

COLEGIO MAYOR NUESTRA SEÑORA DEL ROSARIO



PRESENTADO POR:

MARÍA JULIANA GONZÁLEZ FAJARDO

HOW NEUROSCIENCE AND SENSORIAL THEORIES CAN AFFECT THE MARKETING  
OF DIFFERENT COMPANIES' PRODUCTS AND SERVICES?

TRABAJO DE GRADO

MONTPELLIER, 2014

COLEGIO MAYOR NUESTRA SEÑORA DEL ROSARIO



PRESENTADO POR:

MARÍA JULIANA GONZÁLEZ FAJARDO

HOW NEUROSCIENCE AND SENSORIAL THEORIES CAN AFFECT THE MARKETING  
OF DIFFERENT COMPANIES' PRODUCTS AND SERVICES?

TRABAJO DE GRADO

TUTOR:

JUSTINE ESTARAGUE

ADMINISTRACIÓN DE NEGOCIOS INTERNACIONALES

MONTPELLIER, 2014

## Table of Contents

<b>ABSTRACT</b>	<b>4</b>
<b>INTRODUCTION</b>	<b>5</b>
<b>LITERATURE REVIEW</b>	<b>6</b>
<b>MULTISENSORY AND NEURO-MARKETING</b>	<b>6</b>
<b>ENVIRONMENTAL CONTRIBUTIONS TO THE SELECTION OF FOOD AND DRINK</b>	<b>10</b>
<b>MULTISENSORY PACKAGING DESIGN</b>	<b>12</b>
<b>THE ETHICS OF NEUROMARKETING</b>	<b>14</b>
<b>METHODOLOGY</b>	<b>14</b>
<b>THE PEPSI VS COKE CHALLENGE</b>	<b>16</b>
<b>SONY BRAVIA</b>	<b>17</b>
<b>RESULTS</b>	<b>17</b>
<b>RESULTS FOR THE PEPSI VS COKE CHALLENGE</b>	<b>18</b>
<b>ANALYSIS</b>	<b>20</b>
<b>CONCLUSION</b>	<b>25</b>
<b>BIBLIOGRAPHY</b>	<b>¡ERROR! MARCADOR NO DEFINIDO.</b>

## **ABSTRACT**

Taking into account the aggressive competitiveness among businesses nowadays, marketing represents a highly important tool to grow or even survive. There are many theories around marketing however most of them consider only the expressed conscious preferences and rational choices.

This work pretend to have a closer look of how Neuroscience and Multisensorial theories can nourish the marketing domain, for this, we will revise some of the most relevant bibliography around this area to frame the purpose of the study. After the information gathered through this revision, we will review two important examples of actual world wide known companies that have use neuroscience inspired marketing taking also into account the synergy of the senses.

After this, the two examples will be analyze and discuss in order to conclude how neuroscience and the multisensorial theories can affect the marketing of different products and services. This paper intends to approach marketing from the preferences that our brains show through neuroscience, even if we don't know about them.

## **INTRODUCTION**

The importance of marketing in the success of any product or service in the market is well known since various years ago, however it is constantly evolving as a response of the high competence and levels of imitation in almost every domain.

One of the aspects that have been developed lately is the perception of how customers and humans in general receive and process information through the different senses (such as smell, taste, sight, hearing, and touch) and cognitive and affective processes. This approach evaluates the customer experience as a rich multisensory phenomenon that takes into account the synergies resulting from our experiences and translates into multisensory marketing exploring in a deeper way all the affective components of a purchase as well as the effect of aspects such as the name, the packaging and the environment in the customers' perception.

The present text will attempt to do a review of the state of art of this application of neuroscience and multisensory characteristics into the marketing of goods and services, pointing out the main research and work made in this domain through the analysis of the work made by different influential authors such as Aradhna Krishna, Dan Ariely, Gregory Berns and Charles Spence covering the main definitions and concepts of multisensory and Neuromarketing as a matter of introduction to this topic.

By the other hand it is relevant to the complete understanding of the subject to take into account that the use of the kind of marketing described in this text should be observed through the frame of a social marketing that accomplish ethical and responsibility parameter as this marketing approach starts out of the principle that the customers perceive with all their senses but they don't know how the brain works.

After reviewing all these studies in this topic this work would like to answer the question of

how neuroscience and sensorial theories can affect the marketing of different companies' products and services? For answering this question they will be given two different examples of companies using neuroscience and multisensory-based marketing to in this way observe and analyze how it actually works in the field.

First it will be exposed the Pepsi vs Coke Challenge in which worldwide known beverages companies where exposed to neuroscience based techniques showing important purchase and enjoy factors that are not clear to customers and haven't been identify by the traditional marketing but could be identify in our brain.

The second case study that will be presented is the one related to the television division, Bravia, of the multinational Sony. This company executed neuroimaging scanning to the spectators of two different advertising campaigns for the same products, finding very different reactions.

Multisensory and Neuro-Marketing is everywhere. Colors, tastes, textures, sounds and smells fill our day-to-day experiences and either if we are or not aware they affect our behavior and in this matter our purchase decision.

In this order of ideas the better understanding and acknowledgement in this domain may result in better a marketing strategy, complementing the traditional theories, with these new and trendy approaches.

## **LITERATURE REVIEW**

### **Multisensory and Neuro-Marketing**

There is a general perception of marketing as something evil, this because it is perceive as a motor making customers buy products or services even if they don't need it, or the tool to disguise thinks to make them seem better than they are; in contrast the ultimate goal of the

marketing is to help matching people's needs with products and services characteristics. (Ariely & Berns, 2010)

Marketing helps in the design and presentation of goods making them more suitable for meeting customers' needs and preferences and by the other hand they guide the customers in the purchase process. In order to achieve these goals, marketers had use for many years several tools such as focus groups and surveys, which are simple and usually cheap methods that might not be the most accurate but may give an important guidance, however; nowadays there are many other complex tools such as the neuroimaging that can help to solve some of the marketers' problems towards understanding the decision-making processes as it seems to reveal some information that was unreachable through traditional methods and that could in theory influence the buying behavior in ways that remained unknown until now. (Aradhna Krishna, 2010)

Coherent with the hope neuroimaging and neuroscience represent to marketers this new concepts have gain a lot popularity in the last years, leading into an arising interest thus to a growing research in this domain resulting into publications and organizations marketing neuroscience it self. (Ariely & Berns, 2010)

But is this new methodology in marketing really going to reveal new information hidden in the customers' mind? That is something that may be hard to say but this is one of the reasons that make it so revolutionary as traditional marketing relies in the expressed, not hidden, preferences and in this order of ideas neuromarketing sets apart from anything known until now, however neuromarketing has been concentrating in the evaluation of the success of different campaigns and strategies that have been already developed, which could hint it haven't been as useful yet in other stages such as the planning. (Ariely & Berns, 2010) The following chart will present different traditional methods and some of the characteristics with the intention of understanding, which are the main needs of marketers and the different result the techniques give us.

	Focus groups	Preference questionnaires	Simulated choice methods	Market tests
<b>What is measured</b>	Open-ended answers, body language and behaviour; not suitable for statistical analysis	Importance weighting for various product attributes	Choices among products	Decision to buy and choice among products
<b>Type of response process</b>	Speculative, except when used to assess prototypes	The respondent must try to determine his decision weightings through introspection, then map those weightings into the response scale	A hypothetical choice, so the same process as the actual purchase — but without monetary consequences	An actual choice, with customers' own money, and therefore fully consequential
<b>Typical use in new-product development processes</b>	Early on to aid general product design; at user interface design for usability studies	Design phase, when determining customer trade-offs is important	Design phase, when determining customer trade-offs is important; may also be used as a forecasting tool	End of process, to forecast sales and measure the response to other elements of marketing, such as price
<b>Cost and competitive risk</b>	Low cost; risk comes only from misuse of data by the seller	Moderate cost and some risk of alerting competitors	Moderate cost (higher if using prototypes instead of descriptions) and some risk of alerting competitors	High cost and high risk of alerting competitors, plus the risk of the product being reverse engineered before launch
<b>Technical skill required</b>	Moderation skills for inside the group and ethnographic skills for observers and analysts	Questionnaire design and statistical analysis	Experiment design and statistical analysis (including choice modelling)	Running an instrumented market and forecasting (highly specialized)

TABLE 1 Comparison of Different Research Approaches

Source: Neuromarketing: the hope and hype of neuroimaging in business, Ariely and Berns, 2010 for the nature magazine online.

This table shows how difficult it may be to analyze which is the more efficient of trustful approach to measure decision utility, because even if we can see market tests may reveal useful information it encounters big risks and running one of for each product or service is not a viable option.

However further than this we could ask if the neuro-marketing could help us to predict not only the decision utility, which of course is a huge expectation of any market research, but also the satisfaction or reward experienced by the customers at the time of consumption known as experience utility and even if there are a lot of indicators that may lead to think nothing has been demonstrated yet, which can be understand by the recentness of the scientific neuromarketing related knowledge.

But what is already been executed is the fact that creating sensations or just emphasizing on



existing one can increase a product or service appealing and this is when we start talking about the neuromarketing and sensory marketing nowadays and we will stop commenting its ambitious influence for the future.

Through the development of the relations between psychology and neuroscience research it has been shown how it exist a synergy between all our senses. In other words our eating experience is not only affected by the taste sense, but it is a complex union of interrelations between all the senses. In this order of ideas the eating experiences can be affected by “external” factors such as the music in the restaurant, the color of your plate and the smell of your neighbor’s dish. (Ernest & Banks, 2012)

As a matter of fact it has been only of around 8% of the “eating experience” is given by the sense of taste (Spence, 2012), this can appear unbelievable as people is use to associate food with taste as a major strong relation. But the truth is our brain creates taste out of the colors, smells, shapes, colors, etc as explained: “The perception of flavor is a multisensory integration process and thus provides several opportunities for neuroimaging to disentangle a complex perception that subjects might not be able to articulate; taste, odor, texture, appearance and even sound all contribute to the gustatory experience.” (Ariely & Berns, 2010)

For this reason the design of any product or marketing campaign should manage this synergy for its flavor. For example if the principle of people avoiding unpleasant sensation and seeking for pleasant ones we could imagine than when creating a candy, which is meant to be placed in the mouth companies should develop a shape and textures that look agreeable to the sight and the touch of the mouth as well as a pleasant smell and not only focus on creating a good flavor, that was the approach for several years.

And if we add this knowledge with the one provided by techniques such as the neuroimaging; which consist in a Magnetic Resonance Imaging (MRI) that for the neuromarketing domain refers to the scanning of the brain to detect its activity and reaction to some external stimulus, giving marketers guidance of the preferences that customer might not be able to express when they have been asked, but their brain identify. This will create enormous advantages in the

marketing field as it could take the traditional methods such as surveys to set a limit of what to experiment with on a neuroimaging.

Actually different food and beverages have been administered in the MRI scanner giving as a result valuable information about customers' preference that could lead to a super food or to make healthy food more appealing as you can see how the brain reacts to the different sensation given but the multisensory experience and the actual combination that your brain prefers. (Ariely & Berns, 2010)

In summary, nowadays neuroscience and theories such as the multisensory, or synergy of the senses, have been developing widely, bringing new information, techniques and tools not only to the scientific and medical domain but also to the marketing as it supports the customers' purchase decisions and preferences theories through their brain activity when being exposed to a product or campaign and releases important information that couldn't be gathered through other classic approaches. By the other hand this new information is not extensively available, as it requires the use of very specific electronic devices (to perform the MRI) and a specific knowledge to operate them, which permits that traditional marketing tools, continue to be used and updated.

### **Environmental Contributions To The Selection Of Food And Drink**

After the introduction of the multisensory theory and knowing there are new techniques to get to know what people really want and that there are new techniques that can help marketers develop better products, this work wants to examine other important factor involving the neuromarketing approach and that should take into account by any marketer or business holder in the alimentary sector, the influence of the environment in the eating experience.

Have you ever wonder why airplane food always taste awful? (Green & Butts, 1945) or why wine tastes better when you drink it in a nice place and a good company? (Smith, 2009) well this are some examples of how the environment where we are can affect our perception of food and drinks, everything from the lighting, the sounds, the tablecloths and the fragrance around you can drastically change the way you feel what you are eating. (Meiselman, 2008).

This is just coherent with the fact that hunger increases as well as the production of saliva when seeing, smelling or listening a related sound with the food we like. (Wijk, Polet, Engelen, et al., 2004)

This is called a crossmodal influence and it occurs even if we are aware of it or not (Spence, 2010) so knowing how to manage it, a perfect eating environment could be designed in order to raise the congruency between the meal and the surrounding and increase the number of happy clients and a whole stimulus eating/drinking experience. To better explain this issue a clear example will be presented and explain next,

“The experience is familiar to many. There you are sitting in the sun, au bord de la mer on the Cote d’Azur, eating delicious seafood with a loved one, and drinking Provencal rose. The glass frosted with condensation contains a wine of pale salmon colour; the bottle rests in the ice bucket. The experience is intensely pleasurable and at that moment you can come to believe that this is one of the most enjoyable wines you have ever had. Later you buy a case of the wine and when you open it back home on a cold grey day, it has lost all its savour. This is not an exceptional wine. It is not even that enjoyable. What has brought about this decline in the value of the wine from Provence? Is it that it doesn’t travel? We know that wine making techniques and preservation have dramatically increased and there is no reason to suppose – if the wine was properly transported and stored that the wine has suffered any more than any wine that comes from foreign shores. Its fate cannot be due to a dramatic change in the wine. So what explanation can we give of this paradox of Provencal rose?” (Smith, 2009)

The explanation to the Provencal rose paradox is that the sensory attributes, even those who aren’t directly related to food or drink have a drastic impact in our perception of food and drink. (Spence, 2010). Further more it influences the food/drink purchases and after-purchases’ experience. (e.g., Bawa, Landwehr, Krishna, 1989; Meiselman, Hirsch, & Popper 1988; North & Hargreaves, 1998; Rozin & Tuorila 1993; Wilson, 2003).

This could be corroborated also, by the study made by several researchers in 1994 in which they demonstrated how several dishes' judgment and perception could be enhance without changing the ingredients on them. (Spence 2010) All this fact has raised the interest and appliances of this concepts and knowledge in many different restaurants, to create a whole experience out of a meal. (Heldke, 2005)

To sum up everything we see, hear or smell can affect what we select eat/drink, how we evaluate it, how much we enjoy it. (Spence, 2010) In this order of ideas, anyone trying to sell any gastronomical product should pay close attention to the setting of the environment, as it is a key success factor.

### **Multisensory Packaging Design**

The multisensory approach can also optimize the design of the packaging or our products. In fact marketers can obtain several advantages just for using color in their packaging such as attracting attention, setting apart of competence, indicate product properties such as flavor quality, change the product's flavor or perception or create sensory incongruence that could lead to new flavors. (Spence, 2102)

How can a marketer attack attention in a supermarket where a client can see a thousands products in one minute? There are different tools that could help to do it correctly. For instance the use of red color, red is a symbol of danger in our brain and for this reason it stands out and we can see it easier than other colors. By the other hand, it should take into account which kind of products are been market so that while attracting more attention you don't alter the perception of the products in other domains as it happened with 7Up:

“When 15% more yellow added to the green on 7-Up cans people report the taste to be a lot more limey/lemony. People were upset: ‘you’re changing my Seven-Up! Don’t do a ‘New Coke’ on me.’” (Hine, 1995) This example reinforce the multisensory effects, remember our brains construct taste out of the stimulus in all our senses (like color) and highlights the importance of a well-designed package.

By the other hand you can use shape and materials in packaging to hint characteristics

of your products such as freshness, premium quality, low price, among others and it must be taken into account that you can not charge your customer premium if you are offering your product in a low quality package. (Spence, 2010) Shape also has a high impact in purchase and consumption. Recent research shows that the shape of the glass in which a drink is served can have a profound effect on the consumption of this product. People drink around 88% more when served in a shorter, wider glass than from a narrower, taller (Wansink & van Ittersum, 2003, 2005).

Towards the sound of the packaging it plays an important role as well. There is not functional need for the noise produced by the package of the crisp but it enhances your perception of the product as well as it does the opening system of the Kleenex which sound gives your brain the illusion of softness. (Spence, 2012)

When choosing the texture of your packaging take into account the areas of the body it will be touching as there are some that are more sensitive than others. Also think that the touch is a highly emotional sense and if you stimulate it on a positive way it could give good result to your brand recognition. (Aradhna Krishna, 2012). Another important fact related to touch is that the weight has a huge influence in the quality perception of customers and in this order of ideas in the price a customer is willing to pay, for examples people are willing to pay 1,5 dollars more for the same wine only when they change the bottle to one 8gr heavier. (Spence, 2012)

Smell also plays an important role. It is, with touch one of the most emotive sense of humans and playing with this can bring a lot of benefits. For example on a survey made in 2007 by IRI SECODIP 72% of the people said they took into consideration the smell when purchasing any hair care product and there is a reason why car companies such as Volkswagen or Roll Royce invest a lot of money in the development of their “new car” fragrances as well as Apple has a very unique and remembered new product smell. (Spence, 2012)

In conclusion marketers should based their design in the multisensory theory in order to better access customers in the purchase moment and please users when using the product, always

paying careful attention to the congruency, the pricing and products features and the brand's "signature".

### **The Ethics of Neuromarketing**

As businesses might be able to read their customers' mind through this new marketing tools and for this reason the privacy of thoughts might become a concern. A person who participates of a neuroimaging experiment should be guaranteed that the information gathered through these techniques is only going to be used as agreed in advance. The issue might be that there are nor prior legal regulations for marketing research tools:

*"A lack of regulation. Traditional marketing methods, because they are not typically viewed as experimentation, have not been subject to institutional review board (IRB) oversight. MRI scans are approved by the US Food and Drug Administration (FDA) for clinical use but, because no diagnosis is being made in a marketing setting, there is the potential to circumvent both FDA and IRB requirements. The burgeoning neuromarketing industry would be well advised to adopt an industry standard of independent review. Clients should demand it."* (Ariely & Berns, 2010)

This lack of regulations strongly implies the need of ethics for the well use of the MRI and neuroimaging tool in the marketing fields in order not to violate the integrity or privacy of the participants of the experiments as well as the customers as a lot of information might be revealed.

## **METHODOLOGY**

It has been explained all the recent knowledge in the neuroscience and multisensory-based marketing domain. After, it is intended to show two examples of real companies who have been developing their marketing using tools that contain this kind of knowledge. In other

words, it will be shown now concrete actions developed by companies in their marketing of their products to see how it works in a business scenario and their results.

Experimentation would be the most suitable and desired method to test all the information explained before in order to compare in the first hand the different results obtained from a classical marketing research and a neuroscience based marketing research. However, due to its highly specific requirements such as MRI scans and very controlled environments, plus the difficulties it represents to test neuroscience theories, the two companies analysis method has been chosen as it is a way to clearly see the effects of a neuromarketing strategy on the real business conditions and it is in the scope of the resources possessed.

The first companies in the table are Coca-Cola Company and Pepsi Co. This work concentrates only in their two insignia products: Pepsi and Coke. The Coca-Cola Company is an North American company that started in 1886 and has a huge acquired knowledge in marketing and branding, is one of the most known brand in the whole world. (Coca-Colacompany.com, 2014). In the other side we have Pepsi Co, which resulted from the merge of Pepsi-Cola and Frito Lay in 1890 but which history comes far before combining the marketing knowledge of two big and well-known North American brands that have succeed worldwide. (Pepsico.com, 2014)

Following, the neuromarketing strategies adopted by Sony for its line Bravia will be presented. Sony is a North American electronics company based in New York, US and Tokio, Japan with a lot of success as one of the leaders of this important sector in the world. (Sony.com, 2104)

It is important to state that the two experiments that will be treated right after took place during the first years of the 2000s, which was a very important period for the neuroscience and multisensorial-based marketing. They took place in the United States of America in highly controlled environments that avoid external stimuli.

One of the companies that are on stake commanded these experiments; it was Sony

who wanted to improve its marketing using the neuroscience and multisensorial approach. In the other case it was an experiment done in academic bases, but that had a very important impact in the marketing that Pepsi Co develops nowadays.

Neuroscience experts executed both of the experiments, as there is a needed knowledge in order to be able to manipulate the techniques used.

Through the development of the work it will be explained the specific actions that link these companies with the purpose of this work and why be categorized as neuroscience and multisensorial-based strategies.

### **The Pepsi vs Coke Challenge**

This experiment was executed by: Read Montague (director of the Neuroimaging Laboratory at Baylor College of Medicine in Houston), in 2004. The test was composed of 50 subjects exposed to 3 different stages that represented branding in different ways (McClure et al, 2004):

1. Stated preferences: the subjects participating in the experiment were supposed to state of the preferred one brand over the other.
2. Anonymous taste test: The participants were given two unknown samples of Cola and they were asked which one tasted better. They were always one sample of Coke and one of Pepsi, but they didn't know the order in which they received them. Meanwhile fMRI scanners were used to examine the brain activity of the subjects while they were drinking both.
3. Brand-Cued taste test: In this part of the experiment the subjects will also receive two samples. One was label whit the correct brand and the second was unlabeled ad they were said that the second sample could contain any of the two Colas, Pepsi or Coke. In this part they also had fMRI to check on the neural activity.



## **Sony Bravia**

In this case, Sony, with the help of tools that correspond to neuromarketing, measured the reaction of spectators with two different television advertising for the same product, the Sony Bravia TV. The techniques they used are known as neuro-trace and it correspond to the use of EEG, EMG, which are tools to scan the brain activity while being exposed to a certain stimuli.

Parallel to this they tried to find emotions tracking the reaction of the skin in relation with the advertisements with a technique called galvanic skin response which consists in placing electrodes, usually in the hands or feet, and expose the subject being study to and stimuli when the subject increases its arousal it becomes a better conductor representing an emotional reaction.

As explained before the goal they seek with this, was to rate the emotional and cognitive response and level of attention and care the subject experienced when they where watching and listening to the ads. So that in this way the company could choose the most convenient campaign for this product.

There were several advertising that were tested for Sony Bravia, however this study will focus on two advertising with very similar characteristics. The pieces of pub show some streets of San Francisco with more than 25000 rubber balls of different colors bouncing. There are some objects in the background such as car. Also there is one scene in which there is a green frog jumping surrounded by the balls. At the end of the advertising spectators can se the slogan of the product “color like no other” and then the image of a Bravia screen. The second advertising is quite similar, but they deleted the image of the frog jumping. Both ads are musicalized by the cover of a song called Heartbeat originally from The Knifes and interpreted by Jose González.

## RESULTS

### Results for the Pepsi vs Coke Challenge

The result of the first step showed no differences of preferences among the participants as nearly half of the subject claim to prefer Pepsi and half of them Coke. (McClure et al, 2004 & Spence, 2014)

	NUMBER	PERCENTAGE
<b>PEOPLE WHO PREFERRED COKE</b>	26	52%
<b>PEOPLE WHO PREFERRED PEPSI</b>	24	48%

For the second part of the test many participants said they wanted to repeat the test times before they give and after the maximum 3 tastes of the samples, this are the results (McClure et al, 2004 & Spence, 2014):

	NUMBER	PERCENTAGE
<b>PEOPLE WHO PREFERRED COKE</b>	23	46%
<b>PEOPLE WHO PREFERRED PEPSI</b>	27	54%

For the last stage with participants knowing one of the brands this are the results (McClure et al, 2004 & Spence, 2014):

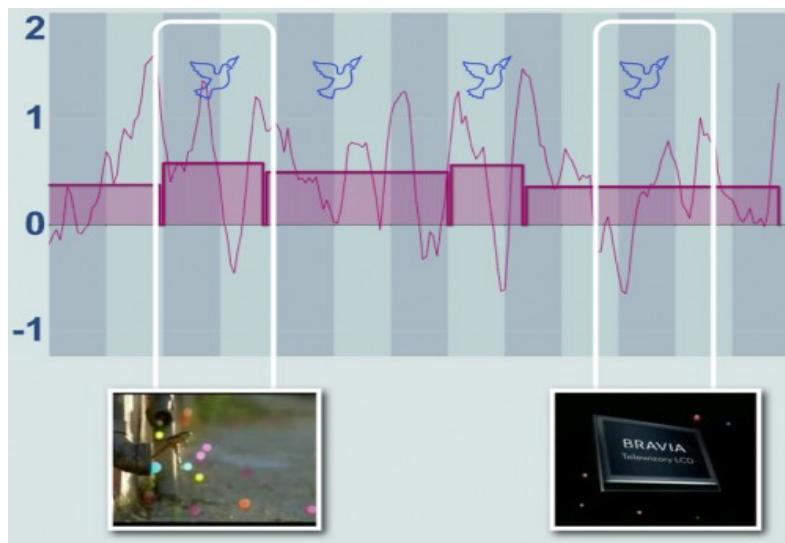
	NUMBER	PERCENTAGE
<b>PEOPLE WHO PREFERRED COKE</b>	34	68%
<b>PEOPLE WHO PREFERRED PEPSI</b>	16	32%

Parallel to this there is a significant result that came of the reading of the fMRI scanners during the second and third parts of the test. For the second part, the same part of the brain where activated while the participants where drinking coke and Pepsi, this area of the brain is called Ventromedial Prefrontal Cortex. (McClure et al, 2004 & Spence, 2014)

However, during the last stage of the test another two areas of the brain were activated, these areas are called hippocampus dorsolateral prefrontal cortex and midbrain. (McClure et al, 2004 & Spence, 2014)

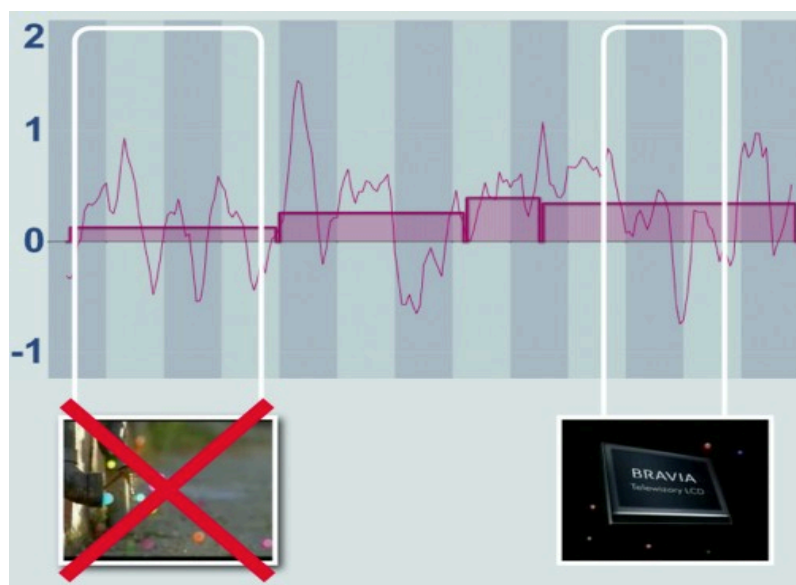
### Results for the Sony Bravia Experiment

This was the brain activity registered for the first advertising, which included the image of a frog jumping as one of the scenes, the birds represent a high level of attention:



Source: tallerd3.com

Next there is the brain activity founded in the subjects after the frog jumping was removed from the advertising:



Source: tallerd3.com

## ANALYSIS

First it will be analyzed the Pepsi vs Coke case. For this we will take a closer look to the result in the different stages of test. In the first part the participants are supposed to state which of these famous cola drinks they prefer, this claiming t use their memory and supposed stated preferences without any test of the drink. So this first part of the test seems to be seeking if the subjects had previous preferences. Without being examined by the fMRI scan this part applies techniques that are typical of the classic marketing in which individuals answer what they think they like and prefer. This is a question one could find in an interview, a focus groups or survey.

As mentioned in the results part of this work 52% of the participants agreed they preferred coke to 48% of the participants who said they preferred Pepsi. This difference doesn't seem to be very representative which is normal as they are both very similar drinks with very similar

ingredients and therefore flavor. This result however, represents the perception that the subjects have of the brands and their drinks and correspond to a conscious answer.

For the second and third parts of the test things get more interesting for the purpose of this study as the neuromarketing technique are introduced. First it will be explained in more detail the tool used, for this it will be quoted the description of a respected neurological page:

*“Functional magnetic resonance imaging, or fMRI, is a technique for measuring brain activity. It works by detecting the changes in blood oxygenation and flow that occur in response to neural activity – when a brain area is more active it consumes more oxygen and to meet this increased demand blood flow increases to the active area. fMRI can be used to produce activation maps showing which parts of the brain are involved in a particular mental process.”* (Devlin, 2007)

This represents a very significant tool for neuromarketing as neuroscience is capable of identifying which areas of the brain are in charge of the different cognitive and emotional functions and in this order of ideas when the fMRI scan shows an area of the brain that is lighting it can give a clue to marketers about how the participants react to the different stimuli of products and advertising and is not the conscious reaction, but the brain activity that unconsciously occurs even with subjects not aware of it.

In the second part of the test, that corresponds to the blind test they found that 54% of the participants preferred Pepsi to Coke. This is a very interesting result because even if the difference is still not very significant, it showed that when subjects judge these two drinks just though their senses, Pepsi appears to be just slightly superior.

But this is just one of the sides of test. After analyzing the fMRI scans of the brain during this part of the test we can see that the same area of the brain was activated when they were drinking both; Pepsi and coke. This area of the brain is called Ventromedial Prefrontal Cortex and is strongly related with the choices made out of sensorial information. (McClure et al, 2004) This, hints that sense-wise they both stimulated on a similar way the brain so the

difference of preferences between the beverages is not based the flavor.

In the third part, which corresponded to the semi blind test, the changes were very significant as 68% of the participants agreed to preferred coke. Without further information no great conclusions could get out of this test. It would be confusing as people in the first test stated half and half preferences about the same drink evaluated in this part, it was the same soft drinks, the ones they said they had tried before and the only think different in this part is the fact that one of them was marked, resulting in a strong preferences to one of them.

But the missing clue results from the analysis of the complementing information gotten by the fMRI. As mention in the result part, two areas of the brain were activated, apart from the part that activated in the previous stage; these areas are called hippocampus dorsolateral prefrontal cortex and midbrain. These parts of the brain involve choices that take into account previous experiences and associations with cultural information and can modify behavior though emotions. (McClure et al, 2004).

This extra information that could be gathered from the fMRI gives us the missing part to understand why this big change occurred in the perception of the two colas. If we closely analyze the results of this part of the test we can see the importance of the brands in the pleasure that customers feel when consuming or using a product, in other worlds we can see there is what could be called a reward in our brain when we use an specific product that we can associate with a positive cultural pattern or memory in our brain.

In other worlds, these new parts of the brain that activated when knowing the brands correspond to an emotional impulse of purchase that can also increase the customer satisfaction. But how can we generate these positive associations in our brains? Marketers can't actively work in the customer's memories when consuming the product, at least not in the general bases. However marketing represents a very powerful tool to change the perception customers have of a brand and as explained during this entire work neuromarketing truly changes the experiences of buying and using the products.

In this order of ideas, after the result obtained though this new neuromarketing tools, the

superiority that coke could have over Pepsi is not related to the product as such, because as we saw Pepsi obtained better result during the blind taste, but rather on their marketing campaign and the associated emotions that customers have with the brand. The packaging colors, the advertisements, the logo and all the other details we have been analyzing through the work of different authors, can represent a real change for two products with very similar characteristics.

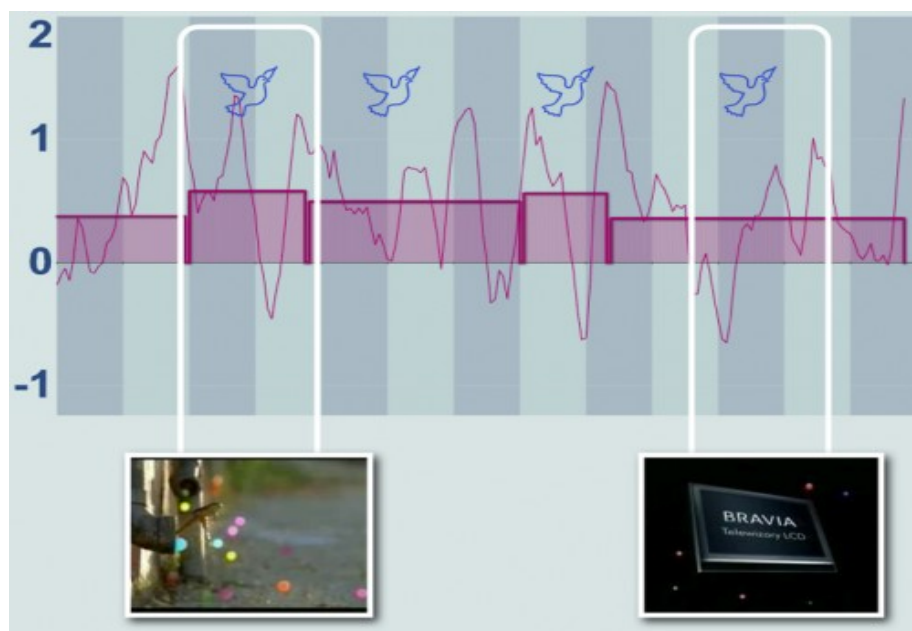
Without the neuromarketing techniques and sticking to traditional marketing, we may find that Pepsi and Coke are doing same as good in all the fields, people may evaluate the taste as good, and the packaging as accurate, but the truth is there is more information in our brain than the one we consciously express, there is a lot of information the human beings are still unable to decode but that tools such as a fMRI scanner can show us.

Now this work will focus on the second example given for arguing the importance of neuroscience and multisensorial knowledge in marketing nowadays, the interesting advertising build for Sony Bravia. As described before several advertisements for the same product were tested. As explained in the methodology, this work will concentrate in two of them who are extremely similar one to the other but which had very different reactions in the testing spectators.

The main difference is the fact that in one of them there is a scene of a frog jumping and in the second this part is deleted. We might think that this part is very poorly related to the product that is aiming to introduce to the market, however the results showed by the fMRI scanner are very different for the two commercials which shows that this frog has a special impact.

As a matter of introduction the technique used in this test is called a neuro-trace, which involves an EEG, an instrument to scan the electrical activity of the brain determining the levels of attention in different situations or stimuli. (Pedersen, 2013)

Next it will be presented the result of this scan in the participants when observing the first ad, the one containing the scene with the jumping frog:



Source: tallerd3.com

The birds in this image represent attention pikes of the spectators. As it is visible, there are four different pikes of attention in this segment of the advertising; one of them corresponds to the jumping frog, another to the slogan of the product and the last to the image of the product. (Monge, 2009)

But what happens when the frog is deleted from the advertising:





Source: tallerd3.com

In this second advertising the pike of attention that corresponded to the jumping frog disappears, which is logical, but the interesting fact is that the attention pikes corresponding to the slogan and the image of the product disappeared as well. (Monge, 2009)

The causes are not completely determined, that is how complex the human brain is. However the use of this neuroscience based tool helped Sony to develop the most optimal advertising for its campaign, without this tool they might have deleted the frog from the ad, without knowing the huge impact this had on transmitting the final message to the potential customers.

By the other hand, the galvanic test showed that this advertising had a very positive impact on the spectators as they had a very good combination of music and images. This reaffirms the multisensorial theory that explains how the images complement with the sounds generating a powerful impact in the spectators.

## CONCLUSION

Out of the study of the literature on this relatively new methods that use knowledge relative to neuroscience and theories such as the multisensory in the marketing domain and after having a close look to two very relevant and widely known examples of applications in this areas there are several conclusions to state.

First of all we can say the goal of marketing is to find the best way to approach customers, many books have been written about how to gather clients' attention and awaken an emotion that can lead to purchase and then to a positive experience. The traditional marketing methods are not completely wrong and they give us a lot of useful information, however its mistakes relays on the fact that traditional marketing usually sees customers as an entity that can be categorized by aspects such as gender or age, without taking into account more important facts like that humans beings are systemic and gather the information of the world though senses that work all together in processes that might be unconscious and we don't fully understand.

The neuroscience and multisensorial applications of marketing have a more wide understanding of these aspects and they actually work, representing a very useful tool for marketers and any business professionals to accurately design and improve their marketing. Everything since the packaging to the advertising can nourish from these sciences that even if they were design for other purposes fit perfectly for the needs of the marketers.

Knowing the customers preferences towards small changes in the features of a product, a specific way to deliver a service or developing a campaign from a perspective that was until a few years unknown can really give a turn to all the concepts and approaches to marketing.

This new "era" of the marketing not only involves the known classical ways to gather information out of potential or actual customers, but also gives a new strategy. It calls the

unconscious preferences of people opening a whole new box of opportunities and information.

In this order of ideas it could be state that the use of this new information and techniques can translate into a huge competitive advantage to the companies adding neuroscience theories to the classical ones in their products and services and can really represent the difference between a success and a failure and in the long term the use of these techniques can even determine the leader companies in different sectors and the ones that will end up closing.

However the use of these neuroscience techniques is not as simple as the application of traditional marketing tools, it is a lot more expensive and needs trained people that know how to handle the equipment. For this reasons it can appear to be very unfair as those companies with the money and the possibility to invest in getting into the mind of their customers can continue to grow, however the small companies who are starting to rise might have a lot more trouble investing in this techniques.

Even tough, companies starting should make the effort to involve these practices in their marketing and product and service design as they represent a powerful tool and could help them to make the accurate moves into success, instead of struggling while trying to find the formula that would led them to find the characteristics that customers like indeed, though less expensive but also less effective methods.

But the other side marketers should take into account all the senses for designing their products and services. As seen in the cases and in the literature the important of the combination of our senses is very significant and in many cases can represent the key to success. Many products center in one aspect only, in pleasing one specific sense. However we could see how the synergy of all senses is what can actually create a positive emotion that can lead to a first purchase or to a brand loyalty

## BIBLIOGRAPHY

Ariely, D., & Berns, G. S. (2010). Neuromarketing: The hope and hype of neuroimaging in business. *Nature Reviews Neuroscience*.

Spence, C. (2009). Measuring the impossible. In MINET Conference: Measurement, sensation and cognition

Lee, N., Broderick, A., & Chamberlain, L. (2007). What is "neuromarketing"? A discussion and agenda for future research. *International Journal of Psychophysiology*, 203

Meiselman, H. L. (2008). *Dimensions of the meal: the science, culture, business, and art of eating*. Gaithersburg, Md.: Aspen Publishers, Inc..

Smith, B.C. (Ed.) (2009). Questions of taste: The philosophy of wine. Oxford:Oxford University Press.

Müller, M. Saliva from Obese Individuals Suppresses the Release of Aroma Compounds from Wine. *PLoS ONE*, e85611. Retrieved April 2, 2014, from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3899019/>

Toca, C. (2009) Fundamentos de Marketing: Guía para su estudio y comprensión. Bogotá: Editorial Universidad del Rosario.

(Heldke, 2005) (e.g., Bawa, Landwehr, Krishna, 1989; Meiselman, Hirsch, & Popper 1988; North & Hargreaves, 1998; Rozin & Tuorila 1993; Wilson, 2003).

Stein, B.E. & Meredith, M.A. (1993). The merging of the senses. Cambridge, MA: MIT Press.

Spence, C. (2011). Sound design: How understanding the brain of the consumer can enhance auditory and multisensory product/brand development. In K. Bronner, R. Hirt, & C. Ringe (Eds.)

Spence, C., & Gallace, A. (2011). Multisensory design: Reaching out to touch the consumer. Psychology & Marketing.

Devlin, H. (2007). What is Functional Magnetic Resonance Imaging (fMRI)? *Psych Central*. Retrieved on April 30, 2014, from <http://psychcentral.com/lib/what-is-functional-magnetic-resonance-imaging-fmri/0001056>

Spence, C. & Shankar, M.U. (2010). The influence of auditory cues on the perception of, and responses to, food and drink. *Journal of Sensory Studies*

Spence, C. (2010). Location, location, location: Atmospherics and the Experience Economy. Unpublished manuscript.

Spence, C., & Shankar, M. U. (2010). The influence of auditory cues on the perception of, and responses to, food and drink. *Journal of Sensory Studies*.

Spence, C. (2012). Managing sensory expectations concerning products and brands: Capitalizing on the potential of sound and shape symbolism. *Journal of Consumer Psychology*.

Spence, C. (2010). Taste's great, but what do we call it? The art and science of food naming and labelling. Unpublished manuscript.

Spence, C. (2010). The price of everything – the value of nothing? *The World of Fine Wine*.

Spence, C. (2010). The multisensory perception of flavour. *The Psychologist*.

Spence, C., Harrar, V., & Piqueras-Fiszman, B. (2012). Assessing the impact of the tableware and other contextual variables on multisensory flavour perception. *Flavour*.

Krishna, A. (Ed.). (2010). *Sensory marketing: Research on the sensuality of products*. London: Routledge.

Lindstrom, M. (2005). *Brand sense: How to build brands through touch, taste, smell, sight and sound*. London: Kogan P.

Yale Medical Group. (s.f.). Yale School of Medicine. read the 13 de April of 2013, available at <http://www.yalemedicalgroup.org/stw/Page.asp?PageID=STW024552>

Malfitano, O., Arteaga, R., Romano, S., Scínica, E. (2007) *Neuromarketing: Cerebrando Negocios y Servicios*. Buenos Aires, México, Santiago, Montevideo: Granica.

Neuromarca. (s.f.). Neuromarca: El blog sobre neuromarketing en español. Recuperado Noviembre 12, 2013, from <http://neuromarca.com/neuromarketing/eye-tracking/>

Pradeep, A. (2010). *The Buying Brain: The secrets of selling to the subconscious mind*. New Jersey: John Wiley & Sons, Inc

Braidot, N. (2009). *Neuromarketing: Por qué tus clientes se acuestan con otro si dicen que les gustas tú?*. Barcelona: Gestión 2000.

PEDERSEN, T. EEG Shows Different Brain Waves in ADHD Subtypes. *PsychCentral*. Retrieved April 1, 2014, from <http://psychcentral.com/news/2013/10/14/eeg-shows-different-brain-waves-in-adhd-subtypes/60724.html>

Monge, s. (2009, March 25). Sony Bravia y el neuromarketing. *taller d3 blog sobre comunicacin RSS*. Retrieved April 2, 2014, from <http://www.tallerd3.com/archives/3370>

Recursos creativos en spots de televisión | Neuromarca. (2009, May 25). *Recursos creativos en spots de televisión | Neuromarca*. Retrieved May 2, 2014, from <http://neuromarca.com/blog/recursos-creativos-spots-television/>

Pepsi o Coca-Cola. Aspectos epistémicos y éticos del neuromarketing. (2013, March 19). *Neurofilosofa*. Retrieved April 21, 2014, from <http://neurosofia.wordpress.com/2013/05/19/pepsi-o-coca-cola-aspectos-epistemicos-y-eticos-del-neuromarketing/>

NEUROMARKETING: EL EXPERIMENTO DE COCA-COLA Y PEPSI. (2013, May 31). . Retrieved April 16, 2014, from <http://www.educadictos.com/b/neuromarketing-el-experimento-de-coca-cola-y-pepsi/>