

Neuromarketing: An Overview

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Abstract

Advances in neurosciences are re-defining and enhancing our understanding of how we make decisions in general and how consumers make decisions from a marketing perspective. Laboratory and field based applications are contributing new insights on consumer behavior that have a direct impact on marketing plans. Courses in consumer neuroscience and Neuromarketing are now offered by many IIM's. How the brain processes and generates responses when viewing an ad is now the subject matter of research. A preliminary study in the eighties showed that subjects preferred Pepsi if they didn't know what they were drinking, but preferred Coke if they did. Brain scans however showed different activity in different parts of the brain in each case. Today using (Functional MRI) fMRI, (Electro Encephalo Graphy) EEG, (Magneto Encephalo Graphy) MEG, eye tracking, face scanning and other objective methods of measurement some neuroscientists claim that they will soon be on the way to identifying the location of the “ **Buy Button**” in the brain and eventually perhaps this area of the brain could even be stimulated and manipulated. The complex neuronal network which is active during a “simple” decisional process connected to the purchase of a product is now being studied in detail that is what actually happens in the brain when we see an advertisement. What finally presses the “ Buy button” . Can this be predicted and even manipulated. Would this be ethical ? In one study of neural responses to sips of wine, medial Orbito Frontal Cortex response were higher when subjects were told that the wine was expensive (\$90 per bottle) versus inexpensive (\$5 per bottle). If an ad does not produce functional changes in the brains of the intended audience, then it has not worked! New vistas on marketing and glimpses into the future of neuro marketing are on the horizon

Introduction

Neuro marketing is the branch of neuroscience research that aims to better understand the consumer through his cognitive processes and has applications in marketing, explaining consumer's preferences, motivations and expectations, predicting his/her behavior and explaining successes or failures of advertising messages. Neuro science can help Marketers by Providing confirmatory evidence about cerebral changes. Generating more fundamental (i.e., a neural level) conceptualization and understanding of underlying processes, refining existing concepts of various phenomena, and providing methodologies for testing new as well as existing theories are in the offing.

The term neuromarketing was first used in a June 2002 press release by an Atlanta advertising firm, BrightHouse, announcing the creation of a business division using fMRI for marketing research. The annual advertising market in the USA alone in 2014 was 475 Billion US \$. Traditionally marketers have watched what we do in stores or tracked how purchases rise or fall in response to promotional campaigns, changes in pricing, endless surveys and focus groups, asking us what we buy and why. In Neuromarketing one understands patterns of brain signals (electrical, blood flow, O2 and blood utilisation in specific regions) as a function of time (milliseconds) during observation of commercial advertisements , leading to information about cognitive and emotional processing of information in the brain . The neurophysiological changes in the complex neuronal network , during a simple decisional process, involved in purchase of a specific product is studied. The response to advertising (how the message is encoded) matters more than the stimulus (the ad itself) because the response is what the ad leaves behind.

Advertising productivity will increase if managers knew how advertisement stimuli (the Unique Selling Proposition) were received and stored by the brain, and how they affect brand choices. Individuals with a high BMI prefer a thin-shaped bottle, even if this drink is higher in price. Brains in obese people respond differently to nutrition labels. When given an identical milkshake , there is an increased brain activity in reward areas if the label reads 'regular' compared to 'low-fat'!!. Neuroimaging has been used to identify structural and functional brain markers associated with racial biases, trustworthiness, moral reasoning, economic cooperation, social rejection, sexual preferences and even consumer brand attachment. While one school of thought says “ Don't just advertise. Neurotise ”, others believe that Brain Scans are only Brain scans !!

Basis of Traditional Marketing:

The main objective of marketing is to match products with people. - guiding design and product presentation to suit consumer preferences – *is it possible to examine what the brain does while making a purchasing decision*

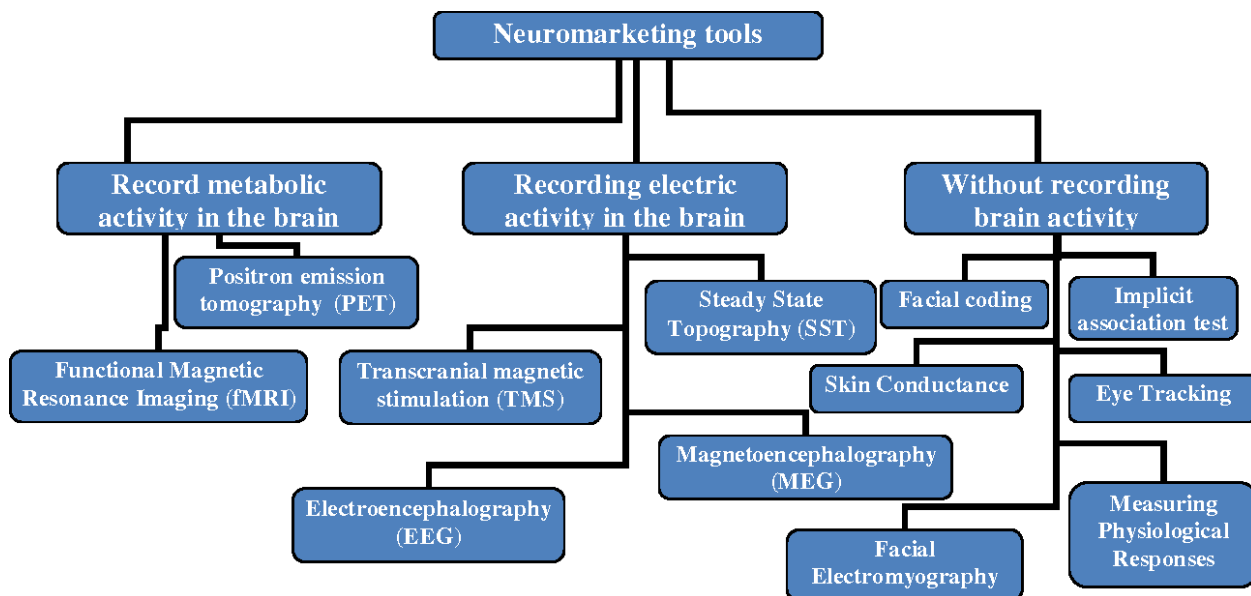
Basis of Neuromarketing

Cognition describes the way our brain thinks, reasons and solves problems. Changes that occur in the brain while we focus, concentrate, maintain or divide attention can now be qualitatively and quantitatively measured. Learning, remembering

new things, planning, executing and regulating activities, understanding and using language, assembling and grouping things together all form the basis of neuromarketing studies.

Neuromarketing Tools

This is represented pictorially below. However these studies can only be done in well equipped neuro labs with considerable infrastructure and technical expertise.



Source: Sharad Agarwal IIM Ranchi

Techniques of Neuromarketing

Eye movement tracking is a standard tool deployed for understanding interaction with both online and bricks-and-mortar environments. Eye movement (fixed and interrupted) reveals focus and attentional bias, distribution and gaze time (of the look) and pupil dilation. These are surrogate markers of the subject’s attention and cognitive processing. A longer blinking interval would correspond to better processing of information. ERP ANALYSIS: An Event-Related Potentials (ERPs) analysis, revealed that visuo cortical processing shows an increase in the early positive component (P1 of an ERP), at central and parietal sites, along with increase of the later negative component (N2 of the ERP), at parietal and occipital sites, related to the observation of disliked logos. Brain fingerprinting includes identification of the p300 wave in EEG and MEG and correlating this with observed responses when exposed to a marketing stimulus. Transcranial magnetic stimulation (TMS) a neuroenhancer could even have potential for altering “Neuro responsiveness” to Branding. The brain is the ultimate business frontier and technology is now letting marketing managers peek inside our heads. An EEG allows neuroscientists to track the electrical changes occurring in the brain when watching a commercial. Miniaturization and portability of the equipment has made evaluation of potential customers easier.

Illustrations of Neuromarketing

Subjects preferred Pepsi if they did not know what they were drinking, but preferred Coke if they did. Brain scans showed different activity in different areas. When tasting blind, **the ventromedial prefrontal cortex** responded more actively to Pepsi. When told they were drinking Coke, there was more activity in the **medial prefrontal cortex** — a part of the brain dealing with higher cognitive processing and memory. *Positive brand associations could almost literally be seen overriding the basic pleasure response (taste)*

Specific Documented Brain changes when seeing an Advertisement

Strong activation of the Right Inferior Frontal Cortex (Vocalisation), at 500 ms, latency and in the Left Orbitofrontal Cortex (Judgement) between 600 and 1200 ms after stimulus presentation has been recorded. Active involvement of **Anterior Cingulate Cortex (ACC)** and **Cingulate Motor Area (CMA)** have been correlated to liking or disliking particular advertising logos. **Ventromedial Prefrontal Cortex (VMPC)** is critically involved in emotion and emotional regulation, playing a pivotal role in brand preference. The Prefrontal cortex discriminates cognitive processes, encoding new complex stimuli (e.g., logos, products, testimonials, payoff, etc). Amount individuals were willing to pay (a measure of decision utility) correlated with activity levels in the Medial Orbitofrontal Cortex (OFC) and Prefrontal cortex (PFC). Similar activation in the OFC was observed when subjects anticipate a pleasant taste, look at pretty faces, hear pleasant music, receive money and experience a social reward. In a study of neural responses to sips of wine, medial OFC response

were higher when subjects were told that wine was \$90 per bottle vs. \$5 per bottle!!! If an ad does not modify the brains of the intended audience, then it has not worked . This would be the way a marketing campaign is assessed

Neuromarketing: a Peep into the Future

MRI scans for neuromarketing studies are at present not regulated by FDA or IRB. *Neuro-caution* must be used in deploying the new *neuro culture* of neuro marketing, while appreciating the exciting discoveries about human behavior using neuro technologies. Commercial effectiveness indicators could be measured including emotional engagement, memory retention, purchase intention, novelty, awareness and attention. We make decisions based on our emotions. Emotional engagement is secondary to the emotional excitement. What happens in the brain when consumers respond differently to an ad, brand or campaign will be understood. Cerebral changes during the Emotional Reaction and Cognitive Processing component of seeing an advertisement can be studied. This is correlated with remembering /forgetting the Ad, attention sustenance, like/dislike . Marketers could exploit these tools in an ad pretest. The exact location/s of the “Buy Button” could be identified. Using principles of reverse engineering the BB could be stimulated and consumer behaviour modified !!! Improbable Yes. Impossible No

About the Author



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Few Neuromarketing Books

Hooked

Author: Nir Eyal (@nireyal)

This book explains the Hooked Model: a four-step process embedded into the products of many successful companies to subtly encourage customer behavior and form habits. Hooked is not abstract theory, but a how-to guide for building better products. Nir Eyal masterfully weaves his insights of technology, business, and psychology into his four-step model that reveals the formula for creating habit-forming products.

<https://www.amazon.com/Hooked-How-Build-Habit-Forming-Products/dp/1591847788/>

Neuromarketing for Dummies

Author: Stephen Genco (@sjgenco)

Don't be put off by the title of this book, it's one of the better neuromarketing books on the market. Although the content is presented in the format used by all books in Wiley's Dummies series, there's a ton of well-researched information in the book. Neuromarketing for Dummies (my review) is a readable intro to both non-conscious effects on decision-making and the more technical side of neuromarketing.

<https://www.amazon.com/Neuromarketing-Dummies-Stephen-Genco-ebook/dp/B00EO3ZIIS/>

Buyology

Author: Martin Lindstrom (@MartinLindstrom)

The lessons in Buyology (my review) are pulled from a three-years, \$7 million research project which Lindstrom started in 2004. This might still be the largest neuromarketing study ever conducted' Lindstrom worked with organizations around the world to test what people actually feel about certain advertising techniques and products using fMRI. Some of the findings about tobacco warning labels and red Formula One cars will surprise you. One of the first neuromarketing books to be a true bestseller.

<https://www.amazon.com/Buyology-Truth-Lies-About-Why/dp/0385523882/>

Neuromarketing Books: The Ultimate Reading List:

<https://www.neurosciencemarketing.com/blog/articles/neuromarketing-books-reading-list.htm>