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A Publication of
Department of Marketing,
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Editor's message

I feel really pleased and honored and with great pleasure to launch this new journal. I welcome you to the Journal of Contemporary Marketing (JCM). The JCM is a peer reviewed, open access, online and print journal for the enhancement of research in different areas of Marketing. The Journal aims at publishing highly readable and valuable researched papers.

There are a lot of challenges which the growing economies face in the realms of basic necessities in life. Marketing knowledge can play a very distinct role in bringing about this change. It is very important that different stakeholders unite and collaborate on issues which confront the society. One of the key objectives of research should be its usability and application. This journal attempts to document and spark a debate on the research focused on marketing development in context of emerging geographies. The sectors could range from education, energy, environment, health care, transport, shelter, manufacturing, logistics, supply chain and service areas. The key focus would however be the emerging sectors and research which discuss application and usability in societal or consumer context whether individual or industrial.

The first issue has been very carefully put together covering a range of issues in the domain of marketing development, marketing and competency planning and development, finance as well as new media development. The contributions have come in not only from academics but also from very renowned institutions and global industry groups as well.

We are more than happy to receive contributions for our next issue from academics, professionals, practitioners and postgraduate students to ensure the consistency and the success of the Journal. We welcome comments and suggestions that would advance the objectives of the Journal.

As the Editor of the Journal, I take this opportunity to express my sincere gratitude to authors who have chosen the JCM to disseminate their research. Further, I would like to thank members of editorial advisory board, members of editorial board, my secretary Mrs. S. B. Obenge and other supporting staff at the Department of Marketing, Rivers State University of Science and Technology.

Dr. Bright C. Opara,
Editor
Department of Marketing,
Faculty of Management Sciences,
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Editorial criteria

The aim of this journal is to publish articles that enrich the practice of marketing development particularly in Sub-Sahara Africa while simultaneously making significant contributions to the advancement of the discipline. Preference is given to manuscripts that relate across marketing development in business, service industries, nations and economies. All articles appearing in the journal are double-blind refereed

It should be noted that research is not the only basis for an acceptable article. Case analyses, creative concepts and applications, book reviews, industry reviews, commentaries, and other thought-provoking manuscripts are encouraged. Particularly welcome are future-oriented manuscripts that offer marketers visions of development in the twenty-first century and practical road maps for getting there. Also encouraged are manuscripts that address interdisciplinary topics or approach "traditional" topics from an interdisciplinary perspective. Authors with papers intended for publication are expected to conform to the following guideline:

- 1 should be submitted electronically to the editor's email address nwokah.gladson@ust.edu.ng
- 2 must have not been published or under consideration with any other Journal.
- 3 must have a structured abstract of not more than 200 words. Abstract should define the purpose of the study, approach/methodology, findings, implications and originality.
- 4 should have at least four keywords
- 5 not exceed 3000 words or 25 pages of double line spacing on A-4 paper. All margins should be 1 inch or 2.5cm
- 6 words cited in the paper should follow the Harvard system of author's last name and year, and to be mentioned in appropriate places, for instance Josh (2009) for summarized sources, and Josh (2009, P.2) for direct quotation. At the end of the paper, the list of authors
- 7 all Tables and figures should be placed at the appropriate and not as index

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Neuromarketing: An emerging Scientific Tool for Marketing Decisions

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Abstract

Neuromarketing is an emerging revolutionary marketing research concept which provides marketers with richer understanding of customers' perception, attitude and behavior. It is actually a sub-field of neuroscience that aids marketing related decisions via the usage brain research techniques. This work reviews extant literature on the meaning of neuromarketing concept, importance of neuromarketing, neuromarketing techniques and application of neuromarketing to the traditional 4Ps of marketing as well as limitations of neuromarketing. The paper was fundamentally based on documentary sources through review of text books, journal and seminar papers, conference papers and dissertations. It was concluded that neuromarketing is an emerging marketing tool that can be used to measure neural activities which occurs during relevant marketing-related consumer behaviors such as attention, memory, affect, and choice. It is also a significant instrument for detecting hidden information about target customers. The paper suggested that marketing managers across different industries should try to explore and exploit the opportunities offer by neuromarketing techniques to improve their decision making in the areas of marketing efforts.

Introduction

Over the years, marketing managers have been seeking for ways to study and understand the exact thinking patterns of consumers about their firms' marketing programmes and strategies which are devoid of using the traditional methods of asking consumers what their thoughts were through surveys and focus groups. These traditional methods of measuring consumer thinking and perception are bedeviled with some obvious limitations such as human bias, errors, inattention, inability of individuals to self-assess, etc. For instance, Hsu (n.d.) cautioned that the

validity of self-report measures can be severely compromised by a number of well-known shortcomings such as respondents' imperfect memory as well as changes in respondents' behavior as result of questions being asked among others. Thus, neuromarketing technique is recommended by a number of scholars such as Murphy et al., (2008), Hubert and Kenning, (2008), Eser et al., (2011), Page (2012), and Fortunato et al (2014) as an important and revolutionary form of marketing research which provides access to richer and less biased marketing insights than other traditional research techniques, like surveys, focus groups and other qualitative researches.

Therefore, organisations that want to appropriately serve the needs of target consumers must keep track of those happenings in the market which continuously agitate the minds of consumers. The need to operate in compliance with the principles of marketing concept (i.e. development of products that will satisfy the need of consumers) made a number of marketing managers that desired success in today highly competitive business environment to seek an advanced methods for exploring the essential mental processes that consumers go through to make purchase decisions. This desire led to the adoption of the methods and insights used in the field of neuroscience by marketing researchers. Neuro-marketing research and neuroscience according to Kenning and Plassmann (2008) and Huettel et al. (2009) provide a seemingly promising objective perspective for doing this. Neuromarketing is a branch of the general field of neuroeconomics, which is an interdisciplinary field that combines economics, neuroscience and psychology, to study the functioning of the brain in decision-making situations (Kenning & Plassmann 2005; Kumar, 2015).

Neuromarketing techniques in the views of Genco, Pohlmann and Steidl (2012) are based on scientific principles about how humans really think and make decisions. This involves brain processes which our conscious minds aren't aware of. When these new techniques are combined with sound experimental designs and procedures, they provide insights into consumer decisions and actions that are invisible to traditional market research methodologies. It enables researchers to obtain information about human brain's response to marketing stimuli through the use of techniques and advancements in neuroscience (Renvoisé & Morin 2007) that are devoid of relying on subjective reports given by the participants (Hubert & Kenning 2008; Murphy, Illes, Reiner et al. 2008). This field when applied in marketing can help in brand positioning, hierarchy of effects, and brand loyalty (Perrachione and Perrachione 2008).

Literature Review

Meaning of Neuromarketing

There are several definitions of the neuromarketing as a concept in the literature but this study considered the most workable ones among them. Neuromarketing is the result of the merge of the marketing and neurology. It is a new branch of marketing research that investigates the emotional and neural responses of the marketing stimulants among the consumers (Heydari & Heydari, 2014). According to Kumar () neuromarketing is a new branch of marketing that makes use of technology to determine a consumer's internal subconscious reaction to products and brand names in order to plan effective marketing strategies. Genco et al. (2013) see neuromarketing as any marketing or market research activity which uses methods, techniques or insights from the field of neuroscience, while, Lee, Broderick and Chamberlain (2007) opine that

neuromarketing refers to the application of neuroimaging techniques to sell products, or to dazzle potential clients with snazzy imaging technology. Fisher, Chin, and Klitzman (2010), Hubert (2010), Ariely and Berns (2010), Dapkevičius and Melnikas (2011) and Gang, Lin, Qi, and Yan (2012) view neuromarketing as a sub-field of neuroeconomics and neurosciences which deals with problems relevant to marketing by making use of methods from brain research in managerial practice.

Importance of Neuromarketing

- a. **Detection of hidden information:** Application of neuromarketing makes possible for marketing researchers to detect hidden information about their target consumers. In fact, the major importance of neuromarketing stressed by many writers such as Hubert and Kenning (2008), Senior and Lee (2008) Tusche, Bode and Haynes (2010), Ariely and Berns (2010) and Krajnovic, Sikiric, and Jasic (2012) is the possibility of detecting hidden information. Lending to this position Wilson et al. (2008) pointed out that the use of neuromarketing does not only help buyers and marketing experts to understand each other better, but it also make marketers to better understand consumers' requirements in the market.
- b. **Determination of firms' marketing strategies:** The essence of applying neuromarketing is to determine appropriate strategy (ies) that will enable the firm to attain its stated goals and objectives. In this regard, Eser et al., (2011) observed that neuromarketing had been identified as a way of shaping companies' marketing strategies. For instance, Senior and Lee (2008), Fugate (2007) and Ohme and Matukin (2012) maintained that neuromarketing makes it possible to identify advertising elements that trigger positive feelings and it also helps to avoid elements that should not be present in the communication such as elements that cause consumer aversion to the products.
- c. **Improvement in marketing decisions:** Neuromarketing as a scientific research process enables marketers to come up reliable and valid research results about customers which can be used to make informed marketing decisions. Indeed, Lee et al. (2007) claim that neuromarketing has become a popular technology to establish the probability and non-probability of purchasing decisions in the market. Therefore, marketing decisions in the areas of product, price, place and promotion can be improved on through the adoption of neuromarketing.

Neuromarketing Techniques

According to Burgos-Campero and Vergas-Hernandez (2013) the collaboration between neuroscience and marketing has led to expansion of knowledge in marketing research areas such as measurement of relationship between the consumer and the product, the influence of advertising stimuli, the formation of a brand, unmet needs and business opportunities etc. Neuromarketing which is the product of this collaboration enables inside reflexes studies about advertising, packaging, brand association etc. Inside reflexes studies empower marketers to

determine what a person experiences during an advertisement (Postma, 2012). The expansion in knowledge in this area is possible through the use of neuromarketing techniques such as positron emission tomography (PET), functional magnetic resonance imaging (fMRI), electroencephalography (EEG), magnetoencephalography (MEG) and galvanic skin response (GSR) (Touhami et. al., 2011; Kolar, 2014; Dube, 2016;). In fact, Kolar (2014) illustrated how these neuromarketing techniques is applied using the Coca Cola experience in 2004 when an fMRI research team led by McClure (a brain researcher) discovered that there can be a difference in brain activation between Pepsi and Coke. This study actually found that while drinking the two different products in a blind test, no difference was measurable, but when a consumer knew which product he consumed, there was a measurable difference in brain activation. These neuromarketing techniques are briefly discussed below:

i. Electroencephalography (EEG)

Electroencephalography refers to an electrical reproduction of brain activity and the acronym for Electroencephalography is EEG (Postma, 2012). Madan (2010), Ariely and Berns (2010) and Morin (2012) observed that EEG makes use of various electrodes attached to the skull that recognize electronic signals which represent current brain activity (Postma, 2012; Morin, 2012; Ariely, & Berns, 2010; Madan, 2010). EEG measures electrical waves produced by the brain which allow researchers to track instinctual emotions such as anger, excitement, sorrow, and lust through fluctuations of activity. To use EEG, marketing researchers should put the electrodes attached to a helmet or cap on a person's head, and then present certain products or services from which the attractiveness in form of brain activity can ultimately be measured and recorded (Morin, 2011; Postma, 2012). The main merit of EEG is its high temporal resolution while its main demerit is the limited spatial resolution according to (Kenning & Linzmajer, 2011). EEG is usually employ to measure attention, engagement / boredom, excitement, emotional valence, cognition, memory encoding, recognition and approach / withdrawal. It is used when testing advertisements, new campaigns, movie trailers, identifying the key moments of an advertisement or video material, testing websites design and usability, and in-store experience (Bercea, n.d).

ii. (functional) Magnetic Resonance Imaging (fMRI)

The acronym fMRI stands for functional magnetic resonance imaging and it fundamentally refers to a tool which makes an anatomic representation of the brain by making use of magnets (Postma, 2012). fMRI involves using a powerful magnet to track the brain's blood flow as subjects respond to audio and visual cues. On his part, Dube (2016) opines that fMRI technique allows examiners to access a deep part of the brain known as the "pleasure center" and allow marketers to know how people are really responding to their marketing efforts. The application of this technique requires an MRI scanner that is used to measure the blood oxygen level of an individual and this measurement can give an indication of increased brain activity in certain regions (Ariely, & Berns, 2010). The magnetic field is able to recognize the blood oxygen content in the brain and if neural activity in a certain brain area is increasing, the oxygen-rich blood increases too because oxygen is required by the brain to work (Roth, 2013). Eser, Isin, and Tolon (2011) supported this position when they pointed out that fMRI displays the blood flow of oxygen-rich blood to different regions in the brain in order to explore human behavior.

The main merit of this method is that it recognizes the order of brain activities where there are several ongoing ones while its main demerit is that devices are relatively expensive and the

situation of the person being observed is usually unpleasant. fMRI is employed to measure memory encoding, sensory perception, valence of emotions, brand loyalty, brand preference and brand recall. According to Bercea (n.d) fMRI is mostly used when testing new products, new campaigns, developing advertisements, identifying the key moments of an advertisement or video material, packaging design, testing prices, repositioning a brand, predicting choices, identifying needs and celebrity endorsement.

iii .Magnetoencephalography (MEG)

MEG is equally an acronym of Magnetoencephalography and it is a technique that is sensitive to changes of the magnetic fields that are induced by electrical brain activity (Kenning & Plassmann, 2008). It is a similar non-invasive technique of investigating neural activity but unlike EEG method it allows a better spatial resolution compared to the EEG (Gatterer, 2012) and it also makes it possible to visualize activities in deeper brain regions (Kenning & Linzmayer, 2011). The main strength of MEG is its better spatial resolution, while, its main weakness is that it is expensive like the two earlier discussed techniques. MEG measures individual perception, attention and memory and it is applied when testing new products, advertisements, packaging design, sensory and identifying needs (Bercea, n.d).

iv. Positron Emission Tomography (PET)

PET is the abbreviation for Positron Emission Tomography which uses scan imaging test that helps to reveal how human tissues and organs are functioning. PET uses radioactive technique which placed X-ray around the head and sweeps the patient's body. The technique records radiation from the emission of positrons in the radioactive substance administered to the subject (the radioactive chemicals in blood) and this enables researchers to analyse patterns in the human brain which occur over longer periods of time (Gatterer, 2012). PET usually produces three dimensional pictures of activities in human bodies.

The main merits of this technique is that it is a valid and reliable measure for cognitive and affective responses and it easily detect changes in chemical composition or changes in the flow of fluids in the brain (Wang et al. 2008). Issues relating to technicality involve obtaining the radioactive materials and its short life are the major drawbacks of this technique. PET measures sensory perception and valence of emotions of individual and it is used to test new products, advertisements and packaging design (Bercea, n.d).

v. Transcranial Magnetic Stimulation (TMS)

TMS is the acronym for transcranial magnetic stimulation and it uses magnetic induction in order to modulate the activity of certain brain areas that are located 1-2 centimeters inside, without reaching the neocortex (Bercea, n.d). The measurement of sound properties caused by cortical activation has a limited spatial resolution but its main advantage can be seen in low costs (Gatterer, 2012). Bercea (n.d) observes that TMS discharges a magnetic field that passes through the brain which allows changes to be made in the brain tissue in certain locations and being able either to temporarily activate neurons (using high frequency) or temporarily disable neuronal activity (using low frequency). To understand how this technique works, Zurawicki (2010) made a comparison between TMS and fMRI, and stated that TMS is able to highlight causal inferences by analyzing the subject in front of marketing stimuli while certain brain areas are disabled, stimulated, or normal.

The major strength of TMS is that it studies causality of specific brain regions for certain mental processes while its drawback is that it is expensive to obtain and there are certain ethical barriers surrounding its usage. Bercea (n.d) suggests that TMS can be employed to measure attention, cognition and changes in behavior and that it is used to test new products, advertisements, packaging design and other marketing stimuli.

vi. Steady State Topography (SST)

SST is the abbreviation for Steady State Topography and it was developed by Richard Silberstein according to Silberstein et al. (1990) and Bercea (n.d). SST is a tool used in cognitive neuroscience and neuromarketing research for observing rapid changes and measuring human brain activity. Vialatte et al. (2010) observe that SST records brain electrical activity (EEG) while a sinusoidal visual flicker is presented in the visual periphery, eliciting an oscillatory brain electrical response known as the Steady State Visually Evoked Potential (SSVEP). Changes in brain activity that are task related are then determined using SSVEP measurements. One of the most important features of the SST methodology is its ability to measure variations in the delay (latency) between the stimulus and the Steady State Visually Evoked Potential response over extended periods of time (Bercea, n.d).

The ability to track rapid changes in the speed of neural processing in different parts of the brain is the main advantage of SST while its main disadvantage is its low spatial resolution. Bercea (n.d) opines that SST is normally employed to measure consumer behavior, video materials effectiveness, long term memory encoding, engagement, emotional valence, processed visual and olfactory input and attention. This technique is used when testing advertisements, movie trailers, testing prints and images, and brand communication.

Neuromarketing and Traditional Marketing Mix

Neuromarketing as a concept could either replace or supplement marketers' understanding of consumer thinking process with regards to product, price, place and promotion, and what they required to market products towards the consumer (Plassman et al., 2015; Glaenger, 2016). Neuromarketing through brain-imaging technology allows for the measurement of neural activity which occurs during marketing-relevant behavior (attention, memory, affect, and choice) and it also aids in understanding how marketing mix elements may affect consumer behavior in the periods before and after purchase (Plassman et al., 2015; Glaenger, 2016). It can replace or supplement each of the four marketing Ps in the following ways according to (Glaenger, 2016).

Product

Prior to the development of any product, companies must first conduct marketing research to identify the needs of consumers and the benefits that will satisfy these needs. Products, or bundles of benefits, are the main things that companies offer to the customers as their own part of the exchange. A product provides benefits to its customers, which is why they are prepared to part with their hard-earned cash to buy it (Blythe, 2006). Furthermore, Ruskin-Brown (2006) pointed out that a good product consists of the numerous advantages that customers choose to buy and that the product concept implies a good, a service, or a combination (Ruskin-Brown, 2006).

In the view of Glaenzer (2016), neuromarketing as an emerging area in the field of marketing could aid in product marketing research because it assists marketers to understand what consumers are looking for in products and why they choose certain products over others. These assertions could be adequately advanced through the usage of neuroimaging tools and techniques which assist marketers see inside of the brain to recognize the hidden preferences of consumers. In this way, marketers can begin to look at the relationship between the brain and the expressed preferences to understand consumer thought without any bias, hence, create a true market research test (Ariely & Berns, 2010). The results of the test according to Glaenzer (2016) are usually more reliable than traditional simpler approaches (i.e questionnaires, interview and focus groups) which are bedeviled by social bias of the consumers, collators' error and may be misleading. Glaenzer (2016) further pointed out that parts of brain are usually activated by certain things that are aesthetic or desired, and through showing products, packaging, or adverts to consumers, neuroscientists can discover which areas are most strongly and reliably activated by these systems.

Price

This is the only element of marketing mix that does not constitute costs to marketers because it generates revenue. Price is one of the most flexible marketing mix elements that can quickly be changed unlike product features and channels commitments (Kotler & Armstrong, 2012). Price in the views of Kotler and Armstrong (2012) is the sum of all the values that consumers give up to gain the benefits of having or using a product or service. Price is usually considered to be a signal of value or an expression of value in monetary form.

How to price products precisely to appeal to customers in the market is a serious challenge confronting every marketer. However, emerging researches in the area of neuromarketing are currently providing valuable directions to this complex decision-making process. Usually, marketers are expected to consider factors such as costs, customers and competitors in setting prices for products because these factors determine the likely extent of price acceptance in the market. Supporting this position, Glaenzer (2016) observed that prices are closely linked with consumer decision-making and many factors go into how to price a product and how that price may change over the course of the products' life cycle. Price is also closely linked with brand and most times, brand name items cost more than their generic counterparts because consumers knew they are paying for an item they can "trust". Truly, neuromarketing cannot likely generate exact prices that products should cost but it could help marketers understand what price means in the mind of consumers and what the differences between high and low prices of products represent in consumers' mind. The adoption of neuromarketing according to Roth (2013) allows marketers to confront buyers with products and a choice of different prices and then ask which of the presented prices would represent buyers' maximum willingness to pay and the brain activities is analyzed to see if there are rather regions of pain or happiness being activated through this process. Therefore, one can assert that neuromarketing provides marketing managers valuable tools for overcoming the challenges associated with the complex decision making regarding product pricing

Place

Developing quality products that satisfy customer requirements in the market is important, but this is not enough to guarantee successful marketing strategies for a firm. Marketing firm must made product available in adequate quantities in accessible locations at the times when

customers desire them (Pride & Ferrell, 2010). Sharma, Singh, Deepak and Agrawal, (2010) opine that place or distribution as a marketing mix element refers to the process of making the product available at places convenient enough for consumers to locate and buy. They argued that consumers weigh costs such as cost of travelling, cost of time spent in locating products on the shelves etc. against the benefits a product provides before taking decision to buy or not. Therefore, a product that is available at a convenient nearby place and shelves location would be preferred by most consumers (Sharma, Singh, Deepak & Agrawal, 2010).

The application of neuromarketing to distribution or place as a marketing mix element enables marketers to use neuromarketing techniques such as eye tracking, body language, EEG, fMRI to obtain relevant internal information from the target customers regarding distribution decisions (Ailawadi, & Keller, 2004; Kotler, & Keller, 2006). For instance, Glaenger (2016) observed that eyetracking which is means of tracking consumers' eye when they walk into a store to understand what they look at first and what they may never see at all before leaving the store helps marketers in the placement of products on the shelves to get optimal sales. While supporting this position, Roth (2013) presented a specific example of how neuromarketing assists in making distribution decisions through the analysis of top-shelf. The finding of the study of Chandon, Hutchinson, Bradlow and Young (2009) indicated that products on the top shelves are really ones that consumers usually assessed in the stores also supported this position.

Roth (2013) further exemplified the importance of these techniques when he illustrated that when consumers go grocery shopping, one can simply attach an EEG cap to their heads and follow them through the supermarket and as well perform eye tracking. The analyses of these neuromarketing processes according to Plassmann, Ramsøy and Milosavljevic (2012) could likely convey detailed information about the decision-making process of these groups of consumers.

Promotion

Marketing firms do not only need to create customer values but they should also use promotional mix elements to clearly and convincingly communicate those values to the target market. The concept of promotion in marketing encompasses all communication activities such as advertising, sales promotion, public relations, personal selling and direct marketing which firm uses to persuasively communicate consumer value and build customer relationships (Kotler, 2008; Blythe, 2006). Promotion generally, involves the process of informing the target market about the existence of a product and why consumers need to try or buy the product.

However, the extents to which marketers' efforts in the areas of promotion influence target customers in the market leave much to be desired. In fact, Ruskin-Brown (2006) cautioned that a famous saying among marketers is that marketers know that half of the money spent on advertising works but do not know which half works. Since marketers do not know the exact effects or influences of promotional mix on consumers yet, neuromarketing techniques like

neuroimaging, fMRI or EEG techniques are considered to be an exciting and helpful instrument which they can use to overcome this problem according to Ariely and Berns (2010). This claim was buttressed by Pitt, Berthon and Caruana (2005) and Hubert and Kenning (2008) when they maintained that neuroscience which is a mother discipline of neuromarketing can help bridge the existing gap, that is, through neuroscience; it is possible to find answers to the question of how advertisements act upon consumers and as well as when is an advertisement recognized as attractive. Kenning and Linzmajer (2011) pointed out that the usage of neuromarketing tools such as neuroimaging, fMRI or EEG make marketers discover that more attractive advertisements messages activate the ventromedial prefrontal cortex and the ventral striatum which are responsible for emotions in the decision-making process, while these brain regions were not activated when a less attractive advertisement was presented.

The background knowledge about the brain areas responsible for thoughts and activities in human and the technical analysis that shows the brain areas which are activated in a decision situation enable marketers to gain informative knowledge about consumer decision making process. Thus, the application of neuromarketing techniques such as neuroimaging, fMRI or EEG empowers marketers obtained accurate information which shows whether an advertisement is appealing or not (Ambler et al., 2000). The import of this position is that, the usage of neuromarketing techniques make it possible for marketers to find out if an advertisement is perceived by target customers to be attractive or not.

Limitations of Neuromarketing

The potency of neuromarketing as an evolving concept in the fields of marketing and consumer behavior has been limited in the following ways according to Fortunato and Giraldi (2014), Dragolea and Cotîrlea (2011).

Firstly, the development of a wave of "neuromania" fields across disciplines had led to the growth of areas of knowledge that simply add the prefix "neuro" to their disciplines to overemphasize and legitimize their studies' findings (Javor et al., 2013; & Fisher et al., 2010). Javor et al. (2013) further pointed out that the phenomenon of the "neuroculture" is construed to represent creation of new science branches which combine neuroscience with other fields of human sciences, physical sciences, social sciences, humanities such as neuromarketing, neurophilosophy, neurotheology etc. In fact, Hubert and Kenning (2008), Senior and Lee (2008) and Javor et al. (2013) opined that the excitement of neuromania scientists in the aspects of providing explanations for certain consumer behaviours and actions based on neuroscience had barely resulted in changing or adding anything to the results obtained through the traditional research techniques. Secondly, a number of authors such as Hubert and Kenning (2008), Senior and Lee (2008), Murphy et al. (2008) and Fisher et al. (2010) have argued that neuromarketing technique is a very complex processes of studying brain related emotions and as such little of the eventual findings of the study could be generalised or stated with certainty. Indeed, Fugate (2007) and Perrachione and Perrachione (2008) suggested that the variation in individuals influences the regions where certain emotions are processed and how they are processed. Thirdly, high cost and the required technology are major limitations to the adoption of neuromarketing especially in Africa and other developing countries. For instance, Dragolea and

Cotîrlea (2011) observed that the most relevant neuromarketing techniques like fMRI and PET are only use in laboratory and the amount of rentage for these equipment are significantly high, while, Hubert and Kenning (2008) opined that costs as a challenge to the application of neuromarketing had limited the number of individual researches in the area. Fifthly, the reactions of consumer protection associations is another limitation which must not be overlooked according to Dragolea and Cotîrlea (2011) because these associations try to limit the freedom of advertising agencies and that of the companies to study the market in order to obtain information regarding the way in which consumers make their decisions. These reactions are mounted to prevent the companies from manipulating consumers to act in a predetermined ways such as using the identified "purchasing button" to transform consumers to sure victims of advertising messages. Finally, regulations and ethical related issues have constituted serious limitations to the applications of neuromarketing because in some nations researchers need government's approval to conduct this type of research (Babiloni, 2012 and Hubert & Kenning, 2008).

Summary and Conclusion

This paper reviewed the concept of neuromarketing, its techniques and applications in the areas of the traditional 4Ps of marketing. This was done by reviewing scholars' views in the literature on this revolutionary marketing concept which provides access to richer and less biased insight on target consumers/customers. Neuromarketing is a sub-field of neuroeconomics and neuroscience that deals with marketing related decisions through the use of methods from brain research in managerial practice. It is an evolving marketing tool which allows for the measurement of neural activity that occurs during marketing-relevant behavior such as attention, memory, affect, and choice. It is an important tool for detecting hidden information about target customers and it is also useful in determining appropriate strategy (ies) that enables marketing firm to achieve goals and objectives. Neuromarketing techniques or methods include positron emission tomography (PET), functional magnetic resonance imaging (fMRI), electroencephalography (EEG), magnetoencephalography (MEG) and galvanic skin response (GSR). The concept could supplement marketing managers' understanding of consumer thinking process with respects to product, price, place and promotion, as well as what marketers need to do to market their products to target customers efficiently and effectively. In fact, neuromarketing assists marketers to understanding how marketing mix elements may influence consumer behavior in the periods before and after purchase. Neuromarketing is a commendable revolutionary concept in the field of marketing research but it must be used with cautions because of certain limitations in application.

Reference

- Ambler T, Ioannides A, & Rose S (2000). Brands on the brain: Neuro-images of advertising. *Business Strategy Review* 11:17
- Ailawadi K.L., & Keller K.L. (2004). Understanding retail branding: Conceptual insights and research priorities. *Journal of Retailing*, 80(4), 331-342.
- Ariely, Dan & Berns, Gregory S (April 2010). Neuromarketing: The hope and hype of neuroimaging in business. *Nature Reviews Neuroscience*, 11, 284-292.
- Babiloni, F. (2012). Consumer neuroscience: A new area of study for biomedical engineers. *IEEE Pulse*, 3(3), 21-23. <http://dx.doi.org/10.1109/MPUL.2012.2189166>
- Blythe, J. (2006). *Principles and Practice Marketing*. London: Thomson Learning

- Bercea, M.D. (n.d) Anatomy of methodologies for measuring consumer behavior in neuromarketing research (PhD Student, "Alexandru Ioan Cuza" University of Iași, Romania)
- Burgos-Campero, A. A., Vergas & Hernandez, J. G. (2013). Analytical approach to neuromarketing as a Business Strategy. *Procedia - Social and Behavioral Sciences*, 99, 517-525.
- Chandon, P., Hutchinson, J. W., Bradlow, E. T., & Young, S. H. (2009). Does in-store marketing work? Effects of the number and position of shelf facings on brand attention and evaluation at the point of purchase, *Journal of Marketing*, 73(6), 1-17.
- Dapkevičius, A., & Melnikas, B. (2011). Influence of price and quality to customer satisfaction: Neuromarketing approach. *Science-Future of Lithuania/Mokslas-Lietuvos Ateitis*, 1(3), 17-20
- Dragolea L., Cotîrlea D.(2011) Neuromarketing - Between influence and manipulation, Polish Journal of Management Studies, Vol. 3, 79-89
- Dube, E. (2016) Neuromarketing 101: What is neuromarketing and how are companies using It?
- Eser, Z., Isin, F. B., & Tolon, M. (2011). Perceptions of marketing academics, neurologists, and marketing professionals about neuromarketing. *Journal of Marketing Management*, 27(7-8), 854-868.
- Fisher, C. E., Chin, L., & Klitzman, R. (2010). Defining neuromarketing: Practices and professional challenges. *Harvard Review of Psychiatry*, 18(4), 230-237. <http://dx.doi.org/10.3109/10673229.2010.496623>
- Fortunato, V.C.R. & Giralaldi, J.M.E (2014) A Review of Studies on Neuromarketing: Practical Results, Techniques, Contributions and Limitations, *Journal of Management Research*, Vol. 6, No. 2, 201-220
- Fugate, D. L. (2008). Marketing services more effectively with neuromarketing research: A look into the future. *Journal of Services Marketing*, 22(2), 170-173.
- Gang, D. J., Lin, W., Qi, Z., & Yan, L. L. (2012, May). Neuromarketing: Marketing through science. In *Service Sciences (IJCSS)*, International Joint Conference on (pp. 285-289). IEEE.
- Genco, S.J., Pohlmann, A. & Steidl, P. (2012). Neuromarketing for dummies. Dummies a Wiley Brand. Retrieved from <http://www.dummies.com/how-to/content/neuromarketing-for-dummies-cheatsheet.html>.
- Gatterer, P. (2012). Neuromarketing and Business Ethics: A recap of neuroscientific methods in marketing and rehash of the theoretical background for an ethical approach (neue Ausg). Saarbrücken: AV Akademikerverlag.
- Glaenger, E. (2016) Are the brain and mind one? Neuromarketing and how consumers make decisions. Honors Theses Paper 812. <http://digitalcommons.colby.edu/honorsthesis/812>. Helen Wills Neurosciences Institute, University of California, Berkeley.
- Heydari, H., & Heydari, H. (2014). An investigation of the effects of the pricing techniques in the neuro-marketing on the purchase behavior among the garment consumer: A case study of the Patanjameh stores in the province of Kurdistan, *International Journal of Basic Sciences & Applied Research*. Vol., 3 (SP), Pp 279-283, Available online at <http://www.isicenter.org> ISSN 2147-3749
- Hsu, M. (n.d.) Neuromarketing: Inside the mind of the consumer, Haas School of Business and Helen Wills Neuroscience Institute, University of California, Berkeley.

- Hubert, M., & Kenning, P. (2008). A current overview of consumer neuroscience. *Journal of Consumer Behaviour*, 7(4-5), 272-292.
- Huettel SA, Song AW, McCarthy G (2009b) Functional magnetic resonance imaging, (2nd ed.). Sinauer, Sunderland.
- Javor, A., Koller, M., Lee, N., Chamberlain, L., & Ransmayr, G. (2013). Neuromarketing and consumer neuroscience: Contributions to neurology. *BMC Neurology*, 13(1), 1-12.
- Kenning, P., & Plassmann, H. (2005). Neuroeconomics: An overview from an economic perspective. *Brain Research Bulletin*, 67, 343-354
<http://dx.doi.org/10.1016/j.brainresbull.2005.07.006>.
- Kenning, P. H., & Plassmann, H. (2008). How neuroscience can inform consumer research. *Neural Systems and Rehabilitation Engineering*, IEEE Transactions on, 16(6), 532-538.
- Kenning, P., & Linzmajer, M. (2011). Consumer neuroscience: an overview of an emerging discipline with implications for consumer policy. *Journal für Verbraucherschutz und Lebensmittelsicherheit*, 6(1), 111-125.
- Kolar, E. (2014) Neuromarketing and Marketing Management: Contributions of Neuroscience for the traditional Marketing Mix *3rd IBA Bachelor Thesis Conference*, July 3th, 2014, Enschede, University of Twente, Faculty of Management and Governance, The Netherlands.
- Kotler P., Keller K.L. (2006). *Marketing Management*. Prentice-Hall International: New Jersey.
- Kotler, P. (2008). *Principles of marketing* (5th European ed). Upper Saddle River, New Jersey. Pearson Prentice Hall.
- Kotler, P. and Armstrong, G. (2012). *Principles of marketing* (14th ed.), London: Pearson Education Limited.
- Kumar, S. (2015). Neuromarketing: The New Science of Advertising Hype, Hope or Necessity, *Twelfth AIMS International Conference on Management pp 1222-1229*
- Lee, N., Broderick, N.J., & Chamberlain, L. (2007) What is 'neuromarketing'? A discussion and agenda for future research, *International Journal of Psychophysiology*. 63, Pp199-204
- Madan, C. R. (2010). Neuromarketing: the next step in market research?. *Eureka*, 1(1), 34-42.
- Morin, C. (2011). Neuromarketing: the new science of consumer behavior. *Society*, 48(2), 131-135.
- Murphy, E. R., Illes, J., & Reiner, P. B. (2008). Neuroethics of neuromarketing. *Journal of Consumer Behaviour*, 7(4-5), 293-302.
- Page, G. (2012). Scientific realism: what 'neuromarketing' can and can't tell us about consumers. *International Journal of Market Research*, 54(2), 287-290.
- Perrachione, T.K. & Perrachione J.R. (2008) Brains and Brands: Developing Mutually Informative Research in Neuroscience and Marketing. *Journal of Consumer Behaviour*, 7, 303-318.
- Pitt, L. F., Berthon, P., Caruana, A., & Berthon, J. P. (2005). The state of theory in three premier advertising journals: a research note, *International Journal of Advertising*, 24(2), 241-249.

- Plassmann, H., Venkatraman, V., Huettel, S. A., & Yoon, C. (2015). Consumer neuroscience: Applications, challenges, and possible solutions, *Journal of Marketing Research*, 52, 427.
- Plassmann, H., Ramsøy, T. Z., & Milosavljevic, M. (2012). Branding the brain: A critical review and outlook. *Journal of Consumer Psychology*, 22(1), 18-36.
- Postma (2012). Anatomie van de Verleiding. Neuromarketing – Neuromarketing succesvol toegepast
- Pride, W. M., & Ferrell, O. C. (2010). *Marketing Foundations* (4th ed.). Mexico: South-Western Cengage Learning.
- Renvoisé, P., & Morin, C. (2005). Neuromarketing: Is There a 'buy Button' in the Brain?: how Selling to the Old Brain Will Bring You Instant Success. Thomas Nelson Inc.
- Roth, V.A. (2013) The Potential of Neuromarketing as a Marketing Tool, presented at 1th IBA Bachelor Thesis Conference, Enschede, University of Twente, Faculty of Management and Governance, The Netherlands.
- Ruskin-Brown, Ian (2006). *Mastering Marketing*. London, GBR: Thorogood Publishing.
- Scharma, J.K., Singh, D., Deepak, K. K., Agrarwal, D. P. (2010). *Neuromarketing: A Peep into Customer Mind*. New Dehli: PHI Learning Private Limited.
- Senior, C., & Lee, N. (2008). Editorial: A manifesto for neuromarketing science. *Journal of Consumer Behaviour*, 7(4-5), 263-271. <http://dx.doi.org/10.1002/cb.250>
- Silberstein, R.B., Schier, M.A., Pipingas, A., Ciorciari, J., Wood, S.R., Simpson D.G. (1990). Steady state visually evoked potential topography associated with a visual vigilance task. *Brain Topography*, 3, 337-347.
- Touhami Z.O., Benlafkih, L., Jiddane, M., Cherrah, Y., EL Malki, H.O. & Benomar, A.(2011). Neuromarketing: Where marketing and neuroscience meet, *African Journal of Business Management* Vol.5 (5), pp. 1528-1532.
- Vialatte, F., Maurice, M., Dauwels, J., Cichocki, A. (2010). Steady-state visually evoked potentials: Focus on essential paradigms and future perspectives. *Progress in Neurobiology*, 90, 418-438.
- Wang, Y.J. & Minor, M.S. (2008). Validity, Reliability and Applicability of Psychophysiological Techniques in Marketing Research. *Psychology & Marketing*, 25(2), 197-232.
- Zurawicki, L. (2010). Neuromarketing, Exploring the Brain of the Consumer.. *Berlin Heidelberg*. Springer-Verlag.