



ORIGINAL RESEARCH PAPER

Management

NEURO MARKETING A NEW FIELD IN MARKETING

KEY WORDS: Neuroeconomics, Marketing .

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ABSTRACT

This article surveyed the main neuro marketing techniques used in the world and the practical results obtained. Specifically, the objectives are (1) to identify the main existing definitions of neuro marketing; (2) to identify the importance and the potential contributions of neuro marketing; (3) to demonstrate the advantages of neuro marketing as a marketing research tool compared to traditional research methods; (4) to identify the ethical issues involved with neuro marketing research; (5) to present the main neuro marketing techniques that are being used in the development of marketing research; (6) to present studies in which neuro marketing research techniques were used; and (7) to identify the main limitations of neuro marketing. The results obtained allow an understanding of the ways to develop, store, retrieve and use information about consumers, as well as ways to develop the field of neuro marketing. In addition to offering theoretical support for neuro marketing, this article discusses business cases, implementation and achievements.

1. INTRODUCTION

Unconscious mental processes are major influences in people's deliberation. Among the newest techniques for the measurement of marketing stimuli are neuroimaging techniques, which make an image of the patient's brain using non-invasive means. When used in marketing to understand consumer behavior in relation to markets and commercial trade, these methods are called neuro marketing techniques.

The use of neuro marketing activities has aroused some controversy. On one hand, critics of the subject believe that the use of such techniques would affect consumers' ability to choose not to consume marketed products, leaving the individuals unable to resist such efforts and making them easy targets for the company's campaigns. On the other hand, defenders of neuromarketing activities, discuss the benefits deriving from the technique to both consumers and organizations. According to these authors, consumers would benefit from the creation of products and campaigns directed to them and would have their decisions facilitated rather than manipulated, while organizations would save large portions of their budgets that are currently used on inefficient and ineffective campaigns, ensuring greater competitiveness and improvements to customers. There is yet another segment of researchers who believe that neuro marketing would be much more science fiction than reality because it is impossible to find people with identical thoughts in the world, as thought is changeable and varies according to personal experiences, values and character.

DEFINITION OF NEURO MARKETING

Neuro marketing is also described as a research tool that provides direct observations of brain reactions during marketing stimuli. According to certain researchers, the brain is a black box that hides consumers' emotions and preferences and neuro marketing works as a window that unveils and gives access to these emotions. When obtaining insights from the brain processes of individuals, researchers will be able to understand, assess and predict the consumers' behavior.

Neuro marketing was also recurrently defined as the neuroscience of consumers. However, some authors emphasize the difference between the two fields. Fisher et al. (2010) classify neuroscience more broadly as a neuroscientific field that studies consumers, whereas neuro marketing is defined as the simple application of these results to administrative practices. Lee et al. (2007) make clear the distinction between the terms: neuro marketing can be defined as the application of neuroscientific methods to analyze and understand human behavior in relation to markets and marketing trades.

This usage most likely occurs because fMRI is the most prominent technique under the academic and market spotlights, although the neuromarketing studies identified in this work go beyond brain imaging.

In this broad definition approach, several authors provide more elaborate explanations of neuro marketing. For example, some authors report neuro marketing as a way of revealing the cognitive emotional processes (fear, motivation, recognition, well-being and reward) underlying human conscience. Fugate (2007) approaches the topic so as to convey the notion of neuro marketing in two ways (simple and elaborate). He asserts that neuro marketing travels between the emotional and rational parts of the person and that it is a technique that makes it possible to show that the physical and the psychological are co-dependent through images that record the rational and emotional responses to marketing stimuli.

Although the field of neuro marketing makes room for different understandings and observations, it is obvious that the definitions are inter-related. Therefore, a comprehensive definition that lists the main points of recurrent neuro marketing in the readings can be inferred. Thus, neuro marketing can be described as a field of research that creates a bridge between the fields of neuroscience and marketing.

It has the purpose of establishing relations between marketing stimuli, the brain areas in which these stimuli were processed and the physiological consequences related to the nervous system, so that such areas can be associated with cognitive, psychological and emotional processes and can generate an understanding about the consumer.

NEUROMARKETING AND TRADITIONAL RESEARCH METHODS

Neuromarketing is recommended as an important and revolutionary form of marketing research. Fisher et al. (2010) assess neuro marketing as a type of qualitative research that produces graphic and quantifiable results. Bercea (2013) explains that there is difficulty in classifying the research in this new area as qualitative or quantitative and that the equipment types used and the research protocol adopted are the determinants of this classification. Regardless, the importance of neuromarketing lies in its ability to assess emotional processes. Thus, the technique provides access to richer and less biased marketing insights than other traditional research techniques, such as surveys, focus groups and qualitative research.

The vast majority of reviewed articles mentioned the advantages that neuro marketing has over traditional marketing techniques. In most articles, the ability of neuro marketing to access and assess information beyond the level of human consciousness was the most cited topic. This ability puts neuro marketing ahead of other research techniques because, according to some authors, the purchase process happens subconsciously.

The second most cited topic in this category was the inability of individuals to self-assess. Lee et al. (2007) state that it is very

difficult for individuals to express their feelings and other subjective factors. In addition, individuals usually cannot explain the origin of and reason for certain behaviors (Hubert & Kenning, 2008) because emotions are quite complex and often the individual is not aware of the reason for them. In a further challenge to marketing, the individual may not be aware of even experiencing a specific emotion (Murphy et al., 2008).

The inability to self-assess is not the only problem faced in research; individuals are sometimes unwilling to collaborate in research. Individuals tend to transmit incorrect information when the topic is very sensitive or when they feel the need for social acceptance. Thus, the responses obtained are not genuine; they are filtered by the interviewee's consciousness before being reported. Neuromarketing represents the opportunity to overcome these obstacles, as research participants do not have control over the information collected.

Another advantage of neuro marketing is the speed and simultaneity of information collection. Some techniques of neuro marketing, such as electroencephalography and magnetoencephalography, can measure the responses of the consumer at the same time that they are exposed to the marketing stimuli. With this feature, the researchers can determine exactly which elements of the marketing strategy should be reinforced or discarded.

In the face of these specific characteristics of neuro marketing, the majority of the texts consider this form of marketing research more valuable than focus groups and in-depth interviews. However, despite all the excitement about neuromarketing, it should be used in parallel with traditional methods of research. Individuals not only act according to their feelings, they consider the expectation of reward to make a decision in the short and long-term. The combination of both research techniques will ensure more valuable insights into consumer's preferences and the purchase process.

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ETHICAL ISSUES IN NEURO MARKETING

In the same way that the techniques of neuromarketing raise excitement among companies, they also raise controversy related to ethical issues. Among the texts reviewed, the main ethical issue involving neuromarketing is related to the violation of consumers privacy. Neuro marketing techniques may have the ability to read consumers minds.

Thus, companies would be able to identify and easily trigger mechanisms that induce consumer purchasing behavior. Consumers, therefore, would become transparent to the companies, which, at any moment, could invade their private thoughts. Another ethical question of neuro marketing lies in the use of the technique for commercial purposes. In examining the cognitive processes related to individuals consumption preferences, companies acquire great power to influence the purchase decision. Many texts cite the lack of ethics related to the possibility of neuro marketing creating irresistible ads and products. Neuro marketing would then represent a major threat to the autonomy of consumers because it would remove their defence mechanisms.

The issues mentioned above relate to ethics involving the principles of neuromarketing. The institutions that apply neuromarketing, how it is applied and the audience surveyed are also grounds for criticism. Among the texts analyzed, four indicated the existence of ethical dilemmas involving the application of neuromarketing by academics and physicians or the conduction of neuromarketing studies within universities.

Dinu et al. (2010) show that to many people, universities are a place to acquire new knowledge, as opposed to the potential for neuromarketing to influence consumers. Other authors also say that neuromarketing has raised criticism because there are physicians and academics working in marketing research companies (Fisher et al., 2010 and Fugate, 2007). According to Dinu et al. (2010), possible damage to the health of participants or negative aspects of marketing research can be hidden and, therefore, the results would be biased.

Some authors say that companies should disclose the procedures and results of their research to avoid accusations of irresponsible behavior.

Consent from participants should also be obtained before studies are conducted. The protection of vulnerable populations is also part of the concern regarding neuromarketing. Murphy et al. (2008) commented on the need to regulate the use of neuromarketing techniques on children and other vulnerable groups, such as people with neurological diseases or pathological disorders, people sensitive to advertisements and legally protected groups.

Finally, a concern that appeared in some texts was whether neuromarketing causes consumption disturbances. Lee et al. (2007) cite shopping addiction and over-consumption as problems associated with neuromarketing. In the face of all of the ethical issues involving neuromarketing, a solution proposed by various authors for better regularization and acceptance of the technique was the adoption of an ethics code for neuromarketing.

NEUROMARKETING TECHNIQUES

Neuro marketing can be characterised as a new scientific field, essentially an interdisciplinary field that seeks to connect studies in marketing with neuroscience. The area of neuroscience, in turn, is also interdisciplinary, in that it joins fields such as chemistry, computer science, physics, medicine, psychology and other related areas. There is difficulty in defining precisely what does or does not constitute neuroscience. Among the works included in neuroscience are studies on brain lesions, studies of the nervous system (not only the brain), studies of the genetic and cell structure of the brain and its neural circuits.

The scope of neuromarketing techniques must, therefore, take advantage of this diversity in neuroscience research lines, and studies should not be restricted only to the brain or to the central nervous system but should include all of the areas and physiological and cognitive processes. This scope is reflected in the diversity of techniques that should be considered as neuro marketing techniques: from physiological aspects such as perspiration, electrical conductivity of the skin, hormonal and neurotransmitter changes, movement and dilation of the pupil, movements of muscles (body and face), to even the understanding of complex cognitive aspects, such as the functional activity of specific regions of the brain by means of the analysis of different markers such as electrical waves, cerebral metabolism and its blood flow. This bridge between several lines of neuroscience and marketing allows each of these techniques to have enhanced or reduced applicability to respond to different problems that traditional marketing techniques cannot respond to, or respond to only partially.

Among all of the techniques, new and old, the ones that drew the most attention were the techniques that used brain imaging, and the results of these studies had great impact in both academia and business. One of the first studies that demonstrated this potential was conducted in Harvard in the late 1990s using some fairly invasive equipment called PET-SCAN (Zaltman, 1997). Another important milestone project used another technique that also draws considerable attention, functional magnetic resonance, which is costly but not invasive equipment (McClure et al., 2004).

If no area of the brain underwent changes after having been exposed to an advertising stimulus, then this stimulus was not successful. However, if the stimulus caused organic modifications

in a region, it can be inferred that there is a correlation between advertising and the activated emotion (Fugate, 2007). It is flippant, though, to say that a specific area of the brain that lights up during the investigations does so because an image triggered certain emotions and patterns of consumption, as different emotions depend on different combinations of activations of neural substrates (Marcus, 2012).

Each of the techniques has advantages and disadvantages, often measuring variables that are complementary to better understand a marketing problem. Therefore, to obtain an effective result with neuromarketing technologies, it is advisable and productive to use combined techniques whenever possible. There are three types of neuromarketing techniques: those that measure the metabolic activity in the brain or related to it, those that measure electrical activity in the brain and those that do not measure brain activity.

The main neuromarketing techniques are currently, the following:

Functional magnetic resonance imaging (fMRI): the advantage of this technique is its ability to measure deeper and smaller structures of the brain, i.e., with high spatial resolution. Along with the technique of electroencephalography, it is the most employed technique to measure brain activity in the field of neural science. However, the use of this technique is expensive, the equipment is not portable, and the environment makes it difficult to conduct the experiment. This technique requires a delay of 6 to 10 seconds to record the processing of neurons, which represents a great disadvantage with respect to several marketing stimuli because these numbers constitute low temporal resolution.

Electroencephalography (EEG): In this technique, electrodes that measure the brain waves associated with different states of stimuli are placed on an individual's scalp through bands or helmets, and these waves can be measured at small intervals up to 10,000 times per second (Morin, 2011). In addition to having the advantages of being more widely available, being less invasive and cheaper, EEG presents greater validity in the measurement of emotional styles and the detection of psychopathologies (Kline, 2004). This technique features the possibility of synchronization with the stimuli, and the equipment is portable. The weakness of this technique concerns the measurement of deeper brain structures; it can only record more superficial electrical signals. Therefore, in contrast to fMRI, EEG features high temporal resolution and low spatial resolution.

Positron Emission Tomography (PET): A technique with validity and spatial resolution similar to those of fMRI. However, radioactive particles (positrons) must pass through the participant for the collection of results, making this technique highly invasive and difficult to use in neuro marketing (Lin, Tuan & Chiu, 2010).

Magnetoencephalography (MEG): this technique is based on the expansion and mapping of the magnetic field created through neural activities, electrochemical signals between neurons. Similarly to electroencephalography, magnetoencephalography has excellent temporal resolution; however, its spatial resolution, while not ideal for measuring subcortical areas and deeper areas in the brain, is superior to that of EEG (Morin, 2011). In contrast to EEG, when conducting MEG research, individuals use hyper-sensitive sensors to measure the electro-magnetic field without contact with the scalp. The cost of the acquisition of the necessary equipment and of the magnetoencephalography session is very high, which contributes to the greater popularity of EEG than MEG (Crease & Robert, 1991).

Eye Tracking: Increasingly used along with other techniques such as EEG and fMRI. Advantages, this method is able to measure the focus of consumers' attention, the pattern of visual behavior of fixations of the gaze, dilation of the pupils, focus, and microfocus; in addition, the equipment is portable. Among the main disadvantages is the fact that it is not possible to understand what emotions are associated with the areas that were the focus of attention, and not deducting, automatically, that focus necessarily represents higher visual attention. Some of the data of interest to

marketing in relation to this technique are the time that the subject spends focusing on the object of study, the measurement of the pupils, the areas and the frequency of observation of users in the stimuli presented (Nenad, 2011).

Facial recognition (or Electromyography): A technique still not largely used in neuro marketing that consists of measuring facial muscle movements that are imperceptible to the human eye through electrodes placed on the muscles of the mouth (zygomaticus minor and major) and on the occipitofrontal and orbicularis muscles to check the type of emotion (happiness, sadness, indifference, pain, etc.) (Melillo, 2006).

Among its advantages, following can be emphasized: high spatial resolution, growing credibility for use in the analysis of different affective reactions to visual stimuli, reactions of taste, smell and hearing, human interactions and behaviors. One disadvantage is that the electrodes fixed on the face may inhibit some facial movements. Another important disadvantage for use in neuro marketing is the double meaning of certain expressions, which invalidates a standardization of single expressions correlated with specific emotions, restricting studies of some more specific emotional reactions (Jones & Beer, 2009).

Cardiovascular Parameters: This approach records the heart rate and its variability, blood pressure, interaction between heart beats and pulse transition time to infer emotional and attention states of the research subjects.

The Galvanic Skin Response: This technique measures the objective excitation caused by an emotionally relevant stimulus. The central nervous system is directly connected to the reactions recorded on individuals' hands, and this method is able to identify the neural responses that precede certain emotions, such as happiness, sadness, fear, anger, disgust and indifference.

FINAL CONSIDERATIONS

This study had the following purposes: identifying the main existing definitions of neuromarketing; identifying the importance and the potential contributions of neuromarketing; demonstrating the advantages of neuromarketing as a marketing research tool compared to traditional research methods; identifying the ethical issues involved with neuromarketing research; presenting the main neuromarketing techniques that are being used for the development of marketing research; and presenting studies in which neuromarketing research techniques were used and identifying the main limitations of neuromarketing.

Neuromarketing was identified as an important tool to help clarify and understand consumers' behaviour, having great potential in the area of communication, as well as the potential to identify consumers' subconscious needs and thus create more attractive packaging, pricing decisions and more efficient brand positioning strategies. In general, the great importance of neuromarketing lies in the ability to fill the gaps left by traditional marketing research, such as in-depth qualitative research and focus groups.

Among the advantages of neuromarketing over traditional marketing research methods, neuromarketing does not depend on the consumer's ability or desire to report emotions. Another valuable element of neuromarketing research is the simultaneity of information records with the identification of emotions processed in fractions of a second, which enables the demonstration of the triggering factor of this particular emotion.

The main ethical issues involving neuromarketing are the violation of the privacy and autonomy of the consumer. Another ethical issue found is the presence of physicians and academics conducting neuromarketing research for commercial purposes. Concern regarding the exploitation of vulnerable groups, such as children, was also identified as an ethical issue.

Concerning neuromarketing techniques, functional magnetic resonance (fMRI) was the technique that most attracted the attention of scientists and companies. Other commonly used

techniques include electroencephalography, which is widely used to determine the effect of each element from television ads, and eye tracking and galvanic skin response (GSR) measurement. Other techniques presented, but used less frequently by research and consulting firms, include positron emission tomography (PET), magnetoencephalography (MEG), facial recognition, and the measurement of cardiovascular parameters and neuro-immunoendocrinological activities.

Experiments were found using these techniques in the areas of marketing related to advertising and publicity, elements of communication, new product development, packaging, pricing and promotion strategies, brand positioning and the forecasting of consumer choices. Finally, some limitations were identified. Many neuromarketing experimental results are inaccurate and biased. Furthermore, there is a high cost in the development of neuromarketing research, which leads to experiments with small samples that limit generalisability. Moreover, there is not a framework to relate the marketing stimuli to the emotions processed and the brain areas activated.

In conclusion, it was seen that the presence of neuromarketing as a marketing research tool and people's interest in this field of science have increased in recent years. With more studies about neuromarketing being conducted and their results disseminated, it is possible that more companies will join the neuromarketing efforts to have better designed products and more effective advertising. Therefore, neuromarketing efforts can help the understanding of many kinds of complex buying behavior. For example, one does not fully understand what types of "triggers" lead individuals to use their intuition in certain situations, but not in other ones. The comprehension of what rationality or irrationality levels occur in consumption decisions can also be enhanced. The better understanding of the brain cognitive mechanisms by means of the new technologies discussed in this article has the potential to explain many of the major issues which marketers seek the answers.

REFERENCES :

1. Bercea, M. D. (2013). Quantitative versus qualitative in neuromarketing research. Munich Personal RePEc Archive, 44134, 1-12.
2. <https://www.neurosciencemarketing.com/blog/home>
3. <https://www.neurosciencemarketing.com/blog/articles/what-is-neuromarketing.htm>
4. Dinu, G., Tanase, A. C., Dinu, L., & Tanase, F. (2010). The new techniques for handling consumer behaviour. Proceedings of the International DAAAM Symposium, 21(1), 1115-1116.
5. Dooley, R. (2010). Brandwashing? Retrieved from
6. <http://www.neurosciencemarketing.com/blog/articles/brandwashing.htm>
7. Fugate, D. L. (2007). Neuromarketing: A layman's look at neuroscience and its potential application to marketing practice. *Journal of Consumer Marketing*, 24(7), 385-394. <http://dx.doi.org/10.1108/07363760710834807>
8. Fugate, D. L. (2008). Marketing services more effectively with neuromarketing research: A look into the future. *Journal of Services Marketing*, 22(2), 170-173. <http://dx.doi.org/10.1108/08876040810862903>
9. Green, S., & Holbert, N. (2012). Gifts of the neuro-magi: Science and speculation in the age of neuromarketing. *Marketing Research*, 24(1), 10-14.
10. Hubert, M. (2010). Does neuroeconomics give new impetus to economic and consumer
11. research? *Journal of Economic Psychology*, 31(5), 812-817. <http://dx.doi.org/10.1016/j.joep.2010.03.009>
12. Kline, J. (2004). Frontal EEG asymmetry, emotion, and psychotherapy: The first, and the next 25 years. *Biological Psychology*, 67(1-2), 1-5.
13. Morin, C. (2011). Neuromarketing: The new science of consumer behavior. *Society*, 48(2), 131-135. <http://dx.doi.org/10.1007/s12115-010-9408-1>
14. Zaltman, G. (1997). Rethinking market research: Putting people back in. *Journal of Marketing Research*, 34(4), 424-437. <http://dx.doi.org/10.2307/3151962>