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Ethical Perspectives of Neuromarketing – A Qualitative Analysis

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Abstract
Neuromarketing has emerged as a novel research technique which analyses an individual's neurophysiological mechanism in response to various types of marketing stimuli, in order to develop insights into customer behaviour and motivation. It is touted to be better than traditional question-based market research because instead of asking consumers what they want, it studies the body's reaction to accurately gauge their preferences. However, numerous studies have criticized this technique in the light of various purported ethical malpractices that can occur or are already occurring. The following exploratory research uses Grounded Theory to deep-dive into the various ethical issues of neuromarketing. The central theme that emerges from the study is the need to develop regulatory framework to supervise neuromarketing research. The study concludes with recommendations for industry and academia on the required set of ethical principles that must be adopted while conducting neuromarketing research.
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1. Introduction

With cut-throat competition in today's day and age, most companies are resorting to marketing innovations in order to increase market share, and improve RoI. Modern techniques comprising big data and predictive analytics have helped the marketers by bolstering their efforts to narrow down on the customer's tastes and preferences, and generate better sales accordingly (Wassouf et.al 2020). However, such progression has opened a Pandora's Box – namely issues pertaining to ethical marketing. The Cambridge Analytica scandal during the 2016 US presidential elections brought to the forefront, the risk and level of vulnerability associated with misuse of data (Hinds et al 2020). This incident has been crucial in sparking conversations about data privacy and ethical usage.

Modern marketers often tread a grey area, when it comes to personalization. Personalization in marketing is defined as tailoring the product offerings/value proposition to resonate with current and prospective customers' desires (Chandra et al 2022). Personalization is being augmented heavily by what is known as Neuromarketing. The term neuromarketing has been penned in 2002 by Professor Ale Smidts of Erasmus University. It is a branch of marketing research, concerned with studying the human brain and physiology to track consumer attention and their emotional responses without explicitly asking them to describe their feelings (Karmakar, 2011). The scope of applying neuromarketing includes (Olteanu, 2015; Harrell, 2019):

- Marketing – to gauge effectiveness of communication, optimize advertisement design and message, determine the right media mix, branding strategy etc
- Product development – to add/remove features based on preferences, package design, taste etc
- Pricing - to estimate demand elasticity of consumers
- Politics – to evaluate effectiveness of communication

While initially it was considered to be an "extravagant frontier science" (Harrell, 2019), it has been burgeoning of late with several studies supporting its potential to become a highly valuable and sought-after technique for market researchers. Companies like Microsoft, Google, Yahoo, Hyundai, Frito-Lay, PayPal to name a few have leveraged insights from neuromarketing research in their commercials and have reaped huge benefits from it (Flores et al, 2014; Lindquist, 2014; Hensel et al, 2017).

However, since its emergence, it has raised many controversies with respect to the ethical dimensions of market research (Pop, 2014). Wilson et al (2008) have highlighted several issues regarding consent, awareness, consumer free will and invasion of privacy surrounding this technique. Certain tools that are used in neuromarketing, particularly the scanning of brain waves, have been recommended by Young (2002) to understand consumer's reaction to commercials for the purpose of brand positioning, but have also been called out for being unethical practices (Babu, Vidyasagar 2012). While Morin (2011) suggests neuromarketing to be a more effective alternative to traditional research as it can directly probe into the minds of the consumers without their conscious participation, Murphy et al (2008) suggests that bypassing traditional behaviour testing to find information beyond whatever one might divulge voluntarily, is an ethical issue that raises substantial concerns about this field – calling it stealth neuromarketing. Using neuromarketing for manipulation and undue persuasion is another ethical critique, that can evoke negative reaction from the consumers according to Flores et al (2014).

At present, research on ethics of neuromarketing is broadly limited to review and comparison of existing literature, without deep-diving into the underlying issues at ground level. This paper attempts to examine the general public's understanding of the ethical issues right from the scratch. The methodology applied is qualitative analysis using Grounded Theory to shortlist major areas of concern. The study also provides recommendations, which will allow industry professionals to exercise vigilance while conducting neuromarketing research and help academicians to propose guidelines and conduct further research.

The following section provides a brief conceptual understanding of neuromarketing. The tools of neuromarketing are then discussed to identify sources of ethical violations, followed by existing literature review and the research gap. Furthermore, the applied methodology is discussed wherein the concept of Grounded Theory is introduced. The findings are then summarized to draw on the theoretical and managerial implications for ethical implementation of neuromarketing research.

2. Understanding Neuromarketing

According to Maclean (2002), the human brain can be divided into the reptilian brain, the old mammalian brain and the neomammalian brain. The reptilian brain or R-complex is the lower most part of the brain, which is responsible for basic instincts such as fight, flight, hunting, mating and everything related to survival (Maclean, 2002). The old mammalian brain is responsible for emotional feelings of fear, anxiety, happiness and so on. The neomammalian brain is responsible for cognizance, invention, abstraction, logical reasoning and empathy.

The reptilian part of the brain works mechanically and without any consciousness, according to him. It has default reaction mechanism to its environment and performs tasks that can be done without learning or thinking. For example, functions like breathing, squinting at the sight of blaring lights, the need to relieve oneself etc are activities that require no prior thinking and are almost involuntary. Most researchers are of the belief that it is the reptilian brain that can be tapped into, in order to get maximum return from marketing tactics. Renvoise (2013) believes that people's choices respond to the predilection of the reptilian brain, and its role is more important than that of the neomammalian.

There are 6 stimuli to the primal brain (Renvoise, 2013): self-centred, contrast, tangible, memorable, visual and emotional. Marketers capitalize on these stimuli to drive their message. Their strategies are designed to stimulate the reptilian part of the brain, that often leads to consumers reacting unconsciously, without putting in further thought. This is the core essence of neuromarketing, and its success is evaluated by its ability to trigger the "buy button" of the human brain (Witchalls 2023). The trick lies in how marketers harness the power of stimuli. There are multiple examples of marketing that rely on the response of the reptilian brain.

An example of effective neuromarketing strategy is to identify pain points of the customers and offer a value proposition to them that demonstrates an improvement over their painful experiences (Ghuman, 2022). By way of contrast stimulus, this kind of strategy elicits self-centric reaction from the reptilian brain, which leads to better conversions for the marketers. Given that customers are mostly impatient, many online businesses such as Uber, Zomato etc allow customers to track the status of their cab/food and expected time of arrival. This makes the consumers feel in control, thereby allaying their pain points. Additionally, messages like "Don't miss out on..", "Discount ends tomorrow.." used by Amazon and eBay are tricks of creating fear in the minds of the consumers, which the reptilian brain will try to avoid. Advertisements put out by Amul tend to rely on moment-marketing and are hence memorable (Sinha, 2020). Creatives depicting "before and after weight-loss programmes" help in creating contrast in the consumer's minds.

The biggest advantage of neuromarketing is that instead of asking customers what they want, it helps to understand what the customers truly need because most often, the customers do not really know what they want. As Isa et. Al (2019) puts it, the scope of neuromarketing is to gain answers that are unobtainable using traditional market research methods. Companies like Nielsen Consumer Neuroscience Center (India), Xanadu Consulting (India), Emonalytics (USA), Mindketing (Mexico), Explorer Research (USA) are some of the top market research firms facilitating neuromarketing studies.

2. 1 Tools used in neuromarketing

The core neuromarketing research deals with studying activities within the human brain in reaction to various stimuli, in order to detect causality between human behaviour and the neurophysiological mechanism (Patrizia et al 2019) to further gain insight into the consumer's psyche and true desires. This kind of study can be used to build models to predict consumers' behaviour. Below are examples of tools that are used:

Facial Coding: It is a technique to detect the emotional state of a person and its intensity, by observing facial expressions. Paul Ekman and Wallace Friesen were early pioneers of this technique, wherein they studied the expressions by recording the changes in the 60 muscles that control the face (idStats, 2020). Subjects are made to watch a visual creative like an advertisement/catchphrase. By using a webcam or other high-definition cameras, their expressions are recorded. Image processing softwares are then used to analyze every frame of the recording to capture subtle changes in micro-expressions of the subject vis-à-vis the content of the creative.

These changes are used to estimate the feelings of the subjects during the entire episode, which can help in predicting whether that particular creative elicits the desired feeling or not. The advantage of this tool is that unlike depth interviews or surveys where people can conceal facts, facial expressions are almost always involuntary and hard to control, thereby allowing to gather truer information. The most famous example of facial coding is the use of AI and facial recognition by Disney, to track the facial expressions of a movie-watching audience to gauge their emotional reaction. They are now able to predict the reaction of the audience to a movie by only 10 mins of facial expression analysis with high accuracy (Mezzofiore, 2017).

Tracking eye movements: Eye tracking technique is used to observe the visual attention of the consumers and associate it with their emotional responses (NeuroRelay, 2016). The sequence and speed with which the eye position shifts from one spot to another, the duration of the fixation on a certain spot, patterns of visual search, frequency of blinking and the dilation of the pupil can give insights into the audience's conscious or unconscious response towards a particular creative or advertisement. According to research conducted in Australia, an image with a baby next to an ad copy has more people viewing the baby instead of the text, whereas another image with the baby itself looking at the ad copy has more audiences paying attention to it (Dooley, 2019). There are devices available such as the one invented by iMotions (NeuroRelay, 2016) or GazeSense, which allow to track eye movements with great precision. There are also wide ranges of webcam-based and infrared-based eye-tracking systems that are used. These systems measure the following (Genco, 2020):

- Fixation (duration of stationarity of eyes) and saccades (rapid eye movements between fixation) can help in determining the attention, level of cognizance or success of the area of interest. For example, reverse saccade or going back to a previously visited spot can denote lack of clarity, or sudden change in fixation can imply failure of a stimuli to hold on to the audience's attention. Heat mapping is also used to help determine the intensity of the attention.
- Blinking or blink synchronization among audience is an effective measure of attention as people tend to blink less when they pay attention.
- Pupillometry is the measurement of change in pupil size. Dilation of pupil is typically a response to increased interest, clarity or emotional arousal and hence serves as an effective feedback mechanism.

EEG: Perhaps one of the most famous tools, Electroencephalography is a neuroimaging technique which is used to measure the electrical activities within the brain. It is used to capture the underlying brain responses and gauge the reactions of the participants to various stimuli. The electrical signals that are passed between neurons in the brain can be picked up using sensitive head gears containing electrodes. These head gears are connected to amplifiers that convert the brain signals into digital information capable of being stored in computers. These can capture different frequencies of signal – Alpha, Beta, Gamma, Delta, Theta (Drummond, 2019). Signal processing is conducted to obtain meaningful information from these raw data. An example is frontal asymmetry, wherein the alpha wave signal emitted from the left frontal lobe of the brain is compared against that of the right frontal lobe (Drummond, 2019). If the left signal is estimated to be stronger, then it is considered to be a sign of interest from the participant while taking a decision.

EEG has wide range of applications especially in understanding consumer decision-making and psychiatry. Wine-tasting, scent-smelling, touching clothes, tasting food are some of the avenues for EEG application. There have also been studies conducted to detect preference of advertisements across demographic market segmentations, especially to understand emotional arousal or memorization capability from various visuals, using EEG (Bazzani et al 2020).

fMRI: Often used in tandem with EEG, Functional Magnetic Resonance Imaging helps in detecting neural activity in the brain, especially in the Limbic System, which is responsible for cognitive tasks and emotional decisions. It is performed using the MRI scan which uses strong magnetic field to create 3D images of the brain. It can detect changes in the levels of oxygenated blood in different areas of the brain, that can help in determining which brain regions are most active during the fMRI – because the more active regions require higher levels of oxygenated blood. These active areas can be associated with the activities that the participants were involved in such as watching an ad during the test, or answering questions related to a particular product imagery. It is better adept at capturing the entire brain's picture and mapping feelings of distrust, anger, fear and so on. There are several success stories of fMRI implementation – Mercedes Benz had used it to find out the consumers' opinions towards the external design of their cars, Ford had used it to gauge their customers' reactions to their commercials, Tele2 (a Dutch telecom company) used the same to optimize their TV ads (Baldocchi, 2021).

Some of the other neuromarketing tools include measuring heartbeat, tracking respiration and galvanic skin reaction when subjected to stimuli to determine level of interest, arousal etc (Yadete et al 2023).

3. Literature Review

Ulman, Caker and Yildiz (2015) define neuromarketing as a process of connecting perception and action that is driven by neurobiological mechanisms. This paper cites that a journalist posed doubts on the mind-reading

capabilities of neuromarketing, questioning the thin line between acceptable influence and manipulation. The paper also discusses the 2011 bill passed by the French Government which bans commercial use of neuroimaging techniques for anything other than medical purposes. It then goes on to discuss extensively on the below themes:

- *Reliability and scientific validity*: The use of EEG to determine 'excitement' or 'frustration' is often disputable and may not truly capture the inherent cognitive preferences. Accordingly, the companies might be misguided if the findings of the research are overestimated and not credible.
- *Dignity and non-maleficence*: Human dignity has to be preserved at all cost, and their rights must be respected as part of bioethics norms. Neuromarketing research should be questioned on its potential impact on human rights, especially when it comes to the autonomy of the subjects. The paper stresses that the subjects should be treated as "human beings" and given all the dignity and not treated as mere subjects. Hence, brain mapping techniques should be conducted with utmost care, because the individuals have their rights to disclose their preferences autonomously and their choices should be respected.
- *Informed Consent*: Human participants in the research must be given full disclosures of the aim, scope, risks and benefits. The technical aspects must be adequately explained before obtaining their consent on the participation and efforts must be made to ensure that the participation is voluntary and not coercive. Moreover, apart from the primary findings, the incidental/secondary findings from the research must be made known to the participants, along with the scope of usage of the same.
- *Confidentiality*: The identity of the participants is to be kept completely anonymous. The findings of the research should be published scientifically and not associated with their individual identities. Their identity must be protected and not distributed to third parties. The neuroimaging technology can have risk of stigmatization, judgement, prejudice, bias and privacy invasion which will need to be addressed upfront by the researchers.
- *Vulnerable groups*: There must be proper monitoring and control on neuromarketing research conducted on children and patients with psychiatric disorders, who could be subjected to undue influence and exploitation. The findings of the research from such patients are hard to be justified on ethical grounds, unless absolutely novel. Young and impressionable children must be protected from the risk of increased consumerism.
- *Public Engagement*: The researchers must inform and share their knowledge/findings with the public and encourage feedback/criticism from them.
- *Legal Framework*: There must be an impartial ethics committee or governing body to ensure controls in place, regarding neuromarketing practices and there should also be strict adherence to bioethics principles.

Stanton et. al (2017) mentions a letter written to Emory University in 2003, that sought to ban all neuromarketing practices, because searching for a "buy button" violated the Belmont Report (1979) which had charters for researching on human beings as subjects. While the neuromarketing companies portray this technique as a better alternative to traditional marketing research, the authors believe that it should not be given a privilege status as its simply one of the many techniques that help in predicting consumer behaviour. Moreover, despite recent increase in academic research and practitioners in this field, the criticisms of its purported capability still prevail. Few of the main issues highlighted are below:

- Earlier researches have demonstrated that fMRI could be effectively used to predict consumer choice with high degree of accuracy (often before the choices have been made), which critics see as a potential violation of privacy rights. This could also lead to customers being treated as robots without dignity. The counter-argument here is that neuromarketing predictions are merely probabilistic and not factual.
- A bigger fear in this context is the ability to influence the will power of the consumers especially at the level subconsciousness. While concrete evidences are yet to be established on this, some evidences have been found on the influencing power of supraliminal marketing.
- Given the industry clients are not fully aware of neuromarketing techniques, the firms may use poorer research methods and overstating their findings. This risk arises due to lack of peer review to analyze the findings. Moreover, these companies do not publish their protocols on data collection and consumer privacy protection.
- A potential privacy violation can be in the form of eye-tracking devices installed in the stores, to track pupil dilation of individual shoppers when they look at specific items. The sales people can monitor that and have undue advantage of selling the item off after hard negotiation, especially when the customers could have bought those at lower prices.
- However, the paper also argues some of the misconceptions associated with these issues and state that some of the new-age ethical dangers of this technique are unrealistic.

Matthews (2015) claims that in the future, neuromarketers may get involved in direct persuasion of customers and such advertising behaviour could be morally risky. He cites the example of a hypothetically possible situation, where neuromarketers would be able to capture real-time brain snapshots and create a neuro-profile of

the shoppers, without disclosing it to them – which is a prima facie breach of privacy. Moreover, activities in the orbitofrontal cortex could also indicate emotions pertaining to nostalgia and not necessarily the shopper's conviction to make a purchase, thereby leading to false positives. Another concern raised by him is that scanning of brains could allow for consumer manipulation, and while this is indeed an ethical concern, it is not specific to neuromarketing alone as traditional marketing also attempts the same. With respect to the issue of privacy, he mentions that while a subject may consent to giving up his/her brain data for the researchers - if such research is conducted over an extended period of time, it allows the creation of a "bank of data" that grants full access of the individual characteristics/mentality of the subject to the researcher, which is the true essence of loss of privacy and hence cannot be downplayed. This kind of aggregation of data and its potential for misuse need to be monitored.

Pop, Dabija, Iorga (2014) believe that the ethical dimension is one of the most sensitive issues in this field. The controversies surrounding it are primarily due to its potential for "intrusion into the subject's minds". Media reports pertaining to the "buy button" within the human brain has led to further distrust about this technology, because it would allow people into being manipulated to making purchases of products of a particular brand. They take the example of a persuasion model which combines both traditional and neuromarketing approaches. A group of target individuals are firstly selected and are subjected to a marketing stimulus, post which their responses are recorded. This is called the screening phase. Based on the responses, a marketing message is created which is then shown to the consumers (intervention phase), who can then either accept or reject the offer. It is during the screening phase that the subjects' brain activities are studied under neuromarketing and analyzed for their subconscious reactions. The issue arises when the subjects are not fully aware about how the data collected in the screening phase will be utilized. Notwithstanding the necessity for confidentiality of such data, there are also issues regarding property rights to the data, subsequent use and distribution to third parties. A second challenge arises from the correlation of the emotions associated with the marketing message for an underlying product. There is a risk of leveraging the emotional data to create highly effective marketing message, which may not truly reflect the actual characteristics of the product. Another major challenge is with respect to obtaining the consumer's consent for being monitored continuously via software programs that can record their emotions/reactions in front of a product on a shelf, which is collected via cameras installed within the store premises. While consumers are made aware of video surveillance and cctv cameras, there is no consent taken for usage of such footage. The authors cite the Code of Ethics, 2013 laid down by NMSBA which states that participants cannot be misled into the study due to their lack of knowledge on the subject matter, and that the objective of the study must be clearly expressed before obtaining consent.

Krausová (2017) studied neuromarketing from the Czech legislation perspective and claims that according to the opponents of neuromarketing research, this technique is a tool to override rational consumer choice by use of powerful stimuli. She believes that this technique has more potential to limit consumer autonomy in comparison to traditional marketing, because it can not only circumvent the subject's decision-making process to capture his/her bodily reactions to certain stimuli, but also interfere with the right to privacy. The reformed Czech Civil Code (2012) emphasizes heavily on the autonomy of will, and protecting it is necessary for developing the private life of a person. This is in contradiction to the objective of neuromarketing which seeks to gain emotional reaction from advertising, because the ambit of the code caters primarily to intellect. She further states that according to the code, a transaction is legal if it's performed as per the individual's will. On the contrary, advertising backed by neuromarketing research appeals to the unconscious desires of human beings by its messaging. Hence it could be argued that the purchase of a product based on such advertising is involuntary. Therefore, circumventing the conscious decision-making process in order to elicit a biased response is essentially limiting individual autonomy, which violates the fundamental principles of the civil code. She also points out that biometric data that is collected from the subjects during the research is unique and can be used to identify the individuals, thereby putting them at risk of data breach and that there is no law protecting the data gathered from neuro/physiological processes.

Oleksii et. al (2021) echo similar sentiments. In the context of Ukraine, it is mentioned that there are no legal regulations on the use of methods to procure data used for targeting audiences. This paper stresses particularly on the issue of data confidentiality, as it threatens the fundamental rights of the citizens. Data obtained from neuromarketing research contains information not only about an individual, but also about his/her biometrics and medical history. Hence, the paper calls for amendments to be made to include neuromarketing under the purview of criminal law, property and consumer laws. The purpose of conducting neuroscience research must also be disclosed to the public for transparency and educational purposes, as it has far-reaching implications not only in marketing but also in politics.

Olteanu (2015) states that researchers need to be cautious with the ethical aspects of brain scanning and neuroimaging techniques if used to understand consumer decisions. She highlights the evidence of increased academic work in neuroethics, to bring to light the growing concerns about practical applications of neuroscience in the topic of marketing and decision-making.

It is mentioned in this study that consumers could be negatively impacted by personalized marketing because of development of purchase addiction. This paper calls for informing subjects before conducting research about how the information will be retrieved from them and utilized. It further states that the researchers should themselves make a proposal on how they plan on handling the ethical issues that might arise during the research. The media should also be involved in discussing neuromarketing in public forums, in order to allay the apprehensions among common people. Additionally, certain issues such as scientific rigour, violation of free will, children in research etc that are previously discussed have also been mentioned.

Hegazy (2021) put forth an interesting perspective on how big data and neuromarketing have been used to influence the 2016 American election outcome. The role of Cambridge Analytica has been very controversial and called out worldwide for being unethical and violating some fundamental rights pertaining to autonomy. This paper discusses the massiveness of big data 2.0 especially in the digital age, which can be crunched in order to derive meaningful insights for the benefit of politicians. It can serve as a political weapon for marketers and campaigners, by identifying the public's preferences and attitudes and developing strategies accordingly. The paper gives the example of a research conducted in 2004 by Emory University on 30 members of both Republican and Democratic parties, who were asked to criticize both their preferred as well as opposing candidates. Neuroimaging via fMRI revealed that the parts of the brain related to emotion were active while making statements about their own candidates, and the areas responsible for objective/logical thinking were not active at all. The paper mentions that there has been proliferation of political neuromarketers who deploy microtargeting to sway voters.

Harit et. al (2017) published their study on consumer's perception on neuromarketing by using Kano questionnaire. The findings reveal that the consumers have positive outlook for application of neuromarketing in market research, while also indicating that conducting such research without revealing to the consumers can lead to unethicality and dissonance among buyers. Jayakrishnan (2014) argues that neuromarketing can help companies make inroads into the rural and semi-urban sector of India by innovative colour and packaging, but there could be challenges if the customers begin to feel that they are being manipulated into becoming "robotic shoppers". Spence (2020) goes as far as to foretell that customers might soon find themselves being "nudged" to select less healthy items and thus asks for ethical guidelines surrounding sensory marketing.

3.1 Research Gap

While these studies have highlighted the key ethical concerns, their limitations are primarily lack of perspectives from the general public and more dependence on existing literature. Harit et. al (2017) tries to rope in the consumer perception of neuromarketing, but the Kano model limits the consumers' thoughts to ranked scale of binary sets of questions, thereby not allowing to probe deeper into further possible insights.

4. Methodology

The methodology for this study is as follows:

(1) Extensive review of top researches/literatures/discussions in the field of neuromarketing to identify major themes and topics discussed in those researches, and the opinions of the authors with respect to ethical issues.
(2) Conduct primary interviews and apply Grounded Theory approach to analyze the key concepts from the interviews.
(3) Identify key topics and the central theme emerging from the analysis.
(4) Summarize the learnings and provide recommendations to address the ethical challenges of neuromarketing.

4.1 Grounded Theory

Grounded theory (GT) is a qualitative research technique, developed in 1967 by Glaser and Strauss, to discover new theories based on actual data. In this method, there is a concurrent process of data collection and analysis for generating new theories (Mohajan et al 2023), and the data is collected so long as new insights are discovered. The analysis continues until the saturation of theoretical discovery, when additional data brings no new information.

In the current context, the application of grounded theory would help in understanding what the general people feel about neuromarketing. Since the topic is fairly new, this methodology will bring in fresh perspectives from the initial reactions and the apprehensions within the Indian market. The findings can be used by marketers and researchers to address the said concerns feedback and build ethical research frameworks to ensure that the fears are allayed.

4.2 Sampling and data collection

The data for analysis was collected in accordance with the guidelines of GT. The study required personal opinions about the idea of neuromarketing and its potential challenges. Hence, the responses of 28 individuals

were collected via depth interviews, with each session lasting between 15 to 20 mins. Purposive sampling was applied to select the responders, because the responders needed to satisfy below criteria:

- Must be adult with age between 18 to 60 – to represent the actual neuromarketing sample profile
- Must have decent academic qualifications i.e a bachelor's degree or equivalent – to ensure adequate cognizance about current affairs, ability to distinguish between ethical right and wrong and understand concepts of purchase behaviour
- Must be either working or studying – to understand decision-making under uncertainty and with constraints
- Could be either male or female or transgender, but of sound mind and able to make conscious decisions and articulate opinions with proper rationale
- Is able to share new information and opinions in comparison to previous responses.

To ensure minimal discomfort to the responders and to protect their identity, there have been no audio/video recordings of the sessions. The interview was semi-structured, designed to be conversational in order to probe further into their thought processes. There were no incentives provided as participation was completely voluntary. Many of the respondents were not comfortable with English and hence their responses in vernacular languages had to be translated while preparing the transcripts.

Following the principles of concurrent data collection and analysis under GT, the questions were customized from one responder to another to avoid saturation of the concepts and to also discover new ideas. Broadly, the interview began with asking the participants whether they were aware of neuromarketing as a market research technique. If they claimed to be not aware, the technique was briefly explained to them along with examples. The participants were then asked what were their initial reactions to this technique. Then they were probed about perceived advantages and disadvantages of neuromarketing, ethical perspectives, possible solutions to ethical violations.

4.3 Interview Analysis

The analysis began with assigning primary labels to the data. Below is the transcript from the first person who was interviewed on the subject.

> *Is an advertisement based on neuromarketing technique realistic/effective? Brain activity could be dicey/misleading if not pinpointed correctly. Use of samples to learn effectiveness of a product/advertisement may not be fully accurate as there might be internal differences within the samples, it could just be very costly requiring double work. Seems like it can be effective for something like a Mercedes Benz, which can tap into the inner hedonism of people, but not so much for "commoditized" products like everyday items. Biometrics should absolutely not be stored, there were already massive protests around Aadhar doing the same. If Nielsen or any other company in India plans on doing it, there has to be a legal framework to look into it. We can't afford our data getting hacked. Where is the data getting stored, and how much data is actually required?*

The primary labelling is done to discern the objects that are of high importance to the responders. The labels are highlighted in bold.

> *Is an advertisement based on neuromarketing technique **realistic/effective**? Brain activity could be **dicey/misleading if not pinpointed correctly**. Use of samples to learn effectiveness of a product/advertisement **may not be fully accurate** as there might be internal differences within the samples, implying **lack of representation**. It could just be **very costly** requiring **double work**. Seems like it can be effective for something like a Mercedes Benz, which can tap into the **inner hedonism of people**, but not so much for "commoditized" products like everyday items. **Biometrics should absolutely not be stored**, there were already massive protests around Aadhar doing the same. We can't afford our **data getting hacked**. **where is the data getting stored**, and **how much data is actually required**?*

The responder, who was already aware of neuromarketing, sounds skeptical of the technique and questions its effectiveness in accurately predicting consumer needs. He/she also points out the risk associated with biometric data getting stored and its potential for misuse. Open coding was conducted on this data and the codes generated from the highlighted labels are as follows: ***lack of efficacy, lack of representation, very costly, double work, inner hedonism, no storage of biometric data, chances of data getting hacked, justify requirement of biometric data.***

Below is the excerpt from the second interview:

> *It seems to be a **highly interesting topic**! Amazing, never could I imagine that something like this is possible at all. There is **no way people will be able to fake what they want**. How can you control your **innate bodily reactions**, its brilliant. Whoever came up with this idea big salute, life for consumers can only get better with this.*

On probing further about potential challenges:

> ***Absolutely no issues**, those who sign up, **they do it voluntarily** knowing fully well the consequences. Moreover, **reputed companies won't indulge in selling away data** about biometrics, seems to be a ridiculous idea.*

The second responder was intrigued by this technique and believed it to be highly accurate as subjects would not be able to state fake preferences or control the natural bodily functions. He/she also believes that the subjects opt for the research voluntarily and reputed companies are usually careful in securing data. Hence, there is no concern about confidentiality or data privacy issues. Open codes generated are as follows: ***interesting, no possibility of faking preferences, no control on body's reactions, voluntary participation, reputed companies won't sell data.***

The stark differences in both the responses with polar opposite opinions warranted further interviews to discover newer concepts. Another response went like this:

> *Well biometric data or thought process in general **can be used very dangerously** if they want. There has to be **proper surveillance** over this kind of research. What if they actually conduct an experiment and modify it in a manner to **store my thought process about certain political opinions**, do I have any guarantee that it won't be misused against me. Laws are easy to be broken. Higher authorities should **ensure complete anonymity of the test subjects** and **complete protection of their rights and freedom**. Although in a country like ours, it might be difficult. These companies should be **penalized if they leak the data**.*

The responder believes that information gathered via neuromarketing can potentially be misused especially in political campaigns for spreading false propaganda, as has been discussed in many literatures. He/she also calls for maintaining anonymity of the test subjects and protecting their freedom and dignity. Open codes generated are as follows: ***biometric data can be used dangerously, proper surveillance needed, potential to store data on political opinions, ensure anonymity of test subjects, protection of their rights and freedom, companies should be penalized if data is leaked***.

Example of another response:

> *How **feasible will it be in the long run**, because **getting the right sample itself will be a massive challenge**. Will the results be **indicative of the true behaviour** at all? Also, there are **some secret likings of mine I probably wouldn't want to share** it with everybody. I also know that there can be **minor side-effects** to techniques like EEG.*

This responder brings up the issue of feasibility of neuromarketing research and whether the huge costs will justify the returns. He/she believes that gathering the right and representative sample will be difficult, which begs the question of whether the results will be indicative of true behaviour. He/she alludes to the fact that there are preferences that one may not want to be discovered and would rather keep to themselves. He/she is also aware of potential side-effects that may occur during EEG procedures. The open codes from this interview are as follows: ***long run feasibility, getting the right sample, indicative of true behaviour, unwilling to disclose secret preferences, possibility of minor side-effects***.

In similar manner, all the interviews were conducted to develop concepts based on open coding. As grounded theory emphasizes on emergence, each of the interviews were thoroughly analyzed before the next in order to look for concepts that were yet to be formed. The previous responses guided the questions to be posed in the later interviews. These interviews were halted once the open codes that were generated started becoming similar, thereby implying that the process was getting saturated and no new concepts could be developed with further interviews.

4.4 Index card sorting

All the open codes that were generated from the 28 interviews were grouped into sub-categories and categories using the exploratory index card sorting: a bottom-up approach to determine the way in which different concepts group together. This was done after revisiting the existing literature in the field of neuromarketing, to eliminate redundancy and retain only the relevant concepts. The below process was followed:

(1) Primary groups were created on the basis of the open codes generated in the interviews
(2) The primary groups were labelled according to the underlying theme
(3) Secondary groups were created on the basis of the primary groups
(4) The secondary groups or sub-categories were labelled
(5) Both primary and secondary groups together led to the development of the final categories

4.5 Axial Coding

The Axial/secondary coding was performed to link the categories to their sub-categories in accordance with the guidelines laid down by Corbin and Strauss (1990). The properties of the categories were laid out to determine which sub-categories best relate to the categories in terms of similarity, consequences and relative associations. The categories in essence become the "axes" around which sub-categories/open codes revolve.

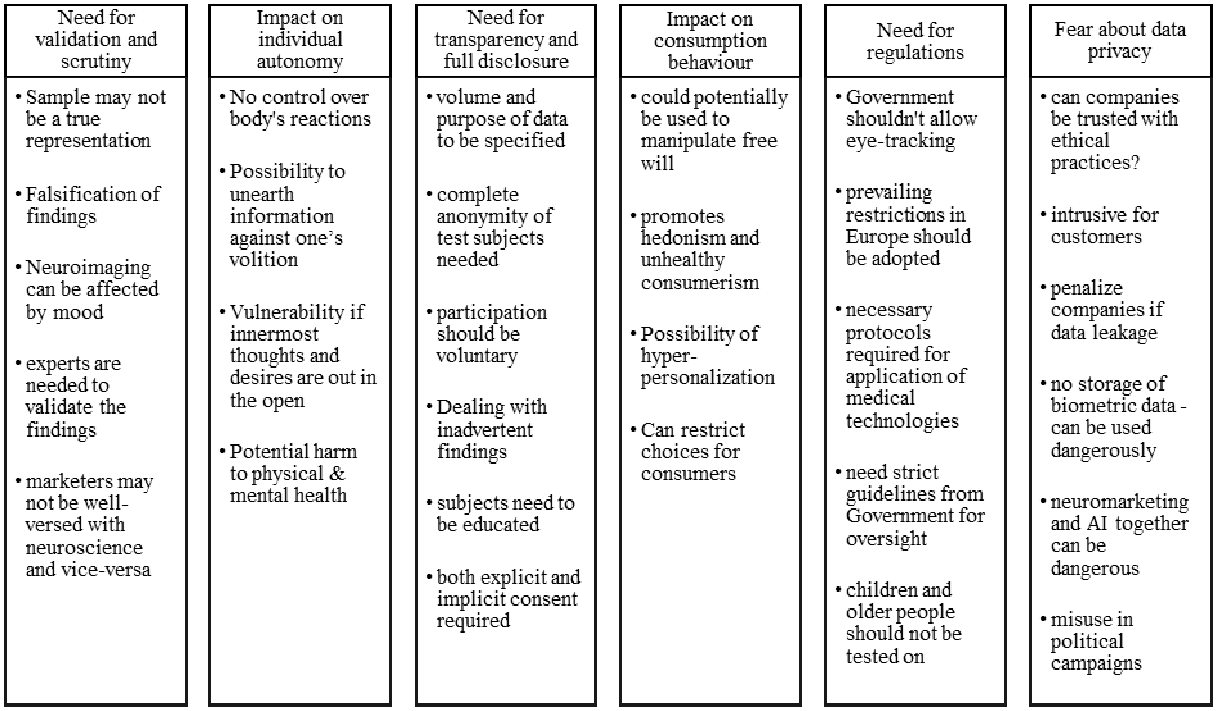

Figure 1. Illustration of Axial Coding to list the emerging themes/categories from the open codes

The first theme generated is "**Need for validation and scrutiny**". In this category, the responders spoke on items related to trusting the validity of the results of neuromarketing research. Hence, the sub categories such as "falsification of findings" and "experts are needed to validate the findings" are a part of this category. While some of the responders did not doubt the efficacy of the technique, they believed that given its complexity, the findings could be misinterpreted or deliberately falsified to dupe the clients. Therefore, neuromarketing research warranted experts to scrutinize the output thoroughly, before publishing the same. Some responders casted doubt on whether a small number of test samples could represent the entire population of the marketer's target audience from a neurophysiological standpoint. Another reason for doubt was that the output of the experiment could be manipulated by the subject's mood. Some felt that the marketers themselves are not poised to be the best interpreter of the results, as one would need to be well-versed in neuroscience to correctly analyse these. Therefore, all these sub-categories casting doubt on the efficacy of neuromarketing are tagged to this category.

The second theme generated is "**Impact on individual autonomy**". Giving a third-party access to one's innermost thoughts and desires (particularly for test subjects) is seen to contradict the nature of autonomy. This item is also related to the category of data privacy, but was found to be more relevant from the standpoint of individual rights. Autonomy in this context is highly important as test subjects/final consumers may not be able to control their physiological reactions when subjected to a stimulus. This essentially implies that there are responses that the test subject may not be willing to share voluntarily. There could be ancillary findings from analyzing a person's physiology beyond what is required, which could lead to bias or discrimination towards the person. Furthermore, activities like brain scan specifically via fMRI may pose side-effects on the physical health of the subjects which must be taken into account. The mental health of the individual must also be regarded, which can be impacted by the stimulus received during the experiment.

The third category generated is "**Need for transparency and full disclosure**". This category is similar to the previous code, but focuses more on the ethical responsibility of the researcher. The sub-categories generated here stress on the need to educate the subjects about the purpose, risk and benefits of the activities and obtain their consent. Another important sub-category that has been generated under this category is the requirement to mention the purpose and volume of data usage for neuromarketing research, given the intricacy of the nature of the data. Some responders have put forth concerns regarding dealing with inadvertent findings from neuroscience research eg - discovering a previously unknown brain tumour.

The fourth category generated is "**Impact on consumption behavior**". The sub-categories that relate to this talk about the buying habits of the people. A few responders suggested that the outcome of neuromarketing research could restrict customer choices, if specific variants of a product receive the most favourable response, as the companies would then focus more on those to optimize RoI. Another important sub-category is that it could be used to promote consumer's hedonistic behaviour, especially in the minds of young impressionable children who could be easily influenced with neuroscience-backed advertisements. As often seen with general

marketing practices, deceptive campaigns have a huge role to play in promoting unhealthy consumerism among the general masses, which has been highlighted in a few responses. Similar to many critics, a few interview responses also put forward the notion that neuromarketing research can be used for manipulation via personalized product or crafty and guileful advertisements, which essentially violate an individual's right to free will. The notion of free will also relates to individual autonomy, but has been mapped here in the context of consumption behaviour.

The fifth and a crucial category generated is "**Need for regulations**". All the sub-categories here indicate the need for strong governance and establishment of rules to oversee neuromarketing research, from a legal standpoint. Few of the responses in the interviews talk about putting restriction on eye-tracking devices that are hidden in a few retail stores, some other responses call for banning children and aged people from being used as test subjects. Responders with medical backgrounds recommended following medical protocols for brain scanning and similar diagnostic activities. Another learned responder cited the example of ban on neuroscience in Europe for purposes other than medical activities.

"**Fear about data privacy**" becomes the sixth theme generated. Some of the sub-categories here claim neuromarketing practice to be intrusive for customers. Some others call for complete ban on storing biometric data as there could be chances of data theft, and to penalize companies indulging in malpractices. The combination of neuromarketing and artificial intelligence could be used unethically if not overseen. Some responders feel strongly about its potential misuse during political campaigns, suggesting that rogue agencies might already by utilizing it. Nonetheless, quite a few have pointed out that test subjects voluntarily agree to the experiments and hence should not be having qualms about data privacy, and should instead rely on the institutions to do the right thing.

4.6 Selective Coding

This is the final step in the Grounded Theory technique, wherein the core category is identified, which links all the available categories and essentially becomes the central theme of the research. This core category/concept becomes the new theory for the topic based on the research, which should allow further researches in other areas and development of newer theories.

Following the bottoms-up approach, most sub-categories in "*Impact on Autonomy*" have similarity in properties with those in "*Need for transparency and disclosure*" and "*Impact on consumption behaviour*" – as these can be extensively associated with intrusiveness and invasion into one's personal space. On similar lines, "*Fear about data privacy*", can be linked to these three categories because these have implications that justify the supposed fears and concerns regarding data protection and individual rights. While "*Need for validation and scrutiny*" cannot be linked to the above four categories as it has more to do with raising concerns about the methodology, scientific due diligence and correct interpretation of results; what has emerged from all these categories is the need for a stringent ethical and legal framework to supervise neuromarketing activities. Therefore, the category titled "***Need for regulations***" is found to be most congruous with the other categories and is ascertained to be the central theme overarching majority of the interview responses. All of the ethical concerns and fears cited thus far can be assuaged by establishing a strict governance framework, in order to oversee neuromarketing research.

Figure 2. Illustration of Selective Coding to determine the pivotal theme surrounding the ethical perspectives of Neuromarketing

5. Discussions

Based on the analysis illustrated in the previous section, there are takeaways for both academic and corporate researchers to ensure ethical conduct of neuromarketing research and the implementation of the findings. Since there is a need for a strict governance framework to oversee neuromarketing, academicians have an important role to play in prescribing a set of guidelines, while industry researchers need to be morally and legally obligated to adhere to the framework. This section will discuss a few recommendations to follow, based on the concerns that were revealed in the GT approach.

5.1 Theoretical and Legal Implications

This research corroborates the ethical dilemma cited by other authors, with qualitative research backed by real data, and substantiates the underlying notion that notwithstanding the novelty and efficacy of neuromarketing, there has to be an ethical boundary that must be respected by practitioners. In doing so, this research bridges the current gap posed by lack of deeper insights from the general public. The establishment of a legal framework for neuromarketing, which has manifested as the central theme of ethics in neuromarketing through this research, is a crucial actionable item. The academicians need to collaborate with the Government of India to introduce a set of guidelines in order to regulate neuromarketing research and implementation. The Code of Ethics formulated by NMSBA should be redefined and adopted in the Indian context, and enlist protocols for commercial applications of medication technologies such as fMRI, EEG and pupillometry - similar to France's civil code, so as to define the extent of usage for marketing and promotional activities. Advertisement and marketing communications should also be brought under its jurisdiction, as the current governance is minimal and consumers must be protected from subterfuge and misleading advertisements.

There should be clear mandates on consent, protection of test subjects, data storage and security, transparency in information, scrutiny of results and ethical implementation of research output that have emerged as key concerns in our study, and the mandates need to specify legal ramifications on account of violations. Some of the other concerns raised in the study such as treatment of by-products of neuromarketing research, biased profiling based on findings, veracity of the research and its practical applications must also be incorporated in the legal framework.

Current data privacy laws such as Digital Personal Data Protection Act 2023 include digital or digitized data in its ambit (PwC, 2023) and the recommendation is to include neurophysiological as well as biometric data in its purview to protect test subjects and general consumers. Additionally, there should be absolute ban on neuromarketing for political campaigns, as the welfare of the citizens should take precedence over marketing, polarization and similar gimmicks – where neuromarketing can be effectively exploited.

Researchers need to work closely with the Government in order to identify loopholes that can lead to ethical malpractices. Since "Need for validation and scrutiny" emerged as a major area of concern, neuromarketing research should be subjected to strict quality control standards. Only those techniques that are theoretically appropriate and practically feasible should be applied to the study, and the procedures that are to be followed must be approved by fellow practitioners or stalwarts in the area. Additionally, there should be initiatives to introduce neuromarketing as a subject in management classes to demystify the topic and encourage discussions.

6. Conclusion

While there is no doubt about the novelty of neuromarketing and the bright prospects about its capabilities, it is equally important to uphold the ethics and integrity associated with research and human dignity. The current study has led to the development of a few key themes around the ethical perspectives of neuromarketing. The central idea to have evolved from these is the need to have a set of guidelines for neuromarketing practice, and a governing body to oversee these. It will be interesting to track developments in this field in the near future.

6.1 Limitations of the current study

This study does not quantify the impact of neuromarketing on consumers or on businesses implementing it. This study depicts the level of awareness among consumers, but does not include a company/practitioner's point of view. There was saturation of concepts after 28 rounds of interviews, however, more concepts could possibly have been built with a more diverse set of respondents. Some information gathered through the interviews might have been lost in translation as few of the responders spoke in vernacular languages.

6.2 Scope for future research

Based on this study, further research is recommended to analyze the legal environment in India for forming regulations on neuromarketing. It is also recommended to study a live neuromarketing research for highlighting the ethical violations that can possibly occur. Another possible study is the causal relationship between communication backed by neuromarketing and impact on performance metrics (revenue, acquisitions) to judge its efficacy. Furthermore, the concerns about manipulation and lack of free will in the context of neuromarketing

should be studied in depth to either confirm or debunk the concerns.

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