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Neuroscience in Marketing: Exploring the Mind through Neuromarketing

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Abstract:
Neuroscience has advanced so much, not only in the field of medicine, but it is also creating ripples in the marketing industry of the western world. Though it is not new to the advertising and marketing industries, but in Indian marketing it is new one. Ever since multinational companies were developing the strategies through this technique to understand the consumer's behavior and capture the market. Efforts were made to utilize this neuromarketing technology to better understand the consumer. Knowing your customer is the biggest challenge. There are various tools through which neuromarketing studies consumer's brain by scanning. It studies the response that the brain gives; this is where the desires and expectations are marked. Neuromarketing is a branch of neuroscience which finds the answers that are hidden on the part of consumer, by studying brain's responses / reactions. Neuroscience has made a niche, which gives ample scope to study the behavior of consumers and how they take decisions. This paper is an attempt to identify neuromarketing which is a new subject / area in marketing of goods and services in Indian society.

Keyword: Neuromarketing, Consumer Buying Behaviour, Online Shopping, Neuroscience, Advertising Effectiveness, and Advertisement.

Introduction:

Traditional methods of marketing are fading, and new concepts like neuromarketing are gaining importance nowadays. This has brought a new storm in the field of market research. Indian consumers since decades are attracting big corporate giants from the world over. Companies see India as a huge market potential; they want to understand it better. Hence, neuromarketing which is a branch of neuroeconomics that combines neuroscience, psychology and economics in it gives scope to understand & study the market. Neuroscience focuses on the brain behavior, while neuromarketing helps the companies to study the effectiveness of brand awareness strategies & their modification to influence customers psychology. It studies the patterns of brain functioning and changes of decision-making situations. Neuromarketing studies the behavior of consumer, and also captures his / her reactions (subconscious) to a certain subject. This helps to understand the advertisers the pattern of behavior of the prospective customer and where to pitch, for getting better results. On this basis marketing strategies are developed.

During 2000 and 2010, there were many studies conducted on how human being reacts, how the brain functions and remembers, and how the brain reacts when an advertisement is shown. After several researches, it was established that neuromarketing is an area, which should be studied in order to

understand the consumer preferences, etc. (Iloka & Onyeke, 2020). Neuromarketing is an amalgamation of the two branches, i.e. neuroscience and marketing. It focuses on the scientific mapping of the brain which helps in analysis of the brain activity and its response to a marketing stimulus. Most consumer's decisions are made unconsciously. Without any concrete study, company's think that by investing lot of money on advertising, promotion, etc. people will remember their brands and will be final consumers. But they fail to understand how the Indian consumers think, process and takes decisions.

Traditionally before launching any advertisement, marketers and advertising agencies discuss the budget and the matter to be communicated with each other, and finalize the promotion without understanding consumer's wants and needs, etc. Thus, most of the good advertisements fail due to failure of understanding right things in the right manner. In order to understand consumer's behavior, emotions, and decision making, etc. One has to study neuroscience, which gives better exposure to identification and understanding of Indian consumers. The most complex organ of human body is brain is the most complex which controls our activities, the mechanism of the brain is yet to be decoded with respect to neuromarketing. Marketers of today know the scenario of the consumers, how they take dec00isions and on what grounds (Turley & Shannon, 2000). To be very prudent consumer's decision is unconsciously taken. Therefore, the marketing and advertising agencies are focusing on one question, i.e., how did they take the decision, rather than why did they take the decision. Brain imaging techniques study responses of the brain to marketing stimuli, which helps to study and to know as to how the customers responds, and what triggers them to take an action (Lewinski, den Uyl, & Butler, 2014). Every year millions of Rupees on advertising are spent without analysis that whether such advertisements will be effective or not. On top of that, the effectiveness of a particular advertisement is very difficult to measure. Advertisers hope that their advertising efforts will ultimately result in purchases. However, the money spent on things like marketing gimmicks may still not yield the desired results. The problem lies with the effectiveness of the advertisement campaigns; how much is the customer engagement and how well they leave an impact in the consumer's minds is the question. This is the point where the advertising and marketing agencies have started pondering over the assumptions and judgments of prospective consumers.

The problem lies with the effectiveness of the advertisements; how much customer is engaged with the advertisement and what level it has created an impact in the consumer's minds. Neuromarketing uses techniques that helps to understand – how and what is in consumer's mind. This will in turn lead to increased sales, and repeated purchases. Sar (2009) explains, that Professor Ale Smidt's of Erasmus University (2002) was first to use & describe the word "neuromarketing". But Gerry Zaltman (Harvard University) is considered to be the founder of neuromarketing. He, for the first time in 1999 used functional magnetic resonance imaging (fMRI) as a marketing tool. Neuromarketing provides a possibility of analyzing the buyer's preferences & purchase decision-making. To get the useful information from data one should know to relate the data with consumers behavior w.r.t. preferences & final selection of product or services. The concept of applied neuromarketing is introduced, where marketing mixes i.e., color, packing, and design, etc. are used. The purpose is to "provoke" the emotions of prospective customers. It is the emotions that modern marketing wants to play and tap. In particular, eye-tracking (ET) and electro-encephalo-graphy (EEG) are the commonly used tools in this field. Neuroscience uses methods from both psychology and neuroscience to study customers buying behavior, thereby providing explanations for consumer preferences and behavior as explained by (Levallois et al., 2012 & Russo et al., 2015).

As per the methods used in neuroscience, there are several techniques where the consumers' activities are studied. Observations and responses help the companies to know – views and attitudes of the consumer. Recording indicates the cognitive and emotional responses of the consumers towards a product or service. Neuroscience is new area in marketing world; it is helping the marketers to study human behaviour. Neuroscientific methods record the activities inside and outside the brain. In electromagnetic study brain's electrical activity and responses are studied by using the tools like Electro-encephalography known as EEG, Magneto-encephalography known as MEG and Steady State Topography known as SST. Also, the tools like Magnetic Resonance Imaging commonly known as MRI and Positron Emission Tomography known as PET, helps to know blood oxygenation levels and chemical composition within the brain. These tests are done to evaluate the performance of new products and test the impact of advertisements and campaigns of the brands. After verification of results, millions of dollars are invested in promotional activities and product launching (Cherubino et al., 2019). Also, Electro-cardiogram (ECG), Eye Tracking (ET), Facial Electro-myography (f-EMG), Heart Rate Variability (HRV) and Galvanic Skin Response (GSR) are some tools & techniques, where the company can know various changes or stimuli that happens during engagement with an advertisement or promotion. Marketing strategies are finalized accordingly (Lim, 2018).

Datta and Mandal (2018) have suggested that the brain mapping techniques for neuromarketing will be expensive in India. Techniques like Eye-tracking and Biometrics were proposed to understand the consumer's responses. Specially in the rural India, the neuromarketing tools which apply visual stimuli are more helpful because consumers there get attracted towards color & packaging of product more than the brand name. Neuroscience tools utilize devices that measure's customers key physiological functions & reflexes. Physiologically these devices measure their-heart rate, respiratory rate, blood pressure, etc. & the reflexes measures include gaze, dilated pupils, facial expressions, etc. of prospective consumers(Global Harmonization Task Force, 2012 In their study, Kumar and Singh (2015) have stated the neuromarketing techniques used by the companies like EEG by Hyundai Motors, Neuro-imaging by Cheetos, Brainwave research by Pay Pal, EEG cap by Yahoo & Microsoft , MRI by Ford Motors etc. These techniques were used for enhancing their promotional activities & customer satisfaction. In another study by Hamelin et al., 2017 it was found that these tools provided information about advertisement impressions, and emotional reactions whether positive or negative on exposing to marketing cues . Yet , in another study by Plassmann et al.,2015, Montazeribarforoushi et al., 2017 it was found that these tools measure consumers neural activity when they perform consumption-related behaviors like testing a product or its purchasing & also during times immediately before & after such behaviors.

The effectiveness of advertising can be assessed through various parameters like consumers attitude about the commercial, the brand, the product, buying intentions, actual purchase etc. Also, while purchasing did the consumer recalled the advertisement or not. Ulman, Cakar, and Yildiz (2015) reported that many international companies started using neuromarketing techniques to fine-tune their product designs and promotional materials to increase customer engagement, attention, and ultimately take purchase decision. Naranjo (2015) advocated that in neuromarketing stimuli is generated through brain by using different marketing elements and is recorded by different medical techniques. Consumer's needs and desires can be predicted more clearly, which will used to obtain valuable information, through neuromarketing tests. Lindstrom, (2008) stated that neuromarketing is a blend of marketing and neuroscience, which helps to understand the consumers purchase behavior by analyzing

their subconscious feelings, reasoning, and desires. As per studies by (Zaltman, 2003), almost 80% purchase decisions are made unconsciously, while, almost 60% decisions are made in less than 4 secs. Zurawicki described neuromarketing is complex, as whenever the consumer acquires the product and service for his / her use, consumers' perception, feelings, and memory play a great and influential role. Neuromarketing techniques can predict customer's buying behavior pattern in a better way than a survey method (Baldo, Parikh, Piu, & Muller, 2015).

The study showed that while research methods cannot accurately predict consumer behavior, using neuromarketing tools provided based on brain scan data can reach 80% predictive accuracy. Besides the researches helped in studying the impact on the gross profit of a company. Hence, the Brain data analysis can help in improving product image and create competitive advantage and value-addition for companies. With the help of neuromarketing (Senior C, Lee N, 2008) advertisers are preparing commercials in order to influence customer's choice. The combination of audio and video selection and timing is very important. This definitely helps with brand design, brand research, and influences the customer decision-making process. The field of neuromarketing has opened an opportunity to study and identify the causes of impulsive shopping disorders. This also helps to study the buying behaviors of the customers and how the successful advertising (Orzán G, Zara IA, Purcarea VL, 2012) is launched.

This paper investigates the basic purpose as to how customers are engaged and encouraged towards online shopping.

- To study factors that influence consumer engagement and the impact of neuromarketing and demographics on impulsive purchasing.
- To study the effects of promotions by e-commerce companies like advertisements, discounts, and offers on consumer purchase intentions as elements of neuromarketing.

On the above basis, following hypotheses are formulated: -

H_0: Study of Demographic variables is essential for understanding neuromarketing.

H_1: Study of Demographic variables is not essential for understanding neuromarketing.

H_0: Online shopping is affected by E-commerce

H_1: Online shopping is not affected by E-commerce

Respondents: Data for this study was collected from Agra's and Greater Noida's respondents that belonged from different age groups, occupation and education levels to know about influences for buying apparels online.

Sample Design: Convenience sample & Random sample.

Sample Size: 110 respondents.

Table 1: Demography of the respondents.

Gender	Population	Age Group	Population	%
Males	66	Below 20	23	20.9
Females	44	21 – 30	34	30.9
		31 – 40	26	23.6
		41 – 50	12	10.9
		Above 50	15	13.6
	110		**110**	**100**
		Education	**Population**	**%**
		Graduates	27	24.5

		Post Graduates	42	38.2
		M. Phil	10	9.1
		Others	31	28.2
			110	**100**
		Profession	**Population**	**%**
		Professionals	28	25.5
		Business	17	15.5
		Govt. Service	29	26.4
		Homemakers	16	14.5
		Others	20	18.1
			110	**100**

For testing first hypothesis H_1: Study of Demographic variables are not essential for understanding ANOVA is used.

Table 2: Different age groups reaction towards ads., discounts & offers

ANOVA						
		Sum of Square's	Degree of freedom	Mean Square	F value	Significance
Do you like watching advertisements?	Between the Groups	1.192	4	0.478	0.414	0.798
	Within the Groups	121.179	105	1.154		
	Total	123.091	109			
Does the advertised product generate a desire?	Between the Groups	11.599	4	2.900	2.921	0.025
	Within the Groups	104.219	105	0.993		
	Total	115.818	109			
Do you believe in your favourite actors / models?	Between the Groups	9.147	4	2.287	2.556	0.043
	Within the Groups	93.944	105	0.895		
	Total	103.091	109			
Most of my purchases are influenced by advertisements.	Between the Groups	7.984	4	1.996	1.595	0.181
	Within the Groups	131.434	105	1.252		
	Total	139.418	109			
Most of my purchases are	Between the Groups	19.578	4	4.895	2.792	0.030

influenced by Atractful good packaging	Within the Groups	184.095	105	1.753		
	Total	203.673	109			
Advertisements compel me to purchase unnecessary items	Between the Groups	3.526	4	.881	0.567	0.687
	Within the Groups	163.247	105	1.555		
	Total	166.773	109			
If I purchase any apparel, it is because of an advertisement	Between the Groups	11.957	4	2.989	2.497	0.047
	Within the Groups	125.716	105	1.197		
	Total	137.673	109			
What do you look for, in an advertisement: Product information	Between the Groups	20.427	4	5.107	3.325	0.013
	Within the Groups	161.246	105	1.536		
	Total	181.673	109			
What do you look for, in an advertisement: Latest trends	Between the Groups	9.355	4	2.339	3.382	0.012
	Within the Groups	72.609	105	0.692		
	Total	81.964	109			
What do you look for, in an advertisement: Offers and discounts	Between the Groups	11.970	4	2.993	2.149	0.080
	Within the Groups	146.221	105	1.393		
	Total	158.191	109			

With reference to above table, it was found that:

The adverti0sed products impact on the desire varied significantly between the age groups as indicated by $F(4, 105) = 2.921$, $p < 0.05$. On closer observation it was seen that people within the age group of 41years -50years strongly desired the advertised product whereas it is not so in the people of the age below 20 years. People in the age group 41years-50years have faith on their favourite actors / models $F(4, 105) = 2.556$, $p < 0$, so they have a strong urge to replicate them, they watch advertisements to know the trends /updates $F(4,105) = 3.382$, $p < 0.05$ and thus as a result of advertisements $F(4, 105) = 2.497$, $p < 0$ they purchase. So, this trend shows that this age group is influenced positively by neuromarketing factors applied in advertisements. Whereas it is not so in the people of the age below 20 years. For the people among the age between 21years-30years watch advertisements, to get information & hence they consider it is very essential $F(4, 105) = 3.325$, $p < 0$. Also, the people below 20years are attracted towards discounts/offers, $F(4, 105) = 2.149$, $p < 0.05$, so they watch advertisements, whereas people in the age group 41years-50years are impacted by quality attractive packaging $F(4, 105) = 2.792$, $p < 0$ hence these features influence their purchase decisions.

Thus, hypothesis stating that the Study of Demographic variables are essential for understanding neuromarketing is accepted. Hence demographic variables should diligently be analyzed by marketer for s effectively & efficiently implementing the techniques of neuromarketing.

For testing second hypothesis H_1: Online shopping is not affected by E-commerce again ANOVA is used.

Table 3: Impact of e-commerce on different age groups

ANOVA						
		Sum of Square's	Degree of freedom	Mean Square	F value	Significance
Variety	Between the Groups	0.976	1	0.976	1.667	0.199
	Within the Groups	63.242	108	0.586		
	Total	64.218	109			
Availability of product	Between the Groups	1.566	1	1.566	2.273	0.015
	Within the Groups	74.398	108	0.689		
	Total	75.964	109			
Brand quality	Between the Groups	3.852	1	3.852	6.813	0.010
	Within the Groups	61.066	108	0.565		
	Total	64.918	109			
Price at other platforms / shops	Between the Groups	0.529	1	0.529	0.830	0.364
	Within the Groups	68.934	108	0.638		
	Total	69.464	109			
Ease of purchasing	Between the Groups	1.788	1	1.788	3.111	0.041
	Within the Groups	62.067	108	0.575		
	Total	63.855	109			
Previous experience	Between the Groups	3.334	1	3.334	3.683	0.058
	Within the Groups	97.757	108	0.905		
	Total	101.091	109			
Mode of payment	Between the	0.113	1	0.113	0.100	0.753

	Groups					
	Within the Groups	121.751	108	1.127		
	Total	121.864	109			
Satisfaction	Between the Groups	0.060	1	0.060	2.232	0.027
	Within the Groups	134.495	108	1.245		
	Total	134.555	109			

With reference to table 3, it is clear that while shopping online, people are affected by- the quality of product $F(1, 108) = 3.852$, $p < 0.05$, product readiness $F(1, 108) = 2.273$, $p < 0.05$, effortlessness of online buying $F(1, 108) = 3.111$, $p < 0.05$, past online shopping experience $F(1, 108) = 3.683$, $p < 0.05$. Hence, it can be concluded that most people opting for online shopping wish to know the brand quality before making a purchase. Besides, their purchasing decision depends on factors like availability of product, easy to buy & less transportation charges. This shows that people choose online shopping mainly to get satisfaction $F(1, 108) = 2.232$, $p < 0.05$. Whereas, factors like product variety $F(1, 108) = 1.667$, $p < 0.05$, comparative price at other shops $F(1, 108) = 0.830$, $p < 0.05$, and the payment mode used $F(1, 108) = 0.100$, $p < 0.05$ do not influence or have much impact on their purchase decision.
Thus, it can be said that e-commerce factors significantly influence online buying decisions. Hence, the hypothesis stating that e- commerce factors affect online shopping is accepted.

Conclusion:

Based on the above research, we accept the hypothesis that neuromarketing induces impulsive buying behavior. Neuromarketing is based on sensory stimulation which involves both the study of psychology and marketing, Neuromarketing has slowly emerged as a tool for generating actionable customer insights. For businesses, survival is a challenge in todays' competitive world. Customers are king and companies need to understand them in order to survive and be profitable. Neuromarketing helps marketers redesign their marketing strategies for customer satisfaction. This study shows that neuromarketing helps in understanding consumer perceptions, the factors that influence their mindset, their decision for shopping online, and finally in customer retention. The study reveals the influence of demographic factors on consumer buying behaviour. It was seen that the people belonging to age group of 41years – 50years are strongly fascinated towards advertisements as it makes them aware about the latest trends, of desired products. Also, this age group is concerned towards good packaging, whereas this it is not so for other age groups. The people in the age group 21- 30years, watch advertisements for enhancing their knowledge about different products.
People today are attracted towards E-commerce as compared to traditional shopping, mainly because it offers people the ease of purchasing by online mode, examining qualities of brand, knowledge about product availability and the charges for transportation, etc. in detail. Hence, these factors influence the consumers which are somewhat not present in traditional shopping. Also, it has been observed that advertised products create a desire among fashion conscious consumers. Along with this Sales and discounts too have a positive effect on the consumer, and therefore have a positive effect on the business. Neuromarketing is therefore the ultimate solution for marketers to grow their business & avoid

failure. It ensures maximum sales & hence profits as compared to cost of neuromarketing tools. This study captures consumer behavior, and also reveals consumer behavior based on specific factors. The paper concludes that neuromarketing is marketing new-age storm that can be used to minimize the gap between customer expectations and company perceptions, and is considered to have great potential in India.

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