

A Review on: Neuromarketing as an emerging field in consumer research

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Abstract

Today, businesses continuously monitor what consumers buy but it is always difficult for them to find out 'why' they buy or how meticulously their thought process functions in making buying decisions. This is the reason why many marketers have started taking interest in understanding human brain through various brain mapping tools for understanding their consumer in a better way. Further various neuroimaging techniques like EEG (Electroencephalography), Nuclear Magnetic Resonance (NMR) and fMRI (functional Magnetic Resonance Imaging), have enabled researchers to plot the crucial brain activity of an individual in response to various marketing stimuli. This paper aims to explore how the emerging field of Neuromarketing plays a pivotal role in unveiling the enigma of consumer psychology and presents neuromarketing as a way to detect brain activation during customer engagement. Paper throws some light on techniques used in neuromarketing, focusing on various parameters in application of neuromarketing, and identifying controversies and ethical issues about it, as well as its limitations.

Key words: *Neuromarketing, Neuroimaging techniques, Consumer Psychology*

Introduction

The term neuromarketing was coined by Ale Smidts (2002), a Dutch marketing expert. The concept of neuromarketing was developed by psychologists at Harvard and the best known technique of neuromarketing was developed by Harvard professor Gerald Zaltman (1990) which was patented under name ZMET (Zaltman Metaphor Elicitation Technique). Implications of Neuromarketing in consumer research through studying key brain mechanisms were identified by Solanais et. al. (2013). These mechanisms were identified as decision making, reward processing, motivation, emotional processing, attention and memory.

Neuromarketing is basically a junction where neuroscience and behavioural research interacts with the discipline and practice of marketing i.e. how and why a buyer responds to a marketing stimuli depending on his neurological sensory-motor, cognitive and affective responses. Tremendous advancements in medical diagnostic techniques have empowered neuroscientists to critically study the activity of cortex region of human brain in the terms of frequency, time, and space which is quickly adopted and applied in consumer psychology for understanding and predicting buyer behaviour and to eventually increase the efficacy of the marketing strategies of firms, harnessing them competitive edge and commercial advantage. Some researchers and organisations have started using Neuromarketing as an alternative to conventional consumer research methods like Google and Frito-Lays which deployed neuromarketing firm in 2008 to identify consumer response towards its cheese puff brand 'Cheetos'.

BrightHouse Neurostrategies group of the USA, established in 2001, was among the first ones to market the commercial studies on neuromarketing by collaborating with the

neurosciences laboratory from Emory University. Many European companies have also actively engaged themselves in this field, one of which known as Shopconsult which collaborated with Ludwig-Boltzmann Institute, claims the paternity of the concept of Neuromarketing.

Neuromarketing utilizes following interdisciplinary branches for its implications into present day marketing:

- Neuroanatomy – Structural study of the nervous system and its tissues.
- Neurology – Study of clinical consequences of the pathology of the nervous system and their treatments.
- Neuro-psychology – Study of the clinical consequences of the nervous system pathology, the cognitive aspect, intelligence and emotions.
- Neuro-endocrinology – studies the connections between the nervous and the hormonal system.
- Cognitive neurosciences – Study of the connections between the nervous and the cognitive systems i.e. knowledge and learning centres (through memorization, reason, emotions and language).

Recent studies have tried to bring together the fields of Neurology and Marketing, generating interest and giving rise to 'neuromarketing' (Marcel et. al. 2009).

Objectives of the study

The objective of this study is to identify the importance and relevance of the nascent field of Neuromarketing as an emerging tool in marketing research as well as examining the techniques used for it. The study also aims to identify its various parameters, current and possible applications and ethical issues as well as limitations involved in its applications.

Applications and Parameters of Neuromarketing

Neuromarketing is certainly guiding marketers for designing preferred products and services as well as crafting hard-hitting ad messages which eventually boost sales response. 'NeuroFocus' of Berkley, California, 'EmSense' of San Francisco, and 'Sands Research' of Texas are some of the eminent firms providing Neuromarketing services to prestigious brands like Google, Hyundai, Microsoft, Walt Disney and Pepsico. The company representatives at Procter and Gamble acclaimed that neuromarketing has enabled the successful release of its new fabric refreshner category brand – 'Febreze' while for Motorola it has played a vital role in brand positioning. Among its various applications, Neuromarketing predominantly finds its role in extracting information hidden in consumers' mind and designing products and services accordingly. Ariely and Berns (2010) suggested few other areas of applications of Neuromarketing like:

Product Development stage for consumer foods: The vast consumer foods sector offers ample opportunity for the implementation of neuromarketing by analyzing the desires for taste and preferences for various food flavours and combinations which tickles the taste buds of the consumer thereby eliciting neuro-sensory response for certain taste, aroma, colour and texture. Identifying these properties with the help of techniques used in neuromarketing, marketers can evolve products accordingly, the way Pepsico used inputs for its brand 'Cheetos'.

Entertainment Sector: Lacey (2010) defined 'Neurocinema' as an application of neuromarketing in hollywood industry. When the movie 'Avatar' was released, James Cameron mentioned that fMRI scans of prospects watching the movies trailer in 3D, showed more neural activity than watching it in conventional version (Desaulniers, 2013; Randals, 2011). Amidst the trend of spending huge budgets on production and marketing of movies nowadays, for the entertainment sector neuromarketing provides immense scope of application when viewers' attention level, engagement and impulsive reaction about audio-

video products in the industry offers an ease of being monitored and presented through fMRI scanners used for neuroimaging.

Political Campaigns: Election campaigns being an area of huge marketing spend today, can offer an implication of neuromarketing where 'image creation' of a political personality as per the desired perception of the target audience needs to be manifested. A neuromarketing research performed by The New York Times showed in what way the different brain areas respond to various people and policies. This, however, raises the issue of manipulating people in the political marketing, but if neuromarketing is used for promoting the messages of the general public interest (e.g. in anti-drug and anti-alcohol campaigns aimed at young populations) or for promoting humanitarian campaigns, its benefits to general public are unquestionable.

Architecture and Real Estate: This is a very interesting field offering application of neuromarketing and prior studies conducted by scanning human brain while navigating through buildings and infrastructures have given indications for the desired structures and facility plans for easy usability and enhanced comfort. Even this idea finds great application in designing public facilities for differently abled people by knowing their neuro response about their specific desired requirements in case they cannot give inputs on their requirements.

Renvoise and Morin (2007) have listed 6 stimuli that always trigger response in human brain, in their book, 'Neuromarketing: Understanding the buy buttons in your customer's brain'. Authors argue that these decisions are made by human mind in the region called 'primal brain' which is bottom region. The following 6 instincts directing for decision making by human brain are:

- **Egotism:** It is a natural and inherent instinct of self-importance which compels an individual to desire for anything which will satisfy their ego, give people a sense of pleasure by eliminating their pain and thereby creating a difference in their lives.
- **Attention for contrast:** In the clutter of redundant ad messages, it is natural for the most contrasting one to ultimately grab the attention of human mind which is efficient in capturing and retaining the contrasting attribute of a message and retaining it for a longer duration in memory.
- **Lazy nature of mind:** It is the lazy characteristic of mind which enables it to easily retain the simplest messages imposing less stress on it to understand, avoiding complications in the memorizing process. Comprising of these two features, keeping a message simple but strong and contrasting with less words and more visuals to further simplify it in the clutter is the key to infatuate the audience and elicit their neuro-sensory response.
- **Attraction for stories:** Studies have shown that the audience are more enticed by the beginnings and the endings of a narration, and thus making the beginning most captivating and keeping the key promotional message by the end will retain the message for more longer duration in the prospects brain.
- **Strong visual memory:** Visual memory of human brain has more impact on his actions than the audio. Thus graphics lay a lasting influence on mind and trigger response which words may not, letting the prospect to make an impulsive decision.
- **Emotional brain wins rational:** Every emotional stimulus is known to generate a chemical response in brain, influencing speed of inter neuronal communication under the hormonal action which triggers the memorizing process of brain pertaining to every experience.

MacLean (1960) formulated the 'Triune brain hypothesis', according to which brain consists of three structures, first one is Reptilian Complex (R- Complex), which is primitive

brain responsible for taking action towards fulfilment of basic needs, second is the Limbic System which is associated with emotions and memory related to any experience and the third one being Neo-cortex which is the rational brain governed by logic and rules through analysis and evaluations. Renvoise and Morin (2007) suggested that these three parts of the brain think (rational brain), feel (emotional brain) and act (reptilian brain) thus in order to be effective, a marketing communication should be based on the needs of the client first rather than the product features and it should target emotional brain first and then to the primitive brain which further transmits the information to the rational brain. Thus the Parameters of Neuromarketing are the following elements of Neurophysiology:

Memory and Learning: Limbic System also plays an important role in triggering emotions related to any past experience or imagery which relates to the marketing message and thus passing on the information and activating the region of the brain responsible for taking action.

Attention and Perception: According to AIDA Model (Dukesmith, 1904) of buyer-behaviour, consumer 'attention' is the first step when customer engages with any marketing message, is further intensified with the 'interest' which can be raised by focusing on advantages and benefits rendered to him by a marketer's product creating a positive perception and thus a 'desire' to purchase arises which prompts him to take 'action' of purchase.

Emotional Engagement: Emotional engagement may be generated at the stage of 'attention' gathered by a unique marketing message. As a function of emotional brain (Limbic System), this emotional engagement further generates interest leading to desire for buying under the influence of any emotional associations formed with the brand.

Neurological Techniques used in Neuromarketing

The inherent zest of psychologists to associate observed behavioural traits with certain parts of the brain has given rise to neuropsychology. There are various brain mapping techniques possible nowadays due to advancement of technology in the field of medical diagnosis and has enabled the study of neuroanatomy. The following techniques mentioned below are widely used in neuromarketing:

fMRI (functional Magnetic Resonance Imaging): Various neuroimaging techniques including fMRI are used to explore hidden emotional motives and social interactions driving people to make these decisions (Fisher et al., 2010). Under fMRI technique, active parts of brain are identified by estimating fluctuations in blood flow and the amount of oxygen consumed as the more active areas show more oxygen consumption and higher rate of blood flow. fMRI works on principle of difference in magnetic properties of oxy and deoxyhaemoglobin which are diamagnetic and paramagnetic respectively. For the diagnosis purpose, prospects are placed in cylindrical devices fixed with fMRI scanners and exposed to marketing stimulus in form of any ad message, graphics or audio. BOLD (blood oxygen level dependent) signals are detected for different areas of brain to identify areas with higher activation as a result of exposure to marketing message.

EEG (Electroencephalography): EEG is based on the principle that neural communication occurs through the electric discharges which generate an electric field and it can be measured and recorded by placing electrodes on the surface of prospect's head while exposing him to marketing stimulus. By measuring potential difference between electrodes, it detects activation of specific brain parts in response to marketing communication but unlike fMRI, EEG has poor sensitivity of deeper brain structures. Neuromarketing research through EEG scans has suggested that a relatively greater activity in the left frontal region is associated with either positive emotional states or the motivational drive to approach an object.

MEG (Magneto-encephalography): MEG measures magnetic signals of brain through difference in magnetic field resulting out of neuronal activity. MEG technique has higher

spatial as well as temporal resolution than EEG due to less distortion of magnetic field as compared to electric field of brain.

GSR (Galvanic Skin Response): GSR measures and records changes in skin response indicators in terms of temperature fluctuations and sweating due to emotional swings.

TMS (Trans-cranial Magnetic Stimulation): TMS may stimulate or inhibit neural signal transmission at synaptic junctions of nerves by creating strong magnetic field which induces electric current in neurons through toroid like device placed on head of the prospect. TMS is used in identifying causal role of certain brain parts in various decisions.

Eye-ball Tracking: This technique is used to identify the portions of an image or a video which tends to catch more attention of the prospect while watching any marketing communication (graphic or video) by tracking the eye-ball movements in response to changing graphics.

Applied Neuroscience: It is a market research tool which trains marketers to design their marketing communications on the basis of neuroscientific interpretations made out of neuroimaging tools which may strike the pulse of consumer brain at a subconscious level.

Controversies and Ethical Issues in Neuromarketing

- **Control on consumer psychology:** There is a constant debate by NGO's advocating for consumer protection that through this market research tool, prominent brands may get hold on consumer psychology to elicit subconscious emotional response towards sale and consumption of potentially harmful products like liquor, cigarettes or obesity causing food. Even one such organisation 'Commercial Alert' has complained against Emory Centre (a neuromarketing research lab) to the office of Human Research Protection in the USA.
- **Manipulation of buyer's brand preference:** Brain mapping data about consumer psychology is easily susceptible to abuse through an attempt to manipulate buyer preference predominantly through peripheral route, targeting emotionally weak points rather than central route based on functional and rational appeal of products.
- **Deductive reasoning questionable:** Neuroimaging data which is highly subjective to individuals, may not be valid for deductive reasoning about consumer psychology of masses in general. On contrary, those specific emotional behaviour traits found in sub-groups of certain populations which are different from masses, may be exploited for marketer's benefit.
- **Disruption of Privacy of thoughts:** If neuroimaging reveals such subconscious desires which are beyond the periphery of neuromarketing researcher's interest, it is an ethical issue against privacy of thoughts of the prospect.
- **Lack of Regulation:** Use of neuroimaging techniques like MRI are not subject to any regulatory controls like IRB (Institutional Review Board) and FDA (Food and Drug Administration) which should approve and lay certain guidelines for the use of all such advanced neuroimaging tools for their implementation in neuromarketing.
- **Promoting Consumerism:** Moreover the application of neuromarketing with the sole intent of selling more and promoting heavy consumerism itself is a risk to sustainability and is an ethical concern.

Conclusion

Neuromarketing is currently an evolving concept in the field of marketing research and has a long way to go as the brain imaging techniques are also congruently in their developing stage. Based on neuroimaging diagnostic techniques, neuromarketing as an exciting method to read human minds, is capturing attention of marketers across the globe. If developed and

implemented judiciously, the further progress in this field can immensely contribute to resolve previously ambiguous issues spanning consumer psychology and business relationships. The need is to view this application of advancement in technology in a non-judgemental spirit, to leverage on its ability to co-create value for businesses as well as consumer groups rather than highlighting darker and unethical side of its applications to control and rule human minds in a wrong way.

Limitations of Neuromarketing and Scope for further research

'Neuromarketing can be perceived as an adjuvant, as a supplement of traditional techniques, not as their replacement' (Bichis, 2011). 'It must be regarded not as an alternative for marketing's future, but as an evolution' (Padurariu, 2011). Highly complex and advanced technological set-up incurring huge cost creates implicit limitations for the routine application of neuromarketing as the techniques like fMRI can only be used in labs with expensive scanning set-up. Moreover there is an inherent reluctance of consumer groups regarding use of neuroimaging for marketing research as they believe it can be used for manipulating their behaviour, which may not be true as quoted by Quartz (2006) and pacified "neuro-sciences are complementary to other studies regarding behaviour, which have been used for a long time. It's just another way to evaluate and measure factors that, until now, were inaccessible. And it is more a method of measuring the preferences, rather than manipulating the choice". Scope for further studies in this field is immense in terms of identifying further potential areas of application for consumer well-being and even to promote conscious and sustainable buying decisions. Future research to effectively implement it at product or service design stage by companies may ensure better value creation for the consumers.

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