MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 2, 2026, Pages 568-572

Ethical Neuromarketing: Vulnerability and Manipulation in Targeted Ads

Dr. Nida Malik
Assistant Professor, Business Administration, PSIT College of Higher Education Kanpur,
Uttar Pradesh, India-209305. Email: maliknida.2011@gmail.com
Dr. Mohd. Ijlal Anjum
Assistant Professor, Business Administration, PSIT College of Higher Education Kanpur,
Uttar Pradesh, India-209305. Email: ijlalanjumm.b.a@gmail.com
Mr. Mohammad Aqib
Assistant Professor, Axis Law College, Axis Institute of Higher Education, Kanpur,
Uttar Pradesh, India-209305. mohd.aqib36@gmail.com

ABSTRACT

Neuromarketing is a new field in which academic and business researchers are beginning to use neurological methods to study customer behavior and marketing strategies. It is possible to assert that neuroscience-based approaches may provide a more direct understanding of the connection between consumer behavior, decision-making, brain states, and other physiological systems. Our discussion here will center on the ethical dilemmas that businesses confront and the hazards that consumers face as a result of neuromarketing in its present form. We contend that, considering the present state of neuromarketing research and its applications, the most often voiced worries about potential invasions of consumers' privacy, control, and autonomy do not give rise to substantial ethical problems. On the other hand, we highlight the potential for major ethical quandaries to arise from the industry's neuromarketing research practices, which are mostly opaque and difficult to comprehend. We find ways to mitigate the associated ethical issues in order to reduce the risks to customers. We draw the conclusion that, contrary to what is often said about neuromarketing's ethical implications, it has the ability to have a beneficial effect on both society and consumers.

Keywords: Consumer behavior, Decision making, Ethics, Fmri, Marketing, Neuromarketing, Neuroscience

INTRODUCTION

Neuromarketing uses neuroscience and physiological research methods to understand customers' behavior, preferences, decision-making, and other marketing-related cognition and behavior. Neuromarketing seeks information and insights beyond surveys, focus groups, experiments, and ethnography to improve marketing theory and practice or consumer preference and behavior predictions when combined with traditional methods[1]. They differ by limiting consumer neuroscience to academic research and neuromarketing to industrial applications. In this essay, we will use the term "neuromarketing" broadly and specify whether we are referring to differences in academia or industry[2]. Many neuromarketing approaches are used. Starting with brain function or activity measurement methods, we will briefly introduce some of those approaches and their results. Functional magnetic resonance imaging (fMRI) assesses deoxygenated hemoglobin. Because that measure is strongly connected to neuronal activity, fMRI may characterize brain function with exceptional spatial precision (one millimeter) and temporal resolution (second-by-second changes)[3]. Capital expenditures for an MRI scanner may reach several million dollars, while marginal costs per individual examined can reach hundreds of dollars. Although expensive, fMRI is used to examine marketing phenomena. For instance, teens' brain responses to music by unknown artists were recorded by fMRI. The individuals' brain reactions to the music from the initial listening session were positively connected with aggregate sales of the same songs three years later, suggesting that cerebral responses to music might predict future sales[4]. Electroencephalography (EEG) may assess brain electrical activity with scalp electrodes at a lower cost and with great temporal precision (millisecond changes). Unlike fMRI, EEG has poorer spatial resolution, making it harder to pinpoint brain activity, and it cannot measure brain activity distal to the skull, such as in subcortical areas of interest to decision makers[5]. In marketing study, Boksem and Smidts (2015) found that brain responses to movie trailers predicted population-level preferences for the tested movies better than self-report measures. Similar to EEG, magnetoencephalography (MEG) monitors magnetic fields rather than electrical activity. Its technological complexity makes it unsuitable for neuromarketing.Additionally, these brain imaging techniques can measure brain activity associated with financial decisions, word-of-mouth, and other marketing phenomena, as well as sensory experiences like viewing an advertisement or tasting a product[6]. Researchers may monitor peripheral physiology including heart rate, breathing, skin conductance (hand sweating), pupillometry (pupil dilation), eye tracking, and more as an alternative to brain imaging. Researchers can compare customer experiences after measuring physiology. Buyers' pupils may be dilated more than others by certain items. Hormones and genetic information in saliva and blood may be gathered practically anywhere and utilized to predict customer behavior. Testosterone levels and risk-taking financial choices might be measured [7].

Neuromarketing goes beyond measuring brain activity and physiology; in labs, direct manipulations provide causal inferences regarding marketing-relevant processing. In the lab, testosterone (v. placebo) may be given to a person to assess decision-making. Recent improvements allow the body to deplete certain physiological elements, such as serotonin, which is essential for mood, by consuming a customized protein shake. Depletion approaches may claim that changes in behavior are caused by them, just like administration methods [8]. Lastly, transcranial magnetic stimulation may directly affect brain function. TMS temporarily disables the ability to recruit a particular brain region by using magnetic fields to "knock out" that area. Once that brain region is temporarily "knocked out," researchers may monitor behavior changes. TMS on the prefrontal brain lowers food value. Like TMS, transcranial direct current stimulation (tDCS) uses direct electrical current to change brain blood flow and neuronal activity (Table 1)[9].

Table 1: Principle neuromarketing research methods: pros and cons

Method	Evaluation Focus	Benefits	Negative Aspects
Neuroimaging (fMRI)	Measures oxygen levels in specific brain regions	• Excellent time accuracy (seconds) • Superior area coverage	• Extremely expensive • Limited setting for participants
EEG (Electroencephalography)	Electrical activity in brain regions	• Cheapest brain imaging • Superior time resolution (milliseconds)	• Poor localization accuracy, esp. subcortical areas
Physiology (hormones, cycle)	Hormonal concentration in saliva, blood (e.g., testosterone)	• Affordable • Non-intrusive • Applicable in lab & field	• Inaccurate in time precision
Eye-Tracking (Gaze Monitoring)	Attention focus, pupil size	• Affordable • High time resolution (milliseconds)	• Difficult to attribute emotional meaning to eye movements
Skin Conductance	Sweat levels in hands → excitement	• Quantifies overall arousal	• Cannot distinguish specific emotions
Brain Stimulation (TMS)	Local brain function temporarily impaired/enhanced	• Identifies functional role of brain areas	• Very poor time resolution • Can only examine one area at a time
Drug/Neurochemical Intervention	Temporary changes in brain chemistry	• Links neurotransmitters to behavior	• Risky without medical supervision

Innerscope Research, which claims that "combining multiple measures means more comprehensive insights," has been acquired by Nielsen. We also agree. Marketing research predictions and insights may be enhanced when neuroscience methods are used in combination. We don't think that marketing or other behavioral fields should use neuroscience approaches or their data as research methods[10]. Neuromarketing businesses argue that neuroscience holds the key to the brain and hidden customer preferences, contrary to our opinion. They assert that they have discovered a dreaded "buy button" in the brain. We argue that neuroscience is only one way to enhance consumer behavior predictions. Conventional research methods like surveys, focus groups, and experiments may be useful depending on the application and subject of the study, but neuroscience methods should not be prioritized or ruled out. In many cases, classic marketing research methods still explain most customer behavior variance[11].

The data and brain processes tracked by the methods above differ, as does their utilization by academics and industry. Cost-benefit analysis drives this heterogeneity. Generally, neuromarketing research is costly. Endocrinology and eye tracking, on the other hand, only require tens of thousands of dollars to set up. Hormone levels are monitored by academics, but not by business. Eye tracking, on the other hand, is popular in industry due to its cheap cost, capacity to be done in many places, and tight relation to advertising as it directly monitors what customers are looking at with great temporal resolution. NeuroFocus, a neuromarketing startup, uses a wireless EEG that customers may wear in realistic situations. This method omits certain laboratory EEG study protocols, such as

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 2, 2026, Pages 568-572

utilizing a gel to enhance scalp contact, for simplicity and portability. New firms are offering low-cost neuromarketing techniques for industrial usage, however the data's validity depends on the data collectors' training and interpretation.

Different marketing objectives are also the focus of neuromarketing research. Market segmentation groups customers with similar requirements and interests. This is commonly done using demographics like age or psychographics like impulsivity, but brain differences may be able to categorize customers. Pricing strategy is another neuromarketing use. Plassmann et al. (2008) showed that fMRI can reveal brain activity variations in response to drinking the same wine at various price points, showing that wine's hedonic experience varies with price.

Neuromarketing thrives in product and brand creation. In one of the first consumer neuroscience research, McClure et al. (2004) found that brand activation strongly affected brain activity in areas that determine sensory value while drinking Coke vs. Pepsi. By activating reward and valuation brain regions, this study may examine how sensory information (taste) and brand information (label) influence customer decision-making. After a product is established, several choices are made about positioning, promotion, and advertising. Neuromarketing has been shown to improve promoting tactics in academic studies. For instance, Stallen et al. (2010) found that when products were paired with celebrities, the medial orbitofrontal cortex, which encodes value, was more active, suggesting that celebrities, models, etc. transfer positive information through classical conditioning in advertising. The papers above provide instances of neuroscience-derived consumer behavior insights that may progress academic research and lead to unique marketing mix manipulations in business.

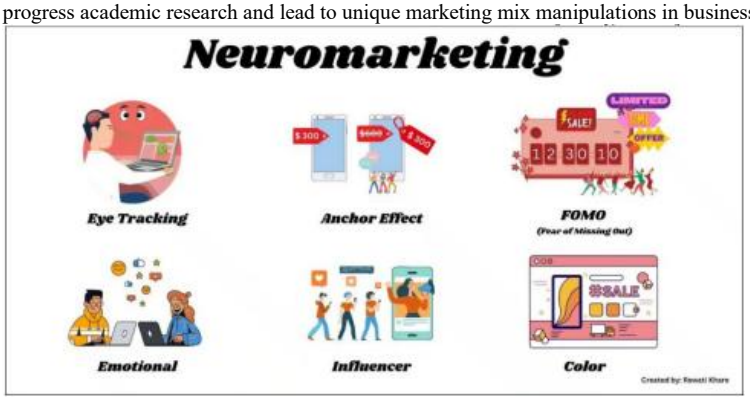

Figure 1. Neuromarketing Pathway from Brain Science to Consumer Purchase

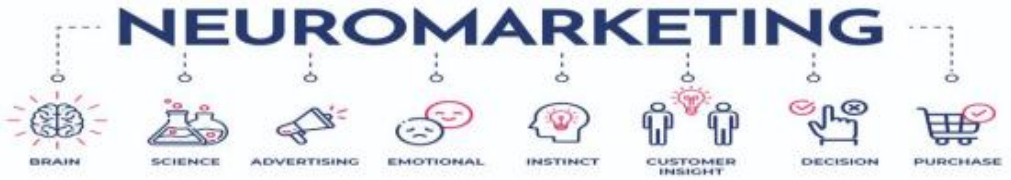

Figure 2. Neuromarketing Strategies Exploiting Emotional and Behavioral Triggers

ETHICAL ISSUES IN NEUROMARKETING: PERCEPTION OR REALITY?

Neuromarketing has been criticized for unethical research, technology, and consumer manipulation since its debut. Despite these concerns, academic research in neuromarketing and related fields has increased substantially, and over 200 neuromarketing research and consultancy organizations have been formed worldwide. Critiques and suspicions about neuromarketing's power have developed as the field has progressed[12]. The majority of ethical objections to neuromarketing, as our introductory quotes demonstrate, concern harms and violations of rights. The resulting damages include both short-term effects on customers and long-term effects on society. Positive rights to privacy, autonomy, and dignity and negative rights not to be tricked, experimented on without permission, or exploited as a means are claimed. The Belmont Report (1979) codifies some of these rights as universally accepted scientific practice. Concerns and responses regarding neuromarketing are based not on ethical theories but rather on common sense ethical boundaries. Particular ethical frameworks may be utilized in future neuromarketing ethical analysis. Some of these neuromarketing worries are pervasive and pose ethical difficulties, but we will demonstrate that most do not. Due of their lack of fresh debate, several of these anxieties are not unique to neuromarketing. Most of the new ethical hazards associated to neuromarketing are unrealistic because they presume it has capacities it cannot attain soon. We'll look at how to deal with the few unique and real ethical issues that arise.

A. Predicting Consumer Choice

The first ethical concern is that neuromarketing may forecast customers' decisions. Traditional marketing research and practice have faced comparable complaints about customer decision prediction, but neuromarketing is likely most criticized. Knutson et al. (2007) showed that brain activity could predict a consumer's choice (for food goods) above and beyond self-report information about preferences, suggesting that neuromarketing can add important contributions to traditional marketing research methods. The restricted conclusions obtained from this or any other research on brain predictors of choice in a specific situation may violate customers' privacy rights, according to some critics. If neuroscience can enter customers' thoughts and retrieve information they do not know, neuromarketing may be able to predict our decisions before we make them [13]. This worry lacks many layers of evidence. In experimental studies, researchers only scan the brains or take hormone samples from the majority of customers. Thus, consumers are not directly privy to privacy violations. As in marketing, biological, and behavioral research, results are extracted from a small experimental sample and generalized to the public. Second, during informed consent, participants in academic research are made aware of the risks and objectives of the study. For neuromarketing study participants, privacy problems may occur, but for everyone else, neuromarketing does not appear to be ethically problematic. Other concerns include corporations that forecast consumer decisions treating clients like robots or automata without freedom or dignity. The public occasionally views neuromarketing findings as scientific forecasts of their behavior. Neuromarketing businesses sometimes exaggerate results, which may boost this notion. 1 Many consider this image of customers as determined processes insulting, hazardous, and unethical. Neuromarketers are accused of using customers as mere instruments to their aims. The moral philosopher Immanuel Kant considered this maltreatment the core of immorality: Beings whose existence is contingent on nature rather than our will are referred to as "things" if they are not rational because they are merely relative means. Rational beings are called ‘‘persons’’ because their nature indicates that they are ends in themselves, so they cannot be used merely as means. Therefore, this criticism has profound historical and cultural origins. Neuromarketing does not rely on this customer disdain for two reasons. Initial neuromarketing forecasts are probabilistic. Neuromarketing corporations might state that customers can cease purchasing their items rather than claiming that their behavior is predetermined. Marketing research, regardless of method, is to prove that customers are more inclined to purchase specific items under various situations. Neuromarketing companies only need to demonstrate this. Consumers may be predictable even when free. According to Kant's understanding, if conventional or neuromarketing research could anticipate customers' decisions, they might be viewed as objects of relative value rather than people. This may degrade their humanity. The field is far from this level of prediction and unlikely to ever reach it[14].

Second, neuromarketing organizations need not approach customers as Kant's means when predicting their decisions. Instead, they may assist customers get the things they want and need more efficiently, which is a good marketing approach. Predicting behavior is distinct from coercing customers, therefore it doesn't negate their logic or dignity.

B. Influencing Consumer Choice

Consumers' worry that neuromarketing might impact decision beyond prediction is another ethical concern. Neuromarketing may deprive people of control and make products irresistible. Marketing normally aims to influence customers' decisions, but can neuromarketing give corporations a fresh way to uncover a brain "buy button"?

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 2, 2026, Pages 568-572

Although consumer decision predictions can be improved by neuroscience, there is no "buy button" in the brain. Some brain regions code for value and reward, especially anticipation. More gratifying or valued things engage these regions more intensively, but this is not a "buy button." Neuromarketing does not offer a unique approach to optimizing marketing messages to control consumer behavior. For instance, it cannot create a menu description that compels customers to buy an entre´e, unlike traditional marketing techniques. Even if this were feasible, targeting a person to identify their best stimulus would be impossible.

Critics may contend that, when carried out below the conscious level, neuromarketing may influence purchases, which is immoral. This worry is not exclusive to neuromarketing. James Vicary pioneered subliminal marketing in the 1950s. Vicary claimed to subliminally integrate marketing messages into movie footage to boost concession sales. The New Yorker reported that customers' brains were being hacked in response. Vicary confessed to fraud years later, but subliminal marketing became popular, raising concerns about overstepping customers' choices.

Ironically, supraliminal yet ignored primes may influence consumer behavior, according to current study. There is emerging evidence that marketing information may dramatically impact customers' decisions, even if they are unaware of it. Ferraro et al. (2009) altered how customers saw pictures of Dasani bottled water. After the trial, buyers could pick among four bottled water brands, including Dasani. Consumers who received repeated Dasani exposure but were unaware of the brands were more inclined to choose Dasani water over the competition. Experiments have demonstrated that marketing manipulation may result in unconscious customer behavior. Behavioral research may reveal hidden consumer influence methods, as shown by these studies. They also demonstrate that neuromarketing is not the sole approach to affect customers subconsciously and does not merit moral condemnation.

Critics may argue that any unconscious influences—neurocognitive or not—remove control, but this confuses awareness with control. Seeing frequent Dasani water ads does not mean a customer had no discretion over which water she chose. If she didn't want Dasani or had a good reason to choose another, she may have. Unconscious consumers may have less control, whereas conscious consumers may have more [15].

Recent study suggests that neuroscience can predict customer preferences and propensity to buy things using uncontrolled physiological characteristics. This is not a distant possibility. A recent research found that a woman's menstrual cycle predicts her desire for "sexy" rather than "nonsexy" apparel and accessories. More "sexy" outfits and accessories were purchased by women nearing ovulation. Preferences for diamond rings, cars, food, and other appearance-related items may also be influenced by menstrual cycles. Women cannot regulate their menstrual cycle, which determines their buying choices.

A corporation may use such data to predict purchase habits. For instance, an online clothes company may analyze recurring customers' purchases and search for 27–30 day trends. Sexy apparel might be advertised via email during menstruation to increase buying intent. Amazon may also customize its offerings to a female customer's menstrual cycle to increase sales.

In today's research setting, measuring physiological parameters like hormones or hormone cycles is cheaper and sometimes more useful than fMRI or other neuroimaging. Numerous businesses have employed similar strategies. Target intentionally developed strategies to identify pregnant women at certain stages of pregnancy to capture them as customers through tailored advertising, which they believe is a key period transition during which customers can be swayed to buy a variety of child-related goods. Target is able to move customers through life stages with customized incentives thanks to its extensive product selection, which encourages repeat purchases. Physiology-based marketing lets customers choose freely even if physiological aspects they cannot control strongly impact them. Neuromarketing's capacity to forecast and influence via physiology is not unique; behavioral studies also show methods to affect customer decision unconsciously. Both customers are oblivious of variables that affect their decisions, yet they choose freely[16].

ETHICAL ISSUES ASSOCIATED WITH INTRODUCING NEUROSCIENCE INTO MARKETING

A. Academia versus Industry (Consumer Neuroscience vs. Neuromarketing)

The number of profitable neuromarketing businesses has risen from a few a few years ago to over 200. It is being studied by academics. Academic and industrial neuromarketing have distinct agendas. Academics share their expertise by publishing techniques and data in peer-reviewed publications. In order to gain an advantage over competitors, industry collects private data and develops proprietary analytical methods. Data are understood and used differently by academics and industry to guide future practice. Academics run experiments and evaluate their results using strict thresholds to prevent chance and non-significance. For example, a tolerance of less than 5% chance that the experimental result is invalid is commonly used. Industrial forecasting is crucial, and a 75% chance of predicting a result might be worth a bet when making a million-dollar management choice. Researchers in corporate and university neuromarketing may face significant ethical challenges as a result of these divergent goals and approaches. [17]

METHODOLOGICAL RIGOR

Maximizing profits may not be scientific. Scientific findings only matter if data collection procedures are good. Neuromarketing businesses' industrial customers, on the other hand, might not be well-versed in neuroscience data collection and analysis procedures. Neuromarketing businesses may be encouraged to employ inadequate research methodologies, small sample sizes, undertrained staff, etc. if they can persuade clients the findings are valuable. Neuromarketing businesses are also encouraged to overstate their skills and accomplishments to attract customers. While academics have peer review, neuromarketing corporations do not, which safeguards against overstating outcomes. Neuromarketing businesses are new to marketing, thus the norms for quality work and deliverables are unclear. Peer review is not yet part of normal marketing practice. Additionally, neuromarketing businesses often own their data. Neuromarketing businesses seldom release their data collecting procedures. This uncertainty makes it unclear if neuromarketing businesses' data is accurate or matches their promotional promises. businesses that use rigorous methodologies and create genuine and trustworthy data should ultimately surpass neuromarketing businesses that don't. Through greater research, such organizations may help customers make accurate market predictions[18].

The Advertising Research Foundation (ARF), a network of marketing research companies and professionals, launched Neurostandards 1.0 and Neurostandards 2.0 in the last five years to address industry methodological rigor and corporate clients' inability to evaluate data quality. In order to validate research methods, standardize research practices, and make neuromarketing research on advertising evaluation more digestible for businesses, the ARF is collaborating with a number of for-profit neuromarketing research companies. The ARF is also giving industry partners in the Neurostandards programs academic peer assessment of procedures and outcomes, which might improve research quality. Few neuromarketing businesses participate in ARF programs. Methodological rigor issues continue to be crucial as additional neuromarketing businesses enter the industry. Academic institutions are less likely than businesses to misrepresent findings or capabilities because peer-reviewed research guarantees methodological integrity and appropriate interpretation. Academic science uses peer review to self-correct. Academics are not exempt from performance incentives that have the potential to lower the quality of data. Many academic researchers have published fraudulent data in pursuit of tenure, promotion, and other incentives, which has led to the retraction of many journal articles. Overstatement is possible in academics and industry[19].

Board (IRB) that monitored the research, its protocol, and informed consent procedures. Publication of all data collecting techniques, raw data, and data analysis would enable independent replication of findings, approaching clinical trial standards. While we expect few neuromarketing firms to agree to this, we believe that full transparency would be the best way to convey the highest level of research competence and could lead to a market shift where firms attract clients because of their rigorous and thoughtful use of well-validated experimental procedures, not because they have developed new (and often questionable) unique brain function measurement methods[20]. Despite the advantages, neuromarketing businesses are unlikely to become fully transparent. First, the corporation should form scientific advisory boards with experts educated in its methods. Neuromarketing businesses might retain private data and technique methods while increasing methodological scrutiny with this strategy. This strategy is flawed because scientific advisory boards (of any corporation, not only neuromarketing) are routinely compensated, which may lead to captured boards. As a result, scientific review boards are not separate from the company. Company-sponsored bias would be eliminated by independent scientific review boards.

A. Transparency

In order to lessen the risk that the neuromarketing industry poses to customers and clients, we urge businesses to establish data and protocol disclosure regulations. Many of Innerscope's research has been presented in snippets, with only brief descriptions of the study's objectives, outcomes, and conclusions. Companies participating in the ARF's Neurostandards 1.0 and 2.0 (including Innerscope) are also becoming more transparent via peer review and results reporting by ARF review panel academics. ARF evaluations may not be shared by all participating businesses. These are good moves, but they are not sufficiently transparent[21]. What would transparency entail? The Institutional Review Board (IRB), which was in charge of the research, its protocol, and the procedures for obtaining informed consent are examples of important information. Publication of all data collecting techniques, raw data, and data analysis would enable independent

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 2, 2026, Pages 568-572

replication of findings, approaching clinical trial standards. We expect few neuromarketing firms to agree to this, but we believe that full transparency is the best way to convey the highest level of research competence and could change the market so that firms attract clients because of their rigorous and thoughtful use of well-validated experimental procedures, not because they have developed new (and often questionable) unique brain function measurement methods.

Despite the advantages, neuromarketing businesses are unlikely to become fully transparent. First, the corporation should form scientific advisory boards with experts educated in its methods. Neuromarketing businesses might retain private data and technique methods while increasing methodological scrutiny with this strategy. This strategy is flawed because scientific advisory boards (of any corporation, not only neuromarketing) are routinely compensated, which may lead to captured boards. As a result, scientific review boards are not separate from the company. Companies' paid bias would be eliminated by independent scientific review boards[22].

B. Quality Certification

Third-party quality certifications that guarantee ethical care and protection of subjects as well as scientific rigor in response to ethical concerns may be beneficial to the neuromarketing industry. The ARF Neurostandards projects are a start, but more can be done. To assist neuromarketing research customers in making better product choices, a third-party entity might provide quality certification[23]. This may be unique to neuromarketing research since its methodologies are technically complex and less tractable than standard marketing research. The appliance and building industries' Energy Star and LEED certifications are analogous to our proposal. Both certifications are a symbol of precise performance requirements, verified by a third-party body, and optional to enterprises in the area, but they have gained great attention since they are considered as a competitive advantage in a crowded industry.

C. Privacy

Consider how similar neuromarketing data are to private health information, which poses a separate privacy risk. Take fMRI, the standard method for gathering data on brain function. As said, neuromarketing experiment fMRI data are extremely contextualized and specific. Structural MRI, which creates a structural map of the brain but does not measure brain activity, is more similar to other clinical private health information (such as HIV status, pregnancy, mental illness, cancer, terminal illness, etc.) because it can reveal brain pathology, tumors, and structural malformations. This information might be used to discriminate. Neuromarketing studies employing fMRI usually include structural MRI, so corporations may obtain structural MRI data. The use or sale of such data to other firms would be opaque to study participants and uncontrolled without informed permission, a major issue in industry[24].

Even the broad ethical considerations in this section apply to marketing research. In conventional marketing research, privacy violations may occur if participants provide confidential health information on a survey rather than an fMRI and that information is used to harm or discriminate against them. We focused on ethical difficulties arising from contemporary neuromarketing research's neuroscience methods..

SHARED ETHICAL ISSUES FOR BOTH MARKETING AND NEUROMARKETING

After addressing neuromarketing-specific ethical difficulties, it's important to clarify topics shared by marketing and neuromarketing. If ethical challenges are not unique to neuromarketing, they may apply to both marketing and neuromarketing.

Marketing and neuromarketing may raise costs for customers. If a product costs more because of neuromarketing costs or because neuroscience research gives the company more power over pricing, customers might have to pay more for it. Market solutions are likely to suffice because neuromarketing will exist in a landscape dominated by conventional marketing strategies for the foreseeable future. Consumption may also be a problem[25]. Consider that neuroscientists evaluate ads to see which ones boost attention and purchase motivation. This appears OK if it just causes buyers to pick one equally excellent or better product over another. However, stronger ads might hurt consumers by creating new wants for substandard or unnecessary things. Customers may be willing to pay more for a product that does not benefit them if advertisements raise customer demands beyond what is healthy for them. The main concern is that neuroscience may make ads more potent and develop new or enhance current wants that harm consumers. These worries could also be caused by the effective application of conventional marketing research[26]. Another issue is that marketing and neuromarketing businesses are frequently not overseen by an IRB to guarantee ethical research. Even beyond neuromarketing, the question of whether corporations may perform behavioral research without IRB approval persists. In one study, Facebook and university researchers influenced almost 700,000 users' moods without their knowledge. The firm was criticized for not obtaining informed consent before the research. Academic research on humans requires informed permission, while for-profit research organizations may not. The results of the Facebook study were held to a higher ethical standard than the majority of industry research because they were published in an academic journal. However, compared to other industry-related ethical violations, such as drug testing in the developing world, where pharmaceutical companies have hidden adverse events related to experimental drugs, the Facebook study was innocuous. Companies avoid openness by concealing data and procedures. This method may be harmful to business clients and customers of neuromarketing research. Marketing and neuromarketing may potentially worsen poor decision-making or increase the risk of buying unbeneficial products. Consider smokers or those who are dependent on cigarettes and whose urges increase brain reactions to smoking signals like cigarette imagery. FMRI might help cigarette producers evaluate novel products or advertising materials that stimulate reward and reinforcement brain areas that may be more addictive. Cigarette smoking causes cancer and other health problems, making such acts unethical. promotion may be destructive when product creation and promotion boost harmful product purchasing. Both conventional and neuromarketing present these ethical issues, and any strategy may harm customers [27]. Future ethical concerns for marketing and neuromarketing include anticipating and influencing customer decision. How influenced or predictable must customers be before an ethical breach occurs? Industry regulation or consumer education: which is superior? The Public Health Cigarette Smoking Act of 1970 banned cigarette company television and radio advertising in the US because cigarettes were considered a public health concern. Subliminal advertising is also forbidden in the US under FCC consumer protection standards. Do products have to be hazardous to be banned from advertising or research methods too successful before intervention? As seen in US examples, other nations and cultures may answer similar questions differently. There is a good chance that solutions to these issues will be debated for decades[28]. As well as the challenges of predicting and influencing customer behavior, we will present a hypothetical scenario from neuromarketing's future. Neuroscience may give sellers an unfair advantage in the future. Suppose an eye-tracking lab research advises jewelers on how to display their products or auto sellers on how to build showrooms to boost sales. The general public is the target. Compare this to a future potential (if it becomes feasible). Imagine a vehicle dealer, rare art dealer, real estate agency, or diamond shop installing an eye tracker system to measure consumer pupil dilations to determine how drawn they are to certain things for sale. Salespeople discreetly utilize this knowledge to negotiate costs. The jeweler may haggle harder and sell the necklace for a greater price if the customer's involuntary eye movements indicate considerable attraction to it. The jeweler profits, but the consumer loses, presuming she would have purchased the necklace cheaper if she could disguise her preferences. If the consumer does not realize the jeweler has access to the new source of information and cannot conceal or mislead, as many customers may in conventional discussions, the new source may appear unfair[29].

Is the ethical dilemma presented by this scenario unique to neuromarketing? We can't influence negotiations using eye trackers yet. This would need new technology and too much money for any except the most costly things. Meanwhile, skilled salespeople may utilize body language, look, and speech modulation to discover unspoken consumer preferences. However, when a customer wants a home, sculpture, car, jewelry, or other item, salespeople may be willing to bargain hard. We enable ads that develop or increase urges to sell items that don't benefit lives. Thus, even if some of these issues raise moral concerns regarding neuromarketing, they should also apply to non-neuromarketing marketing[30].

Future research cannot readily solve our ethical concerns since they originate from study. Future research on consumer perceptions of neuromarketing might be helpful. Consumer advocacy organizations raise several issues. The general public's concerns about neuromarketing tactics have not yet been described; however, if they are, they may serve as a guide for consumer education in academia and industry[31].

COUNTERPOINT: BENEFITS TO CONSUMERS VIA NEUROMARKETING

Our arguments have centered on neuromarketing's danger and potential for bad results. This focus misrepresents neuromarketing's prospects, therefore we'll balance the balances to conclude. Neuromarketing may improve consumer experiences if applied ethically.

Finding and meeting customer needs is the goal of marketing. Research into neuromarketing has the potential to assist businesses in developing better goods, providing advertising materials that are more visually appealing, and enhancing customer experiences. Neuroscience-based product creation may boost profits, but customers gain from better-suited goods. Two neuromarketing benefits might lower advertising frequency and quantity. First, more effective advertising reduce the requirement for high ad volume. Second, neuromarketing intelligence identifies new customer groupings that may be addressed more directly and selectively[32].

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 2, 2026, Pages 568-572

Neuromarketing may help cure addiction. A small number of customers suffer from compulsion purchasing disorder. Neuromarketing may intensify this illness, say critics. In contrast, neuroscience may assist us understand compulsive purchasing's neural underpinnings. These findings might help us design medical and pharmacological remedies for difficulties. Based on its clinical significance to a behavioral problem, neuromarketing academics may seek National Institutes of Health funding to study compulsive purchasing diseases. Neuromarketing research would be bolstered by this application, which would guarantee that neuromarketing strategies can benefit customers and reduce the risks previously mentioned [33]. Last but not least, public-interest marketing and public safety initiatives may benefit from neuroscience. Falk et al. (2013) utilized fMRI to determine which brain regions were more active in response to socially transmitted messages. This study might be used to evaluate and filter future public service announcements and campaigns based on their chances of conveying the essential public safety message. Despite its ethical risks, neuromarketing may benefit society via such usage. For neuromarketing's pro-social effects to be fully realized, subject protection, methodological rigor, etc. must be addressed.

CONCLUSION

Neuromarketing shows how neuroscience and psychology influence customer decisions from brain activity to purchase. This process is shown in the infographics: scientific findings are used in advertising to appeal to emotions, instincts, and decision-making without using logic. Targeted advertisements utilize subtle but strong methods including eye-tracking, anchoring effects, FOMO, influencer endorsements, and color psychology.

These tactics improve consumer intelligence and market efficiency but reveal key weaknesses. Ethical difficulties arise when children, elderly, and technologically illiterate people are easily manipulated. Consumer sovereignty and digital ecosystem trust are threatened by individual exploitation. Cambridge Analytica shows the perils of unchecked neuromarketing. Ethics in neuromarketing requires openness, informed consent, and regulatory compliance. Neuromarketing will become consumer-centric through innovation and responsibility, empowering individuals rather than exploiting their weaknesses. To ensure that advertising benefits society rather than manipulates it, the solution is to establish ethical standards that strike a balance between scientific advancement and human dignity.

REFERENCES

[1]. BBC. (2014). Facebook admits failings over emotion manipulation study. BBC News, doi: http://www.bbc.com/news/technology29475019.

[2]. Berns, G. S., & Moore, S. E. (2012). A neural predictor of cultural popularity. Journal of Consumer Psychology, 22, 154–160.

[3]. Boksem, M. A. S., & Smidts, A. (2015). Brain responses to movietrailers predict individual preferences for movies and their population-wide commercial success. Journal of Marketing Research, 52, 482.

[4]. Cascio, C. N., O'Donnell, M. B., Bayer, J., Tinney, F. J., & Falk, E. B. (2015). Neural correlates of susceptibility to group opinions in online word-of-mouth recommendations. Journal of Marketing Research, 52, 559.

[5]. Clithero, J. A., & Rangel, A. (2013). Informatic parcellation of the network involved in the computation of subjective value. Social, Cognitive, and Affective Neuroscience, 9, 1289–1302.

[6]. Duhigg, C. (2012). How companies learn your secrets (Electronic Version). The New York Times. Retrieved Oct 1, 2014, from http://www.nytimes.com/2012/02/19/magazine/shopping-habits. html?pagewanted=all&_r=1&.

[7]. Durante, K. M., & Arsena, A. R. (2015). Playing the field: The effect of fertility on women's desire for variety. Journal of Consumer Research, 41, 1372–1391.

[8]. Durante, K. M., Griskevicius, V., Cantu, S. M., & Simpson, J. A. (2014). Money, status, and the ovulatory cycle. Journal of Marketing Research, 51, 27–39.

[9]. Durante, K. M., Griskevicius, V., Hill, S. E., Perilloux, S. E., & Li, N. P. (2011). Ovulation, female competition, and product choice: Hormonal influences on consumer behavior. Journal of Consumer Research, 37, 921–934.

[10]. Esch, F., Moll, T., Schmitt, B., Elger, C. E., Neuhaus, C., & Weber, B. (2012). Brands on the brain: Do consumers use declarative information or experienced emotions to evaluate brands? Journal of Consumer Psychology, 22, 75–85.

[11]. Falk, E. B., Morelli, S. A., Welborn, B. L., Dambacher, K., & Lieberman, M. D. (2013). Creating buzz: The neural correlates of effective message propagation. Psychological Science, 24, 1234–1242.

[12]. Fortunato, V. C. R., Giraldi, J. M. E., & Oliveira, J. H. C. (2014). A review of studies on neuromarketing: Practical results, techniques, contributions, and limitations. Journal of Management Research, 6, 201–220

[13]. Huettel, S. A., Song, A. W., & McCarthy, G. (2014). Functional magnetic resonance imaging (3rd ed.). Sunderland: Sinauer Associates.

[14]. Innerscope. (2014). Innerscope research, 1 Oct. 2014, \http://www. innerscoperesearch.com (Electronic Version). Retrieved Oct. 22, 2014 from http://innerscoperesearch.com/.

[15]. Joffe, S. (2014). Revolution or reform in human subjects research oversight. The Journal of Law, Medicine & Ethics, 40, 922–929.

[16]. Karmarkar, U. R., Shiv, B., & Knutson, B. (2015). Cost conscious? The neural and behavioral impact of price primacy on decisionmaking. Journal of Marketing Research, 52, 467.

[17]. Kelly, S. (2013). Testing drugs on the developing world. The Atlantic. http://www.theatlantic.com/health/archive/2013/02/testingdrugs-on-the-developing-world/273329/#articlecomments

[18]. Kramer, A. D. I., Guillory, J. E., & Hancock, J. T. (2014). Experimental evidence of massive-scale emotional contagion through social networks. Proceedings of the National Academy of Sciences, 111(24), 8788–8790.

[19]. Levallois, C., Clithero, J. A., Wouters, P., Smidts, A., & Huettel, S. A. (2012). Translating upwards: Linking the neural and social sciences via neuroeconomics. Nature Reviews Neuroscience, 13, 789–797

[20]. Lichters, M., Brunnlieb, C., Nave, G., Sarstedt, M., & Vogt, B. (2015). The influence of serotonin deficiency on choice deferral and the compromise effect. Journal of Marketing Research. doi:10.1509/jmr.14.0482

[21]. Meissner, M., Musalem, A., & Huber, J. (2015). Eye tracking reveals processes that enable conjoint choices to become increasingly efficient with practice. Journal of Marketing Research. doi:10. 1509/jmr.13.0467

[22]. Plassmann, H., Ramsoy, T. Z., & Milosavljevic, M. (2012). Branding the brain: A critical review and outlook. Journal of Consumer Psychology, 22, 18–36

[23]. Plassmann, H., Venkatraman, V., Huettel, S. A., & Yoon, C. (2015). Consumer neuroscience: Applications, challenges, and possible solutions. Journal of Marketing Research, 52, 427.

[24]. Plassmann, H., & Weber, B. (2015). Individual differences in marketing placebo effects: Evidence from brain imaging and behavioral experiments. Journal of Marketing Research, 52, 493.

[25]. Pozharliev, R., Verbeke, W. J. M. I., Van Strien, J. W., & Bagozzi, R. P. (2015). Merely being with you increases my attention to luxury products: Using EEG to understand consumers' emotional experience of luxury branded products. Journal of Marketing Research, 52, 546.

[26]. Reimann, M., Castano, R., Zaichkowsky, J., & Bechara, A. (2012). How we relate to brands: Psychological and neurophysiological insights into consumer-brand relationships. Journal of Consumer Psychology, 22, 128–142.

[27]. Smidts, A., Hsu, M., Sanfey, A. G., Boksem, M. A. S., Ebstein, R. B., Huettel, S. A., et al. (2014). Advancing consumer neuroscience. Marketing Letters, 25, 257–267.

[28]. Soon, C. S., He, A. H., Bode, S., & Haynes, J.-D. (2013). Predicting free choices for abstract intentions. Proceedings of the National Academy of Sciences, 110, 6217–6222.

[29]. Telpaz, A., Webb, R., & Levy, D. J. (2015). Using EEG to predict consumers' future choices. Journal of Marketing Research, 52, 511.

[30]. Venkatraman, V., Clithero, J. A., Fitzsimons, G. J., & Huettel, S. A. (2012). New scanner data for brand marketers: How neuroscience can help better understand difference in brand preferences. Journal of Consumer Psychology, 22, 143–153.

[31]. Venkatraman, V., Dimoka, A., Pavlou, P. A., Vo, K., Hampton, W., Bollinger, B., et al. (2015). Predicting advertising success beyond traditional measures: New insights from neurophysiological methods and market response modeling. Journal of Marketing Research, 52, 436.

[32]. Venkatraman, V., Payne, J. W., & Huettel, S. A. (2014). An overall probability of winning heuristic for complex risky decisions: Choice and eye fixation evidence. Organizational Behavior and Human Decision Processes, 125, 73–87.

[33]. Yoon, C., Gonzalez, R., Bechara, A., Berns, G. S., Dagher, A. A., Dube, L., et al. (2012). Decision neuroscience and consumer decision making. Marketing Letters, 23, 473–485.