

# **Awakening Of The Five Senses In Neuromarketing**

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## **Abstract :**

In a globalizing world, increasingly competitive environment impels the companies to search for new marketing methods instead of the traditional ones . Besides,the emergence of neuroeconomics, where developed methodes and procedures about brain research are used for economic purposes.. One discipline of neuroeconomics is the so-called ‘Neuromarketing’ in which neuroscientific data is used to address marketing relevant topics. In the past it was difficult to gather objective consumer informations using traditional methods.

Neuromarketing one of the comprising methods is a marketing technique that aims to seduce the consumer by using his senses to influence his feelings and behavior. In neuromarketing, with various stimuli that are sent to five senses, consumer's emotional and behavioral orientations are studied to be affected. In this study, the role of senses in consumer perception and the relationship between

senses and marketing are discussed and followed by neuromarketing practices in which consumers are affected and their responses are analyzed, according to the research conducted on restaurants in service industry it's observed that sound, taste and tactile are the most effective senses in purchasing decision.

The aim of this article is to bring the attention and highlight its actuality and the importance of its understanding.

**Keywords :** neuroscience, neuroeconomy, neuromarketing, five senses.

## **1-Introduction**

For many marketers (and consumers), the affectivity, perception and pleasure are more important than the price. Since many products are now technically similar, they have to be distinguished differently. Sensory branding is based on the idea that human beings most likely to form, retain and revisit memory when all five senses (taste, smell, sight, sound and touch) are engaged.

Keeping marketing in perspective, marketers started using these human instincts as a strategy to sell their goods or services by creating such environment that appeals to senses at the point of sale. (Kotler, 1973) defined the atmosphere of point of sale as « the creation of a consumption environment that produces specific emotional effects on the person, like pleasure or excitation that can increase his possibility of buying ». He considered the creation of this atmosphere as the most important strategic way of differentiation for retailers.

Neuromarketing must consider the meaning of customer control. The nose, ears and touch are as important as the eyes and even more. These senses, more primary give access to less conscious decisions, less filtered by reason. The olfactory nerve for example, has a direct link with priority and the limbic lobe, our pleasure center and memory. Within seconds, we must decide whether here, it smells good or bad.

Neuromarketing is a new process that use new technologies, a new way for comprehending the decision making process of customers in terms of how the brain is affected positively or negatively by messages (Nicole al.Pop, Ana maria Iorga, 2012) .

According to Lindstrom using all the five senses « a total sensory experience would at least double, if not triple, the consumer's ability to memorize the brand » (Sharafat Hussain, 2014).

## **2-Neuroscience:**

A science where the brain and the nervous system are studied . The daunting task of deciphering the mystery of how the brain commands the body. Over the years, this field has made enormous progress.

As an illustration , neuroscientists know that each person have more than 100 billion nerve cells called neurons, and the communication between these cells form the basis of all brain functions . However, scientists continue to strive for a deeper understanding of how these cells are born, grown and organize themselves into effective, functional circuits that usually remain in working order for life (Brainfacts, [www.sfn.org](http://www.sfn.org)).

## **3-Anatomy of the Brain :**

The human brain is the most complex part of our body. It processes about 11 million bits per second, but our conscious brain can only process 40 bits of information per second (Adina Zara).

The knowledge about the brain is increasing and due to some leading scientists the secrets about the brain will become more and more revealed. In this section the aspects of the brain needed in neuromarketing will be explained. Without a small explanation it is hard to understand the process behind neuromarketing. The two most common approaches to divide the brain are mentioned here.

The first approach is that the brain is divided into three parts: the new brain, the middle brain and the old brain , as demonstrated in figure 1 . The old brain is the most important part in taking decisions.

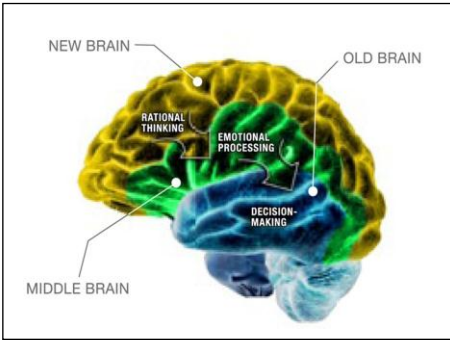
The new brain thinks, it processes rational data. The middle brain feels, It processes emotions and feelings. And finally the old brain decides. It takes into account the input from the other two brains, but the old brain is the actual trigger of the decision (Renvoise & Morin, 2007).

In the second approach, the brain is also divided in three parts as demonstrated in figure 2. The first part is the limbic system, which is

a group of structures in the brain that are involved with motivations, emotions, enjoyment and emotional memory. The limbic system is one of the oldest parts of our brain, it is often referred to as the emotional brain that contains the thalamus, hypothalamus, amygdala, and hippocampus.

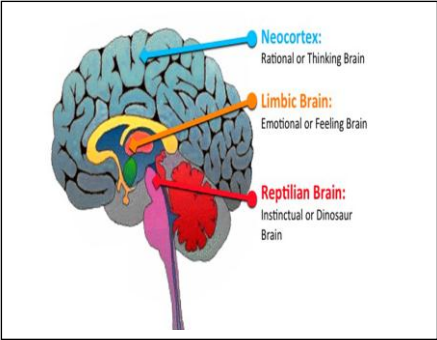
The second part of the brain is the neocortex, which is a six-layered structure found only in mammals. It's a recently evolved structure associated with "higher" information processing in more fully evolved animals (such as humans, primates, dolphins, etc). The neocortex is part of the cortex cerebri and is involved in higher functions of the brain like sensory perception, conscious movements, reasoning, plan, decide and language (zurawicki, 2010). The last part is the brainstem, which is located under the limbic system. This structure is responsible for basic vital life functions such as breathing, heartbeat, and blood pressure (Lobna Ben Nasr MA, 2014). Scientists say that this is the simplest part of the human brain because the entire brains of evolutionarily older animals (for example, reptiles) resemble the human brainstem.

**Figure 1**



Source : [www.fabcomlive.com](http://www.fabcomlive.com)

**Figure 2**



<http://www.medecin-ado.org>

#### 4-Neuroeconomy :

Is a relatively new field in economics whose emergence, like other new fields in economics, reflects the increasing influence of other sciences on economics, in this case neuroscience (John.B.Davis, 2016).

Neuroeconomy is an interdisciplinary field, at the border between neurosciences and economy and aims to build a neuronal model for the decisionmaking process in the economic context (Egidi, 2008). With the help of neuroimaging techniques, researchers can study the brain activity, as a reaction to certain stimuli and can establish correlations between the respective stimuli and the triggered reactions (Camerer Colin et al, 2005).

### **5-Neuromarketing :**

One of neuroeconomy's most dominant applicative developments consists in neuromarketing. The term neuromarketing was first used in 2002 by a German professor Ale Smidts who defined neuromarketing as « the study of the cerebral mechanism to understand the consumer's behaviour in order to improve the marketing strategies » (Orzan, G et al, 2012).

The discipline's founder is Gerry Zaltman from Harvard University who conducted a first FMRI study as a marketing tool way back in 1999 (Krajinović.A et al, 2012).

We consider neuromarketing to be the use of neuroscience and physiological research techniques to gain new insights into consumers' behavior, preferences and decision making. As well as other aspects of human cognition and behavior related to marketing. Neuromarketing seeks information and insights beyond that revealed by traditional techniques such as surveys, focus groups, experiments, and ethnography—with the goals of enhancing marketing theory and practice (Plassmann et al, 2015; Yoon et al, 2012).

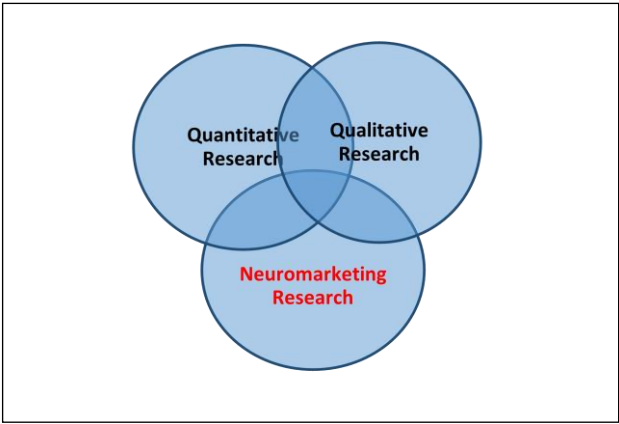
Today neuromarketing lies at the intersection of behavioural psychology, economics and consumer neuroscience. Consumer neuroscience studies cognitive and affective sides of human behaviour (celine solnais et al, 2015), and many researchers define neuromarketing as draws on neuro-scientific technologies to understand the subconscious reasoning and behaviour of customers. It measures brain and body signals instead of, or along with, traditional self-reporting tools like surveys or interviews (Laurent Probst et al, 2014).

Neuromarketing aims to understand how consumers think and why the consumer chooses products by applying « neuroscientific methods

to analyze and understand human behavior in relation to markets and marketing exchanges » (Marion bridonneau et al, 2011).

speaking conceptually, neuromarketing considers both qualitative and quantitative aspects of research methodology as illustrated in figure 3. Qualitative aspects covers issues like the content, medium and mode of delivery of contents to customers. Additionally quantitative research stresses issues like duration of exposure of advertisement to the consumers etc (Naman Sharma et al, 2014).

**figure 3: conceptual framework of neuromarketing**



*Source : (Naman Sharma et al, 2014, p 551 )*

**6-Techniques used by neuromarketing**

The main set of tools of neuromarketing is related to brain imaging techniques. For example, in 2009 over 3000 articles were published in the entire world, also tackling the brain imaging issue (Roullet and Droulers, 2010, p. 10). The most used tools in this context are: EEG, MEG, functional MRI and Eye tracking.

**6-1-Electroencephalography (EEG) :** has been used for a long time in neurology for identifying and measuring brain waves. Its purpose is to measure the variation of the electrical field at the level of the scalp. The brain waves have various patterns, depending on the status of consciousness of the respective person .this waves are registered with the help of electrodes placed on the scalp. The technique is very efficient in registering the moment when the neurons

triggered an answer (temporal resolution), registering reactions almost in real time ( Leon Zurawicki, 2010).

**6-2-Magnetoencephalography (MEG) :** traces minuscule magnetic fields generated by the electrical activity of the synchronized neurons (Roullet and Droulers, 2010). This measures the magnetic field generated by the brain's electrical activity. It has a good temporal resolution and a spatial resolution better than the EEG, and can indicate the depth of the location in the brain with high spatial and temporal resolution (Monica Diana Bercea, 2013).

**6-3- Functional Magnetic Resonance Imaging fMRI:** Unlike both EEG and MEG, the fMRI modality is based on using an MRI scanner to image the change of blood flow in the brain. When neurons fire, they need to use energy which is transported by the blood flow and quickly metabolized. The key element for a marketing researcher to understand is the contrast of the BOLD signal measured by the fMRI. BOLD is an acronym for Blood Oxygen Level Dependant.

When faced with a particular stimulus such as an ad, areas of a subject's brain receive more oxygenated blood flow than they do at rest time (Barbel Husing et al, 2006). This change creates distortions in the magnetic field emitted by hydrogen protons in the water molecules of our blood. The basis of all fMRI studies is to consider that the change in the BOLD signal is an accurate measure of neuronal activity, even though it does not directly measure electrochemical signals generated by our neurons. While the spatial resolution of fMRI is 10 times better than EEG by providing researchers the ability to image the activity of a voxel (Volume-Pixel), a cube of neurons (1 mm x 1 mm x 1 mm in size) (Christophe Morin, 2011).

**6-4-Eye tracking:** tracks what the eyes are focusing at. Voice analysis records the psychophysiological stress responses that come across in human voice owing to the response of the vocal cords to such stress.

By making use of a lightweight headset with three cameras it is possible to record exactly where a person is looking as he or she is exposed to some kind of visual display. For example, a person is

navigating through a website looking to purchase an item, with eye tracking it is possible to mark exactly where the person is looking for specific information about the item, how they compare different items, and where they look to navigate to the shopping cart or other areas of the site (Sunita Kumar, 2015).

Eye tracking is clearly valuable for advertising or other visual stimuli to learn what people actually look at, O'Connell said : It gives more accurate information than self-report, since research shows that claimed viewing is not always the same as measured actual viewing (Barbara O'Connell et al, 2011).

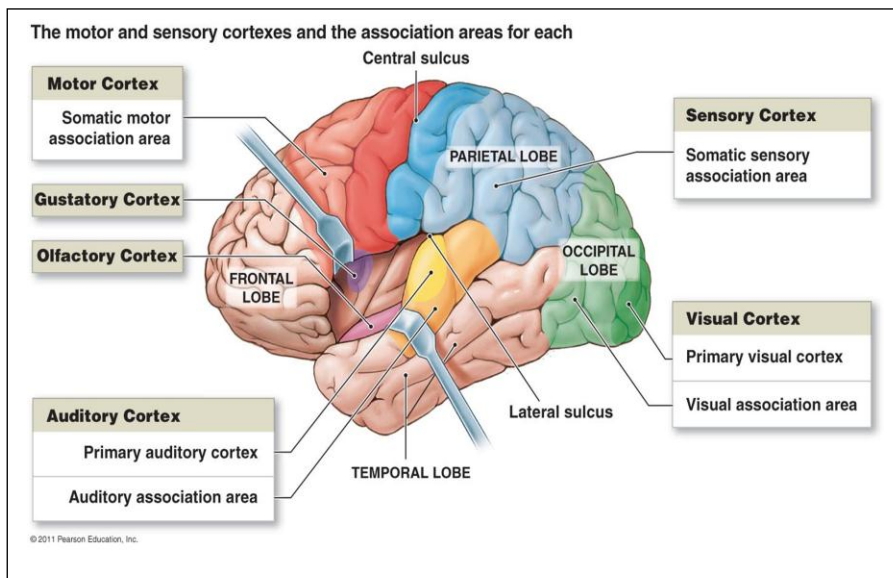
### **7-Five senses and their impact on consumer**

The five human senses have great importance for an individual's different purchase experiences and consumption processes. By the help of senses, individuals become conscious of and perceive firms, products and brands.

Touching, tasting, hearing, smelling also seeing a product plays an important role in our understanding. Perception of these roles has a valuable advantage in the market today. These senses are image of our daily lives while using them we satisfy our needs and desires. Recently, behavioral economists have started addressing these needs through sensory marketing which is usually associated with a favorable emotional response to make a change in the shopping behavior (Mojtaba Shabgou et al, 2014). The motor and sensory cortexes and the association area for each are illustrated in the figure 4.



**Figure 4 : The motor and sensory cortexes and the association area for each**



*Source : [http://www2.highlands.edu/Central Nervous System](http://www2.highlands.edu/Central_Nervous_System)*

This large region encompassing three cortical lobes also functions as the region of cortex processes where information from various senses is bound together for higher order processing in a multisensory perception of the world. The motor or output, regions of the cortex are located in the frontal lobe just besides the primary sensory area. The close physical connection between the somatosensory cortex and the motor cortex allows for a tight coupling between senses of touch, pressure and pain and the action or motor system (Bernard J. Baars And Nicole M. Gage, 2010).

### **7-1-Hearing: Sound (Auditory)**

Sound is any disturbance that travels through an elastic medium such as air, ground or water and heard by the human ear. Sound has the power to influence our mood and sway our buying habits. Functional music is played in stores, shopping malls and offices to either relax or stimulate consumers. Work by Milliman (1982, 1986) varied the tempos of music in supermarkets, restaurants or stores and

found out that consumers would unknowingly change their behavior in the retail environment, whether it 's by ordering more drinks or buying more or less groceries (Judith Lynne Zaichkowsky and Crader, Sumire, 2007).

Sight is the most used sense in marketing, as it is the most stimulated by the environment. The choice of colours and forms in the conception of a product, the layout of a point of sale, the realisation of promotion campaign are key factors of success (or failure), well understood by marketers. Colours and shapes are the first way of identification and differentiation. Many brands are associated to a specific colour, then it is memorised more easily by customers ; Coca Cola is red, Kodak is yellow and KFC red and white. The company can be identified even though the customer didn't see the name. According to memory retention studies, consumers are up to 78% more likely to remember a message printed in colour that in black and white. In the food and beverage industry, the impact of colours is obvious and sharply defined (Khirodhur Latasha, 2016).

Color's impact on people's moods and emotions are well known. The use of color is crucial in attracting a consumer's attention and creating interest in a product by activating thoughts, memories, and particular modes of perception. Furthermore this arousal prompts an increase in consumers' ability to process information (Judith Lynne Zaichkowsky and Grader Sumire, 2007).

### **7-2-Smell (Olfactory) :**

The human nose can distinguish over 10,000 different odors (Nallet. P, 1985), besides being the most sensitive of the senses ; it has a tremendous evocative power of memories and experiences over the years Not everything ap-plies to all products, but certainly it's worth experimenting a little and making sure what we are doing for our brand. Let's consider lemon dishwashing detergent; the lemon makes people feel clean.

The early connection may have been established based on lemon's acidity and its use in earlier times. When people started associating the lemon scent with a feeling of cleanliness, even a different

stimulation more oriented on tasting, could not preclude the perceived link from persisting, so that a lemon scent still indicates « cleaner » (Cinzia di niccolo and all, 2013).

Olfaction is also the most directly connected sense fundamental impulses areas brain (Nallet, Vacher de la Pougé, Baudry, 1985).

However, the impact of smells on customers' behaviour has been definitely certified. First, searchers proved the positive impact of a smell on the evaluation of a product (Laird, 1935, Cox, 1969).

### **7-3-Touch (tactile) :**

which have an important impact on perception and thus purchasing behaviors of consumers, specially at the stage of product assessment and store perception. When buying products such as electronic goods and clothes, consumers tend to buy products that they are allowed to touch. Touching offers information that cannot be obtained through observation, such as smoothness, roughness, temperature and weight, and such information have impact on perception (Aitamer & Zhou, 2011).

When a consumer's attention is captured through visual and other sensory cues, there will be behavioral responses such as moving closer to the object, extended viewing of its appearance, touching of its surface, and ultimately its acquisition (Bloch et al., 2003).

### **7-4-Taste (gustative) :**

Taste sense has a big importance in our lives in physical, social and even emotional sense. Taste sensations change from culture to culture and even from people to people within the same culture and actually it is associated with other senses.

In terms of perception, taste is closely associated with smells. Smells combined with taste create the flavor sensation and recall memories and past experiences.

Recent studies aimed to understand better the mechanism of taste and explore the existing relations between, for instance, taste and colours. Thus, scientists now know that the 4 basic gustative sensations: sweet, sour, bitter and salty, are respectively linked by

consumers to the red, green, blue and yellows colours (Célier, 2004), This might be important in the packaging design process of a product for instance. In a promotional way, companies often use gustative marketing to convince customers by making blind-tests (through comparatives advertisements for instance) or directly with sampling or free-tasting promotional operations. According to Rieunier (2002), such operations can be determinant in the food industry, as customers are more disposed to purchase a product that they already tasted and liked (Cyril Valenti And Joseph Riviere, 2008).

Taste Finally, of course, is a key factor in choosing food, but discovered today, especially following a test carried out in the USA that the image of the brand has sometimes control over consumer choice as the taste itself.

McClure and his colleagues are forerunners in Neuro Marketing. This American researcher had the idea to compare the emotions perceived by the brain of 100 volunteers in terms of two brands. PePsi and CocaCola. Why these two brands? Because they are chemically and physically nearly identical, nonetheless, people routinely strongly favour one over the other (Naman Sharma et al, 2014).

McClure scanned the brain of the volunteers thanks to fMRI. Then, he asked them to try the two drinks and then to decide which one they actually prefer.

At first, the volunteers did not know which beverage they were drinking. 67% preferred the taste of Pepsi. Then, McClure asks them to try again.

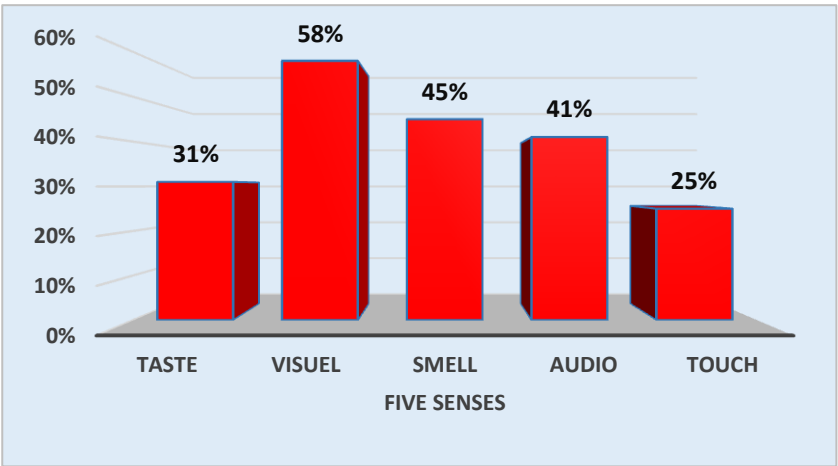
But this time, they knew which beverage they were drinking. In this case around 75% proffered CocaCola. McClure explains that the results are the direct consequence of the brand image of CocaCola. He shows thanks to the fMRI that the emotions perceived by the brain is stronger with CocaCola than with Pepsi.

The researchers concluded that their findings indicate that two separate brain systems (one involving taste and one recalling cultural influence) in the prefrontal cortex interact to determine preferences ([www.fora.fr](http://www.fora.fr)).

### 8-Brand and the five senses :

Sensory branding leverages all five senses to make deeper connections with consumers by baking sight, sound, smell, taste and touch into the brand experience. These elements add texture to help create authentic, distinctive, compelling and enduring brand stories that create competitive edge (Sharafat Hussain, 2014), It's based on studies that linking the five senses with human memory and emotion can greatly enhance one's engagement with a brand (both offline and online). It also increases the likelihood of advocacy, and very possibly, stronger business results. In a rational world of business, connecting at an emotional level is the key, and often missing ingredient, to capturing hearts and building lasting connections, the importance of senses in the relationship with brands as illustrated in the figure 5.

**Figure 5 : The relative importance of the senses in the relationship with brands**



*Source : MMC « Mail Media Centre » Sensational:Harnessing the power of the five senses to create brand connections, June 2008, p 12.*

**9- Application of neuromarketing with the five senses** (Patrick Georges and Michel Badoc, 2010-2012)

**9-1-Satisfied the nose of the customer :**

Increasingly, brands are asking perfumers to create a " smell signature" for them, that will be attached to their stores, hotels, cars: an olfactive logo in all . Stores spread these olfactive signatures by using micro-molecular techniques .

This kind of practice is increasingly used in small shops or in any case retail, whether it's at the shoemaker shop where one feels a smell of leather , at the bakery with a smell of warm bread, pizza or perfume in clothes shops.

Indeed, when going to the cinema , you buy a ticket and just before entering , an irresistible smell of popcorn reaches your noses: it is impossible to resist, and for sure a Coke is more needed since the popcorn will make you feel thirsty . Similarly as we pass by the bakery , the smell of bread made us run there for a small croissant . Finally, although the smell of a perfume is subjective, Abercrombie & Fitch diffuse "Fierce 8" in all its shops and out to encourage the consumer to enter his shop.

**9-2-Satisfied the ears of the customer :**

Sound is precious for our emotional decisions . Our brain organizes them pretty well. It collects them firstly in temporary lobes, close to our ears. Then it divides the work , music mathematics is treated on the left brain , while the harmony of the same music piece is treated on the right. Each has his own speciality.

In neuromarketing, we work sounds, what are the sounds that are being sold ? What kind of music do we need to put in shops ? In ads ? What kind of sounds that light up the pleasure zone of the brain when doing the brain imaging ? What kind of sounds that light up the brain zone favorable to the purchase? What marketing knows intuitively has been confirmed. The seller, an advertiser with a deep voice is more confident than someone who speaks with a low voice.

An animal deep tone reports maturity, dominance, the one we must follow to be safe. Some stores tried a very special sound, a baby crying of hunger mixed with the general sound system. Women then, bought more food. The interpretation is that these are very special sounds that awake an unconscious maternal instinct. As with Coca Cola and the sound of the capsule jumping and gas to escape from the bottle.

### **9-3-satisfied customer's eye**

All what shines is gold, light is so important to our brain, the light we are receiving is the one that have been sent to the object than, resent towards our eye, after being modified by the structure of the object. Our brain "pleasure" reacts strongly to contrast and brightness. A more contrasted text with more brightness is more readable and more believable.

For the brain, what looks beautiful is good, give your products the proportions of a perfect face, they will be sold in a better way. If, in brain imaging, your product lights the face recognition zone in the brain of your customers, it's a good sign.

### **9-4-satisfied customer's skin**

When you analyze an object, the premotor zone of your brain rates immediately its weight, in case you 'll have the idea to ask the brain to take this object, a necessary ballistics need to be provided by that zone. At the moment you grab the object, if it's heavier or lighter than what 's your brain had really expected, there will be an alert of information divergence and the object is shelved. And here is some examples, about the premotor zone. A good quality object needs to be more or less heavy. So neuromarketing will add artificially weight to the device so that the brain while taking it, won't light the "sensorial divergence". Even if it's a box of medicines, the pharmaceutical industries will add or remove a few grams to satisfy the sense of the customer. You'll be surprised by the truth that the brain makes always a specific idea about the weight that an object needs to have and by just seeing it, the brain is being prepared to take this object.

All in all, the senses influence our emotions and decision-making. Touch, smell, taste, sound, and the look of a product all play an important role in our perceptions, attitudes and consumption of a product. Understanding those roles provides a valuable advantage in today's marketplace.

### **10-Conclusion :**

Eventually , regarding today's consumers ,they can not spend their time watching TV ads and other traditional advertising practices. Marketers ,should be providing an enjoyable shopping experience and a transcendent sense and that by spending part of their marketing budget to reach the minds and hearts of the costumers . Even though the extensive investigations, marketers have found that human senses have crucial role in their shopping experience and through strategic stimulation of these senses, consumer buying behavior will be influenced in an innovative way. Neuromarketing puts the human brain, along with its five senses, in the center of the marketing and shows that companies and retailers can have a positive impact on five senses of the consumer through different senses such as color, smell, music, taste and texture.

And this offers the perspectives of a quantitative method to test the effectiveness of ads, logos and sounds before spending money on promotion. This new research tool is a vital instrument for those companies that want to better understand their targeted audience and to design better products for their clients.

If we were to synthesize the neuroscience importance, and consequently of the neuromarketing importance for a company, we would quote Joey Reiman: « **NO BRAIN, NO GAIN** ».

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