ABSTRACT

Neuromarketing is one of the most promising and controversial areas of marketing. The goal of Neuromarketing is to study how the brain is physiologically affected by advertising and marketing strategies. It is the effectiveness of these strategies, brain activity resulting from viewing an advertisement. In Neuromarketing the brain activities are monitored and measured using neuroimaging techniques such as functional magnetic resonance imaging (fMRI) and electroencephalography (EEG). The idea of using this technique is that consumer purchase decisions are made in seconds in the subconscious mind. The emotional side of the brain and that by understanding what we like, we donot like, what we want, what causes us fear when watching our brain responses to stimuli can design products and marketing communications to better meet the unmet needs of the market and determine purchase. Neuromarketing studies indicate increasingly more towards various "centers known" in the brain. The knowledge about these so-called "known centers" are oftensketchy and the demands on their function are often motivated by speculation rather than by a knownfact.

Neuromarketing studies aim to analyze different brain areas while experiencing marketing stimuli in order to find and document the relationship between behavior and the neuronal system. Using knowledge andknow-how from brain anatomy and knowing the physiological functions of brain areas, it is possible to modelneuronal activity and investigate behavior. So Neuromarketing research tries to better understand the effects ofmarketing stimuli on consumers, having the possibility to obtain objective data through the use of the availabletechnology and advances in neuroscience. Researcher is trying to notice the activities decision maker namely the brain. This action led to a controversial new field called Neuromarketing, combining Neuroscience, Marketing and Technology.

Keyword: Neuromarketing, fMRI, EEG, Centers Known, Neuroscience
INTRODUCTION

Neuromarketing is a new field of marketing that studies consumers’ Sensorimotor, Cognitive, Affective response to Marketing Stimuli. Neuromarketing is the study of how people's brains respond to advertising and other brand-related messages by scientifically monitoring brainwave activity, eye-tracking and skin response. Defining Neuromarketing “By studying activity in the brain, Neuromarketing combines the techniques of neuroscience and clinical psychology to develop insights into how we respond to products, brands, and advertisement. From this, marketers hope to understand the subtle nuances that distinguish a dud pitch from a successful campaign.” Neuromarketing is Main Goals Marketing will tell the marketer that the consumer reacts to, whether it was the color of the packaging, the sound the box makes when shaken, etc.

Neuromarketing studies usually measure preference between products in terms of brand familiarity or product preference. Some information’s are hidden deep in the black box the mind of the consumer. Neuromarketing helps us find what is inside of the black box without troubling the consumer with questions that he doesn’t want to answer or that he can’t answer. Today because of an extensive research in mapping cortical and subcortical activity in association with behaviors and thoughts, the confidence in neurological data is growing. Thanks to discoveries in perceptual sciences we can identify the parts of the brain that are responsible for the phenomena that we experience daily. For all those interested in information obtained through Neuromarketing techniques it becomes evident that there are corresponding neural substrates of consumer decision making process and these substrates can be observed, measured, and possibly manipulated. The following paper reveals some important aspects of the use of Neuromarketing in studying consumer behavior by presenting the concepts, methods and techniques used under this sophisticated name, the limitations and advantages of using Neuromarketing techniques and the importance of this type of information in decision making process at a company level. Brainwave recording devices have been available for decades, the difference being that new technologies can now more accurately identify which brain regions are active when people respond to products, when they make brand-level choices or when they are exposed to advertisements. Brain imaging techniques currently used in Neuromarketing are.

TYPES OF NEUROMARKETING

There are many ways to measure physiological responses to advertising but there are only three well established noninvasive methods for measuring and mapping brain activity.

- **Eye Tracking:** Eye tracking allows studying behavior and cognition without measuring brain activity, but where the subject is looking at, for how long he is looking, the path of the subject's view and changes in pupil dilation while the subject looks at stimuli. Eye tracking allows measuring the attention focus and thus monitoring types of behavior. Eye movements fall into two categories: fixations and saccades. Fixation is when the eye movement pauses in a certain position and saccade is a switch to another position. The resulting series of fixations and saccades is called a scan path, and they are used in analyzing visual perception, cognitive intent, interest and salience.

*It is used to measured*

- Visual fixation
- Search
- Eye movement patterns
- Spatial resolution
- Excitement
- Attention
Pupil dilation

It is used when

- Testing websites and user-interface effectiveness (usability research)
- Testing in-store reactions
- Testing packaging design (the visibility of brand and product name)
- Testing advertisements and video materials
- Testing prints and images design
- Testing how the consumer filters information
- Determining hierarchy of perceptions of stimulus material
- Last, which remain unnoticed
- Testing shelf layout
- Testing product placement

- **Electro Encephalo Graphy (EEG):** It is use for brain waves measurement. An electroencephalogram detects abnormalities in the brain waves or electrical activity of the brain. During the procedure, electrodes consisting of small metal discs with thin wires are pasted on the scalp. The electrodes detect tiny electrical charges that result from the activity of the brain cells. The charges are amplified and appear as a graph on a computer screen or as a recording that may be printed out on paper.

  It is used to measured

  - Attention
  - Engagement / boredom
  - Excitement
  - Emotional valence
  - Cognition
  - Memory encoding
  - Recognition
  - Approach / withdrawal

  It is used when

  - Testing and developing advertisements
  - Testing new campaigns
  - Testing movie trailers
  - Identifying the key moments of an
  - Advertisement or video material
  - Testing websites design and usability
  - Testing in-store experience
  - Testing taglines

- **Functional Magnetic Resonance Imaging (fMRI):** It is use for brain activation. Functional Magnetic Resonance Imaging fMRI is the newest and most powerful tool. It uses the same large magnets used in hospitals to diagnose medical conditions. It is possible to see the specific areas on the brain that become activated by thoughts, feelings and memories.

  It is used to measured

  - Memory encoding
  - Sensory perception
  - Valence of emotions
  - Craving
  - Trust
  - Brand loyalty
Brand preference
Brand recall

It is Used When

- Testing new products
- Testing new campaigns
- Testing and developing advertisements
- Identifying the key moments of an advertisement or video material
- Testing packaging design
- Testing prices
- Repositioning a brand
- Predicting choices
- Identifying needs
- Sensory testing
- Celebrity endorsement

NEUROMARKETING ACTIVITIES

The goal of Neuromarketing is to study how the brain is physiologically affected by advertising and marketing strategies. In order to evaluate the effectiveness of these strategies, brain activity resulting from viewing an advertisement is monitored and measured using neuroimaging techniques such as functional magnetic resonance imaging (fMRI) and electroencephalography (EEG). Neuromarketing studies usually measure preference between products in terms of brand familiarity or product preference. In traditional marketing studies, measures such as the product preference for a particular advertisement is sometimes difficult to measure, as a viewer may hold a cognitive bias. In Neuromarketing studies, brand familiarity and product preference have been correlated with neural activity. The field of Neuromarketing is viewed with caution from consumer protection groups as well as many academics due to the possible ethical implications of designing advertisements to intentionally cause specific neurological effects. The types of tools used in Neuromarketing research into the ones that record metabolic activity and the ones that record electric activity in the brain. In the following sections there will be further presented each technique and its experimental procedure. Neuromarketing tools are basically divided into three activities shown in figure 1.

- Metabolic Activity in the brain: Allowing for the assumption in Neuromarketing that the brain contains hidden information about preferences, it is reasonable to set aside, for the moment, the issue of ‘hidden’ and ask what relationships are known to exist between brain activity and expressed preference.
  - High temporal resolution, SST is able to continuously track rapid changes in brain activity over an extended period of time.
  - Tracking rapid changes in the speed of neural processing in different parts of the brain
  - Able to tolerate high levels of noise or inference due to such things as head movements, muscle tension, blinks and eye movements and able to work with data based on a single trial per individual
  - Can be portable
  - Allows studying changes in behavior after manipulation of brain activity
  - Used in studying causality of specific brain regions for specific mental processes

1 Laybourne & Lewis, 2005; Smids, 2002
2 McClure et al., 2004; Schaefer, Berens, Heinze, & Rotte, 2006; Walter, Abler, Ciaramidaro, & Erk, 2005
Its effects are assessed indirectly through behavioral responses such as accuracy or reaction time. Studies causality of specific brain regions for certain mental processes. Good temporal resolution. Non-invasive method. Reliable and valid measure for cognitive and affective responses. Able to detect changes in chemical composition or changes in the flow of fluids in the brain.

- **Electronic Activity in the brain:** It is used to allow observation of deep brain structures and it is suitable for Neuromarketing studies, as it allows measuring following brain activity while subjects perform certain tasks or experience marketing stimuli, searching for patterns. One of the disadvantages is that the method is very expensive. Simpler in use than fMRI. Able to measure variations in the frequency of electrical activity in the brain. High temporal resolution, so researchers can detect changes in the brain activity precisely, connected to rapidly changing stimuli. Allows comparisons between left and right hemispheres measuring approach-related tendencies or withdrawal-related tendencies. Strong correlation between EEG asymmetry and personality traits. Statistical software packages available. Non-invasive method. Can be portable. Valid measure for cognitive information processing. High spatial resolution. Reliable and valid measure for cognitive and affective responses. Able to detect changes in chemical composition or changes in the flow of fluids in the brain.

- **Psychological Responses:** It is used to major following activities can be used together with the Neuromarketing tools described Psychological responses in order to obtain more insights and internal validation. Able to test both voluntary (conscious) and involuntary (unconscious) facial muscle movements. Able to detect the valence of the emotion depicted. Sensitive and precise. Able to measure facial muscle activity even to weakly emotional stimuli. Able to identify the valence of the mood state. Available software to remove artifacts. Changes in pupil dilation and blink rate speed provide accurate information on involvement in processing images and on the degree of excitement. Portable, in kits that can be carried to any location. Able to detect spatial attention. Non-invasive method. Can provide information on the subject's emotional reaction to the stimuli. Can identify a large variety of emotions, unlike EEG. Inferences of emotional engagement / arousal during choice processes. Data acquisition toolbox available. Portable, non-invasive method.

---

3 Anatomy of methodologies for measuring consumer behavior in neuromarketing research, Monica Diana Bercea, Alexandru Ioan Cuza, University of Iaşi, Romania
Neuromarketing, is based on finding a neural correlates for buying behaviours such as brand familiarity and product preference. It is important to acknowledge that researchers are only able to seek a 'correlate’ as most studies are only able to monitor neural activity observationally, and do not induce product preference via neural stimulation.

**IMPORTANCE OF NEUROMARKETING**

Neuromarketing demonstrate a very important fact, namely that, as a rule, decisions are taken by the consumer at a mental, emotional and instinctive level\(^4\). Through brain imaging, marketers seek to capture the rapid commands set up by the brain for efficient and rapid analysis in the evaluation of the alternatives within the purchasing decision-making process\(^5\). To save time, the brain does not always go through the entire list of risks, benefits and value judgments. Whenever possible, it is based on some "quick keys" that are based on experience and the benefits of stored information. The results obtained through Neuromarketing have been used so far in the following areas of interest:

- Increasing brand preference
- Improving advertisements retention
- Maximizing the impact of advertising
- Improvement of TV commercials
- Optimization of media budgets by admastering
- Optimization of production budgets by testing the spot in the production process.
- Making the branding operational
- Testing the products before their market launch.

---


CONCLUSION

We would like to quote Joey Reiman “NO BRAIN, NO GAIN”. Neuromarketing is a relatively new concept which has developed as a consequence of accepting, by an increasing number of persons, the idea that there isn’t an objective reality and that the entire world is actually inside our mind, it is the sum of our exclusively subjective perceptions. Neuromarketing is an emerging field that bridges the study of consumer behavior with neuroscience. Controversial when it first emerged in 2002, the field is gaining rapid credibility and adoption among advertising and marketing professionals. Each year, over 400 billion dollars is invested in advertising campaigns. Yet, conventional methods for testing and predicting the effectiveness of those investments have generally failed because they depend on consumers’ willingness and competency to describe how they feel when they are exposed to an advertisement. Neuromarketing offers cutting edge methods for directly probing minds without requiring demanding cognitive or conscious participation. This paper discusses the promise of the burgeoning field of Neuromarketing and suggests it has the potential to significantly improve the effectiveness of both commercial and cause-related advertising messages around the world.

Because our preference for a certain good or a certain service is unconsciously realized. There are more questions than answers about our brains. We have no access to all processes happening there and we are not able to decode many of information we can see. Neuromarketing helps us to understand the consumers’ behavior. In order to make the consumers to buy, the companies have to try to answer these kinds of questions and to always find new ways of finding out how the consumers think.

Neuromarketing offers the perspectives of a quantitative method to test the effectiveness of ads, logos and sounds before spending money on promotion. Given the existing overabundance number of ads, this new research tool is a vital instrument for those companies that want to better understand their targeted audience and to design better products for their clients. Thus, the neuroscience is not something new; the new thing is its use in business in order to make business more ‘intelligent’ with the help of the doors which are open to knowledge. The innovations regarding the neuroscience allow us to see and to measure what we feel and we think. If we were to synthesize the neuroscience importance, and consequently of the Neuromarketing importance for a company.

REFERENCES

2. Christopher R Madan, Department of Psychology, University of Alberta Neuromarketing: The Next Step In Market Research
3. Mirela-Cristina Voicu, Aspects Regarding Neuromarketing Specific Research Methods, Samuel M. McClure,1,2 Jian Li,1 Damon Tomlin, Kim S. Cypert, Latane´ M. Montague, and P. Read Montague, Department of Neuroscience, Neural Correlates of Behavioral Preference for Culturally Familiar Drinks
4. Monica Diana Bercea, PhD Student, AlexandruIoanCuza University of Iaşi, Romania, Anatomy of methodologies for measuring consumer behavior in neuromarketing research
5. Babes-Bolyai University Cluj-Napoca Faculty of Economics and Business Administration, neuromarketing – getting inside the customer’s mind
6. R. Mark wilson, jeanniegaines, and ronaldpaul hill, Neuromarketing and Consumer Free Will
7. Christophe Morin, Published online: 14 January 2011, Neuromarketing: The New Science of Consumer Behavior
8. Leon Zurawicki, Neuromarketing: Exploring the Brain of the Consumer
9. Neuromarketing for Dummies References and Notes for Readers, 2013 Intuitive Consumer Insights LLC.
14. Monica Diana Bercea, Alexandru Ioan Cuza, University of Iași, Romania, Anatomy of methodologies for measuring consumer behavior in neuromarketing research.