

# A STUDY ON THE IMPACT OF NEUROMARKETING TECHNIQUES ON CONSUMER BUYING BEHAVIOUR WITH RESPECT TO THE ATTENTION AND RETENTION OF THE MARKETING EFFORTS

A Minor Research Project Submitted to the Denary of Commerce and Management, Christ (Deemed to be University)

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**TITLE:** “A Study on the Impact of Neuromarketing techniques on Consumer Buying behaviour with respect to the attention and retention of the marketing efforts”

**ABSTRACT:** *Have you ever wondered why BIG, Bold, colourful letters can capture your attention faster than normal ones? Have you wondered why advertisers use cute images of babies and puppies to lure your attention? This study was conducted to ascertain the relationship between consumer perceptions and consumer buying preferences with respect to attention and retention of marketing efforts. The study also displays how marketing activities of a firm can be adjusted and altered to hit the right targets of a consumer's brain to ensure retention and develop a connection with the brand, which in turn, result in a purchase. In our day and age marketing and advertising is very important in order to create brand awareness and brand loyalty. There is a chain of processes that the consumer must pass through before making a purchase decision. marketers usually try to grab consumers attention and try to persuade them into buying their products. Neuromarketing is a subset of marketing research that understands consumers' psyche. It takes their cognitive and affective responses to various marketing stimuli. It helps combine psychology with marketing to help study consumers cognitive responses which helps understand consumer decision making process. The need of the study is to ascertain whether or not psychology and sensory targeting can influence a consumer's decision to buy the product. To even responses like clicking a link, liking a movie to even remembering the ad or brand, Neuromarketing can be used to identify them all.*

**KEYWORDS:** *Neuromarketing, consumer perceptions, attention, retention.*

## 1. INTRODUCTION

Effectiveness of marketing campaigns are very important in order to ensure that the right message is sent across in the right way and is retained in the consumer's memory. Brand awareness can be created to increase brand recognition and brand recall, this will help foster and build a positive brand experience for consumers. There is a chain of processes that the consumer must pass through before making a purchase decision. marketers usually try to grab consumers attention and try to persuade them into buying their products. At every stage of the consumer buying cycle marketers use their influences to drive purchase decisions. The pleasure centers of the human brain are stimulated when a person watches a particular advertisement or listens to a particular genre of music. The researchers want to measure this level of simulation using neural methods and therefore help organizations better decide what their customer base wants and prefers and how their brains can be tracked to decide which product they prefer and why. The 2 main methods of measuring this are electroencephalography (EEG) and functional magnetic imaging resonance (fMRI) technology. Neuromarketing techniques including eye-tracking, which reveals what captures people's attention, facial emotion coding, which measures people's ongoing emotional responses in real-time, biometrics such as heart rate, and neural measurements using electroencephalography (EEG) and fMRI. Neuromarketing is the new age marketing technique. It has been proven that your mind and your thinking can be used to predict purchase behaviour. Therefore these tools can be utilised to better the effectiveness of advertisements.

### 1.2 NEED FOR STUDY:

The problem lies with the effectiveness of advertising and marketing campaigns. Advanced techniques like Neuromarketing could cause better memory and retention of these advertisements and could lead to building a good perception of the brand. The study thus also aims to prove how much scope and growth is there for these new age marketing techniques. The problem lies with the effectiveness of the ad campaigns, how much customer engagement the ads have and how well they leave an impact in the consumers minds.

Since neuromarketing uses techniques that help retain the ads in consumers minds it helps create brand awareness. This brand awareness leads to increased brand recall and recognition and thus helps build brand image. A good brand image is essential to develop a positive reaction or experience in consumers mindsets. Which will in turn lead to increased sales, and repeated purchases. This will thus help increase revenue and profits. Therefore at the crux, we realise that marketing is one of the vital functions of a company and can help generate a lot of profits.

## 2. REVIEW OF LITERATURE

David, A. (2014) This article talks about how neuro marketing is an upcoming field that is very fascinating to many people. Studies have indicated that the hype about neuromarketing has overtaken the scientific advancements. But this articles goes to show that due to this hype and proven results, Neuromarketing is the new age marketing technique. It has been proven that your mind and your thinking can be used to predict purchase behaviour. To even responses like clicking a link, liking a movie to even remembering the ad or brand, Neuromarketing can be used to identify them all. But, this can only be useful if neural activity is merged with survey and market results. If campaigns and advertisements are made with reference to the activity triggered in the medial prefrontal cortex where the "thinking happens" then we will efficiently be able to predict the success and journey of mass media campaigns. They show two studies: The success of an anti smoking campaign and about movies box office success. Both these results were obtained to determine which movie would do well in the box office and whether the anti smoking campaign would make people quit or at least click on the link.

Both these studies were successful but we are still in a very early stage in the emerging field of Neuromarketing. Costs of brain imaging through EEG and fMRI are relatively inexpensive but don't provide 100% results. Magnetic resonance imaging is a highly advanced technology that is quite expensive. All said and done, if brain imaging data on a small study could help increase the effectiveness of a large widespread campaign then the cost would not be an issue and the science of Neuromarketing would finally arrive. Mukherjee, J. (2012) This article articulates the process and science behind Neuromarketing and how it works. It talks about the process, and the post process result and how it can be used to increase success. Neuromarketing works by using social psychology to influence what we buy. No company wants their product to fail, especially when they've invested so much into it. Because of this they turned to Neuromarketing to understand how market stimulus impact people by interpreting and observing their emotional responses. Emotional processes in the brain help determine the willingness to buy something. Electric signals from the brain are taken and analysed to provide clients with answers. Neuromarketing exploits the half second interval when you think about something and when you make a judgement about it (bias or preference). This half second electric response measure what the individual truly feels about the product, service or campaign. A few opportunities and threats would be that it is cost effective and it requires only a small sample. But some threats are that it could cause mass manipulation over consumers. Therefore with Neuromarketing we can design how products look feel and function before introducing them to the market. This reducing risk and increasing efficiency.

Bosch, Simon. (2013) Have you ever wondered how BIG, Bold, Colourful letters can divert your attention? □ *Have you ever wondered how sentences dressed like this grab your attention?* □ Or have you noticed how the smell of cookie man cookies as you enter forum makes you hungry? □ Or how the scratchy noise of Stedler sketch pens makes you keep writing? □ That's all due to the sensory marketing tactics used by companies to grab not just your attention, but your subconscious attention as well. □ Sensory marketing is new, evolving, rapidly growing mechanism used by marketers to get that extra advantage over competitors. Marketing mainly requires you to advertise your products in such a way that it makes the consumers want more. Sensory marketing does that, in a way that you won't even realize that it happened. Sense-based marketing works off of sensory perceptions and stimulation of the five senses: Sight, hear, touch, smell, taste. □ Like the saying goes "Its all about the selling sizzle rather than the steak" This article articulates with various examples and researches about how the five sense can be used to simulate buyers and how various brands have been using (or have to use) these tactics recently and how it has benefitted them.

Sensory marketing is the main topic discussed in the article. They talk about how marketing can now be used to talk to consumers on a subconscious level and alter decisions to the firm's advantage. Embodied cognition is when your decisions are affected by bodily conditions and your physical environment. It is a situation when without your awareness your body's sensations help determine what decisions you make. There has been a lot of research conducted by Lawrence E. Williams, of the University of Colorado at Boulder, and John A. Bargh, of Yale that shows you how ambient conditions and temperature can affect your thinking, as shown in their experiments of warmth and comfort correlations. Through their research you can see that under warm temperatures and warm lighting, people are more friendly and welcoming. They are more open and tend to make quick decisions and usually conform to buying what everyone in that room buys.

Aradhna Krishna of the University of Michigan then talks about how people are starting to now realise how deeply marketing can affect the sense and how sensory marketing can become a whole new communication system. She writes in her book *Customer Sense: How the 5 Senses Influence Buying Behaviour*, about a few examples and questions that brought out the love for this field in her. She sights various examples such as: Touch - Foil around *Hersheys Kisses* (chocolates) to excite the senses while the customer opens the chocolate □ Smell - *Dunkin' donuts* released an atomizer that let out the aroma of coffee. □ These studies of brands indicate that after practicing such marketing strategies their sales have increased. The article also talks about how certain companies haven't used this theory to their advantage. Krishna talks about how every field must realise the importance of packaging, appearance, smell of their products or surroundings. Example Banks should have more reassuring surroundings with wooden or leather furniture. Or how online luxury clothing brands should package their clothes in bubble wrap. The article tells us so much about the depth that communication should have with customers.

Daugherty, T., & Hoffman, E. (2016), The article talks about how there is a gap between functional magnetic resonance imaging (fMRI) used by academic institutions and by organizations. It was found that only 31% used fMRI machines in firms whereas 71% reported to have used it in their respective academic institutions. The major reason attributed to this huge difference is that many organizations find it to be financially and physically a burden to the company as it requires specialized machines and special skills to operate them. Many organizations preferred to go for traditional methods to analyse consumer behaviour and prefer ability to a new advertisement or product launched by a company. To specify on the effectiveness of fMRI compared to traditional methods, the researchers conducted an experiment with a medium number of subjects. They compared commonly used behavioural marketing research methods with a raft of Neuromarketing techniques including eye-tracking, which reveals what captures people's attention, facial emotion coding, which measures people's ongoing emotional responses in real-time, biometrics such as heart rate, and neural measurements using electroencephalography (EEG) and fMRI. It was found out that though traditional methods predicted outcomes accurately, neural methods seem to have a much more significant contribution beyond what traditional methods provided. There were many advantages to this method. Large consumer choices can be analysed using a small number of subjects due to the technical advantages of these methods. The researchers also gave their opinion on how firms could integrate fMRI into their functioning.

Ackerman, U. (2011) The article mainly talks about how the pleasure centers of the human brain are simulated when a person watches a particular advertisement or listens to a particular genre of music. The researcher wants to measure this level of simulation using neural methods and therefore help organizations better decide what their customer base wants and prefers and how their brains can be tracked to decide which

product they prefer and why. The 2 main methods of measuring this are electroencephalography (EEG) and functional magnetic imaging resonance (fMRI) technology. EEG measures fluctuations in the electrical activity directly below the scalp, which occurs as a result of neural activity. By attaching electrodes to subjects' heads and evaluating the electrical patterns of their brain waves, researchers can track the intensity of visceral responses such as anger, lust, disgust, and excitement. Frito Lays used EEG to measure how consumers responded to their product Cheetos. With the help of this data, they came up with another advertisement which received an award from the Advertising Research Company. The author draws a comparison between EEG and fMRI and concludes that both have their own respective limitations but are very useful as studies have shown activity in that brain area can predict the future popularity of a product or experience. Neuromarketing can provide important but complex data to companies that target a global audience. Therefore the author provides ways by which companies can make use of Neuromarketing to predict future success or failure of a product.

Stone & Liyanarachchi. (2017) This paper looks into there is no important part in retaining the customer. The company should not look as satisfaction as a separate aspect it should be within the delivery of the service to customers. There is a problem in maintaining the old customers and also it is very difficult to maintain the new customers. The research collects data that how a company struggles to maintain the service quality in delivering the service. However, the company look after different levels of growth in managing the retention and satisfaction.

Briggs, R. (2000) The article talks about how from being an area of lack of proper academic research moved on to becoming an area where there is abundant research and relevant findings have been proven to be successful. He talks about a recent study which was conducted to test the effectiveness of the most popular Neuromarketing technologies. The main aim of the study was to be impartial and to do a more carefully controlled study where all the methods are being treated equally in terms of the protocol. For every method, the protocol was the same. They collected real-world performance data based on what happened to the product that was featured in an ad. A separate team analysed the correlation between neuroscience data and ad performance. The scientists tested eight different methods: traditional surveys; implicit measures; eye tracking; heart rate; skin conductance; breathing; brain activity, using fMRI (functional Magnetic Resonance Imaging); and brain waves, using EEG (electroencephalography). Their experiments and subsequent data analysis showed that only fMRI provided a significant improvement in predictive power over traditional surveys. Therefore he concluded by saying that though there is a slow progress with regard to neuroscience in the corporate world, there is much more scope and the gap between Neuromarketing claims and academic validation is beginning to close

Moskowitz, H. R. (2008), 'Pain', because marketers look at the frustrations and the challenges that consumers experience. There are basic six rules that small businesses can follow. First is to avoid the word we and see how you can relieve the customers' pain. Second is to focus on the customer rather than bragging about how renowned your company is. Thirdly making your points visual, there needs to be some solid stuff to market on. Fourthly, staying concrete and tangible. Fifthly, making sure you have made an impact with your marketing. The brain pays more attention in the beginning and in the end. It's important because the brain needs to recap and store. Lastly, to create a memorable brand, you have to use emotional connectors in your advertising.

Zurawicki, L. (2010), 56% of the digital ads that are posted on the internet are not seen by the humans, only 50% of the ads are viewable. Mr. John Wanamaker lamented that 50% of the money spent on ads go to waste. The latest research on Neuromarketing just published that there is a whole new level of understanding and influencing consumer behaviours through the science of influence as a promotion variable. Marketing management are faced with two problems mainly: having data that can relate controllable marketing variables to real outcome variables and finding marketing variables that are consistent.

Ranaweera & Prabhu, (2016) The study analyzes the blended on satisfaction effects, the factors that customer look into the service for retention. It advocates that such an avenue discovers the service providing company how they are neglecting customer satisfaction and the ways to keep the existing customers for the company. The study results in indicating that there is a positive barrier for the customer to change the company rather than retaining with company it may be because of the trust factor or the satisfaction factor for which company has to look after the strategies to retain the customers.

Lindell, A. K., & Kidd, E. (2013), This article presents Neuromarketing as a way to detect brain activation during customer engagement. Neuromarketing is basically a field of marketing research that studies consumers' cognitive and affective response to marketing stimuli. Consultative selling suggests that a customers' shopping experience is managed by the salesperson's behaviour and in-store marketing assets, and that the customers gets engaged step by step. The study implies that laboratories can build virtual environments just as a shopping complex and observe consumer behaviour while they participate in the buying process and respond.

Klie, (2016) This study looks at the basic customer contribution towards the profit of the company. In every sector the customers are treated as profitable assets. There are many tools in the industry to measure the customer relationship management. As the industry experiences more profit there are several software which helps the company to know their customers who are potential and who are new to the company. Before implementing any strategies in the company it should analyze and then take decisions by this the company will not incur loss.

Philo, G. (2013) in the paper "Getting The Message: How The Internet Is Changing Advertising" discussed the fact that how Advertising world is being transformed and revolutionized through the Internet, 6 years after the first Advertisement banner hit the Internet, making the Internet a booming area for companies to turn their thinking hats too and dominate and capitalize on the fast-changing and dynamic medium of Online Advertising. With the introduction and development of efficient technologies like Neuromarketing, fMRI and brain scans can track responses and target customers; the Internet is now offering marketers a new wave of possibilities. In 1994, A new company called Yahoo! developed a way to search for information on the sites on the Internet—the search engine. HotWired was the primary online magazine to have advertisements. Today, Online advertising is more sophisticated—with dominant capabilities to deliver high-end graphics, targeting the appropriate audience, and measure responses in a time efficient way. Many experts believe that Internet advertising is still in an infant stage. It is a widely held belief that in the future Advertising Online will precede Television and Outdoor Advertisements in the Marketing and Advertising Budgets of the Company as it offers a way to companies to not waste time and effort on widespread and moot reach and have a more grounded and targeted reach, the World of Advertising is making the Target in the middle of the dart board bigger and bigger due to specialized reach based on online activities of certain sets of people online.

Bardin, L. (1977) This article talks about the scope of neuromarketing and consumer neuroscience in other fields. It gives us valuable information about how consumer neuroscience and neuromarketing help contribute to health care, thus proving that it is a very emergent,

upcoming and widely applicable field. They explore the fields of trust, ethics and reward management and correlate it to human behaviour. For example they talk about how compulsive buying is used as a common interest in neurology and consumer neuroscience. Many aspects predicted and derived from neuroscience is used to gain insights into psychology and treatment of frontotemporal dementia, Parkinson's disease, epilepsy, and Huntington's disease. Thus the article mainly talks about how neuroscience has a wide scope and coverage and contributes to the field of neurology. Commercial applications and prediction of human behaviour can be used to understand treatment of neurological diseases.

A, Hannaford, 2013, the article tells us how certain brain responses help you make a decision without your awareness. They study the split second interval where you subconscious dictates your actions. They relate this to study whether consumers subconscious can help dictate their buying behaviour, and whether neuromarketing can help affect that subconscious decision and cause you to purchase the product. They want to study the gap between what marketers think we feel, and what consumers actually feel. They conducted studies using EEG, FMRI and eye tracking to predict and ascertain shopper habits. The article brings out many real time examples where companies have used these techniques to measure the emotional engagement of consumer while watching ads and looking at print ads. In these studies, it was found that simplicity always seems to win, when you add two competing aspects in one ad, it causes confusion and frustration and the consumer tends to turn away and thus, leads to non purchase. The article concludes by saying that neuromarketing can be very useful in predicting buying behaviour but it does have its pitfalls. The main one was that people may like the ad, may develop positive emotions to it, but if the associations following that aren't positive it could lead to rejection.

Ruchi Nayar and S.L Gupta in their research on "Determinants of Internet Buying Behaviour" (2011) studied the various factors which have led to a change in the buyer behavior of the consumer on the Internet. It gives us insight into how consumer buying behavior works in an online landscape and how print media and marketing efforts help increase online sales. Easy payment options, reduced prices of hardware, reliable technology, etc. This article also explores the Internet retailing scenario and how it affects consumer behavior online. The convenience offered to a consumer which makes opt for an internet purchase over a physical store purchase and its advantages have been discussed which provides a wide overview of the determinants of internet buying behaviour. Privacy concerns have dampened the online consumer enthusiasm in India. There are a number of issues related to security and transaction frauds. High occurrences of failed payments deter the customer to revisit portals for shopping. This study involves non-probabilistic convenience sampling. 500 customers were selected throughout the urban and semi urbanized locations of India. The article also told us that a consumer is mostly persuaded by catchy, aesthetic print media and offers and sales. Eye catching print ads with proper placement and good colour scheme can help drive consumer purchases.

Bercea, M. D. (2013) The article brings out various examples and techniques that companies actually use in order to improve the retention and attention of advertisements. Some of the findings are simple, and inexpensive that even smaller companies can adopt them. Examples are, using matte finish instead of a shiny finish lead to more positive responses. Thus eye gaze, packaging, framing, placement mechanisms, anchoring, benefits, reward and punishment, pricing, layout design, headlines are some of the inexpensive techniques that one can use without using any equipment. Whereas, EEG, FMRI, Eye tracking, prototyping are more expensive, equipment based techniques. Using a combination of these techniques will help improve the attention and retention of ads.

Butler, M. J. (2008) This article talks about how effectively we can increase the efficiency of print ads, by using eye tracking, gaze path finder and heat mapping to study how consumers gaze moves when they look at a print ad. It helps us understand what aspects or parts of the print ad people pay most attention and time on and what factors can be missed out, or just go unnoticed. By using simple tricks in the imagery, we can guide a consumer through the image helping them concentrate on the more important things that the marketer wants to put across or communicate. The results showed that faces or main objects tend to capture more attention than headlines and content. And in order to avoid more attention on the model, the solution found was that the model should face or view the headline which forces the viewers gaze towards the headline. This helps move the viewers eyes through out the print ad and helps in better communication. Using brighter colours and placing the main object in the centre or to the right usually grabs more attention. Therefore using techniques like eye tracking helps you perfectly ascertain what the consumer looks at when they look at a print ad.

Crease, R. P. (1991) This article gives us a comparison between print and digital media to help us understand which media is more effective in terms of memory and retention. They use various experimental techniques, questionnaires and neuromarketing technologies to find out what their subjects liked better, and what was retained more in their minds. The results show that there was no definite preference between digital and paper and viewers absorbed about the same amount of information from both media, but physical ads caused more activity in brain areas associated with value and desire. They showed greater emotional response and memory for physical media ads and retained them in their memory for longer. Whereas digital adverts were processed more quickly. Marketers want to use the most effective and efficient channel, but also have to focus efforts on the media that consumers are utilising the most. Even if we believe print ads are potentially more powerful, we have to understand the huge shift to mobile devices for everyday activities. Print is more widely for things like luxury items, distinctive brands, fashion etc. Not only will print be able to communicate the unique properties of the offering, it will give greater emotional impact to drive consumer behaviour and increase purchases.

Fisher, C. E., Chin, L., & Klitzman, R. (2010) This article brings out the importance of using bright, coloured, clear high resolution images which elicit false memory creation in the minds of consumers. So when the viewers view the advertisement, good quality ads which bring out the structure of the objects can bring out positive responses towards the ad. Texture, scent and other sensual aspects will help make the viewers 'mouth water' and cause them to actually sample the product. The sensory experience will remain in the mind of the viewer.

The subjects were surveyed to ascertain their attitudes toward the product and how confident they were about their views and opinions. The members of the group that viewed the more clearer ads reported that they had tried the product as the group that actually used the samples. The members that saw the low imagery ads reported they had tried the product, and had weaker, less favorable views about the product. Therefore we can see the actual difference presented between using high and low resolution imagery. Therefore, spending more money and effort on high quality, clear and high resolution pictures will help create a virtual experience for the product and drive purchases.

### Research gaps

The research studies the current responses and consumer psychology with the current technological advancements but fails to research on new advancements and better mechanisms to detect consumer preferences. The research can be used to find ways by which researchers can make

other neuro science methods more effective.

The reasons for people to take particular decisions are subjective and vary from time to time and from people to people, so there has to be research bridging this aspect and relevant outcomes from a neuroscience perspective. Whatever maybe, everybody is different and prefers different things. You may not be able to cater to everybody with your product or service through your ads or marketing. The upshot is the people want information but they want it basic and served simply. Building virtual environments in a laboratory is an expensive process and observing consumers and their behaviors is a very time consuming process. Taking just the sample of 10-15 won't help. It has to be done on a large scale.

### 3. ESEARCH METHODOLOGY

#### 3.1 Research questions

Does neuromarketing affect marketing campaigns?

Do customers get influenced by the perceptions and in their brains, to make a purchase decision?

Is there any scope for the growth and future of Neuromarketing in the field of advertising and marketing?

Is there a relationship between Neuromarketing and purchase decision?

#### 3.2 Objectives of the study

1. To interpret the relationship with consumers perceptions towards the marketing efforts of the firm
2. To examine the impact of print and digital advertisements and brand image
3. To ascertain the level of retention and attention of marketing campaigns
4. To examine the impact of jingles and placement of objects on consumer perceptions

#### 3.3 Research Hypothesis

- 1) H0: There is no significant difference in consumer perceptions with respect to the advertisements H1: There is significant difference in consumer perceptions with respect to the advertisements
- 2) H0: Neuromarketing techniques have no impact on brand image  
H1: Neuromarketing techniques have significant impact on brand image
- 3) H0: Neuromarketing techniques and emotional responses are not closely related H1: Neuromarketing techniques and emotional responses are closely related
- 4) H0: There is no significant relationship between neuromarketing techniques used and attention and retention of advertisements  
H1: There is a significant relationship between neuromarketing techniques used and attention and retention of advertisements
- 5) H0: Neuromarketing techniques do not have any impact on consumer perceptions H1: H0: Neuromarketing techniques have significant impact on consumer perceptions
- 6) H0: Jingles used in advertisements does not have any impact on consumer retention H1: Jingles used in advertisements does not have any impact on consumer retention
- 7) H0: Placement of graphics, words and figures does not have any impact on consumer perceptions. H1: Placement of graphics, words and figures has significant impact on consumer perceptions.

#### 3.4 Scope of study

Firms will be able to understand how their ads and marketing efforts can be made more effective. It will help them ascertain the key points and techniques that they can use to capture and grab consumers attention. Neuromarketing uses eye tracking and heat mapping to ascertain the exact placement and positioning of graphics, figures, text which would grab consumers attention at the first glance and help engage them for atleast 10 seconds and helps move their eyes across the ad. This helps them read the advertisement and absorb the information. After the advertisement leaves a positive impact in the minds of consumers the brand image is increased and can be retained in their minds for a longer period of time. This helps create a positive consumer experience and helps increase sales.

#### 3.5 Limitations

The study focuses on highly technological and high cost equipment that may not have much scope due to the lack of affordability. Every person may differ on their sensory reactions and thus no solid result can be obtained the field is very subjective. The data is also subject to variations because of subjectivity of opinions between different consumers. Thus it might be hard to quantify data and provide absolute results.

#### 3.6 Conceptual Definitions:

**Neuromarketing:** Neuromarketing is a new field of marketing which uses medical technologies such as functional Magnetic Resonance Imaging (fMRI) to study the brain's responses to marketing stimuli. Researchers use the fMRI to measure changes in activity in parts of the brain and to learn why consumers make the decisions they do, and what part of the brain is telling them to do it. Dooley, R. (2010).

**3.7 Operational Definitions :**

Neuromarketing: Neuromarketing is a set of techniques used for creating advertisements that in the most effective manner to target and hit the right parts of a consumers brain in order to increase retention and memory of the advertisement. It involves techniques like eye tracking, heat mapping, placement and positioning of objects which will help control consumer perceptions.

**3.8 Sampling Techniques**

Target: Consumers across age groups and gender Sample Size: 150 respondents

Data sampling techniques: Convenience sampling

Data collection: The data will be collected from primary sources through questionnaires and surveys to the public.

**3.9 Data collection methods**

Data Collection Tool: A structured questionnaire was constructed using close ended questions in order to collect data.

Scale of measurement: Likert Scale (1 representing strongly disagree and 5 representing strongly agree) and nominal scale was used to measure variables.

**3.10 Statistical Tool for analysis**

Tools used: Correlation to find out if there is any significant relationship between any two variables. Regression is used to find out the impact on one variable on the other.

Wilcox is used to find significant difference between two variables for which we do not have normal data.

**4 ANALYSIS & INTERPRETATION**

1) H0: There is no significant difference in consumer perceptions with respect to the treatment of advertisements

H1: There is significant difference in consumer perceptions with respect to the treatment of advertisements

**NPar Tests**

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Advertisement 1 - with NMT	167	3.73	1.089	1	5
Advertisement 2 - without NMT	167	2.98	1.056	1	5

**Wilcoxon Signed Ranks Test**

Ranks				
		N	Mean Rank	Sum of Ranks
Advertisement 2 - without NMT - Advertisement 1 - with NMT	Negative Ranks	97 <sup>a</sup>	60.90	5907.00
	Positive Ranks	21 <sup>b</sup>	53.05	1114.00
	Ties	49 <sup>c</sup>		
	Total	167		

a. Advertisement 2 - without NMT < Advertisement 1 - with NMT

b. Advertisement 2 - without NMT > Advertisement 1 - with NMT

c. Advertisement 2 - without NMT = Advertisement 1 - with NMT

**Test Statistics<sup>a</sup>**

	Advertisement 2 - without NMT - Advertisement 1 - with NMT
Z	-6.615 <sup>b</sup>
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test

The significance value i.e  $p=0.000$  which is less than alpha value i.e  $0.05$  that signifies that data is significant. When comparing the mean value between advertisement with neuro-marketing technique (3.73) and advertisement without neuro marketing technique (2.98), shows that those adds which clearly projected with colorful image tend to be more attractive to the audience when compared to those ads which are vague and less colorful. Here the null hypothesis is rejected and alternative hypothesis is accepted. There is significant difference in consumer perceptions with respect to the treatment of advertisements

- 2. **H0: Neuromarketing techniques have no impact on brand image**  
**H1: Neuromarketing techniques have significant impact on brand image**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.051 <sup>a</sup>	.003	-.004	.879

a. Predictors: (Constant), Neuromarketing utility

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.325	1	.325	.420	.518 <sup>b</sup>
	Residual	126.075	163	.773		
	Total	126.400	164			

a. Dependent Variable: Consumer perceptions  
 b. Predictors: (Constant), Neuromarketing utility

The results shows  $F(N-2)=0.420$ ,  $p=0.518$  which is more than the significant value= $0.05$ , indicates that the model is not significant. Therefore we accept our null hypothesis and reject the alternative hypothesis. Neuromarketing techniques have no impact on brand image.

- 3. **H0: Neuromarketing techniques and emotional responses are not closely related**  
**H1: Neuromarketing techniques and emotional responses are closely related**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.142 <sup>a</sup>	.020	.014	.88010

a. Predictors: (Constant), Neuromarketing techniques used

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.620	1	2.620	3.383	.068 <sup>b</sup>
	Residual	127.805	165	.775		
	Total	130.425	166			

a. Dependent Variable: Emotional response  
 b. Predictors: (Constant), Neuromarketing techniques used

The results shows  $F(N-2)=3.383$ ,  $p=0.068$  which is more than the significant value= $0.05$ , indicates that the model is not significant. Therefore we accept our null hypothesis and reject the alternative hypothesis. Emotional responses are not closely related to neuromarketing techniques.

**4.H0: There is no significant relationship between neuromarketing techniques used and attention and retention of advertisements**

**H1: There is a significant relationship between neuromarketing techniques used and attention and retention of advertisements**

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.374 <sup>a</sup>	.140	.135	.874

a. Predictors: (Constant), Neuromarketing techniques used

### ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.505	1	20.505	26.850	.000 <sup>b</sup>
	Residual	126.010	165	.764		
	Total	146.515	166			

a. Dependent Variable: Memory and Retention

b. Predictors: (Constant), Neuromarketing techniques used

The R square value=0.140 and adjusted R square= 0.135, which indicates that 14% of the variability is explained by the model i.e. 14% of the total variability in the dependent variable (memory and retention) is explained by the independent variable (neuromarketing techniques used). Neuromarketing techniques has a predictive ability to memory and retention.

The results shows  $F(N-2) = 26.85$ ,  $p=0.000$  which is less than the significant value =0.05, indicates that the model is significant. The null hypothesis is rejected and alternative is being accepted. Therefore there is a significant relationship between neuromarketing techniques used and attention and retention of advertisements.

**5. H0: Neuromarketing techniques do not have any impact on consumer perceptions H1: Neuromarketing techniques have significant impact on consumer perceptions**

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.046 <sup>a</sup>	.002	-.004	.961

a. Predictors: (Constant), Neuromarketing utility

### ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.316	1	.316	.342	.559 <sup>b</sup>
	Residual	150.496	163	.923		
	Total	150.812	164			

a. Dependent Variable: Controlling consumer perceptions

b. Predictors: (Constant), Neuromarketing utility

The results shows  $F(N-2)=0.342$ ,  $p=0.559$  which is more than the significant value=0.05, indicates that the model is not significant. Therefore we accept our null hypothesis and reject the alternative hypothesis. Neuromarketing techniques do not have any impact on consumer perceptions

6. **H0: Jingles used in advertisements does not have any impact on consumer retention H1: Jingles used in advertisements has an impact on consumer retention**

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.288	1	5.288	7.503	.007 <sup>b</sup>
	Residual	116.281	165	.705		
	Total	121.569	166			

a. Dependent Variable: Jingle retention

b. Predictors: (Constant), Airtel Jingle

#### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.209 <sup>a</sup>	.043	.038	.839

a. Predictors: (Constant), Airtel Jingle

The R square value=0.043 and adjusted R square= 0.038, which indicates that 4% of the variability is explained by the model i.e. 4% of the total variability in the dependent variable Jingle retention is explained by the independent variable consumer perception. The results shows F (N-2) = 7.503, p=0.007 which is less than the significant value =0.05, indicates that the model is significant. The null hypothesis is rejected and alternative is being accepted. Therefore Jingles used in advertisements have an impact on consumer retention.

7. **H0: Placement of graphics, words and figures does not have any impact on consumer perceptions. H1: Placement of graphics, words and figures has significant impact on consumer perceptions.**

#### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.282 <sup>a</sup>	.079	.074	.923

a. Predictors: (Constant), Position of objects

#### ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.137	1	12.137	14.234	.000 <sup>b</sup>
	Residual	140.690	165	.853		
	Total	152.826	166			

a. Dependent Variable: Controlling consumer perceptions

b. Predictors: (Constant), Position of objects

The R square value=0.282 and adjusted R square= 0.074, which indicates that 28% of the variability is explained by the model i.e. 28% of the total variability in the dependent variable (controlling consumer perceptions) is explained by the independent variable (neuromarketing techniques used). The results shows F (N-2) = 14.234, p=0.000 which is less than the significant value =0.05, indicates that the model is significant. The null hypothesis is rejected and alternative is being accepted. Therefore **Placement of graphics, words and figures has significant impact on consumer perceptions.**

### 3 FINDINGS

1. While comparing the mean value between the advert using neuro-marketing techniques (3.73) and the advertisement without neuro marketing techniques (2.98), shows that those advertisements which properly projected with colorful images tend to be more lucrative and attractive to the audience when compared to those ads which are vague and less colorful. (Daugherty, T., & Hoffman, E. (2016)

2. While comparing the mean value between consumer perceptions (4.20) and using the neuromarketing techniques to build brand image (2.32) we can see that there is no impact of using these techniques on brand image. This tells us that we can use neuromarketing to increase the attention and retention of ads which may or may not help build brand image. Building brand image is the far sought goal for effectiveness of marketing which does not have a direct impact.
3. While comparing the mean value between emotional responses (2.30) and neuromarketing techniques used (12.87) we see that emotional responses have no relation to neuromarketing techniques used. Subtle stimuli like emotions and sentiments can be targeted to increase the impact of the ad but do not have any connection to neuromarketing techniques, they can be used to identify the placement and the use of words, graphics and other objects of the emotional factors but do not influence emotional responses directly. (Philo, G. (n.d.))
4. While comparing the mean value between memory and retention (3.95) and neuromarketing techniques used (12.87) we can see that there is a significant relationship between neuromarketing techniques used and attention and retention of advertisements. This means that using the techniques can help grab attention of audience and help retain these ads in the consumers memory, therefore building brand awareness.
5. While comparing the mean between neuromarketing techniques (2.32) and consumer perceptions (2.08) we can see that the techniques have no impact on consumer perceptions. This means that the consumers are not able to perceive the techniques used as they are more subtle and underlying so they may not be able to understand them clearly.
6. While comparing the mean values between jingle usage (1.53) and retention (1.24) we can see that jingles can be used to increase retention of the advertisements in consumers minds. Jingles are obvious stimuli that is well known and liked by the Indian masses and usage of these jingles will help retain the ads in the consumers minds better.
7. While comparing the mean values between consumer perceptions (2.08) and placement of objects (1.77) we can see that placement of words, figures and text has an impact on consumer perceptions. The right placement will help garner attention faster and will allow the consumer to read and understand the ad better.

#### CONCLUSION

Through the research findings we are able to conclude that on an average neuromarketing is not suitable for the Indian market. Some aspects like jingles, placement of words, figures and graphics are shown to have a positive and significant impact on consumer perceptions. Whereas factors like colour scheme, emotional responses, and use of certain neuromarketing techniques do not have a significant impact on consumer perceptions. Therefore we can understand that the findings are split into two. This tells us that the Indian market understands the more obvious stimuli that are common and widely used like sound, jingles and headlines. But more subtle techniques like emotional responses and witty statements are not easily perceived. Thus neuromarketing does have scope for growth in the future after educating the audience about newer techniques.

#### 4 RECOMMENDATIONS

Since we find that certain stimuli are easily perceived, Indian marketers should focus more on these stimuli and use it to grab attention and help retain the ads in consumers memories. Use of jingles could help the ad linger in their memory and make the ad more attractive. Using colourful bright images and using catchy taglines helps people like the advertisement more as compared to ads that do not have these factors. Use of more subtle stimuli can be used but should be made easily understandable to the Indian masses. These techniques on a whole will help firms raise brand awareness and help increase attention and retention of advertisements.

#### 8. FUTURE SCOPE OF THE STUDY:

This study can be further explored in the area of sensory marketing where sensations of touch, sound, smell, sight are studied to ascertain consumer perceptions.

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