

# Consumer's Awareness Towards Emerging Integration Of Neuromarketing In Marketing Research With Particular Reference To India

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## ABSTRACT

With the rising usage of neuroscience techniques in marketing research by the name of neuromarketing; which conducts customer brain research *to identify preferences or constraints for fulfilling the needs of customers*. Traditional market researches cannot make clear completely why consumers buy? What they buy? Or how they respond to specific marketing stimuli. While Neuromarketing research tools have capacity to study the brain of consumers and may provide answer of many unanswered questions related with consumers. The Purpose of this paper is to identify the Indian Consumer's awareness towards the concept of Neuromarketing as well as the applications of neuroscientific techniques in marketing research. Finally this paper analyses with the help EFA & CFA to conclude about the Indian Customers Awareness towards Neuromarketing.

**Key Words:** Consumer Awareness, Neuromarketing, Neuroscientific techniques and Neuroscientific Techniques

## 1. INTRODUCTION

It has been reviewed from previous research studies that with the application of neuroscientific techniques marketers could actually look into, and correctly gets, consumer's thoughts without a social filter, and neuromarketing has the capacity to improve incorrect market research data and help in developing and promoting a more efficiently marketed product or service. Generally existing market research strategies are expensive and may collect erroneous data of what consumers want because at the time of reporting responses respondent can feel undue influenced by social bias, what they feel the marketer wants to hear, or unsure of how they truly feel and ultimately lead the marketer off track. Marketers hope that neuromarketing will be an efficient upgrade version for market research.

Neuromarketing is simply a process of applying neuroscientific technologies to view which areas of the consumer's brain are being activated by given marketing stimuli. The various neuroscientific methods available in this marketing research like body language, facial coding, empathic design, eye tracking, fMRI, EEG, MEG, galvanic skin conductance and heart rate, etc. These neuroscientific techniques are applied for getting an inside view into the brain of consumer. The main forcing reason for making use of these more established methods is that the consumer responses can be captured without conscious manipulation by respondents, while at the same time being able to record the unconscious processes taking place in the human body. Therefore, neuromarketing measures can be a supplement to the self-report measures.

This paper will measure consumer's awareness towards neuromarketing and its application with reference to India with the help of data collected through survey on likert scale based questionnaire and later on by statistical analysis with R package.

## 2. LITERATURE REVIEW

In this digital era marketers have adopted an integrative marketing research field as neuromarketing, that have been emerged for better understanding and characterizing the neural correlation behind consumer behavior and the processes underlying choice.

Morin (2011) observed that neuromarketing has potential to investigate 4P's of marketing- product, price, promotion and place- and can contribute extensively to marketer's understanding about effectively marketing their products or services.

Christophe (2011) explained neuromarketing is an emerging field which bridges the consumer purchase decision with neuroscience. Neuromarketing is advancing rapid believability and acceptance among advertising professionals.

Eser et al. (2011) indicated that neuromarketing uses state-of-the-art resources in brain scanning to understand the consumer buying process.

Martínez (2012), author of 'The Consumer Mind', consumers' minds can be differentiated within four categories; what they think, what they say, what they do and what they feel. Martínez emphasizes that a critical point of traditional marketing research is that “consumers contradict themselves, saying what they want, but doing what they feel”.

Suomala et al., (2012) explained neuroimaging is a suitable method for investigating customer perceptions in situations where pleasure and displeasure can be measured at each step of the customer engagement.

Genco et al. (2013) found that during the past decade, methods and insights from the field of neuroscience have received great interest and attention in the field of marketing and consumer research and a hybrid has emerged from these two: neuromarketing.

Colaferro & Crescitelli, (2014) have concluded as Neuromarketing brings to endure a wider range of knowledge, aggregating to behavioral information the hidden motivations in the unconscious mind that guide individuals in their process of choosing.

Marichamy & Sathiyavathi (2014) experienced traditional research tool for testing and predicting the behavior of consumer have generally failed because they depend on consumers' willingness and competency to describe how they feel when they are exposed to an advertisement.

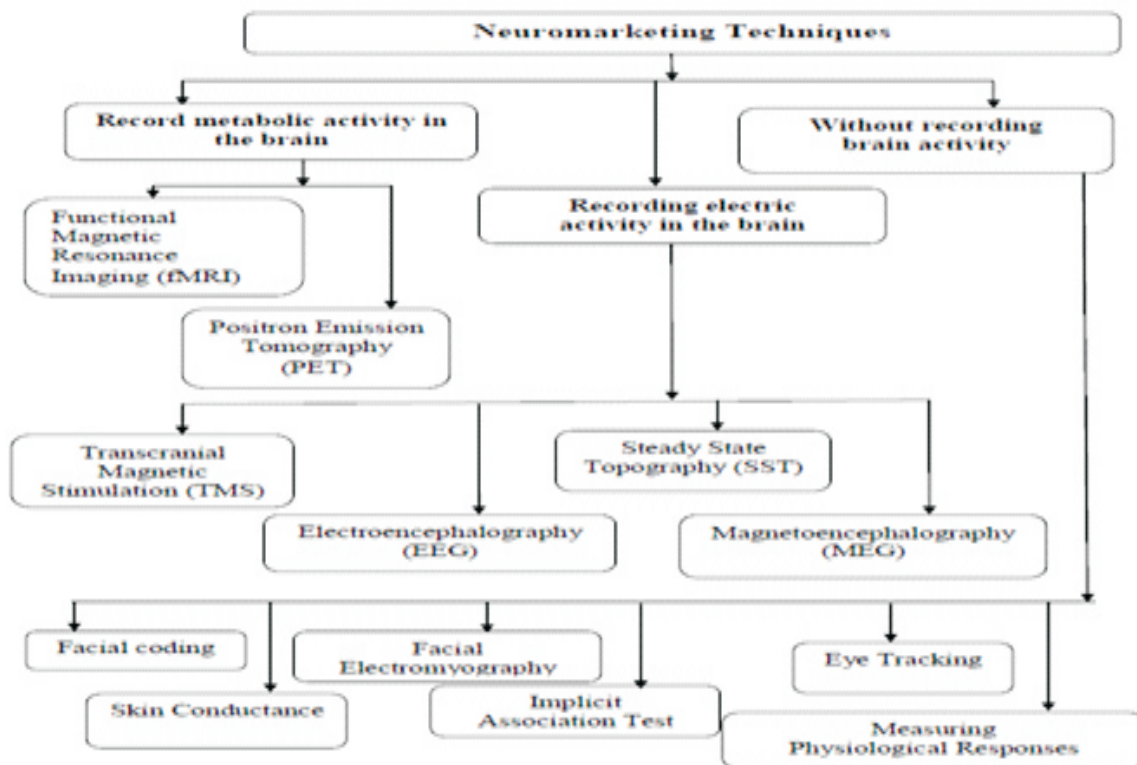
Ulman, Y.I., Cakar, T. & Yildiz, G. (2015) argued that neuromarketing technologies should be suitably discussed in public spheres and applied under the ethical principles and lawful provisions designed in line with human rights and human dignity.

Oliver (2016) suggests that consumer brain activity is universal, although human cultures, education levels and religions may be different. It actually implies that neuromarketing helps in creating global marketing campaign; any research you do in one market or country can be applied in another market or country.

Hsu Ming (2017) proposes in brain-based approaches that may enable managers to directly probe customers' underlying thoughts, feelings, and intentions.

Neuromarketing research techniques have been divided by Zurawicki (2010), Kenning et al. (2005) and Calvert et al. (2004) majorly into three categories on the basis of metabolic activity, electric activity in the brain. Classification of neuromarketing techniques is given in Fig.1.

Fig.2.1 Types of Neuromarketing Techniques



### 3. OBJECTIVE OF RESEARCH

- i. To measure Indian consumer's awareness towards neuromarketing.
- ii. To identify Indian consumer's awareness about emerging integration of neuroscientific tools in marketing research with particular reference to India.

### 4. METHODOLOGY

This research measures consumer awareness towards neuromarketing in India through the implementation of a quantitative survey administered on consumer's awareness towards emerging integration of neuromarketing techniques in market research studies in India.

#### 4.1. Research Design

Descriptive & Exploratory research designs are used.

#### 4.2. Sources of Data

Primary and secondary sources of data are used.

#### 4.3. Research Instrument

Questionnaire (Likert Scale questionnaire)

#### 4.4. Sample Size

The proposed study is based on primary as well as secondary data. For the purpose of primary data collection for Sample Size determination; As per Hair et al. (2006), every Likert scale item must have 10 responses (10:1 rule).

The total number of Likert scale items in the study was 6, so the minimum sample size should be 60. However, in order to be on the safe side, sample of 100 has been taken.

#### 4.5. Tools & Techniques used for Data Analysis

It includes the various statistical tools & techniques. Statistical tools help in analyzing the data and the data analysis is helpful in drawing conclusions.

4.6. For analysis the data of this research **Factor analysis (Exploratory Factor Analysis and Confirmatory Factor Analysis)** has been used.

### 5. Analysis and Interpretation

Data analysis is considered to be important step and heart of the research in research work. Data analysis entails that the analyst break down data into constituent parts to obtain answers to research questions. Here researcher has divide data analysis into three sections:

#### Section-A

*It is* based on the various issues related to Validation of the Survey Instrument.

#### Section-B

It refers to check the dimensional validity and the underlying factor structure exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed.

#### Section C (Item Wise Descriptive Statistics & Scale Wise Descriptive Statistics)

It refers to check the scale wise descriptive statistics of questionnaire.

#### 5.1 Section A

The reliability of the constructs is checked through Cronbach's Alpha. Field (2009) recommends a cut-off value of  $\alpha \geq 0.7$  for a construct to be reliable. As per table 5.1, all the constructs have Cronbach's Alpha value above the 0.7 threshold.

**Table 5.1 Average Variance Extracted and Reliability**

Factor	Average Variance Extracted (AVE)	Cronbach's Alpha
Awareness about Neuromarketing	0.983028	0.9114

#### 5.2 Section B

In order to measure the various identified dimensions associated with awareness of neuromarketing, a self-administered survey was conducted. A total of 100 valid responses were obtained from the survey process on the identified 6 items. The responses on these 6 items were measures on a 5 point Likert scale.

In order to check the dimensional validity and the underlying factor structure, exploratory factor analysis (EFA) was performed. The exploratory factor analysis (EFA) was conducted using the psych (Revelle, 2017) package in R. Table 5.2 summaries the preliminary results of the exploratory factor analysis. The KMO (Kaiser-Meyer-Olkin factor adequacy) estimated for the data collected is 0.93. Kaiser (1974) recommends a bare minimum value of 0.5 of KMO for factor analysis to work. However, values greater than 0.9 are considered superb (Field, 2009). Table 5.1 also summarizes the factor extracted. Factor extracted have Eigen Values (SS loadings) greater than 1, which is in accordance with the criteria mention by Field (2009) for factors to be considered significant.



**Table 5.2 Factor Analysis Summary**

Kaiser-Meyer-Olkin factor adequacy: 0.93	
<b>ML1</b>	
SS loadings	4.265
Proportion Var	0.122

Table 5.3 summarizes the factor structure and loadings. Since the sample size of the current study is 100, factor loadings greater than 0.30, were considered significant. All the items in the questionnaire scored factor loading above this threshold, therefore, no item was deleted after the EFA.

**Table 5.3 Factor Loadings (varimax rotated factor matrix)**

	<b>ML1</b>
a1	0.565
a2	0.602
a3	0.793
a4	0.852
a5	0.817
a6	0.711

The factor solution obtained from the EFA was also subjected to confirmatory factor analysis (CFA). CFA allows the testing of the hypothesis that a relationship between observed variables and their underlying latent constructs exists. CFA was conducted using the lavaan (Rosseel, 2012) package in R. The values are shown in Table. 5.4, the value of the fit indexes CFI and RMSEA are 0.950 and 0.079. The acceptable value for CFI for a CFA model should be greater than 0.9 and for RMSEA, this value should be less than 0.1 (Bryne, 2012). Since both the fit indexes have values within the specified limits, therefore, it can be concluded the observed data fits the factor structure.

**Table 5.4 CFA Results**

Comparative Fit Index (CFI):		0.950		
Root Mean Square Error of Approximation (RMSEA):		0.079		
<b>Latent Variables:</b>				
	<b>Estimate</b>	<b>Std.Err</b>	<b>z-value</b>	<b>P(&gt; z )</b>
<b>Awareness about Neuromarketing</b>				
a1	0.799	0.055	14.614	0.000
a2	0.880	0.055	16.001	0.000
a3	1.024	0.050	20.595	0.000
a4	1.102	0.049	22.472	0.000
a5	1.090	0.050	21.632	0.000
a6	1.017	0.056	18.110	0.000

### 5.3 Section C (Item Wise Descriptive Statistics & Scale Wise Descriptive Statistics)

It refers to check the scale wise descriptive statistics of questionnaire.

**Table 5.5 Item Wise Descriptive Statistics**

Item	Mean	Sd
<b>Smart Buyer's Awareness about Neuromarketing</b>		
a1	3.2225	1.2048331
a2	3.3175	1.2391661
a3	3.0300	1.2135823
a4	2.9800	1.2383189
a5	2.9125	1.2525038
a6	3.1100	1.3123283

**5.3.1** The first item in the awareness about neuro marketing scale (a1) is titled "I know about the term Neuromarketing." the mean score on this item is 3.2225 (sd: 1.20), this signifies that majority of the respondents of the sample neither agree nor disagree with this statement.

**5.3.2** The second item in the awareness about neuro marketing scale (a2) is titled "I am aware that Neuromarketing is a market research tool to *understand consumer behaviour without asking question.*" the mean score on this item is 3.3175 (sd: 1.24), this signifies that majority of the respondents of the sample neither agree nor disagree with this statement.

**5.3.3** The third item in the awareness about neuro marketing scale (a3) is titled "I am aware about the neuromarketing techniques such as fMRI, PET, EEG, Eye Tracking & Skin Conductance etc." the mean score on this item is 3.0300 (sd: 1.21), this signifies that majority of the respondents of the sample neither agree nor disagree with this statement.

**5.3.4** The fourth item in the awareness about neuro marketing scale (a4) is titled "I am aware that marketer uses neuromarketing tools like Functional Magnetic Resonance Imaging (fMRI) & Positron emission tomography (PET) to record metabolic activity in the brain of customers." the mean score on this item is 2.9800 (sd: 1.23), this signifies that majority of the respondents of the sample neither agree nor disagree with this statement.

**5.3.5** The fifth item in the awareness about neuro marketing scale (a5) is titled "I am aware that marketer uses neuromarketing tools like Transcranial magnetic stimulation (TMS), Steady State Topography (SST), Electroencephalography (EEG) and Magnetoencephalography (MEG) for recording electric activity in the brain of customers." the mean score on this item is 2.9125 (sd: 1.25), this signifies that majority of the respondents of the sample neither agree nor disagree with this statement.

**5.3.6** The sixth item in the awareness about neuro marketing scale (a6) is titled "I am aware that marketer uses neuromarketing tools like Facial coding, Implicit association test, Skin Conductance, Eye Tracking, Facial Electromyography and Measuring Physiological Responses to record the responses of customers." the mean score on this item is 3.1100 (sd: 1.31), this signifies that majority of the respondents of the sample neither agree nor disagree with this statement.

## 6. Findings and Conclusions

This study was conducted to consumer's awareness towards emerging integration of neuromarketing tools in marketing research with particular reference to India. This study was done with the help of review of secondary data and analysis of primary data. This study evaluated the awareness of Indian buyer towards neuromarketing.

On the basis of responses received from the respondents and the data analysis, following are the major findings of the study:

- The survey conducted for this research have the proportion of males and females in the sample is roughly equal (males 55% and females 45%).
- Maximum respondents (64%) are representing the age group 18-30 years i.e. 18 -30 years age group is the most prominent age group in the sample , followed by 22% from the age group 31-40 years, 12 % from the age-groups 41-60 years and only 1% from the below above 60years age group.
- Most of the respondents in the sample were employed as service professionals (43%), followed by 34% as students, 16% respondents are businessmen/ self employed, 5% as house wife and only 2% as unemployed.
- Majority of the respondents (52%) are married, however, single status is the second most prominent (47%).
- The KMO (Kaiser-Meyer-Olkin factor adequacy) estimated for the data collected is 0.93. Kaiser (1974) recommends a bare minimum value of 0.5 of KMO for factor analysis to work. However, values greater than 0.9 are considered superb.
- Barlette's Test of Spercity's value reported for the data collected is Chi-Square: 3150.96, df= 595, p=.000. A significant Barlette's Test ( $p < .05$ ) indicates that the correlation matrix is not an identity matrix and items have some correlation between them in order for factor analysis to work.
- As sample size of the current study is 400, factor loadings greater than 0.30, were considered significant. All the items in the questionnaire scored factor loading above this threshold, therefore, no item was deleted after the EFA.
- The factor ML1 (SS loading 4.265) captures the respondents' general awareness about neuro-marketing.
- The value of the fit indexes CFI and RMSEA are 0.950 and 0.079. The acceptable value for CFI for a CFA model should be greater than 0.9 and for RMSEA, this value should be less than 0.1 (Bryne, 2012). Since both the fit indexes have values within the specified limits, therefore, it can be concluded the observed data fits the factor structure.
- All the constructs have Cronbach's Alpha value above the 0.7 threshold.
- Respondents are not completely ignorant about neuromarketing as well as they do not have complete knowledge about this concept.
- Respondents are not completely ignorant about meaning of neuromarketing as well as they do not have complete knowledge about this concept.

- Respondents are not completely ignorant neuromarketing techniques as well as they do not have complete knowledge about this concept.
- Respondents are not completely ignorant neuromarketing techniques usage for recording metabolic activity in the brain of customers as well as they do not have complete knowledge about this concept.
- Respondents are not completely ignorant neuromarketing techniques usage for recording electric activity in the brain of customers as well as they do not have complete knowledge about this concept.
- Respondents are not completely ignorant neuromarketing techniques usage for measuring physiological responses to record the responses of customers as well as they do not have complete knowledge about this concept.

As per as conclusions of this research are concerned it has been found that in India customer are a little bit aware about the term neuromarketing as well as they are also not totally ignorant about the emerging integration of neuroscientific techniques in market research and by these conclusions it is also understood that if customers get awareness about the benefits of neuroscientific technique based market research, they will be more interested to participate in marketing research and marketer will get a chance to identify wishes, wants of customer's without conscious manipulation.

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