarketing research in the business environment, at the first World Neuromarketing Forum held in Amsterdam. Neuromarketing is an application of information and data from the sciences involved in brain study, in the field of marketing. The need to proceed with this implementation arose due to the fact that we, the consumers being constantly assaulted by marketing stimuli, bring our brains into the supersaturation situation, not being able to process this information efficiently and putting us in difficulty in the process of making a decision or even several purchasing decisions**.** This has led to the need to identify marketing stimuli that are more efficient at the subconscious level, opening a number of perspectives but also limitations (Nedelko, 2018).

As already known, 90% of all the information processed by the brain is processed at the subconscious level. Basically, neuromarketing research is based on methods that originally have neurosciences and can collect and measure data on brain activity, blood flow, electrical activity, and other data from reactions of the subconscious. In order to respond to consumers' expectations, needs and wishes (Kotler, 2006), often unexpressed ones (and this really means to be one step ahead) those who are active in the field of marketing use approaches that try to offer them answers regarding the degree of visibility of the products or services, of the advertisements for them, of the satisfaction or on the contrary, of the failure to meet the objective of consumer satisfaction and implicitly making a low profit. These approaches or methods can be divided into some complex ones, for example market tests that require budgets capable of supporting them and simpler approaches (related to the first ones) that are based on surveys or focus groups but which can generate information altered by various others factors. In the case of surveys conducted in environments that are not familiar to the respondents, the simple questioning of a respondent who is not used to such interactions, can produce stress and may lead to an altered response to the same situation. In the case of focus groups, despite the fact that the participants may at one time consider the respective medium as familiar (which could give them a certain psychic comfort needed to provide unaltered answers), however, even the interaction between the group members can lead to a variable distortion of the feed back depending on the component of the group. These drawbacks can be largely overcome by neuromarketing techniques that collect, analyze, process the primary information generated as a result of exposure to marketing stimuli. This leads us even to the

purpose of neuromarketing, which is to provide answers even before launching a product or service on the market, having a double benefit, on the one hand for the manufacturer who will not use his material and human resources in a a direction that will generate losses and on the other hand, for consumers who will not waste time and even money in the process of purchasing and returning products that they have not satisfied.

1.1. Types and characteristics of technologies used in neuromarketing research

Electroencephalogram or EEG is a fairly old neuroscience technology that is successfully used in neuromarketing research but has certain limitations. This technique identifies small electrical discharges of neurons and their voltage variations in the presence of marketing stimuli. It can record over ten thousand frames per second but cannot penetrate deep layers of the cerebellum (Telpaz *et al*., 2015). Functional magnetic resonance imaging or fMRI, follows oxygen-enriched blood flow and due to its high penetration power, up to the deep layers of the cerebellum, it can follow the order in which different regions of the cerebellum are activated when stimulated (Stoll *et al.,* 2008).

Magnetoencephalography, or MEG, detects the magnetic field in the deep layers of the cerebellum and the electrochemical signals produced as a result of communication between neurons. It is possible to follow the communication between the neural networks in real time. It is faster than the functional magnetic resonance imaging scanner (Babiloni *et al*., 2004), (Ioannides *et al*., 2000). Positron emission tomography (PET) is used in the medical field to identify conditions such as Parkinson's and Alzheimer's, but the fact that it can identify the metabolism of the cerebellum while consuming nutrients injected into the bloodstream for example and as a result of exposure to stimuli, qualifies it for use in neuromarketing research (Zurawicki, 2010).

The eye tracking technique or ET, is a technique obviously focused on visual stimuli. It identifies where, how long, in what order, if and how often we look at certain visual cues to the detriment of others (Duchowsky, 2007). Eye tracking is based on the visual salience mechanism (Milosavljevic *et al.,* 2012). Galvanic skin response or GSR, is a technique that, using a galvanometer, can record variations in electrical resistance in the skin as well as the amount of perspiration, that is the effects of exposure to emotional stress. These effects are triggered automatically and cannot be controlled.

Emotion Measurement is a technique based on the FACS model, developed by Ekman, Friesen and Hager in 2002. This technology collects the data and processes it automatically, dividing the emotions into seven positions that relate to a reference point, the neutral one. These basic emotions are: joy, surprise, skepticism, sadness, fear, disgust and negativity.

2. Methodology of research

The method used in this demonstration study that wants to highlight the way in which data on emotions can be obtained is called "Emotion Measurement". It is carried out through an online platform (software) and with the help of a webcam (hardware), incorporated in most laptops. A questionnaire containing two questions was used for verification and comparison. The participants were informed in advance about how the test will take place. All were in agreement with the conditions of the test, even more so as they performed the test in a familiar environment, so without stress, at their homes.

Specifically, participants were told that they would receive an email, which contains a link that will direct them to an online platform. Once you get there, they watched a short video with a duration of 1 minute, this after previously activated the webcam. The video is an assembly divided into three modules in which you can view three tourist locations in Romania. Each module has duration of 20 seconds. The three tourist locations, in order of appearance in the film, are:

A. Peles Castle, located near Sinaia, Prahova County, Romania, owned by the Royal House of Romania.

B. Sibiu (old center) Sibiu county, Transylvania, Romania, the birthplace of the President of Romania, Klaus Werner Iohannis.

C. Bran Castle, located near Bran, Brasov County, Romania.

The participants in the study numbered 11, were between 33 years and 52 years, with an average age of 39.8 years. The group consisted of 6 women and 5 men. All participants are right-handed and have not undergone botox or hyaluronic acid beauty surgery on the face. One participant wears glasses permanently; the other two have noticeable vision difficulties but only wear glasses occasionally. These last details are important because the emotion measurement technology, the one that identifies micro-expressions, would be hampered because they could no longer record the extremely fast movement of the face muscles (around 40 milliseconds) that would be found in case of surgical operations, under an immobile layer of the epidermis. Respondents were assigned numbers from 1 to 11, in the order in which they responded.

The objective of the demonstration study was to find out to what extent, watching a short video with duration of 1 minute, in which some tourist locations are presented, can trigger emotions strong enough to lead to the decision to include them as point's tourist interest in a future holiday.

Questionnaire:

Question no. 1. *Have you ever been to any of the three tourist locations (Peles Castle, Sibiu, Bran Castle)? If the answer is affirmative, please specify the location*.

Question no. 2. *If the financial part is not a problem, which of the three tourist locations would you like to go to?*

3. Data analysis. Results

Table 1. Questionnaire analysis:

Respondents	Answer to question no.1 Locations			Answer to question no. 2 Locations		
	PELES	SIBIU	BRAN	PELES	SIBIU	BRAN
Respondent 1	✓	✓	✓	✓	—	—
Respondent 2	—	—	✓	✓	—	—
Respondent 3	✓	—	✓	—	✓	—
Respondent 4	✓	—	—	—	—	✓
Respondent 5	—	—	✓	—	—	✓
Respondent 6	—	—	✓	✓	—	—
Respondent 7	✓	✓	✓	—	✓	—
Respondent 8	✓	✓	✓	✓	—	—
Respondent 9	—	—	—	✓	—	—
Respondent 10	✓	✓	✓	✓	—	—
Respondent 11	—	—	—	—	—	✓
Total	6	4	8	6	2	3

Legend: Sings✓; — indicate positive and negative

A number of 2 respondents chose the Sibiu location, 3 respondents chose the Bran Castle location, while 6 respondents chose the Peles Castle location. From this point of view, in order of preferences we have: Peles Castle, Bran Castle, Sibiu. It is interesting that out of a number of 7 respondents who had previously visited Bran Castle, only one expressed their desire to visit it again, while out of 6 respondents who had previously visited Peles Castle, 3 wanted to repeat the visit. Sibiu, out of 4 respondents who had previously visited the location, only one wanted to return.

The result of the emotion measurement test showed that the answers of a number of 6 respondents (54.5%) of the total, correlated with those of the questionnaire:

Table 2. Emotion measurement test

No.	Respondents	Emotion measurement test	Questionnaire
1.	Respondent 1	↑ surprise -Peles; ↓ pleasure -Sibiu	Peles
2.	Respondent 2	↑pleasure-Peles; ↓pleasure-Sibiu	Peles
3.	Respondent 4	↑↓pleasure-Peles; ↑pleasure-Sibiu;maximum Bran	Bran
4.	Respondent 6	↑ pleasure –Peles;	Peles
5.	Respondent 7	↑ pleasure - Sibiu;	Sibiu
6.	Respondent 8	pleasure -Peles	Peles

Legend: Arrows ↑; ↓ indicate increasing or decreasing trend.

In Table 2, we have the respondent no. 1 who experienced surprise in one section and pleasure in another, of the emotion measurement test. His answer to the questionnaire was given by the highest value of the two emotions, respectively the surprise. Two respondents in Table 2 who experienced pleasure in several sections during the emotional test, respectively respondents 2 and 4, answered the questionnaire according to the highest value of this emotion. The other three respondents who experienced pleasure in a single section of the three, respectively 6, 7 and 8, answered the questionnaire in accordance with this.

Another table with results of the test of measuring the emotions of a number of 5 respondents, showed that they did not correspond with the answers from the questionnaire:

Table 3. Emotion measurement test

No.	Respondents	Emotion measurement test	Questionnaire
1.	Respondent 3	skepticism, cumulated 3 sec.	Sibiu
2.	Respondent 5	sadness in the Peles section	Bran
3.	Respondent 9	↑pleasure throughout the test, overlap over the answers in the questionnaire, with a peak of 92-93 percentage points in the section Sibiu	Peles
4.	Respondent 10	skepticism in the Peles section as well as in the Bran section	Peles
5.	Respondent 11	skepticism in the Peles section as well as in the Bran section	Bran

Legend: Arrows ↑; ↓ indicate increasing or decreasing trend.

In Table 3, a number of two respondents, respectively respondent 3 and respondent 5, obtained a response of less than 1% in the emotion measurement test, a possible explanation being that they suffer from hyperopia, respectively presbyopia and yet did not wear glasses during the test. Respondent 11, suffering from presbyopia, wore glasses during the test. He had a brief moment of pleasure in the Sibiu section (Horezu ceramics). In the questionnaire, the choice was Bran Castle. Respondent 9, although he recorded pleasure throughout the test, had higher values in the reserved section of Sibiu. In the questionnaire, the choice was Peles Castle. Respondent 10, registered skepticism in the sections Peles Castle and Bran Castle. He had no reaction in the Sibiu section. In the questionnaire, the choice was Peles Castle. It should be remembered here that the answers in the questionnaire are conscious or controlled answers while in the emotion measurement test, we benefit from raw answers.

Figure 1. Graphic representation of emotion-sadness. All respondents

Source: cooltool.com

In figure 1, in which we have a cumulative value of sadness, we can observe the moment of its appearance, its duration and its distribution by sections. The emotion-sadness was recorded in the sections corresponding to Peles Castle and Bran Castle, respectively from 0 sec. at 20 sec. and from 40 sec. at 60 sec. with only three moments in the middle section (Sibiu). We can advance the hypothesis that being old buildings belonging to past times, can generate this kind of emotion. This hypothesis could be verified in other studies by creating videos based on alternating between old buildings or locations with new ones. The answer could be useful in the situation where it is desired to avoid generating this emotion or to the contrary.

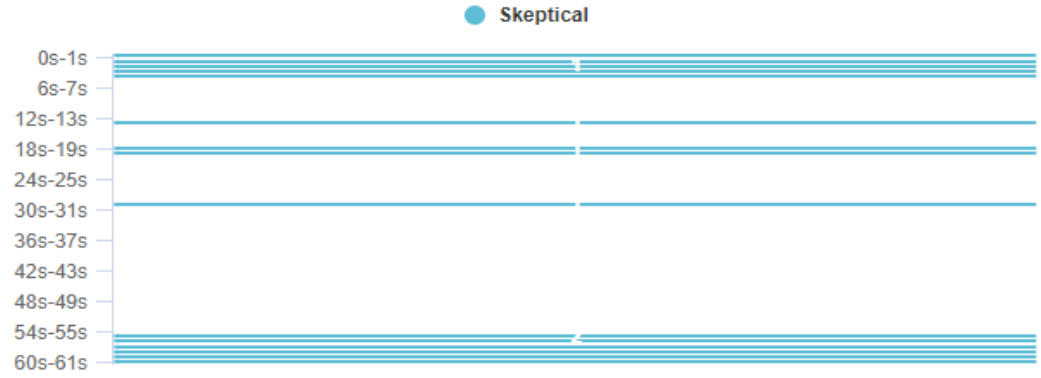

Figure 2. Graphic representation of emotion-skeptical. All respondents

Source: cooltool.com

In figure 2, we have a cumulative value of skeptical with duration and distribution by sections not including percentage points. Skeptic emotion was recorded especially at the beginning of the first section and at the end of the third section of the video. Skeptic has two values, one positive and one negative, yet as an emotion, although it can be perceived as negativism, it is not a bad thing, it can be accepted as an additional filter in the evaluation made by the brain in the primary mode.

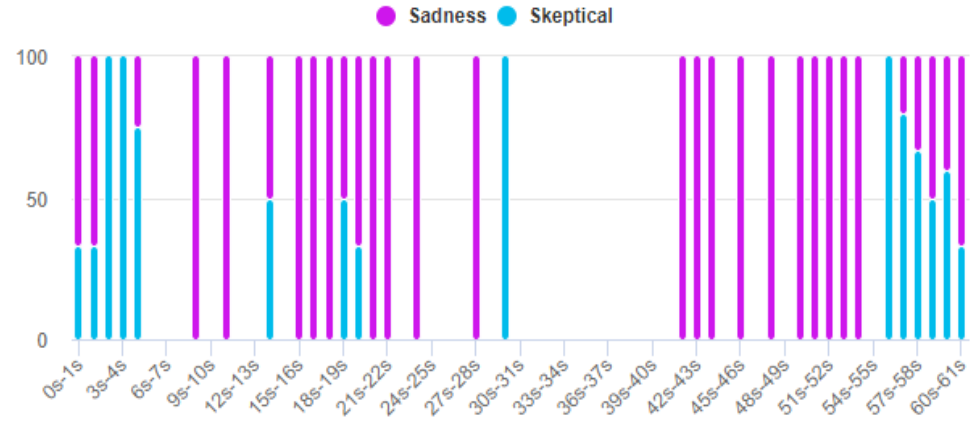

Figure 3. Graphic representation of sadness and skeptical emotions. All respondents

Source: cooltool.com

In figure 3, we have a cumulative value of sadness and skeptical emotions not including percentage points through which we can visualize their overlap especially at the beginning of the first section and at the end of the third section. There are studies that suggest there may be a connection between the two emotions, so sad respondents may be more skeptical in general than others.

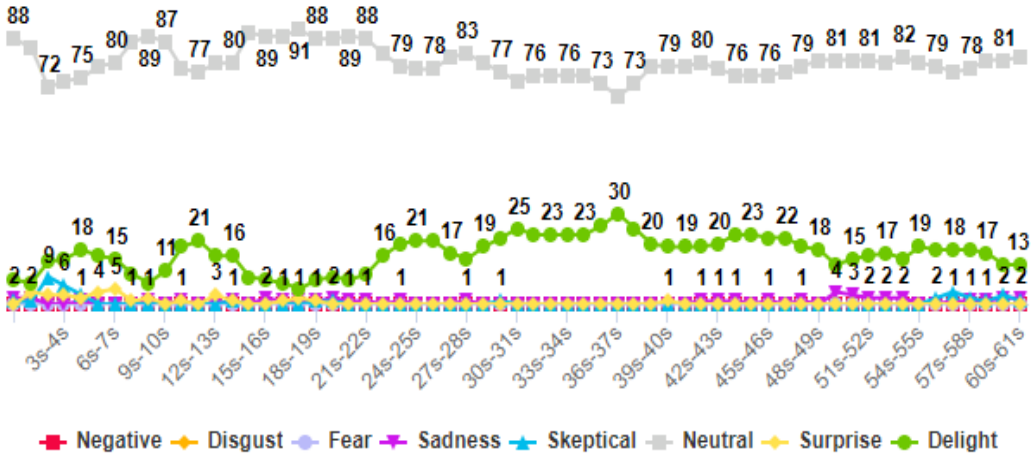

Figure 4. Graphic representation of the seven basic emotions. All respondents

Source: cooltool.com

In figure 4, we see a graphical representation of the relationship between them of the seven basic emotions of all 11 respondents. It must be viewed from the perspective of the three sections or modules as follows: Peles Castle - 0 to 20 seconds; Sibiu - 20 to 40 seconds; Bran Castle - 40 to 60 seconds.

4. Conclusions

This demonstrative study showed that the use of this research technology in neuromarketing clearly generates a reaction to a visual stimulus. In fact, it generates more emotional reactions depending on the complexity of the visual stimulus. Referring to the value we can attribute to an object, brand or location and how this way of perception can influence us, we can give an example. A few years ago, while staying with a friend in front of a mall in the north of Bucharest, Romania, we took part in a comparative study between Coca Cola and Pepsi. The participants were offered samples of soft drinks without knowing which brand the drink belonged to. Then we had to match the drinks with the brand name. We both made the same mistake. We both chose the sweetest drink (which we liked) as Coca Cola when it was actually Pepsi. The

explanation could be given by the brand image, Coca Cola apparently having a more efficient marketing, even in Romania. We do not know how many of the participants in that study had the same option but other Pepsi versus Coca Cola studies were initiated that instead used neuromarketing technologies. Surprisingly, the results were similar but they also benefited from a large amount of additional data. This demonstration study could have had different results if the participants were not Romanian citizens. If for example, in a new study, the participants would be foreign citizens who do not live in Romania and who have read the fictional novel by the Irish writer Bram Stoker, entitled "Dracula" or who are familiar with the myth of the vampire Vlad Tepes and of Dracula Castle instead of Bran Castle, we can go further than a simple assumption that the outcome of the study would be different but would not deny that emotions can be measured. We are inclined to believe the results would be 100% correlated with the questionnaire and all in the third section, although this is not the purpose. The combination of several technologies, for example (Eye Tracking), (EEG) and (Emotion Measurement), results in very accurate results especially when testing video content and advertisements. Although in this study, we used a single neuromarketing technology, we benefited from a remarkable visualization of the emotional response to visual stimuli because we did not get only a graphic representation but even a real-time expression of emotions. It is even more remarkable that this technology a few years ago was very difficult to access and did not achieve such spectacular results. Now, some of these technologies are accessible and are brought to the level of use of any marketer. The purpose of neuromarketing technologies is to continuously improve the video content of advertisements, video clips, banners, packaging, design and web design, products and even before launching them on the market and no marketing department he cannot ignore them.

Of course, the presentation video can and should be improved. Aspects related to choosing the right frames, angles, colors, layout and other elements that keep the attention is an advantage that professionals have for sure but it can start with simple things and with maximum effect. We would like to remind here that, in the video, in the section assigned to Sibiu, and there are presented some frames in which are clearly seen ceramic pots by Horezu. Only one person from those who watched that section showed no emotion in their view, the rest even though they had a neutral attitude in other sections and did not even choose the Sibiu questionnaire, they could not ignore that explosion of colors and shapes. And they experienced a sudden leap of pleasure. Moreover, the emotional (primary) response to the questionnaire response may be considered as true. Participants can also consider other aspects (of which we know nothing) when answering a question because they do it on a conscious level. Another aspect to consider is the composition of the group. From this point of view, we have drawn some conclusions: people who suffer from presbyopia or hyperopia are not to be selected. Also, because of the group of two cameramen, they tended to focus more on the technical aspects of the video (having a critical attitude) than on the content itself. On the other hand, we learned about their critical attitude from the very emotional response because otherwise they would not confess this because they are extremely nice people and with a lot of common sense. Understand? We found interesting information without asking any questions; even this could be an accomplishment. The brain looks at things from its own point of view. So did marketers in the beginning. The best ones started to look at things from the perspective of potential customers. Those were winners, along with their customers and they will continue to win as long as other marketers continue to look at things from their own points of view. This is also the role of neuromarketing; it gives us a unique perspective on consumer reactions. The need for marketers to know what their consumer wants, does not change, it is the same. The fundamental principles of marketing can be further investigated with a much higher success rate.

Studies using neuromarketing technologies provide us with a unique and accurate consumer feedback on the effectiveness and efficiency of marketing communication. Although it is a new field, as it evolves and develops, we can expect other challenges from neuromarketing especially in Romania.

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