

## **Sensorial Marketing and Neuroscience: Neuroscience Contributions to the Marketing Field**

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**Abstract:** The aim of this study is to discuss the use of sensory marketing method and its junction with Neuroscience knowledge applied in consumer behavior studies field. The research is a descriptive theoretical essay, discusses the application of Neuroscience as a method that measures physiological responses and their relationships with the sensory marketing, two synergistic methods and its explanatory reach the consumer choice decision. On one side, the sensory experiments that affect the most basic natural senses (sight, touch, taste, smell and hearing) and the Neuroscience seeking about the sensations with measurable physiological responses for example, eye movements of the face, galvanic skin response among others that may or are combined the new marketing experiments. Thus, it's shown how the marketing and sensory Neuroscience present as synergistic methods that contribute to field studies with information of measured physiological responses valence and potential in the solution marketing problems.

**Key words:** Sensory marketing, Neuroscience, neuromarketing, physiological responses, field

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### **INTRODUCTION**

Starting on the 21st century, the changes on the market, the coming forward of a more demanding clientele, searching for brands of higher value, unattached from their social class, something more than just answering to their basic needs, forced the companies to reinvent themselves (Yeoman, 2004). So, we begin to emphasize functional marketing strategies that are based not only in the most rational models that have the main focus, the consumer purchasing but also, in the hedonic and emotional aspect of their behavior (Martensen *et al.*, 2007).

In the international literature, researchers such as Addis and Holbrook (2001) mention that starting on the 1980's, the research about consumer behavior took a step forward from the epistemic role models to an approach with an emotional emphasis. Therefore, in the ending of the 1990's and beginning of 2000, the Neuroscience applied to the marketing came out with a focus on the study and measuring of the kinds of feelings that the products may provide to the consumer have an effect on their choice and not only in the special needs of the clientele (Schmitt, 1999). The adoption of a "experimental marketing", however for promotion of products and as a research method, in which the consumer gets into direct contact with the product and services has entered the research agenda such as told in the seminal study from Holbrook and Hirschman (1982).

It's generally known that experimentation is remote to the organization's systems as said in popular terms, "since, the world has become a world" (sic). In commercial relationships as an example, in fairs and opened markets the people were stimulated to try out the products before purchasing them. Now a days, many companies provide experimentation systems with the emulation characteristics of products and services through physical prototypes, degustation, products tests and/or services such as pre-releases. These consist in products and services emulation in test zones, under control and/or supervised by an attendant that appropriates opinions, before the final launching of a product in the actual market or the final actual sale. These operations have an aim to present, develop clients and increase the clientele's trust into the purchasing of the product or service. Therefore, is possible to understand that this experiment is more than emulation, it is an intimate approach between product-service-client and serves as purpose of providing the "real perception" as how the product and service will be felt if, they indeed acquire it. Schmitt (1999) goes further to say that the consumption must be interpreted as a holistic experience in which the client is noticed as a rational and emotional being that is in search of experiences.

Nevertheless, Holbrook and Hirschman (1982) reason that the increasing interest of the researchers by the explanatory potential of the "experimental field" marked

by a “hotter and more dynamic” perception of the measurement of the sensation of the clientele in front of the “prospect” object of desire. The collection of sensations from senses like the touch, hearing, taste, smell and sight allow us to capture sensations, sensorial feelings and fun. To Holbrook and Hirschman (1982), the sensorial channels responsible for our access to the environment stimuli to engage us in an experience of consumption are crucial in the influence of hedonic and emotional responses. An organization cannot direct the emotions of the consumer but it can direct the components that create the offer of the experience (Berry and Carbone, 2007). In that sense, the organizations have started to recognize the importance of the experience of consumption to guaranty the satisfaction and fidelity of the clientele (Zomerdiijk and Voss, 2010; Pine and Gilmore, 1998).

On the other hand, the use of Neuromarketing based on Neuroscience techniques, seeks in a more complex way to identify and comprehend the consumption behavior with the objective of increasing the effectiveness of commercialization of products/services using as its base the analysis of the internal architecture of the brain and how it can interfere on the process of choice , considering not only rational choices but also those with emotional appeal or even the instinctive ones (Chorvat and McCabe, 2005). Thus, the neuromarketing seeks to understand the objectives of the market related to the wishes and interests of the consumers with the goal to provide an alignment next to what they want.

Therefore, the objective of this study is to present a sensorial marketing discussion and its junction with the knowledge of the Neuroscience applied to the field of the behavior of the client in the process of choosing a product. The study is a theoretical descriptive essay seeking to identify two methods and their explanatory range in consumer choice decision. On one hand, the sensorial experiments that reach the most basic senses (sight, touch, taste, smell and hearing) and on the other hand, a Neuroscience able to tell eye movements of the face, galvanic skin response among other sensations that are combined in experiments. The sensory marketing and neuroscience stand as synergistic methods with physiological responses with measurable valence and with the potential to solve problems in marketing. Like this, it was tried to argue in favor of the synergy of the methods and techniques seeking to present the scope of sensory experiments and Neuroscience that allow contributions to advances in the understanding of corporate decision-making process of consumer choice.

## MATERIALS AND METHODS

### Theoretical path

**Sensorial, experiential and/or experimental marketing:** The tendencies of the 21st century cause in the marketing, a significant transformation from the traditional, based on characteristics and benefits of the product to the experiential, based on the client’s experience (Table 1).

In that sense to provide experiences to the consumer became a manner of creating differentiation with the application of the most “sensed” and supported in the most human and emotional marketing (Pine and Gilmore, 1998). That makes that brands that are more appealing to the senses in a more creative and involving way be capable of generating a biggest approach to the client, through unique and memorable experiences (Brakus *et al.*, 2009).

According to Schmitt (1999) the experiences are individual events that happen in response to any stimuli resulting from a direct observation and/or participation in events that are real, imaginary or virtual.

The consumption experience is understood as a particular event of the individual in which there is an emotional and affectionate relevance, fundamented in the interaction between stimuli present in products and consumed services (Holbrook and Hirschman, 1982). The researchers still complement that, it corresponds to a state of consciousness essentially subjective and with a variety of symbolical, hedonic and figurative meanings. “The experiences generate sensitive, emotional, cognitive, behaviorist and identification values that substitute the functional values” (Schmitt, 1999).

In that sense, the organizations search for sensorial marketing strategies to captivate, awaken these feelings, the affections and behavior from the consumers with the objective of identify the clientele’s perception about abstract concepts of the product (Krishna, 2012). In addition to that, Holbrook (2000) claims that the experimental marketing involves “four Es”: experience; entertainment of the client; exhibition of the product in a adequate way; evangelization of the client about the purposes and ideals of the brand. The sensorial marketing creates interactive and sensorial experiences which involve the clientele in a physical, mental, emotional, social and spiritual way in the consumption of the product or service, in a way to make this experience memorable (Smilansky, 2009).

Table 1: The essence of marketing’s two paradigms

Traditional marketing	Experiential marketing
Features and benefits	Sensory, affective, cognitive experiences, actions and relations

Adapted from Schmitt, 1999

According to Schmitt in 2001, the experience marketing appeals to the senses with the objective of creating sensorial experiences through sight, touch, taste, smell and hearing.

**Sight:** Blessa in 2010 says that, all of the products are similar and for each to be seen as unique and to create a loyalty to the brand, the fundamental point is to establish a different image of the product, in a way that the clientele can distinguish, it from the others.

**Hearing:** To Gobe in 2002, the consumers when subjected to different musical tempos, levels of sound and amplitude modulations, guaranteed to feel different emotions.

**Touch:** According to Parente in 2000, “this physical contact with the product produces great sense of satisfaction to the client, generates an anticipated pleasure to the acquirement of the product and consists, most of the times, in an indispensable stage to the process of deciding to buy something”.

**Taste:** “The taste is detected by the taste buds that make people have different perceptions of taste”.

**Smell:** Gobe in 2002 explains that the smell is the deepest of all the senses but, many times, doesn't propitiate to the clients attractive and emotional experiences, for each smell is different from the other and gives sensations in a more subtle and intense way. Smells aren't filtered by the brain, they are instinctive and involuntary.

The sensorial marketing creates sensorial appeal by trying to optimize the processes of relationship with the consumer, creating sensations through, the five human senses and constructing an emotional link with them.

#### **Assessment of the human senses in perception**

**How, we learn:** About 1.0% by taste; 1.5% by touch; 3.5% by smell; 11.0%; by hearing; 83% by sight; source: Blessa in 2010.

According to Blessa in 2010 “what is seen through the eyes is felt by the heart” so the sight is the first sense to show itself on the process of choice, being the first to stimulate the brain in the direction of the product. “The sight propitiates to the consumer more information than any other sense”.

The theoretical model of the PAD (Pleasure-Arousal-Dominance), developed by Mehrabian and Russell (1978) is being used for the access of the emotional response to some types of marketing stimuli to measure emotional responses to the environmental stimuli like architectural spaces, attempting to define emotions in

terms of continuous dimensions such as pleasure, activation and dominance. In the application of the PAD model to a retail environment, Donovan and Rossiter (1982) saw that two dimensions in special affect, the so-called pleasure and arousal could explain the consumer's behavior.

Donovan and Rossiter (1982) also applied the theory developed by Mehrabian and Russell (1978), theorized by Turley and Milliman (2000), denominated Stimulus-Organism-Response (S-O-R) which demonstrates the influence of atmospheric variables exercise in a great variety of assessments and behaviors of the consumers.

Another way to develop the senses consists in creating special type of stores which is a reference, denominated maisons, flagships or conceptual stores, in which the preoccupation with the environment goes to extremes so it can, by itself, symbolize the attributes of the products/services offered in them (Moore and Doherty, 2007).

Blessa in 2010 says that, the exploitation of the five senses of the clientele in stores is important to the business, once, it breaks the standardization imposed by traditional retail and gives away the idea of respect to the individuality of preferences. To Terblanche and Boshoff (2006) to understand how the sensorial stimuli influence on the experience of shopping is of extreme importance to the companies that aim a positive impact on the consumption and the increasing of sales.

Smith shows five conceptual ways to implement a successful strategy of experimental marketing. The “Sense” has the objective to create sensorial experiences through sight, touch, taste, smell and hearing.

The “Feeling” tries to create affective experiences with the consumer. The “Thought” stimulates the intellect to create cognitive memories. The “Action” stimulates behavior changes and style by means of motivation, inspiration and spontaneity. And the “Identification” conjugates elements from all the others, going beyond to reach private and individual feelings, increasing the personal experiences. Then, he recommends that, the experimental marketing, in both concept and sensemaking, seeks to account for a change in behavior of the contemporary consumer: more than just buying, they want to obtain unique experiences of consumption. But, these experiences aren't usually spontaneous but induced; the companies need to prepare the right environment and scenario to get them to happen. He adds that, the degree in which a company can offer its clientele the desired experience determines its success in the global market. To Hulten (2011) utilizing sensorial strategies distinguishes a brand in the process of competition, once

that attributes such as price and quality can be more easily compared whereas the direct contact, the most intimate touch, build sensations that convert themselves into emotions that deliberately connect the senses to the human mind. Thereby, it's evident that many senses explored in practical and in literal terms nowadays and most notably, find equivalence of Neuroscience studies the physiological behavior.

**How can the Neuroscience of the physiological behavior help?:**

The advances and contributions of the Neuroscience are similar to its applications in marketing and notably are going to contribute to the new experimental applications in marketing. According to, Ariely and Berns (2010), the inclusion of Neuroscience can be utilized to understand in a deeper way the preferences and behaviors in face of the stimuli that is present in products. The use of these Neuroscience techniques could be confirmed in studies by Lewis who analyzed cerebral activities in response to television commercials and in Zaltman's studies, in which a volunteer was subjected to a brain scanning in order to identify his/hers preferences for products and brands. The researcher also points out that, this study inaugurated the Neuroscience experiments applied to marketing.

To Gade in 1998, "the behavior is an external manifestation of internal psychological processes of responses to stimuli that are processed and transformed in learnt and memorized information". Thus, Kringelbach and Berridge (2009) explain the Neuroscience as the study of the produced thought and its relations with emotions and decisions, providing its components, their measurements and explanations about the behavior in base of the on behavior based on brain activity and how they are affected by the external environment.

Kotler in 2000 names the variables that influence the decision-making process of purchase from external influences (family, social class, reference groups) and internal influences which can be provided from the motivation-cognitive theory that emphasizes the internal mental processes from psychology which emphasizes the observed behavior, understanding the mind like a "black box" from the attitude that can be favorable or not and that represent proactive tendencies in relation to some object, containing cognitive, affective and behavior components or from perception an active process of sensorial construction.

To do so, the related research to the consumer Neuroscience uses different measurement techniques among them the EEG (Electro Encephalo Gram), Resonance Functional Magnetic Imaging (MRFI), the eyetracking among others (Table 2).

**Table 2: Measurement techniques in Neuroscience**

Techniques Neuroscience	Usage and applications
EEG (Electro Encephalo Gram)	The EEG is one of the techniques most commonly used by Neuroscience to measure brain activity (Otten and Rugg, 2005). The studies with EEG occurs through, the Event Related Potentials (ERPs) which consist of an average of the responses of the resulting neural activity of an event (stimulus) presented to an individual. The EEG presents a high temporal resolution which makes it one of the most suitable tools to relate the presentation of a stimulus (logo, print ad, campaign broadcasting) to its corresponding neural activation, meaning that, it is possible know for example, the exact point in a commercial displayed in TV which generated higher levels of care and those in which there was no prominent attentional engagement in the viewer
Functional Magnetic Resonance Imaging (fMRI)	The functional magnetic resonance imaging, in its turn does not measure directly neural activity but the metabolic changes related to it. The equipment captures physiological changes, thanks to the magnetic properties of the Hemoglobin (Hb), responsible for the transport and diffusion of the oxygen in the tissues. It is ideal to respond questions that need to be known with pinpoint accuracy, between 4 and 6 mm <sup>2</sup> which specific areas are activated during an activity. In this sense, studies of making decision, moral judgments, language and memory (Bookheimer, 2002; Haist <i>et al.</i> , 2001) have also used the MRFI technique
Tracking looks: the eyetracking	It is the least complex technique both in terms of operation and in regard to the generated output and ease of interpretation. That is because, this method detects and tracks the sites of a visual stimulus for which the individual turned his visual attention to (Kawano, 2013). It is a method that can be applied to optimize categories in supermarket shelves, in the preparation of site layouts and pre tests on printed and audio-visual advertising material. Besides that, some existing equipment on the market also allow detecting changes in pupil diameter, indicating possible processes of emotional attraction in an individual (Noble, 2013)
Face reader	Used to develop a completely non-invasive technology for lies/detection of guilt. The system should be based purely in reading the facial signs. It is a modern alternative to polygraphs. It can be used in secret situation (without the subject being aware). Generally, humans have very little ability to detect deception and hostile intentions, they have an accurately rate of 40-60% (Burgoon <i>et al.</i> , 1994)
Positron Emission Tomography (PET)	It displays the internal biochemical activity of the brain at any given time. This technique begins with the injection of a radioactive liquid (but harmless) in the bloodstream, spreading through the brain. In finding, radiation within the brain, the computer may identify the more active brain regions, providing an overview of the brain while it research
Magneto Encephalo Graphy (MEG)	Electrical currents in the brain neuronal circuit provoke very weak magnetic fields that can be identified by sensors arranged around the head. This technique has the advantage of achieving measurements at lightning-fast speeds of 1/1000 of a sec., at about the speed at which the brain researches
Steady State Probe tomography (SSP)	Used to monitor activity during dynamic stimulus sequences such as TV commercials. The SSP™ measures the steady state visually evoked by stimuli and records at a rate of 13 frames per second from 64 electrodes in a helmet

Table 2: Continue

Techniques Neuroscience	Usage and applications
Forensic neuroimaging	Seeks to discover the biological basis of violence and psychopathy, in a effort to create a debate between personal autonomy and public security
Neurotechnologies	The neurotechnologies for military use and security are related to psychological resilience and reliability of the staff . Although, the researchers add that, there are already drugs to increase confidence as well as to stimulate sexuality in women who suffer from low libido and also to increase the concentration to reduce anxiety and fatigue. In the security field, there is a device for detection of lies and deceptions. Another use is in the techniques of questioning

Prepared by the researchers

Employing the EEG technique according to Ohme *et al.* (2009), a group of polish researchers who were trying to evaluate two versions of a commercial designed to TV on a skin care product, noted a more positive emotional response (with statistical proof) in the first version and they differed only in a specific scene lasting 4/2 of the commercial: while in one of them the framework was focused only on the face of a woman model, on the other (version 2) the same model appeared performing a hand gesture.

In this regard, studies of Berk, etc. in 2002 showed men's brain activity, analyzed when they were exposed to small cars, sports cars and limousines, in which each participant should then give a note. As a result of the study, subjects found the sports cars more attractive than the other and the brain regions accessed in time to decide show that both cortical areas related to social reward were activated as well as limbic areas of emotional decisions (Erk *et al.*, 2002).

Another study pointed out by Pirouz in 2004 and Botelho in 2008, highlighted the training preferences in the brain, one of the pioneers and today more commonly known was the experiment applied by researchers from Baylor college of Medicine in the US. In this experiment, it was offered to participants samplings of coke and pepsi while recording images of their brains and without any identification, the volunteers drank the two sodas. At first when, there were no identifying traits, half of the participants indicated a preference for coke and the other half by pepsi. Then, repeating the tasting, now with the properly identified sodas about 75% of the participants preferred the coca cola.

In the study, conducted by McClure *et al.* (2004) with the use of the fMRI technique, an experiment was also conducted with the soft drinks of the brands coca-cola and pepsi in which the researchers noted that, the blind condition, associated with sensorial preference, pepsi was chosen by the largest share of the participants. When viewing the tags, the researchers noted greater preference for coca-cola, opening room for an interesting suggestion there may be two distinct preference systems: one grounded in the sensory aspect and the another grounded in cultural aspects (brand awareness).

According to Kawano in 2013 in a launch campaign of a slightly alcoholic drink targeted to the female audience, a study used a portable equipment eyetracking in 52 participants; it was observed that, the ad was considered very relevant and persuasive. Additionally, most women were not able to identify that, the product was an alcoholic beverage. It was found that most visual attention was given to the logo of the product, its packaging and the image of the model. It is very little perceived, the informational message of the product, located at the bottom of page, a fact that caused the company to do a new ad layout with new positioning and larger font size for the call-out.

The researchers Ugail and coauthors in 2011 used the technique face reader in volunteers who got a specific story in which, on one occasion, they were told to tell the truth when asked about the story and on another occasion, they were asked to lie about the story. Then, they were analyzed to extract the specific signals, both visual and of thermal domain. An interview held two separate sessions: the first session was a "controlled section" which could determine the baseline in which the subject is bound to tell the truth and the second session is the "interrogation session" in which the subject can choose to lie or to tell the truth. Based on the experience, the researchers could prove the technical accuracy by 70% which detected 2 out of 3 liars.

Camargo in 2009 points out that even if individual conduct is different, the brain anatomy and physiology is similar in all subjects except those who have some abnormality of anatomical or physiological order. Thus, in response to a given stimulus, the consumer can act culturally and socially differently but the excited area of the brain is the same in all subjects.

However, the neuromarketing allows the investigation by means of neuro-image as "reading the minds" of consumers, more accurately outlining which stimuli trigger excitement, confidence, pleasure, i.e., the emotions that lead people to buy (Wilson *et al.*, 2008). Although, the researchers add that, the measure of these stimuli is unrelated to the characteristics of the products, the result is an attempt to manipulate the consumer and their purchase decision.

Lindstrom in 2009 adds: neuromarketing does not mean to implant ideas in people's brains or forcing them to buy what, they do not want; It means revealing what is already inside our heads, our "Logic of consumption".

The main areas of cognitive neural science described by Kandel and coauthors in 2000 are perception, action, emotion, motivation, learning and memory. And neuromarketing aims to help people identify themselves with the products and thereby facilitate the consumer's selection process using neural signals to measure the effectiveness of advertising announcement (Ariely and Berns, 2010). Lindstrom in 2009 says that, the more companies know about the needs of the consumers and their unconscious desires, more useful and significant products will be introduced. So, we can say that neuromarketing does not manipulate the consumer to buy excessively a particular product but only tries to find a link between the product and the individual.

## RESULTS AND DISCUSSION

**Final considerations:** The study presents two methods of research of epistemological paradigms of marketing, namely the trial in its traditional form and the adoption of prospects of physiological behavioral Neurosciences as a new way to measure the sensations.

The classic marketing understood the consumer as a rational thinker and the experimental marketing as rational consumers and emphasis on the emotional, able to express their feelings in the process of testing of products and services. According to, Schmit in 2002, the focus on functional features and benefits that provide products and customers view as rational decision makers are some key features of traditional marketing which is giving place to the experiential marketing which focuses on the experiences of emotional dimensions before the consumer goods and services.

Thus, it can be said that traditional marketing has its limitation methods presenting studies gaps, failed to provide the desired results by researchers who wish to know in a "more intimate" and that as the consumers react to the experiment (experiential marketing). The result of this new unveiling chance of new findings by the experiences and Neuroscience consortium has caused many companies to seek for research based experiment with physiological measurement. It is noteworthy that, the direct experience with products-services create episodic ergonomic elements and can create physiological sensations with valence and offering provoking stimuli that characterize a collection of events, rather sensations memorable that the product is capable of producing the "emulated consumption".

So what, we now perceive is the largest insertion of knowledge of Neuroscience applied to the sensory marketing. The physiological responses with measurable valence, during the process of "trial" of customers, allowed findings about the behavior of the sensations of customers differently, beyond verbalized belief or filled opinions questionnaires. There will be a measurement direct physiological response in sweating, eye movement, facial response, heartbeat, blood supply of functional areas of the brain, among others.

The literature review in this study, therefore, addresses the scope for expansion of the experiential marketing discipline with new methods and knowledge of physiological behavioral Neuroscience.

## CONCLUSION

Accordingly, it is enriched by consumer behavior studies coming from the measuring verbal, oral or written answers by the participants of the experiments that are more subjective, interpretive seeking describe sensations, emotions and feelings in Trial for more direct mechanisms of the brain's behavior. Like this, many researchers will opt for Neuroscience applications where measurements of the physiological responses are made by machines of greater precision, involuntary from the need for verbalization or written by the measured person or even direct observation of the investigator once the physiological responses are more genuine than, the volitional act and they escape the interpretative nature of the same and are, therefore, more accurate.

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