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Measuring Store Emotional Experience through Facial Electromyography and Skin Conductance

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Project of the Master in Science of Business Administration

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Abstract

Over the years, the retail industry has experienced many mutations. Those mutations also include changes in the consumption patterns. Therefore, characteristics such as fast adaptation and the ability to make right strategic decisions will most likely lead the company to achieve its intention: generate profit.

In order to achieve such situation, knowing your client is the right tool to get the intended goal, so techniques and studies to understand customer behavior have been proliferating. In addition, there is increasing interest in customer experience and the impact that such situations have on customer buying behavior.

This last situation is essentially due to the increasing competition to capture customers in the retail market, since nowadays the competition is not only about prices. Many customers assess one purchase long before they enter a shop and the experience begins here, as a differentiating element.

Therefore, this project applied in a hypermarket of the Auchan Group aims to be a constructive element on how to develop a Neuromarketing study, where the main goal is to analyze the emotional impact that basic experiential simulation, associated to variables identified on the in-store environment, has on potential customers.

Finally, despite the results have not been as conclusive as expected, the experiential environments generated a slight activation that points towards a positive emotional responses.

Key words: Retail; Neuromarketing; In-Store environment; Emotions

Resumo

Ao longo dos anos, a indústria do retalho tem experienciado muitas mutações. Essas mutações também incluem mudanças nos padrões de consumo. Desse modo, características como a rápida adaptação e a habilidade de tomar boas decisões estratégicas, irão muito certamente levar a empresa a alcançar o seu intuito: gerar lucros.

Para se atingir essa situação, conhecer o cliente é a ferramenta correcta para alcançar o objectivo pretendido, desse modo têm vindo a proliferar as técnicas e estudos para compreender o comportamento do consumidor. Além disso, tem vindo a aumentar o interesse na experiência do consumidor e no impacto que essas situações têm no comportamento de compra do consumidor.

Esta última situação dá-se essencialmente graças ao aumento da competição para capturar clientes por parte do mercado retalhista, visto que hoje em dia a competição não é só acerca dos preços. Muitos consumidores avaliam uma compra muito antes de entrar numa loja e a experiência começa aqui, como um elemento diferenciador.

Portanto, este projecto aplicado num hipermercado do Grupo Auchan tem como propósito ser um elemento construtivo em como desenvolver um estudo de Neuromarketing, onde o objectivo principal é analisar o impacto emocional que uma simples simulação experiencial, associada com as variáveis identificadas no ambiente de loja, têm nos possíveis clientes.

Finalmente, apesar de os resultados não terem sido tão conclusivos como se esperava, os ambientes experienciais geraram uma ligeira activação que aponta para uma resposta emocional positiva.

Palavras-chave: Retalho; Neuromarketing; Ambiente de loja; Emoções

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Finally, I address my final words to thank my parents and my girlfriend since they were an important element of motivation and support to stay focused on my goals.

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Sumário Executivo

O objectivo deste projecto é estudar o impacto emocional decorrente da simulação de variáveis do ambiente de loja identificadas por Turley e Milliman (2000).

A indústria do retalho tem sofrido grandes mutações e a competição tem se tornado cada vez mais intensa. Com esta competição têm proliferado estratégias que incluem um conhecimento maior do cliente. De facto esta será uma das variáveis senão a mais importante que hoje em dia uma empresa tem em mente, pois só assim é possível atingir os resultados pretendidos (mais vendas e/ou mais lucros).

Com esta perspectiva em mente surge uma nova ferramenta de análise do cliente, denominada enquanto ciência como Neuromarketing. Esta ciência apresenta várias formas de analisar o cliente, essas formas são: técnicas de neuroimagem (Electroencefalograma) e técnicas psicofisiológicas (Electromiografia - EMG; condutância da pele - SC).

O Neuromarketing tem ganho ao longo dos últimos anos relevância no seio dos estudos de mercado. A sua maior vantagem é permitir obter respostas com menor ou sem risco de serem falsas, o que leva a tomadas de decisão suportadas por informação mais fiável. Esta vantagem é argumentada por muitos investigadores e profissionais na área do comportamento do consumir, tais como Dan Ariely e Dr. Pradeep.

Da revisão bibliográfica, resultou também a possibilidade de construir experiências de acordo com o modelo aplicável para a situação. O modelo em causa de Pine e Gilmore, permite a investigadores, profissionais de marketing e gestores, ter uma forma de construir experiências de acordo com o objectivo pretendido.

Aliado a isto, na revisão bibliográfica, tal como referi anteriormente, Turley e Milliman propõem uma estrutura que identifica as variáveis do ambiente loja que no âmbito do retalho têm sido alvo de estudo, e consideradas como influenciadoras do comportamento dos clientes.

Assim, ligando o modelo de Pine e Gilmore, e a estrutura de Turley e Milliman, foi possível elaborar ambientes experienciais nas variáveis do ambiente loja seleccionadas.

Para se medir o impacto dessas experiências nos ambientes escolhidos, foi identificado também na revisão bibliográfica, um modelo de Peter Lang que propõe o estudo das respostas emocionais através de duas dimensões complementares, dimensão cognitiva (através de questionário) e a dimensão fisiológica (através de EMG e o SC).

Face ao exposto, o meu modelo conceptual foi definido como a ligação entre o modelo de Pine e Gilmore, a estrutura de Turley e Milliman e o modelo integrador de Peter Lang.

A tecnologia utilizada revelou-se um aspecto inovador no estudo das emoções nos ambientes de loja, uma vez que, até hoje não existe evidência da aplicação destas tecnologias (EMG e SC) fora do âmbito da publicidade, ou do universo da psicologia.

A elaboração do estudo pressupôs a filmagem numa loja do grupo Auchan e posterior criação de PowerPoint para apresentação aos candidatos. Após apresentação e recolha dos dados, foram aplicados testes estatísticos para comprovar as hipóteses. Os testes em causa foram *paired sample t'student* e *anova for repeated measures*. Os resultados indicaram não existirem diferenças significativas nas respostas fisiológicas aos estímulos em todas as amostras ($\rho>0,05$). Passou-se então à análise das variáveis através de estatística descritiva, com análise de médias de activação por canal e análise de frequências relativas no caso do questionário cognitivo (também considerado um canal). Para tal foram produzidos gráficos e tabelas que permitissem a análise coerente da informação.

Tendo sido aplicado o estudo a vinte candidatos, foi possível perceber que numa análise geral, as variáveis de loja quando alvo de uma construção experiencial, apresentam resultados que apontam no sentido correcto, ou seja para uma resposta emocionalmente positiva. Esta ideia acaba por ser reforçada com a ligação a estudos passados, revistos e apresentados por Turley e Milliman, onde se concluía igualmente que as variáveis de loja são influenciadoras de atitudes no cliente.

Provou-se também no estímulo que envolveu as almofadas, onde se pressupôs a construção de três variáveis experienciais, que existe diferença entre a resposta consciente e a reacção não consciente dos candidatos. Este facto, é analisável através da activação (não consciente) mais proeminente no caso do apoio da funcionária, enquanto que a resposta cognitiva (consciente) aponta para o domínio do cenário com o poster educacional.

Para terminar, ao longo da revisão bibliográfica e do modelo conceptual definido, este projecto apresenta linhas de orientação para futura aplicação no seio das empresas. Assim, para além da vertente inovadora do projecto, acredito que a ambição educacional tenha sido alcançada.

1 Introduction

In order to introduce my project, I will start by explaining the studied problems, project goal and finally the methodology used to achieve the results.

Research Problematic

Over the years, the retail industry has faced many complex changes and mostly the market itself has turned highly competitive. Since I am working with Auchan Group, I've noticed the opportunity to develop a Neuromarketing study to understand the impact of in-store experiences.

Brands like Auchan are in a very price sensitive market. Hence, long-term changes and investments are not the focus, maybe at a strategic level this occurs, but in daily decisions this situation is unusual to occur. Based on this idea, many retail brands are focusing on new variables such as staging experiences within the in-store variables universe. This constitutes an attempt to gain a customer that is less loyal and increasingly demanding.

Moreover, considered as an important milestone nowadays, the increased intention to really know and understand consumer behavior means the proliferation of techniques that enables its understanding and measurement. Despite this proliferation in techniques, there is no evidence that Neuromarketing studies have been applied. Therefore, there is an opportunity to apply an innovative study through innovative psychophysiological techniques to the in-store experience.

Research Goals

Supported by the research problematic presented above, I will now concentrate on what are the goals of my project.

As identified previously, the retailing market is changing and within this context, experiential in-store environments are considered differentiating tools to attract customers. Hence, 1) the main objective of this project is to extract and analyze customers emotional response to the experiential environment staged. In order to do so, I will apply psychophysiological techniques which can be used as Neuromarketing study tool.

Moreover, as second level goals, this project aims to help managers, retailers, entrepreneurs, (a) identifying in-store environmental variables, (b) how to construct

experiential environments with in-store variables, and (c) elucidate on how to use a different market research tool. Hence, these second level objectives evidence the intention of being a learning tool to managers, retailers and entrepreneurs.

Methodology followed

In order to achieve the goals of this project, it will imply the use of a conceptual model and an empirical methodology.

The conceptual model establishes the foundations of the project, based on three empirical/conceptual models.

The models are Pine and Gilmore (1999) on how to stage experiences, Turley and Milliman (2000) as identification framework of in-store environment variables and finally Peter Lang (1968) integrative model, the major conceptual tool to extract information and measure the identified in-store variables simulated in an experiential way.

The empirical methodology implied some preparatory steps and collection of data at Iscte Lab (Lapso).

Those preparatory steps included creating educational posters, recording the stimuli in an Auchan Store, creating a movie with two versions including all the stimulus recorded in-store and presenting those versions in a PowerPoint presentation (for each version).

After this constructive and preparatory step, psychophysiological technology present in Iscte Lab was applied. The technology used allowed to measure and analyze EMG and SC activation.

After collecting the data, the following step included its statistical analysis through descriptive statistics and validation of the variables significance, using Student t' test and Anova. These methods allowed a proper analysis and a conclusion based on statistical evidence.

2 Literature Review

2.1 Retail Industry

In order to make a proper introduction about the market in which I am performing this study, I will present the Retail industry from a strategic perspective.

The Retail industry has experienced enormous challenges along the last decades. First and foremost, the competitiveness of the marketplace has become increasingly higher with some important strategic adjustments, such as consolidation by big players, expansion of some retailers to new countries and new channels (e.g. E-commerce), as noted by Grewal et al (2006:13).

Therefore, as consequence of an increasing competition, Grewal et al (2006:13) argued that customers' are demanding and willing to buy in a large variety of stores, given that they are always looking for the products that really fulfill their needs at the best price. Thus, I can conclude that maintaining a customer has become more and more complicated.

2.1.1 Identifying Market and Positioning

To properly explain the strategic dynamics of the retail industry, Grewal et al (2006) proposed a model that enables to position a retail brand in the context of the marketplace. That model is based on two dimensions, relative price and relative offering.

Acknowledging these dimensions, the authors indicated that there are four segments depicted in the table 1 below (also see figure 1,page 4).

Retail Segments	Value Proposition
Innovative	Quality-conscious markets seeking premium offerings
Big Middle	Delivers quality at a reasonable price; Large breadth of SKU's
Low Price	Price-conscious Segments
In-Trouble	Unable to deliver value compared to competitors

Table 1: Retail landscape (Source: Adapted from Grewal et al, 2006:14)

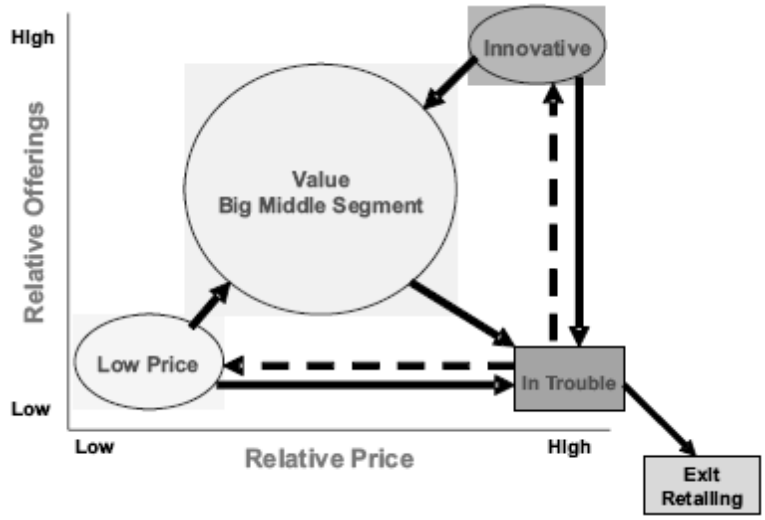


Figure 1- Retail Landscape (Source: Grewal et al, 2006:14)

Moreover, the model purposed by Grewal et al (2006) helps me to position the company I am working for, Auchan Group.

Based on the model, I consider Auchan as being part of the Big Middle Segment, which is in fact a place where most retailers want to be, due to the profitability connected to this segment. According to Grewal et al (2006), that profitability is a consequence of a mass appealing market through an offering characterized by huge breadth and variety of SKU's at a very competitive price.

2.1.2 Levers of Retail Success

Another important issue presented by Grewal et al (2006:18) is the identification of the levers of retail success. The authors proposed six major retail success levers:

Store Factors;	Merchandise;	Supply Chain;
Service Factors	Price;	Technology;

In light of these facts, I will only focus my attention on two of these levers, Store factors and Service Factors.

As Grewal et al (2006:18) noticed, store factors are considered an important strategic tool, since it is most likely to be the primary tool that a customer uses to evaluate a store. Additionally, it was also evidenced by the author that consumers' are increasingly observing prices based on environment and experience felt while in-store (Grewal et al 2006:19).

For this reason, in-store environment should be regarded as a strategic key tool to achieve competitive advantage against your competitors.
Finally regarding service factors Grewal et al (2006:19) argues that those retailers who are able to have a higher service quality, have also a competitive advantage against their competitors. Competitive advantage adds more value to their portfolio of products and services (Grewal et al, 2006:19).

2.2 Experiential Construct

2.2.1 Experience

The definition of experience, according to Pine and Gilmore (1998), is essentially the intentional use of services as a stage and the use of goods as props, by a company, to attract individual customers in a way that originates an unforgettable event. In addition, both authors mention that experiences, resembling to goods and services, have to converge with customer's needs, therefore experiences have to work and have to be deliverable.
Prahalad and Ramaswamy(2003) gave another perspective, arguing that experience environments can be thought, a strong interconnected combination of company abilities and consumer interaction channels, adaptable enough to lodge a wide variety of necessities and preferences. This is due to customer's craved experiences that couldn't be previously established, thus experience environments should actively involve consumers to accommodate a series of probable customer-company relations.
Finally, Steigelman purposes that retail managers should bear in mind that the retail experience must bring significance, if they want to turn a one-time visitor into a repeated customer. (Mathwick et al 2001:40).

2.2.1.1 Methodology to build Experiences

In order to proceed with the concept of experience it is crucial to infer ways to build it in an operational way. Based on this, Sands et al (2008) presented two existing models, one by Pine and Gilmore and the other by Schmitt.

The Schmitt's model characterizes by a typology of experience built on five key dimensions: Sense, Feel, Think, Act, and Relate (Sands et al, 2008:299). On the other hand, Pine and Gilmore model, considered more fairly operational by Sands et al (2008:299), is based on building experiences upon four experience realms: aesthetic, educational, entertaining and escapist (Pine and Gilmore, 1998).

Based on the stated above, Sands et al (2008:299) argued that Schmitt's model appears to be appropriate to build brand experiences, while Pine and Gilmore model is a proper tool for the retail industry. Therefore, I'll dedicate my attention to the Pine and Gilmore's Model (1998).

Firstly, Pine and Gilmore (1998) introduced their model by explaining the two dimensions of experience, one about the participation and the other about the unity or emotional bond created.

Regarding the first one, Pine and Gilmore (1998:101) argued that consumers can lie in two spectrums: passive participation - the consumer is a mere viewer of the event; active participation - originates from the consumers' ability to interact in the experience.

In what the other dimension is concerned, Pine and Gilmore (1998:101) divided it in two spectrums too: Absorption and Immersion. Absorption - the experience's ability as an assimilation event; Immersion - the ability to interact with the customers in a more deeply engaging moment.

Supported on these dimensions, Pine and Gilmore (1998) purposed four realms constructed along the two dimensions (see figure 2, page 7). The four realms are Educational, Escapist and Esthetic or Aesthetic and Entertainment (Pine and Gilmore 1998:102).

In the realm of entertainment, the customer participates passively in the experience and the connection with the experiential environment is by absorption (Pine and Gilmore, 1998:102).

As for the Educational realm, it involves the customers' active participation and absorption connection.

Concerning an Escapist experience, consumers' participate actively in the experiential environment and their connection is by immersion (Pine and Gilmore, 1998:102).

Finally, Esthetic or Aesthetic experiences involve the customers' immersion in the event, but contrary to Escapist they participate passively (Pine and Gilmore, 1998:102).

Figure 2- Conceptual Model to Stage Experiences (Source: Pine and Gilmore, 1998:102)

In conclusion, Pine and Gilmore (1998:102) highlighted that staging an experience is not a consequence of one aspect of the four realms; it can be staged experiences that combine more than one realm, meaning that experiences can cross both experiential dimensions.

2.2.2 Experiential Value

On the study made by Mathwick et al (2001), the authors mention Sheth, Newman & Gross (1991), arguing that the value which stimulates consumption behaviour has been attributed to practical, conditional, social, emotional and epistemic utilities. According to Mathwick et al (2001:40) based on Dodds and Monroe (1985) among others, this wide conceptualization traditionally led researchers to relate value as the trade-off between quality and price. As the authors also noticed by the work of Babin and Darden (1995), when the price aspect is examined it can be acknowledged that the price customers pay can broaden far beyond money to incorporate investments of time and effort.

Therefore, experiential value is defined by Mathwick et al (2002:53) based on Holbrook and Corfman (1985), Zeithmal (1988), Woodruff (1997), among others, as an observed relativistic preference for product characteristics or service performances occurring

from contact within a consumption setting that helps or obstructs success of customers' desires or intentions.

Mathwick et al (2001:41), referring Holbrook and Corfman (1985), stated that an experience is worth it based in relations involving either direct or indirect appreciation of goods and services. These relations grant the preferences held by the individuals implicated.

Nevertheless, there is another division of customer's value that must be considered: the perceived value, which according to Zeithmal (1988) is the consumer's overall consideration of a product's value based on perceptions (Sands et al, 2008:298).

2.2.3 Customer Experience

In 1982, Holbrook and Hirschman defined the notion of 'customer experience' as a new experiential approach to consumer's behavior. Before this, the customers were seen as rational decision-makers, who tried to acquire the best product from an accessible range of products at a reasonable cost. However, the authors believe that several consumption activities are explained better through experiential approach (Petermans et al, page 3).

The studies made by Holbrook and Hirschman highlighted the importance of several variables, essentially emotions, tremendously neglected until then (Petermans et al, page 3).

Moreover, Pine and Gilmore (1998) stated that by creating a unique customer experience, companies could gain massive economic value (Verhoef et al 2009:31), which is companies' ultimate goal.

Besides, in the current years, more and more managers have become conscious of the necessity to create value for their customers. That process has not been exactly successful, since experiences are supposed to offer entertainment or to be attractively creative (Berry et al 2002:1).

For this reason, to Meyer and Schwager (2007:1), the customer experience should contain every feature a company is offering, namely the quality of customer care, marketing, packaging, product and service aspects, simplicity of use and reliability. Reinforcing this idea, Verhoef et al (2009:32) argued that a customer experience and the experiential construct should involve a holistic standpoint.

Given that, according to Verhoef et al (2009:32), customer experiences have the role of creating an interaction that will generate a reaction. This reaction, presented by Gentile et al (2007), can be experienced at different levels such as rational, emotional, sensorial, physical, and spiritual (Verhoef et al 2009:32).

Despite this, Verhoef et al (2009: 38) noticed that it is of extreme importance to have in mind that customer experience is not limited to interaction in-store, rather based on Neslin et al (2006) it also includes experiences before (e.g. search of a product) and after sale (Verhoef, 2009:37).

Therefore, according to the authors it is very important to consider all the variables that could have impact in the dynamics of an experiential environment (Verhoef et al, 2009:38).

2.2.3.1 Conceptual model of Customer experience

Considering the information presented above, one will now concentrate on a conceptual model developed by Verhoef et al (2009:33) based on works of Baker et al (2002), Grewal et al (2003), among others. The model in stake points out relevant determinants that influence a customer experience, which are:

Social Environment;	Price;	Retail Atmosphere;	Assortment;
Service Interface;	Customer multi channel experience;	Retail Brand;	

Each of the relevant determinants presented here are defined with some enlightening examples in the figure 3 (see page 10).

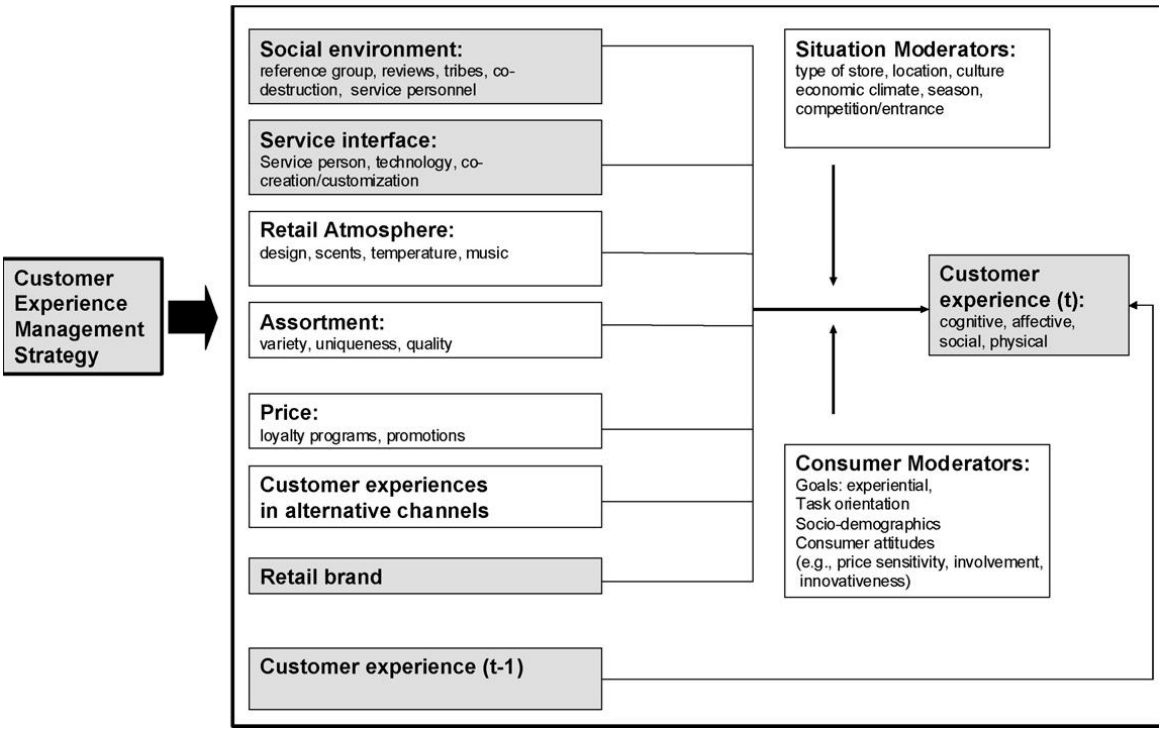


Figure 3- Determinants of a Customer Experience (Source: Verhoef et al, 2009:32).

2.3 In Store-Atmosphere

Dedicating now my attention to the in-store atmosphere, I found that the term atmospheric connected to in-store was firstly coined by Kotler (1973-74), according to Sands et al (2008:298). Moreover, Sands et al (2008:298), based on Turley and Milliman (2000), argues that since Kotler many researches have been made to investigate the impact of visual, aural, olfactory and tactile dimensions in the behavioral aspects.

Aware of this fact, Bitner (1992) evidenced that along the years managers have invested their attention in creating in-store environments that influence consumers (Turley and Milliman 2000:193). This idea was later strengthen by Kaltcheva and Weitz (2006) by evidencing that retailers dedicate continuously resources to store design and merchandise presentation.

Nevertheless, Babin and Darden (1995) addressed an elucidative issue that should be acknowledged. Different segments of customers will react differently to an experiential environment (Michon et al 2005:577).

Therefore, Turley and Milliman (2000:194) showed that atmospheric variables can be constructed in order to generate stimuli that will affect the consumers and, in consequence, result in a behavioural response. Consequently, they also stated that an

atmosphere that leads to certain stimulus at a given point in time, can also change and lead to contrasting stimulus later on (Turley and Milliman 2000:194).

Despite these facts, Kaltcheva and Weitz (2006) argued that atmospheric stimuli could be seen in two ways, one is those retailers that attempt to create engaging environments (e.g Fnac), or it can be seen in the scope of those retailers that succeed with minimalist shopping environments (e.g. Lidl).

Resuming, Michon et al (2005), in reference to Turley and Milliman (2000) research that reviewed 60 experiments intended to test manipulation of store atmosphere, concluded that the tests revealed statistically significant data supporting the strong relation between atmospherics and shopping behaviour.

2.3.1 In-Store Environmental Variables

It is important to notice that from now on the term atmospheric variable will be altered by environmental variables. To explore in-store environmental variables, one needs to identify the variables in cause. In order to do so, Turley and Milliman (2000) based on Berman and Evans (1995), proposed a framework divided in five categories (four of them resulting from the Berman and Evans research). The 1st four categories were the exterior of the store, the general interior, the layout and design variables, and the point-of-purchase and decoration variables. The last category presented by Turley and Milliman (2000) was the human variables.

The main point of this classification according to Turley and Milliman (2000) is the ability to endow managers with a tool that helps to identify appropriate atmospheric elements, allowing them to explain a particular figure or environment to a specific customer segment or target market and therefore motivate an intended result from shoppers.

So the following classification is a clear effort to generate an organized and logical structure in order to study and understand environmental variables (Turley and Milliman 2000:194).

As stated above the categories are, based on the revised typology of Turley and Milliman (2000:194), External Variables, General Interior Variables, Layout and Design Variables, Point-of-purchase and Decoration Variables, and Human Variables.

Having already presented the categories involved, it is important to explain each category and variable.

As External Variables, Turley and Milliman (2000:194) identified the following:

External signs;	Colour of building;	Surrounding Area;
Entrance;	Surrounding stores;	Parking availability;
Exterior display windows;	Lawns and gardens;	Congestion and Traffic;
Height of building;	Address and Location;	Exterior walls;
Size of building;	Architectural style;	

Turley and Milliman (2000:194) also stated that research on external variables is limited, but the existing studies refer that these variables influence consumer behaviour.

Another category presented by Turley and Milliman (2000:194) was General Interior Variables, and it included variables such as:

Flooring and Carpeting;	Tobacco smoke;	Ceiling composition;
Lightning;	Width of aisles;	Merchandise;
Music;	Colour Schemes;	Temperature;
P.A. Usage;	Wall composition;	Cleanliness;
Scents;	Paint and Wallpaper;	

Firstly, the authors denote that the contrast between the previous category and this one is characterized by having more research available.

Turley and Milliman (2000:195) came to the conclusion, on this category, that general interior variables influence behaviours such as approach/avoidance, time spent and sales.

Turley and Milliman (2000:195) also identified that the most studied general interior variable is Music. Despite this, other variables were used to perform this kind of study; some examples are odour, colour, and lightning.

In regard to Layout and Design category, Turley and Milliman (2000:194) identified the following variables:

Space design and allocation;	Placement of cash registers;	Racks and cases;
Placement of merchandise;	Waiting areas;	Waiting cues;
Grouping of Merchandise;	Waiting rooms;	Furniture;
Work Station placement;	Department locations;	Dead areas;
Placement of equipment;	Traffic flow;	

According to Turley and Milliman (2000:197), this category, like the external category, characterizes by having a limited number of studies. Despite the lack of studies, the existing ones present enlightening evidences that suggest influence on consumer behavior.

Another category indicated by Turley and Milliman (2000:194) was Point-of-Purchase and Decoration. The variables included in this category are:

Point-of-purchase display;	Artwork;
Signs and cards;	Product display;
Wall decorations;	Usage instructions;
Degrees and certificates;	Price displays;
Pictures;	Teletext;

Concerning this category, Turley and Milliman (2000:197) identified 14 empirical studies directly linked to this category.
Moreover based on Turley and Milliman (2000:197), most of the information regarding variables in this category leads to conclude influences such as impact on consumer choices and on sales.

Finally, the last Category identified by Turley and Milliman (2000:194), Human Variables includes the following variables:

Employee Characteristics	Customer Characteristics
Employee Uniforms	Privacy
Crowding	

As previously said, Turley and Milliman (2000) added this category to the Berman and Evans (1995) model. The authors identified two subareas, influence of other customers and the influence of employees (Turley and Milliman 2000:197).
Regarding the first subarea, Turley and Milliman (2000:197) stated that most literature is centered on the crowding variable. The other subarea, more important for this study, is identified in Turley and Milliman (2000:197) as one critical aspect. The reviews of studies lead the authors to conclude that these variables create impact on consumer behavior, both positive and negative.

2.3.2 Stimulus of In-store environment

As part of the lightening experiment

One of the first variables to be taken into account is lightning. According to the Turley and Milliman (2000) model it is part of the General Interior Variables.

In an interesting review, Turley and Milliman (2000:194) overlooked experiments from Areni and Kim (1994) and Baker, Grewal, and Parasuraman (1994). The findings suggest that lightning can be an important influencing factor of store figure, product evaluation and merchandise handling. Furthermore, Turley and Milliman (2000:194) also refer that Areni and Kim (1994) found out that lightning level has no direct connection with sales.

As part of the product display experiment

Another variable taken into account in this study is the product display, included in the Point of Purchase and Decoration Variables, defined by Turley and Milliman (2000). Based on a set of studies performed by Curhan (1974), Chevalier (1975), Gagnon and Osterhaus (1985), among others, Turley and Milliman (2000:197) reached the conclusion that product display and a prominent organization of those products could influence sales. One example, in reference to Simonson and Winer (1992), is yogurt, the way the product is displayed (e.g. by brand or by flavor) can create impact on the consumer's decision.

Furthermore, Michon et al (2005:576) also found in a study performed by Areni et al (1999), concerning a Wine Store, that the positioning of merchandise can make an impact on the purchase intention of consumers.

As part of the Educational Posters experiment

Finally, regarding this experiment, my focus divides in Point of Purchase and Decoration Variables and Human Variables.

About the impact of Educational Posters (Signs), the existing studies do not connect directly with Poster, so in order to have some comparability I consider studies on in-store signs.

Turley and Milliman (2000:197) performed a review and found that each research shows that signs tend to have an effect on consumers. According to Turley and

Milliman (2000:197), this influence can be the result of many different types of information displayed, such as signs with price information as Chevalier (1975) among others indicated, or a special display as Wilkinson, Mason and Paksoy (1982) presented.
Despite these types of information, Turley and Milliman (2000:197) also found that according to McKinnon, Kelly, and Robison (1981) signs showing information benefits are better than only price information.
Furthermore, they also found on a Patton (1981) study that the amount of information shown in a sign could also have an impact on sales, because when consumers face products of equivalent quality or price, they tend to choose brands that provide more information. On the contrary, when products have disproportionate quality, the information presented should be limited to a pertinent amount, since it prompts the decision-making.

Regarding Human Variables, based on Turley and Milliman (2000), my concern for this study is to present prior research applied on the employees' variable. This subarea includes several variables, although I will focus on quality/availability of the employees as informers.
Grewal and Sharma (1991) state that salespeople are an important variable to influence consumers in a shopping environment (Baker et al, 2002:127).
According to Turley and Milliman (2000:206), based on Baker, Levy and Grewal (1992), the number/friendliness of employees in the store contributes to a higher enticement. Moreover, Baker, Grewal and Parasuraman (1994) argued that stores with more sales personnel are perceived as providing higher service quality compared to discount stores (Turley and Milliman, 2000:206)
Another interesting fact was shown by Jones (1999), who argued that consumers appreciate more a helpful and nearby employee, than one with an overbearing presence (Tendai et al, 2009:107).

2.4 Neuromarketing

2.4.1 Problems on existing Market research

Ever since the corporate world became aware that being customer centric and building relational transactions is the first strategic trend that they should follow; worries about understanding customers have become increasingly important for enterprises. This means that market research techniques and studies gained important relevance for marketers mostly because the promised outcome was getting to know the client. Therefore, Dr. Pradeep argued that companies nowadays seek ways to understand and effectively appeal their clients (Anonymous, 2010:289).

Despite this, currently there is a debate around all the ranges of market research techniques and studies, and their accurate outcome.

Ariely and Berns (2010) argued that despite all the range of techniques available for marketers and managers, all of them present some arguable level of realism and quality of data, leading therefore to possible unsound moves. This flaw was also indicated by others researchers such as Braidot (2005) and Kenning, Plassmann and Ahlert (2007), who considered that the existing market research tools have problems to measure clients behavior at a subconscious and emotional level (Ohme et al 2009:22).

Furthermore, even if Noble admits that those market research techniques and studies have positive aspects, he also adds that they have an important weak point that should be acknowledged. From what people say and think there is a big difference (Lawton and Wilson 2010).

Moreover, Mya Frazier also evidenced that there is an important inability to extract accurate needs, attention and emotions. This leaded the author, supported on Dr. Pradeep, to state that a consumer not always really knows what they need and want, leading to answering in a form of a lie. (Anonymous, 2007).

2.4.2 Neuroeconomics- consumer choice

In order to properly achieve the subject of Neuromarketing, I will firstly introduce Neuroeconomics.

This area focuses on consumer behavior in a deeper level, which means that the aim is to study what happens in a subconscious level. This kind of information leaded Gregory Berns to argue that signals or activities at a subconscious level are considered valuable data (Lawton and Wilson, 2010).

Findings like this leaded marketers, managers and researchers to believe that they can access subconscious and hidden information of customers (Lawton and Wilson, 2010).

2.4.3 Neuromarketing

Neuromarketing like Neuroeconomics is a recent discipline that relates two worlds Neuroscience and Marketing.

This discipline appeared, according to Lawton and Wilson (2010), in University laboratories in an attempt to understand what goes inside consumers' head. Therefore, Neuromarketing comprehends the use of neuroscientific methods to explore consumers' behavior and reactions to marketing stimulus (Lee et al, 2007:200). Or even, the discipline that focus on analyzing consumers' (conscious and unconscious) response (Valentine 2009).

Neuromarketing covers five major areas, according to Drº Pradeep. The areas are brands, products, packaging, advertising and in-store environment (Anonymous, 2010:289).

Neuromarketing reveals to be an important tool in decoding consumer behavior at a subconscious level, allowing to connect marketing stimuli to customer's inner brain and extracting reliable and effective information. Therefore, in this context, the neuroscientific techniques are the means to reach the goal of Neuromarketing.

2.4.4 Pros and Cons

Like any other science, Neuromarketing has its own pros and cons, as I will explain next.

2.4.4.1 Pros

The idea that Neuromarketing is the step ahead in market research and customer behavior studies is gaining momentum. Some supporters of the Neuromarketing use argue with relevant ideas why this kind of science is an important tool to get to know your client.

Firstly, the extracted information turns to be more revealing and reliable than other market research studies. This fact was evidenced by Ariely and Berns (2010) since they consider that the information extracted is more informative, precise and actionable. Moreover, Lee et al (2007) also supported this idea by arguing that the use of

neuroscientific methods also enables to erase problems such as camouflaged information or lies from the customers.

Secondly, Valentine (2009) indicated that neuroscientific techniques could permit managers and marketers access to customer unconscious thoughts that most likely are lost in interrogative market research techniques.

Thirdly, Ariely and Berns (2010) argued that applying neuroscientific techniques also lead to eliminate possible biased problems resulting from other approaches.

Fourthly, according to Dr^{o} Pradeep, it allows marketers to measure customer reactions to ads, products, brands and customer in-store experience (Anonymous 2010).

2.4.4.2 Cons

Despite the benefits stated by some researchers, I will present the arguments raised to discredit Neuromarketing.

First, there's an ethical issue. Along the last few years, this field of study has faced some questions about ethics. For many companies, as Lindstrom showed (Valentine, 2009), this unclear ethical side as served as constraint.

Valentine (2009) also added that on behalf of customers there is also some doubts and fears about the techniques used, because the idea of "mind reading" is seen as controversial.

The second issue raised was concerned with costs. The costs of buying neuroimaging or psychophysiological techniques are consider more expensive than interrogative market research techniques. For instance, Ariely and Berns (2010:291) considers hardly neuroimaging techniques being more cost-effective than other market research techniques. Regarding psychophysiological techniques there is no evidence whether they are more cost-effective than interrogative market research techniques. Nevertheless, within the context of the neuroscientific methods, psychophysiological techniques are expect to be at least less expensive than neuroimaging techniques.

Third, as evidenced by Underhill (Seckler, 2009) and Zak, J. Paul (Anonymous, 2007), it is also important to notice another issue that is the unfamiliarity or unnatural environment that is linked with these methods. The same is also coherent to assume in the case of the psychophysiological techniques.

Finally, Seckler (2009) alerted that subconscious responses are expected to change after repeated visits. Thus, measuring emotions and reactions will not last and conclusions taken today may change during the course of time.

2.4.5 The expected goal by using Neuromarketing

Since I have been defining Neuromarketing, I will now concentrate on what have been discovered in prior studies and what are the expected goals by using neuroscientific techniques.

So far, I have made clear that Neuromarketing is concerned about studying responses to marketing stimulus on customer behavior.

Therefore, by applying neuroscientific techniques Marketers aim to be able to measure effectively marketing stimuli, such as interest, preference, satisfaction, attraction, attention, and emotions.

Neuromarketing science can study the response of customers' to topics like products, brands, In- Store Environment, and finally Ads (Lee et al 2007).

Consequently, one can conclude that the final goal of Neuromarketing is to encourage the buying impulse, efficiently learn how to appeal to customers' subconscious, build strong emotional ties and boost customer attention.

2.4.5.1 Emotions

Departing from the expected goals presented above, I will now focus my attention to the neurometric or the response to marketing stimulus that is the objective of my study, Emotional response.

According to Castellar (1996:119) emotional reactions are normally a consequence of environmental stimulus surrounding a person. Knowing this evidence he argues that what distinguishes emotions from other types of behaviour is there unconscious root, Castellar (1996:117).

2.4.5.1.1 Identifying emotions

According to Machleit and Eroglu (2000:101), emotions have been frequently studied in the marketing subject. In order to measure emotional response, Marketing often recurs to three models of the psychology subject. Those models are Izard (1977) differential emotions theory, Plutchik (1980) eight basic emotion categories, and

Mehrabian and Russel (1974) pleasure, arousal and dominance dimensions of response (Machleit and Eroglu, 2000:102). As observed, the existing methods are tightly connected to interrogative techniques.

In an attempt to clarify how emotions are identified, Castellar (1996) presented three ways to properly analyse emotional responses: verbal information, external behaviour and physiological response. These three ways were also referred by Hazlett and Hazlett (1999:8).

a) Verbal Information

As Castellar (1996:120) noticed verbal information allows inferring experiential information, this is consistent with emotional dimensions proposed by psychologist such as Wundt, Osgood and recently Lang. The author states the following dimensions: Valence dimension characterized by extremes like-dislike, good-bad; stimulation or intensity dimensions which include the extremes excited-calm or active-relaxed; finally the last dimension relates to dominance and includes the following extremes strong-weak or dominant-subordinate.

Based on the dimensions presented by Castellar (1996:120) and supported on the models that usually Marketing borrows to Psychology (Machleit and Eroglu, 2000:102), I can assume that this way to explore emotions is cognitive and interrogative, hence emotional conclusions are a result of human answers that possibly will be rational and conscious (although the processes behind these answers might be unconscious).

Nevertheless, as Hazlett and Hazlett (1999:9) indicated, there is some agreement in the research world that the verbal measurement of emotions present limitations. According to them, emotions are not a language-based process; rather it should include cognition in order to properly infer the emotions of an experience through words

In the context of this project, this methodology will be used afterwards, since one of the ways to measure emotions will be through cognitive response.

b) External behaviour

Pointed out by Castellar (1996:120) as the emotional behaviour that is manifested by approach or avoidance movements, contacts and interactions with

persons or objects, or even gestures and facial expressions. So this can be considered an observational approach where human behaviour elicits emotional behaviour. This methodology will not be included later in this project.

c) Physiological response

Finally, according to Castellar (1996:121) physiological response are changes in human body resultant from emotional response. This creates two categories of emotional responses, a positive or a negative.

Castellar (1996:121) also clarifies that these responses only can be access through a set of psychophysiological techniques. The techniques access different parts of the nervous system: autonomic (such as the electric activity of the skin); somatic (e.g., Electromyographic activity or also known as the muscular activity); and finally central (e.g., electroencephalographic activity or evoked potentials, both related with Brain activity).

Having presented these techniques it is important to state that from now on my focus will be on autonomous (through Skin conductance) and somatic (through electromyographic activity). Both techniques will be explained properly afterwards.

2.4.5.2 Psychophysiological models

After noticing that Marketing subject borrowed some models from Psychology (Machleit and Eroglu; 2000:102), I realized that those models are not adjusted for this project, due to its interrogative gene. For this reason, Castellar (1996:122) presented in his work the existing psychophysiological models. He indicated that psychophysiological models are divided in three main contradictory ideas, which are Central-peripheral, cognitive-physiological and dimensional-specificity.

An overview done by Castellar (1996) identifies the existing psychophysiological model. The models in stake are James-Lange Theory; Cannon-Bard Theory; Arousal-Cognition Theory; and finally the Integrative model of Peter Lang.

a) Integrative model of Peter Lang

Starting with the model applied in my project, the integrative model of Peter Lang, Castellar (1996:127-128) identifies Lang as the developer of the theory on emotions. According to him, Lang (1968) looked at emotions not

as a unitary phenomenon but as a phenomenon which implies three independent systems (external conduct, verbal information and the physiological response).

So, regarding the topics of psychophysiological models that generated discussion, Lang (1985) argues that dimensionality-specificity relation can be compatible and could represent different levels of organization within emotions. This proposition implies the existence of a hierarchical structure composed by an inferior level in which the specificity dominates and a higher level where dimensionality predominates (Castellar 1996:127). This situation is easily understood by an experimental project done by Lang, relating Skin Conductance (specificity) and Evoked Potentials (dimensionality) as dimensions of Arousal.

Relatively to the divergence on Central-peripherals and physiological-cognitive, Lang understood that emotions can be manifested through cognitive, behavioral and physiological responses (Castellar 1996:128).

In conclusion, Lang purposed a model that is at the same time peripherical and central, physiological and cognitive, and finally dimensional and specific (Castellar 1996:128).

b) James Lange Theory

According to this theory, emotional response creates specific changes in the human body, due to internal perception that consequently produces an emotional experience. Consequently, this theory is considered peripherical, physiological and specific (Castellar 1996:122-123)

c) Cannon-Bard Theory

This theory states that emotions are produced exclusively by the central nervous system. Therefore, I can assume that this perspective follows a central and dimensional line of thought (Castellar 1996:124).

d) Arousal-Cognitive Theory

Castellar (1996:125) considered this theory a modern version of the Cannon-Bard theory while at the same time includes elements of James-Lange

> theory. According to this observation, an emotional state is due to the interaction of two components, a physiological peripheric arousal component and one characterized by a cognitive process. So, this point of view can be considered peripherical and cognitive-physiological (Castellar 1996:125).

2.4.5.3 Psychophysiological techniques and the physiological response

I will now focus my attention on the Electrodermic and the Electromyographic activities. Both are psychophysiological techniques that measure physiological response. Those physiological responses lead to extrapolate emotional responses.

2.4.5.3.1 -Electrodermic activity

According to Mandryk and Atkins (2007: 330) and Castellar (1996:60-62), this type of technology extracts information from the palm of the hands, i.e., existing glands in the hands react to psychological and thermal conditions. Focusing on the first condition, the psychological significance of the Electrodermic activity is associated to biological factors of environment adaptation (Castellar 1996:62).

From a technical point of view, there are two procedures to measure Electrodermic activity. The first, the endogenous, allows the registration of the natural activity of the sudoriferous glands through the placement of two electrodes (Monopolar). This first procedure is also known as dermal potential (Castellar 1996:62).

The second procedure (exogenous) measures the resistance or the conductance of the skin. In order to do so, two electrodes are place in the palm of the hand where there is sudoriferous activity (Castellar 1996:62).

Moreover, as Ohme et al (2009: 24) notice, conductance of the skin permits the analysis of changes resultant from the activation of autonomic nervous system. That activation is an indication of arousal (Ohme et al, 2009:24), which in consequence is a reaction that reflect emotional response (Mandryk and Atkins, 2007:330).

Nevertheless, the limitation of this technique, according to Ohme et al (2009:24), is the ability to measure the level of arousal, not the direction of the emotional response. Therefore, the real emotional measure of a stimuli could not defined on its own, but it is also true that it could work effectively combined with other techniques as a validation or correlative tool.

Finally, methodologically speaking, Castellar (1996:63) indicated that the electrodes should be placed in a bipolar way in the intermediate phalanges of the index and middle fingers). (See figure 7 in page 40)

2.4.5.3.2 Electromyographic activity (EMG)

The Electromyography measures the muscles activation based on their contraction resultant from an electrical reaction (Mandryk and Atkins, 2007:331) and it is considered the principal psychophysiological measure of the somatic nervous system (Castellar, 1996:79).

Moreover, Ohme et al (2009:25) also showed that several researchers validated the Electromyographic (EMG) activity as a method of both emotional valence and intensity.

Another important issue is how the measurements are done. According to Castellar (1996:82) there are two general ways to measure the Electromyographic activity.

The first has a preferably neurophysiologic use and consists in registering activity through the placement of an electrode needle under the skin (Castellar 1996:82).

The second has a preferably psychophysiological use and consists in registering activity of determined muscles through the placement of superficial electrodes (Castellar 1996:82).

Also about this way to register Electromyographic activity, Castellar (1996:82) noticed that some aspects needed to be in place, such as using an electrolytic gel and above all being precise in the placement of the electrodes. This last consideration is crucial since the muscles identified represent divergent emotional reactions (positive / negative).

Regarding the placement of electrodes, Mandryk and Atkinson (2007:331) evidenced that electromyography has been used in the face as a way to infer positive/negative emotional responses. According to Dimberg et al (1998:39), Ohme et al (2009:24) and Mandryk and Atkinson (2007:331), the muscles identified in the face, as eliciting emotional responses, are the Zygomaticus major (positive emotional response) and Corrugator supercilii (negative emotional response).

Finally, Mandryk and Atkinson (2007:331) stated that the major disadvantage of this second EMG procedure is the fact that results can be distorted by other muscle activity - talking for instance.

2.4.6 Technology Available to perform Neuromarketing

Looking over the technologies available, it is important to have in mind that there is an opposition between technologies, due to its different applications and outputs.

If neuroimaging technologies work entirely in a neurophysiologic level, adjusted to Central and Dimensional perspectives, psychophysiological technologies are used as a way to extrapolate physiologic information, which is clearly linked with peripheral and specific perspectives, as it could be acknowledged from the information presented concerning emotions.

2.4.6.1 Neuroimaging Techniques

According to Ariely and Berns (2010:288), the Neuroimaging techniques used in Neuromarketing are Functional MRI (fMRI), Electroencephalography (EEG), Magnetoencephalography (MEG) and Transactional Magnetic stimulation (TMS). Furthermore, Perrachione and Perrachione (2008:307) also added more technologies, such as Diffusion tensor imaging (DTI), Positron Emission Tomography (PET), Near Infrared Spectroscopy (NIRS) and Computed Tomography (CT).

The table below shortly explains the characteristics of the three most used technologies.

Neuroimaging Techniques			
Technique	Instrument	Physical Measure	Applied Measure
fMRI	MRI Scanner	Blood Oxygenation level dependent-BOLD	Metabolic activity
EEG	Electrodes in the scalp	Electrical field in the cerebral cortex	Neural activity
MEG	Requires a magnetically shielded room	Magnetic fields	Neural activity

Table 2**:** Neuroimaging techniques (Source: Adapted from Ariely and Berns, 2010:288; and Perrachione and Perrachione, 2008:307)

2.4.6.2 Psychophysiological Techniques

Regarding these technologies, their usability has been essentially in psychology or related sciences that study human behavior. So, in the scope of Neuromarketing, its use is scarce and the existing studies were performed relatively to advertising, as can be confirm in the research of Ohme et al (2009).

From all the technologies available to study emotional response, Castellar (1996:118) argued that psychophysiological techniques were the most influential, due to its advantages to register peripherical changes in the human body in result of emotional response

Despite the scarcity of information, the psychophysiological techniques identified by Perrachione and Perrachione (2008:307) were Voice Pitch analysis (VPA), Galvanic Skin Response (GSR) and Eyetracking. Here should also be included the Electromyography (EMG).

Psychophysiological Techniques			
Technology	Instrument	Physical Measure	Applied Measure
VPA	N/A	Vocal cord vibration	"Arousal"
GSR (SC)	Electrodes in the palm of the Hand	Skin effects	"Arousal"
Eyetracking	N/A	Pupil Dilatation	"Arousal"
EMG	Electrodes placed in the face	Skeleton-Muscle	Affective valence

Table 3: Psychophysiological techniques (Source: Adapted from Perrachione and Perrachione, 2008:307; Added EMG information based on Castellar, 1996)

2.4.7 Limitations

Regarding limitations, I have to point out that the major one is the lack of studies published about Neuromarketing and even the existing ones seem to be short on information or with an important volume of conceptual information, hence lacking empirical data. This evidence was also raised in studies of Ohme et al (2010:786) and Valentine (2009).

3 Empirical Study

3.1 Conceptual Model

The aim of my project is to extract emotional responses through the application of psychophysiological techniques, inserted in the scope of the Neuromarketing science. The intention is to measure unconscious customer reactions to marketing stimulus within the store environment variables. In order to do so, I will stage experiences concerning in-store environment variables, as we can infer from my bibliographic review (See figure 4 below).

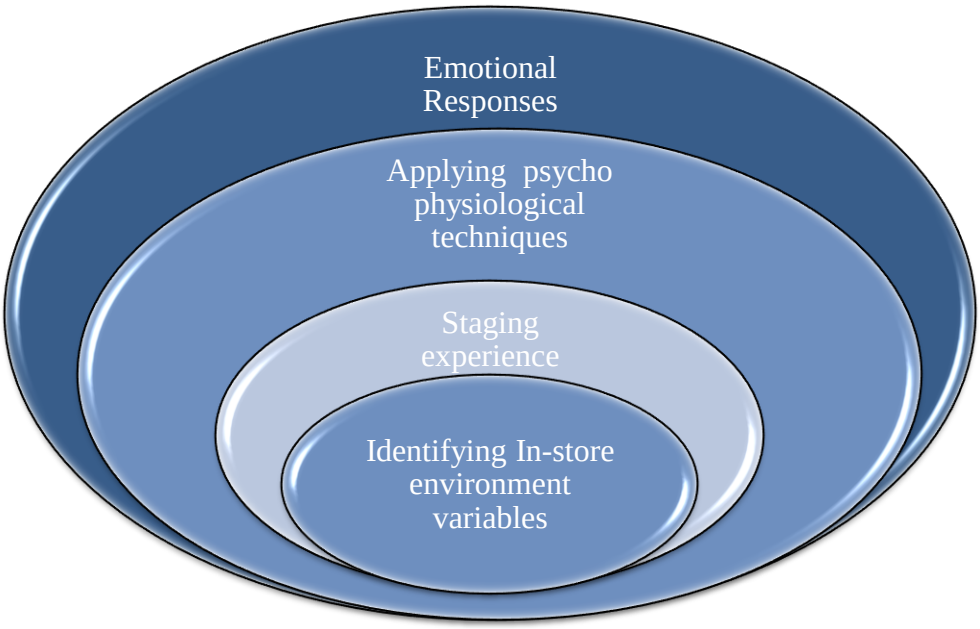


Figure 4: Constructive sequence of my project.

As evidenced in the figure above, the sequence is based in two conceptual models and one framework, Turley and Milliman's (2000) framework identifies the in-store environment variables, Pine and Gilmore's (1998) conceptual model on how to stage experiences and Peter Lang's (1968) integrative model. This constructive sequence allows extracting empirical evidences of customers' reactions to store environment variables.

The study will measure the electrical reactions of the skin and facial muscles through EMG (Electromyography) and SC (Skin Conductance), while taking into consideration a questionnaire, seeking to analyze emotional response.

Another important fact raised from my bibliographic review was the lack or even inexistence of this kind of study (Neuromarketing) and consequently psychophysiological techniques applied to in-store variables. Most of the studies/research found focused on advertising, an important variable of the marketing universe; however it is not that extensive, in terms of the total usability/applicability of Neuromarketing studies and techniques (psychophysiological and Neuroimaging) used to perform it. Therefore, this study intends to be a breakthrough project that will help managers use these new techniques in the decision process.

Dependent Variable

Since I'm studying the electrical reactions to in-store variables, the **dependent variable** measured is emotional response. This study will follow two paths of Castellar (1996) findings: Verbal information and Physiological Response. These paths are based on Peter Lang integrative model that, for the project's purpose, will include Cognitive-Physiological dimensions. So, this variable is influenced at two levels, first dependent on the techniques applied (cognitive questionnaire and the Psychophysiological techniques) and second dependent on the constructive models of Pine and Gilmore (1998) on how to stage experiences and the framework of in-store environment variables identified by Turley and Milliman (2000).

To infer on emotional response (Dependent Variable) it is important to use two main psychophysiological techniques: EMG (electromyography) and SC (Skin Conductance). The first one will extract information from two peripheral channels (Zygomaticus major and Corrugator Supercilii) and the second will extract information from the third channel (Skin in the palm of the hand). Both variables are part of the physiological dimension.

Besides, the cognitive questionnaire measures the valence dimension. For the first question, the measure is the valence like and concerning the second question the measure is the valence interest. The use of these valences is based on the Peter Lang model.

Independent Variable

Regarding the In-store environment variables purposed by Turley and Milliman, their framework identify variables that serve as environmental stimulus, that at the same time can be boosted through experiential strategies to enhance those in-store variables. The store environment variables in stake are Product display, Educational Posters in the top of shelf, lightning, and Employees' as Educational tool.

For the purpose of the project, the **Independent Variables** indicated above are simulated in the following way: Product display will serve as an Aesthetic experience, which includes a situation where product display exposes a customer-oriented standpoint against the lack of any simulation of product display. The second independent variable identified is lightning, includes the simulation of a scenario where the lightning is placed above a product to boost their visibility. Finally, the last independent variable is Educational Help, which includes two in-store environment variables: educational poster in the top of a shelf and employees' as educational tool, both against each other and against an overall situation of no educational help at all.

Constructive Elements

The element serving as a constructive tool of the stimuli is the Pine and Gilmore's model. The Pine and Gilmore's Model support the referred experiential strategies and suggest four variables that help to stage experiences. My focus will be essentially on the educational and aesthetic experiences. Both serve as a supportive definition of the type of staged experience.

Purposed Hypothesis

In what the first in-store variable is concern, the goal is to identify whether lightning can serve as an enhancement element to a specific set of products in contrast with no specific lightning in the same products. The products involved in this situation are Glasses.

H1: Lightning as experiential element relates with higher activation of the Zygomaticus Major.

H2: Lightning as experiential element relates with higher arousal level of the Skin Conductance.

H3: Lack of lightning as experiential element relates with higher activation of the Corrugator Supercilii

H4: The cognitive answers are consistent with the presence of lightning as experiential element.

Concerning educational help, the aim is to stage an experiential environment through the posters/signs variable and compare it with another in-store variable, the store employees`. The aim is to identify whether the EMG and SC reaction to one is far more positive/negative in contrast with the other, and infer through a cognitive questionnaire the cognitive answers of the candidates. The products involved in this situation are Pillows.

H5:Educational experience through posters lead to higher activation of the Zygomaticus Major.

H6:Educational experience through posters lead to higher arousal level of the Skin Conductance.

H7:Educational experience through store employees' lead to higher activation of the Zygomaticus Major.

H8:Educational experience through store employees' lead to higher arousal level of the Skin Conductance.

H9: The lack of educational experience through any In-Store environmental variable generates higher activation of the Corrugator Supercilii.

H10: The lack of educational experience through any In-Store environment variable generates higher activation of the Skin Conductance.

H11: The Cognitive answers are consistent with the presence of educational posters.

H12: The Cognitive answers are consistent with the presence of store employees' as tools of educational experience.

Finally, regarding product display, the proposed environmental stimuli is measured according to aesthetics. This aesthetic experience is based on a customer-oriented position, against a random unclear customer-oriented position. The products involved in this situation are Tableware.

H13: Constructed product displays elicit a higher activation of the Zygomaticus Major

H14: Constructed product displays elicit a higher arousal level of the Skin Conductance.

H15: Lack of a constructed product displays elicit higher activation of the Corrugator Supercilii.

H16: The Cognitive answers are consistent with a constructed product display.

3.2 Methodology

3.2.1 Conceptual bases

In order to construct a coherent Project, I'm supported by three models/frameworks based on my bibliographic review. The three main authors that structure my project are Turley and Milliman (2000), Pine and Gilmore (1998), and Castellar (1996).

Turley and Milliman (2000) proposed the use of Berman and Evans (1995) with reviewed categorization framework. Moreover, note that the table 4 (page 33) present examples of empirical studies made on each of the in-store variables and despite the differences in the used dependent and independent variables, the procedure used was interrogative techniques of different kinds (eg. Surveys, focus groups,etc). Therefore, comparisons with the method I am using are hard. Nevertheless, it is important to acknowledge some conclusion of prior studies. So based on the variables that I intent to study, I will now present the methodology used in those variables on prior researches.

Framework	Category	In-store Variable	Researcher	Independent Variable	Dependent variable	Description
Berman and Evan (1995), reviewed by Turley and Milliman (2000)	General interior variables	Lightning	Arena and Kim (1994)	Lighting	Number of items examined/handled; amount of time spent; total sales	Lighting influence products examined and handled; Total sales are not influenced;
			Baker et al (1994)	Ambient factors;	Merchandise Quality;	Influence merchandise quality.
	Point-of-purchase and decoration variables	Product Display	Simonson and Winer (1992)	Product display	Sales	Concluded that products display (by brand or flavor) influence sales.
			Areni et al (1999)	Merchandise arrangement	Purchase intentions	Merchandise arrangement can have impact in purchase intentions.
	Point-of-purchase and decoration variables	Educational Sign/ Poster	Mckinnon et al (1981)	Sign type	Sales	Concluded that signs with beneficial information are more effective than the ones with price information.
			Patton (1981)	Product quality;	Brand Choice	Proved that products with extensive information relates with more sales.
	Human Variables	Human Variable	Baker et al (1992)	Social Factors (Retail salespeople)	Willingness to buy; arousal; pleasure	Factors increased arousal level and interaction with sales people happens for pleasure and willingness to buy.
			Baker et al (1994)	Social Factors	Service quality	Social factors are influential of service quality.

Table 4: Reviewed Research on In-Store Environment (Adapted from Turley and Milliman, 2000)

To properly explore and study the experiential construction, I will focus my attention in the Pine and Gilmore Model.

As in the bibliographic review, their model serve as a conceptual model to stage experience, therefore the authors present variables that are strategic ideas to properly stage an experience, which essentially mean that they propose a specific reasoning to construct experiences.

Conceptual Model to Stage Experience			
Developed by	Variable	Customer	
Pine and Gilmore (1998)	Entertainment	Passive participation	Absorption
	Educational	Active participation	
	Escapist	Active participation	Immersion
	Aesthetic	Passive participation	

Table 5: Model to stage experience (Adapted from Pine and Gilmore, 1999).

Concluding, I intend to measure the experience within the chosen in-store variables. Firstly, it is important to acknowledge that the neurometric measured is the emotional response, so based on Castellar (1996), I will explain the Integrative model of Peter Lang, adapted to my project.

Used by:	Identifying Emotions	Proposed by	Models	Dependent Variable	Technique used
Castellar (1996)	Physiological Response	Peter Lang (1968)	Physiological	Emotions	EMG
					SC
	Verbal Information		Cognitive		Questionnaire

Table 6: Conceptual Model to analyze emotions (Adapted from Castellar, 1996)

Regarding the cognitive dimension, the purpose is to apply and interpret a cognitive questionnaire that centers on the valence dimensions: like and interest.

The physiological dimension uses two supporting techniques, EMG and SC. The Electromyography (EMG) records the electrical activity of the facial muscles in which two muscles are identifiable, Zygomaticus Major and Corrugator Supercilii. Each muscle brings forth different conclusions, the Zygomaticus reacts with higher activity in

a positive emotional stimuli, the Corrugator is strongly activated by negative emotional stimuli.

The Skin Conductance records the reaction of the skin in the palm of the hand to psychological conditions. The measurement in this technique is the arousal level.

Due to the inability to infer whether the arousal level symbolizes a positive/negative emotional reaction, in this project it will work as a supportive tool of the results on the EMG.

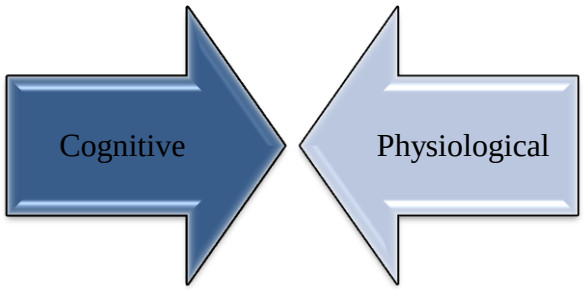


Figure 5: Simplified view of the Integrative model of Peter Lang

3.2.2 Auchan Group

Auchan Group acquired Pão de Açúcar Group in 1996. From this heritage, Auchan Group leveraged their position in Portugal due to the existing expertise in the group and brand awareness acquired among the Portuguese consumers.

Auchan has under its supervision the management of two retailing brands: Jumbo and Pão de Açúcar. Auchan owns 23 Jumbo stores around Portugal; this one operates in the segment of hypermarkets and supermarkets. In the case of Pão de Açúcar, Auchan owns 10 stores and operates in the segment of supermarkets. Despite this, Auchan has also been diversifying its portfolio of brands and segments. This includes stores dedicated to technological products as Box brand, or Gas Stations also called Jumbo, stores dedicated to health and well-being called Saúde e Bem-estar, stores dedicated to Optical goods under the name of Ópticas Jumbo and finally one store operating in the segment of Nature and Garden called Jumbo Natureza.

Auchan Group intends to boost and improve the purchasing power and quality of their customers and to increase the volume of customers, using committed, responsible and professional employees. It is also important to emphasize that the DNA of the group is based on operating with social responsibility.

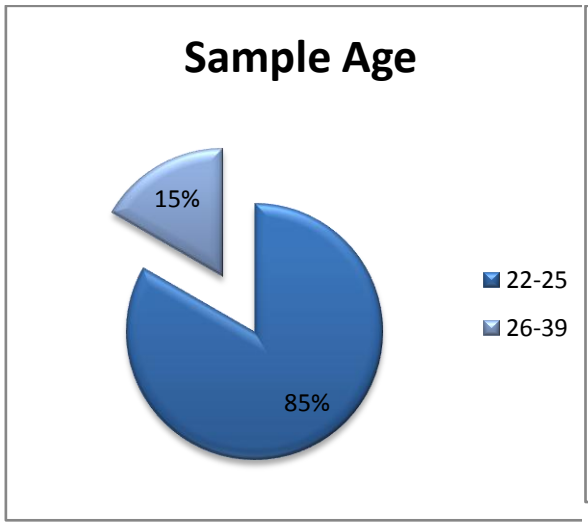
The information about Auchan Group was adapted from their website (link in the bibliography).

3.2.3 Sample characterization

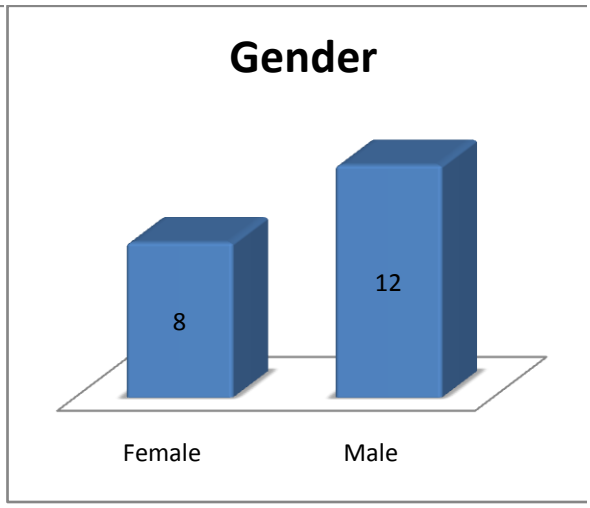
The sample used in this kind of techniques (psychophysiological and neuroimaging) is smaller compared to interrogative techniques. Some examples of samples used previously are now presented. Hazlett and Hazlett (1999:11) used 49 candidates, Ohme et al (2009: 26) used 45 candidates and Mandryk and Atkins (2007:332) used 24 candidates.

Therefore, 20 young adults and adults from the ages of 22 to 39 composed the sample used for this project. The average age was 25 and as one can see from the graphic 1 below, 85% of the sample was between 22-25 years of age and the remaining 15% composed of adults between 26 and 39. There is a predominance of young adults.

Regarding the gender analysis, I have a predominance of males (12 candidates) contrasting with the number of females (8 candidates). This information is shown below in the graphic 2.



Graphic 1: Sample Age



Graphic 2: Gender

Finally, none of the candidates has a direct connection with Auchan Group and although I have not asked their favorite hypermarket, two admitted that they are frequent buyers in a Jumbo Store; the rest of the candidates did not mention the subject.

3.2.4 Preparation of the empirical study

The preparation of the empirical study involved a series of steps. First, I needed an authorization on behalf of Auchan Group that was granted by the National HR director of the Auchan group, Drº Jorge Filipe.

After that, I did the educational posters to be included in the educational experience.The posters intended to help customers in the process of choosing a pillow. With this idea, the posters provided help and advice to customers on how to choose a proper pillow according to some specific characteristics.

Since the empirical study took place in a laboratory, I had to make a movie of each scenario and its opposing situation. The scenarios were built in three groups of products: Tableware, Glasses and Pillows.

Regarding the first scenario, the aim was to use lightning as enhancement tool and environmental stimulus. To do so, I constructed the experiential environment in the Glasses' context. Against, we have a situation where no light is in place, hence lacking any environmental stimulus or enhancement tool (see photos in appendix, pages 71-73)

The second scenario involved three versions of the same situation. The scenario was simulated in the pillows section. Two of the versions were composed by an educational help, one version included educational posters glued to the silo of the pillows and the second included the presence of a store employee as possible educative tool. Against we have the last version where no educational help is included and the only thing customer faces is the product displayed in the silos. Nevertheless, it is also important to note that both versions are opposing and expected to be comparable. (see photos in appendix, pages 71-73)

Concerning the last scenario, one version included a constructed product display according to a customer-oriented position where tableware product was organized vertically according utility (e.g. Spoons for soap all in a vertical line in the module), against we have a situation where candidates faced no organization at all (e.g. Spoons shelf included soup spoons mixed with dessert spoons). (see photos in appendix, page 71-73)

Also regarding the movie, it is important to clarify that two versions were created (A and B) to present to the candidates. The sequence of the presentation goes as follows:

Version A		
1º Tableware	2º Glasses	3º Pillows
Disorganized Tableware	No Light over the Glasses	Employee as educational tool
Organized Tableware	Light over the Glasses	Educational Poster
		Lack of any educational tool

Table 7: Sequence of presentation, version A

Version B		
1º Tableware	2º Glasses	3º Pillows
Organized Tableware	Light over the Glasses	Educational Poster
Disorganized Tableware	No Light over the Glasses	Lack of any educational tool
		Employee as educational tool

Table 8: Sequence of presentation, version B

Nevertheless, it should be noticed that the sequence of the two films (version a and b) is different from the one of the analysis, hence the sequence of analysis is the same as the purposed above in hypothesis (Glasses, Pillows, Tableware).

The preparatory phase included preparing a power point presentation. Before each scenario appears, candidates were face with an informative slide aiming to engage them in the environment of the store and in the situation. Hence the purpose was for the candidates to feel they were actually in the store buying the products referred above.

In addition, the sequence of the three scenarios also included an intermission of approximately 25 seconds between each of them. This time was dedicated for the candidate to relax and for me to apply the questionnaire (Questionnaire available in the appendix, pages 69-70).

The sequence of presentation was mixed in order to avoid possible bias problems and make the project empirically reliable.

3.2.5 Data Collection

Now focusing on the data collection, the procedure took place in the LAPSO lab at Iscte Business School, in the 12th, 13th and 14th of April, in the morning.

The candidates participated in the experience one at a time. During the experiment, there was only the candidate and myself in the lab. My presence was due to the application of the questionnaire.

The equipment used and already mentioned was EMG and SC (both psychophysiological techniques). The preparation process of each candidate included

the placement of electrodes in proper places. In order to understand, Castellar (1996) presented the specific placement of each technique.

Regarding EMG, like Castellar (1996) identified, I applied the placement according to Fridlund and Cacioppo (1986). The electrodes were placed in the Zygomaticus Major and in the Corrugator Supercilii (see figure 6, below).

Concerning to the Skin Conductance (SC), I applied a bipolar placement (Castellar, 1996). This implicated the placement of the electrodes in the average Phalanx of both fore- and middle fingers of the left hand (see figure 7, page 40).

Prior to the placement of the electrodes, the application of a specific gel in each one of the electrodes was needed.

Concerning the equipment, it was used the Biopac System M150 (EMG and SC) and the information was recorded using the version 4.0 of the Acknowledged software.

Despite the indicated Psychophysiological techniques, a questionnaire was applied aiming to collect the cognitive answers of each candidate after they saw each scenario. The intention was to validate the valence dimension (Like and Interest) on each scenario. Those valence dimensions helped to analyze emotional responses. (Questionnaire available in the appendix, pages 69-70).

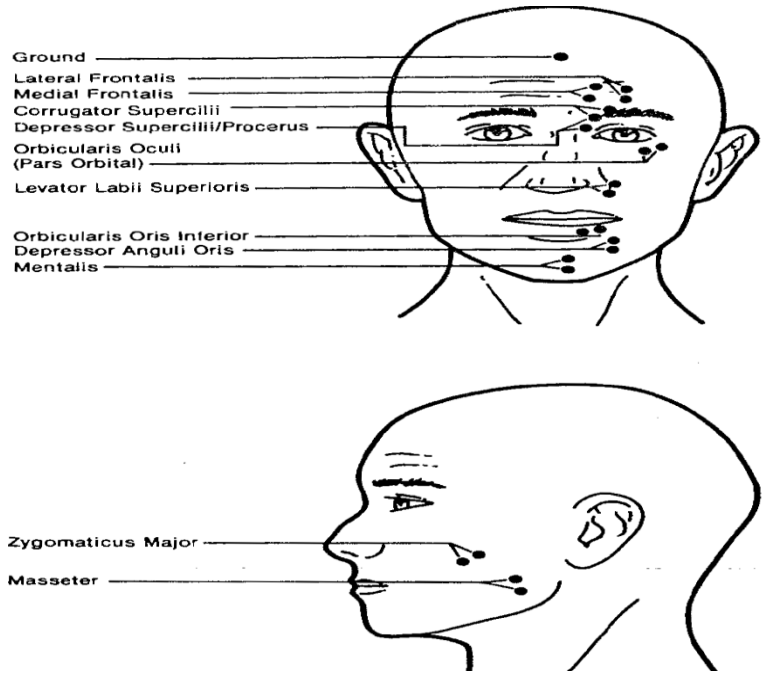


Figure 6- Placement of the electrodes (Source: Fridlund and Cacioppo, 1986)

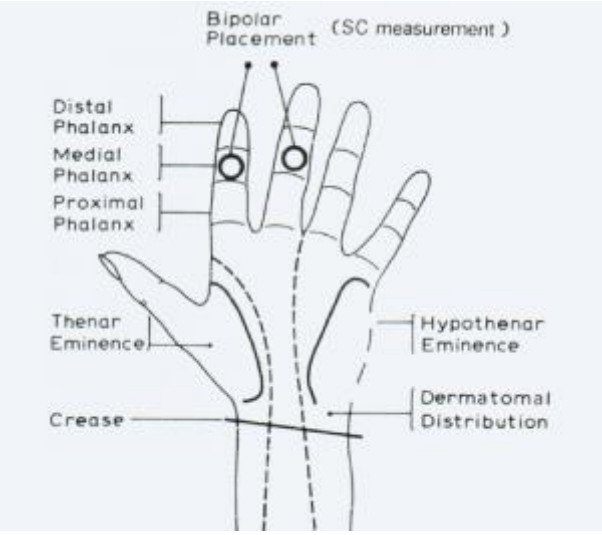


Figure 7- Bipolar placement of the SC (Source: http://www.psychlab.com/hdware_skinConduct.html)

Finally, the outputs of the Acknowledged software were exported to excel and to simplify the data analysis it was organized according to the sequence A, changing to the sequence of version B to be equal to version A.

3.2.6 Proposed statistical methods

In order to validate the information collected, the analysis will be based on two levels.

The first level uses statistical tests to infer whether there are significant differences between the samples tested in each one of the variables. Regarding the Tableware (Proeduct display) and the Glasses (lightning) the statistical test applied was the Students t' test of paired samples, since this test is used when it is intended to compare two samples of the same variable (Maroco, 2007:270)

Concerning the pillows (Signs/posters and store employees'), the scenario included three simulations. Therefore, the statistical test used was the ANOVA for repeated measures, since it allows testing the existence of differences between means of two or more samples of the same variable (Maroco, 2007:275).

The second level of analysis is composed by descriptive statistics based on the analysis of the average activation per sample in the EMG and SC techniques, and relative frequency of the cognitive questionnaire in each scenario.

The average activation per sample intends to analyze only EMG (zygomaticus samples; corrugator samples) and SC samples. The relative frequency intends to ease the comprehension and analyze the extracted information from cognitive questionnaire.

3.3 Data Analysis

Before I start to analyze the data, I have to state that it is not done based in only one channel, rather it is supported by the connection of more than one channel to validate information. The channels here are Zygomaticus, Corrugator, Skin Conductance and Cognitive answers.

3.3.1 Glasses product

Firstly, it is important to state that the differences between the two conditions in the different channels (EMG-Zygomaticus and Corrugator; SCL), in this scenario, were not significant, meaning that in all comparisons the $\rho>0,05$. This information can be confirmed in the SPSS Outputs 1, 2, 5 and 6 in appendix (pages 64-66). In light of this evidence, the hypotheses are analyzed through the average activation of the EMG (Zygomaticus and Corrugator), the average arousal level of the SC and the relative frequencies of the cognitive questionnaire.

H1: Lightning as experiential element relates with higher activation of the Zygomaticus Major.

Based on graphic 8 of the average activation of the Zygomaticus (page 61 in appendix), I can conclude that the activation is slightly prominent in the scenario that included the lightning simulation.
Considering this data, although I cannot postulate that the hypothesis is valid based on the statistical tests, I consider that the difference goes in the right direction.

H2: Lightning as experiential element relates with higher arousal level of the Skin Conductance.

Regarding this hypothesis, comparing both situations simulated in the scenario, the arousal level is slightly prominent in the no light scenario. This conclusion is taken from graphic 10 of the average arousal level of the SC, as one can confirm in page 62 (appendix). So, even though I cannot validate based on the statistical tests performed,

the differences between samples point in the direction to consider the hypothesis not valid.

H3: Lack of lightning as experiential element relates with higher activation of the Corrugator Supercilii

Concerning this hypothesis, graphic 9 of the average activation of the Corrugator (page 61 in appendix) shows higher activation in the scenario where the lightning is not included. Therefore, despite the statistical test does not confirm the validation of this hypothesis, I consider that the difference between samples goes in the proper direction.

H4: The cognitive answers are consistent with the presence of lightning as experiential element.

Finally, the last hypothesis show some difference between graphics 11 and 12 (page 62 in appendix), answers to questions 1 and 2 respectively.

The overall conclusions validate the hypothesis essentially due to the first question, where 14 candidates answered that liked mostly the scenario with light.

The second question can generate some contradictory directions, but I analyze the information as an example of a possible risky situation resultant from the cognitive questionnaire. This idea came from the fact that the option that revealed more answers was actually a tricky option, since the only thing that was changed in the scenario was the light presence. Therefore, I conclude that the answers were the consequence of the presence of light that enhanced the product, making the candidates answer in that direction. This situation becomes an example of a questionnaire that generated two different answers. Therefore, and despite the contradictory information in the 2nd question, I consider this hypothesis valid.

Overall conclusion of the experiential scenario

As I stated previously, the results of the statistical tests showed that there is no statistical significant difference between the samples tested. Moreover, in general terms, from the four hypotheses formulated only the H4 turned to be valid.

In order to reach some conclusions, a second level analysis showed through average activation per channel and relative frequency per question of the cognitive questionnaire

that, there are slight evidences in the data that point in the direction of experiential environments being associated to positive emotional responses. To reach this direction, I consider the average activation of the zygomaticus (slight higher activation in the lightning situation) and the answers to the cognitive questionnaire (higher relative frequency of answers to the light situation). So, despite the hypothesis H1 has not been considered valid, the second level analysis shows that it points in the proper direction of the formulated hypotheses. This information linked with the validation of the hypothesis H4, evidences that the data extracted from the considered channels (Cognitive questionnaire and EMG-Zygomaticus) points in the direction of a positive emotional response to the experiential environment simulated.

The opposing simulated situation (no light), points out to a negative emotional response. To reach this direction, I reflected on the information extracted through SC and Corrugator channels. Regarding the Corrugator channel, the average activation revealed to be slightly prominent in the no light situation, which means that the information extracted and analyzed at a second level points in the direction of the formulated hypothesis (H3). Concerning the arousal level, I consider that the information analyzed at a second level revealed that the arousal level was slightly higher in the no light situation. This means that the extracted information points in the direction of not validating the hypothesis formulated (H2). Therefore, the information extracted from these two channels (SC and EMG-Corrugator) is considered to point in the direction of a negative emotional response to the lack of experiential environment.

Concluding, although the statistical tests do not validate the difference between samples tested, I consider that in general terms a situation simulated with an experiential construction (lightning presence) points out to a positive emotional response, while the lack of an experiential construction (lack of lightning presence) points out to negative emotional responses.

3.3.2 Pillows product

Regarding this scenario, once again the statistical tests performed (ANOVA for repeated measures) showed no statistical significance ($\rho>0,05$) on the samples tested (SPSS Outputs 3,4,and 7 pages 64-66 in appendix). Consequently, the validation of hypothesis is done by analyzing the average activation of the EMG (Zygomaticus and

Corrugator), the average arousal level of the SC and the relative frequencies of the cognitive questionnaire.

H5: Educational experience through posters lead to higher activation of the Zygomaticus Major.

Regarding this hypothesis, the graphic 13 of the average activation of the Zygomaticus (page 63 in appendix) shows that the highest activation was not in the situation with the educational posters. Therefore, even though I cannot validate based on the statistical tests performed, the differences between samples analyzed at a second level analysis (average Zygomaticus activation) point in the direction of the hypothesis not being valid.

H6: Educational experience through posters lead to higher arousal level of the Skin Conductance.

In this hypothesis, the information of graphic 15 of the average arousal level of the SC (page 63 in appendix) shows that the presence of educational posters did not elicit in candidates higher arousal levels. Nevertheless, it should be noted that the slightly difference of means of the three situations simulated in this scenario point out to educational posters being the second highest average arousal level. Therefore, despite the statistical test do not confirm the validation of this hypothesis, I consider, through a second level analysis, that the difference between samples don't go in direction of validating the hypothesis.

H7: Educational experience through store employees' lead to higher activation of the Zygomaticus Major.

Concerning this hypothesis, the analysis of graphic 13 of the average activation of the Zygomaticus (page 63 in appendix) evidences that the activation is slightly higher when this situation (presence of store employees' as educational elements) is simulated in the scenario. Therefore, although I cannot state that the hypothesis is true based on the statistical tests, I can argue based on a second level analysis that the difference between samples point in the proper direction.

H8: Educational experience through store employees' lead to higher arousal level of the Skin Conductance.

Concerning this hypothesis, I confirm that the arousal level is higher in this simulated situation. To achieve this conclusion, I analyzed graphic 15 of the average activation of the SC (page 63 in appendix). Hence, even though I could not state that the hypothesis is valid due to the statistical tests, the analysis performed at a second level shows that the difference between samples goes in the right direction.

H9: The lack of educational experience through any In-Store environmental variable generates higher activation of the Corrugator Supercilii.

In what concerns the H9, the analysis of graphic 14 of the average activation of the Corrugator (page 63 in appendix) show higher activation in both situations with educational experience. So, even though I cannot validate based on the statistical tests performed, the differences between samples analyzed at a second level analysis (average Corrugator activation) point in the direction of the hypothesis not being valid.

H10: The lack of educational experience through any In-Store environment variable generates higher activation of the Skin Conductance.

Concerning this hypothesis the graphic 15 of the average arousal level of the SC (page 63 in appendix), evidences that the highest arousal level is not in the situation simulated without any kind of educational experience. Hence, despite the statistical test does not confirmed the validation of this hypothesis I consider through a second level analysis that the difference between samples don't go in the direction of validating the hypothesis.

H11: The Cognitive answers are consistent with the presence of educational posters.

Looking to the H11, graphics 16 and 17 of the cognitive answers (pages 63 and 64 in appendix) revealed consistency, pointing out to the presence of educational posters. This fact resulted from a relative frequency of 16 candidates answering that liked the simulated scenario with the educational posters in the first question and 13 candidates answering that the most interesting was the presence of static help (educational posters). Hence, supported on this evidences I consider this hypothesis valid.

H12: The Cognitive answers are consistent with the presence of store employees' as tools of educational experience.

Finally, the H12 revealed to be not valid. This conclusion streams from the analysis of graphics 16 and 17 (pages 63 and 64 in appendix), showing that the candidates did not consider the presence of store employees' as a situation that they liked, compared to the presence of an educational poster. Therefore, I consider this hypothesis not valid.

Overall conclusion of the experiential scenario

To resume the information above, I will explain my overall conclusions on this scenario. In the pillows scenario the results of the statistical tests showed that there is no statistical significant difference between the samples tested. Moreover, from all the eight hypotheses formulated only the H11 was considered valid. So, to reach some statistical directions I analyzed the information based on a descriptive statistics (Second level analysis).

Starting with the simulated situation that includes the presence of store employees' as educational help, the information was validated through the EMG-Zygomaticus and Skin Conductance channels. The evidences found on the hypothesis formulated (H7, H8) point out to a positive emotional response. Hence, the analysis of the average activation (Zygomaticus) and average arousal level (SC) suggests slightly higher results, that point in the direction of a positive emotional response for the presence of store employees' as tool of educational help.

In what concerns the situation with the educational posters in the scenario, the information was validated through cognitive questionnaire. In this situation I had, in fact, a hypothesis that is valid, H12. Moreover, it should be noted that in this situation it was registered the second highest average arousal level (SC channel). Nevertheless, the hypothesis H6 was not considered to point in the right direction. Assuming these evidences, I consider that the educational posters point out to a positive emotional response, mainly through the result of the cognitive questionnaire (higher relative frequency), despite being a weaker experiential variable (only one channel point consistently in this direction).

Also regarding the two previous situations (employees' presence and Posters) simulated in the pillows scenario, it should be noted that the results of average activation of the Corrugator channel could be understood as pointing out to a negative emotional response. Nevertheless, this situation can be explained through the effort that each candidate made to read the information in the posters and to visualize better the store employee. Acknowledging this, I have to note that this type of experience should not be considered when thinking in consumer response to store environmental variables studies through psychophysiological techniques.

Finally, regarding the scenario that includes a situation without any kind of educational help, the evidences extracted from the hypothesis formulated (H9 and H10) do not point out to a negative emotional response. Nevertheless, the only channel that could point out to a negative emotional response is the cognitive questionnaire. In this case, since the Corrugator channel results were influenced by meaningless facial activity, due to an effort to read and to properly see the store employee, this situation was not considered to point in any direction.

In conclusion, despite the statistical tests do not validate the difference between samples, I consider that in general terms both educational experiences seem to point out to a positive emotional response, excluding thereof the influential situation stated above. Concerning the lack of educational experience, it is important to attain the lack of evidences pointing in any kind of direction (neither positive nor negative).

3.3.3 Tableware Stimuli

Firstly, it is important to state that from the statistical tests performed (Student t' test of paired sample), the conclusion was that none of the samples revealed to be statistically significant ($\rho>0,05$) (SPSS outputs 1, 2, 5, 6 pages 64-66). Hence, the validation of hypothesis is done by analyzing the average activation of the EMG (Zygomaticus and Corrugator), the average arousal level of the SC, and the relative frequencies of the cognitive questionnaire.

Moreover, it is also important to state that the simulated situations in this scenario (tableware) are weak, due to some contradictory facts. Therefore, I used a different

perspective and rather looking to the data as positive and negative emotional responses, I firstly analyzed the situations that generated engagement from the candidates' behalf.

H13: Constructed product displays elicit a higher activation of the Zygomaticus Major.

To analyze this H13, I used graphic 3 of the average activation of the Zygomaticus (page 60 in appendix). Despite there is a slight difference between each situation, the higher activation is with the constructed product organization. So, although the statistical tests do not permit to validate the hypothesis, I consider, supported on a second level analysis, that the difference between samples goes in the proper direction.

H14: Constructed product displays elicit a higher arousal level of the Skin Conductance.

Regarding this hypothesis, the information in graphic 5 of the average arousal level of the SC (page 60 in appendix) revealed that the arousal level is higher in the simulated situation that included a disorganized product display. So, since the statistical tests do not confirm the validation of this hypothesis, I conclude through a second level analysis that the difference between samples do not go in the direction of validating the hypothesis.

H15: Lack of a constructed product displays elicit higher activation of the Corrugator Supercilii.

In what concerns the H15, the information presented in graphic 4 of the average activation of the Corrugator (page 60 in appendix) shows that the disorganized product display did not elicit a higher activation of the Corrugator. The activation in the other situation (organized product display) generated a highest average activation. So, even though I cannot validate based on the statistical tests performed, the differences between samples analyzed at a second level (average Corrugator activation) point in the direction of the hypothesis not being valid.

H16: The Cognitive answers are consistent with a constructed product display.

This hypothesis revealed in graphics 6 and 7 (pages 60 and 61 in appendix) show that the candidates' answers are consistent with the hypothesis formulated. This means that 18 candidates revealed in the first question that they liked the simulated

situation where the products were organized. Regarding the second question, all the candidates revealed interest by the simulated situation that had the product organization. In conclusion, the hypothesis is valid.

Overall conclusion of the experiential scenario

Having already explained in the beginning of the scenario analysis, different approach were applied; it is important to refer once again in order to avoid confusions. Therefore, in this scenario I did not point in any kind of direction of emotional response. Rather I looked for the situation in the scenario that generated more engagement and in consequence that could point to some emotional response.

In this experiential scenario, like in the other two scenarios, the results of the statistical tests showed that there is no statistical significant difference between the samples tested. Moreover, the second level analysis (descriptive statistic) did not allow any kind of specific direction in the emotional response. Nevertheless, the second level analysis (descriptive statistic) shows that the average activation in some channels (Zygomaticus, Corrugator and Cognitive questionnaire) turned to be slightly higher in the situation with a constructed product display. This information is also presented and was referred in the analysis of hypotheses H13, H15 and H16. Based on this evidence, I consider in fact that a situation with a constructed product display points in the direction of creating engagement compared with the opposing simulated situation.

In conclusion, despite not being possible to point in any kind of direction of emotional response, the extracted information from the channels allowed to acknowledge that a constructed product display in the scenario creates engagement. This perspective could lead to emotional response; however one may not be able to determine the direction of that emotional response due to the weakness of the data

4 Conclusions/Discussions

4.1 Discussion

Being aware that the retail industry is a fast changing environment in all its variables (e.g. price, product development, promotions, in-store environment), the data collected and now summed up revealed some interesting findings, through the use of different methods and tools to analyze consumer behaviour.

The evidences of the bibliographic review pointed out that retail managers are constantly attempting to boost their business. In overall, their goal is to generate profit. Consequently, research on this topic has been diverse and has involved empirical studies without applying any neuromarketing mindset. This fact arose as an opportunity. Moreover, regarding the constructive process of each experiential situation, it involved simple changes in the environment, which do not mean a significant investment but rather a use of existing resources. Hence, the lack of big differences in the activation within each channel is believed to be the consequence of the stated above.
In order to have a uniform and coherent study, the information was analyzed by combining the four data collection channels (EMG-Zygomaticus and Corrugator; Skin Conductance; Cognitive questionnaire). It is also important to notice that none of the statistical tests performed, resulted in a statistical significant value (all $\rho>0,05$), meaning that none of the samples tested show any statistical significant difference.
Now, I will focus on connecting my data and the empirical evidences of the bibliographic review.

Starting with the in-store variable (lightning), despite I cannot postulate a statistical significant difference in the samples tested and supported on a second level analysis (descriptive statistic), I consider that the information collected shows slightly differences in the samples (Zygomaticus and Cognitive questionnaire), pointing out in the direction of a positive emotional response. The simulated situation in stake involved the placement of light over a specific product (glasses) that intended to create an aesthetic experience through the enhancement of the product.

The opposing simulated situation (no light) goes in the direction of a negative emotional response. To reach this direction, I considered the information extracted through SC and Corrugator channels. Therefore, the lack of experiential environment is considered to point in the direction of a negative emotional response.

Being these perspectives validated, it is also important to adjust and connect my results with the empirical evidences found in my bibliographic review.

On the review made by Turley and Milliman (2000), and according to Arena and Kim (1994), and Baker et al (1994), they concluded that lightning influences product examination and quality. These perspectives linked with the direction of my results can prove that experiential environments, including lightning, can influence the subconscious behaviour of a customer and most likely generate interest over a product while in-store. The flaw is the inability to prove the influential direction on sales, nevertheless the influential on the enhancement of the product can ease the outcome, the sale.

Moreover, my data also evidenced an example of a possible risky situation resultant from the cognitive questionnaire. The fact arose due to the divergence in what people say. The cognitive questionnaire implied testing two valence dimensions (like and Interest), and despite being two different valences the intention was to point in the same direction. In the first question the answers were clear and consistent and pointed to a higher relative frequency for the presence of lightning in the scenario. The divergence appeared in the second question. In this case, the pattern of answers showed higher relative frequency for an option that was in fact a tricky option (product display that was not altered). Therefore, this example becomes an evidence of a possible flaw associated with the quality of information that is extracted in interrogative studies.

Concerning the second, it includes two simulated situations with in-store variables (Store employees'; Posters/Signs). The overall conclusion of my data was that, although I could not postulate a significant value of the statistical tests, the second level analysis shows differences in the samples that point in the direction of positive emotional responses for educational experiential construct. On the contrary, the lack of experiential construct did not point in any kind of direction of emotional response, due to the lack of consistency in the data collected.

Despite this, between both experiential environments, my analysis evidenced that the presence of store employees' as educational element point out a higher positive

emotional response compared with the presence of educational poster, hence the human variable is possibly understood as the most influential of the customer emotional response.

Finally, connecting my data with the information reviewed by Turley and Milliman (2000) and according to Mckinnon et al (1981) and Patton (1981), signs with more information are more effective, meaning increasing sales. This just proves that positive emotional response expectably links with more likelihood of sales.

Concerning the human variable, Turley and Milliman (2000) based on Baker et al (1994) showed that employees' presence is seen as evidence of service quality, e.g. the employees' presence near a product will make the customer notice the overall service as having more quality. Hence, I conclude that an experiential environment staged with the presence of an employee, besides pointing in the direction of a higher positive emotional response, the overall perception of the service could presumably lead to more sales.

Moreover, my data also shows the divergence between what people say and think as Lee et al (2010) noticed. This fact was seen through the comparison of the EMG-Zygomaticus and the cognitive answers that validated different simulated situations of positive emotional response. In the EMG-Zygomaticus case, the presence of store employees' as an educational tool point out to a positive emotional response. While in the cognitive questionnaire, the situation that consistently generated higher relative frequencies was the simulation with posters as an educational tool. Nevertheless, it should be referred that both situations are part of the educational experience strategy, so there is not an indication in the opposite side.

Finally, regarding the last in-store environmental variable product display, the results can be seen as contradictory or divergent with my study. Nevertheless, this view is wrong; it is true that concluding whether one scenario generated positive emotional response compared with the opposing scenario, in this simulated environment, was not possible. To overcome this perspective, I used a different approach. So, I intended to identify which simulated situation created a higher engagement.

The data collected of this in-store variable shows that the simulated situation (constructed product display) within the perspective of experiential environment points in the direction of creating engagement.

Hence, although I could not determine any direction of emotional response, the extracted information from the channels allowed acknowledging that a constructed product display in the scenario points in the direction of creating engagement. This perspective could lead to emotional response, without being able to determine the direction of that emotional response due to the weakness of my data.

Therefore, connecting my conclusions with the research done by Turley and Milliman (2000), according to Simonson and Winer (1992) and Areni et al (1999) that stated that product display is seen as a variable that influence buying intentions and sales. So, since the constructed product display points in the direction of creating higher engagement compared with the opposing situation, it can be considered consistent with the authors' perspective that an experiential setting can presumably influence sales or being an influential factor of purchase intentions.

The general conclusion of this project supports that, using the conceptual model of Pine and Gilmore on how to stage experience is in fact an important tool to construct scenarios according to an experiential strategic view. This strategic view could be seen as too theoretical, but no other model is adjusted to support the construction of experiential environments regarding in-store variables. This in fact makes me conclude that this framework is adjustable to the enterprise world. Hence, it could be used in more projects with the scope of studying experiential environment.

Moreover, also a part from the discussion of my data, Ariely and Berns (2010) argued that the costs associated with the technology used (psychophysiological techniques in this case) in a Neuromarketing study are normally referred as justification to reject the application of this highlighting study about consumer behaviour. Nevertheless, I should also note that this fact was referred to the neuroimaging techniques. Hence, through this project, companies, managers and marketers can become aware of other techniques apart from neuroimaging, some of them more cost effective than others.

Finally, it is important to address the research goals. Starting with the main goal, the results do not allow to infer more than emotional response directions, therefore I conclude that this purpose was not fully achieved. Regarding the second level goals, I conclude that they were properly achieved and this project can be seen as a learning tool to managers, retailers, and entrepreneurs

4.2 Limitations

First, due to my lack of experience in video recording and quality of the camera, the final result seen by candidates had low quality. Therefore, I consider that this fact limited and influenced the outputs.

Secondly, the lack of information about neuromarketing (in its full extent) is somehow limitative of comparison and the existing studies show an incredible tendency of no empirical evidence, just a conceptual scope.

Third and final, when the candidates had to read information from the poster and to focus on the employees' presence showed a limitation of the EMG technology. The candidates were obliged to make an effort to properly perceive what they were seeing. This situation generated meaningless facial activity. Therefore, in future research this kind of simulated scenario should not be an option

4.3 Future research directions

I will now concentrate on some directions for future research on this field. First, if the project involves studying in-store variables, I propose different variables or the same but in different products. Moreover, the staged experiences should try to be more impactful to the candidates, in order to have higher differences in the results.

Secondly, the recordings should be done as far as possible in the most professional or semi-professional way, in order to avoid any problems of lack of quality that may influence the result of the outputs.

Thirdly, if possible involve a researcher in the field of psychology, as I involved in my project. I seriously believe that it is a value added between the two sciences (marketing and psychology).

Fourthly, I advise using different Psychophysiological techniques or even if possible neuroimaging techniques. Connecting both neuroscientific techniques will be a surplus value in studying customer response to marketing stimulus.

Finally, despite the limitations presented, this project proves that it is possible to study variables of in-store environment with the physiological measures that are less susceptible to the conscious control of participants. Hence, I recommend using these techniques more often and if possible applied in real context.

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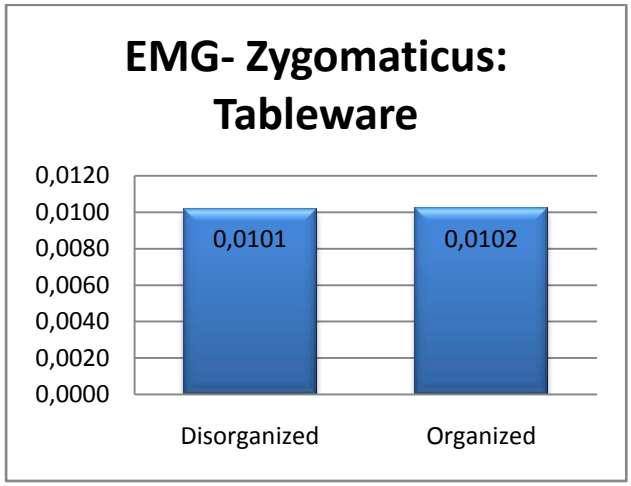
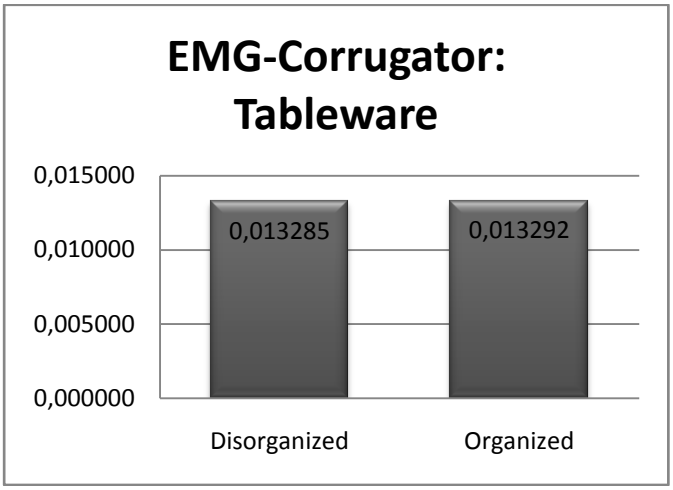
6 Appendix

6.1 Graphics

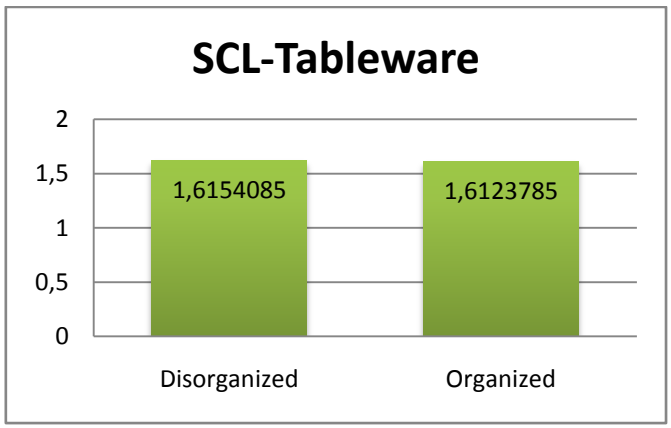
Tableware Stimulus



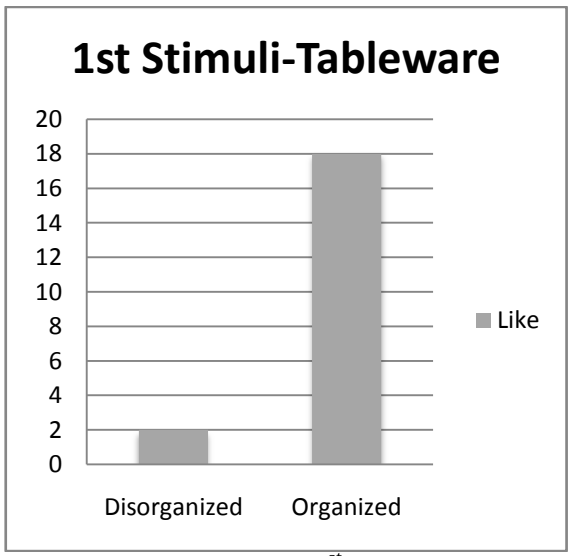
Graphic 3: Average Zygomaticus activation Tableware



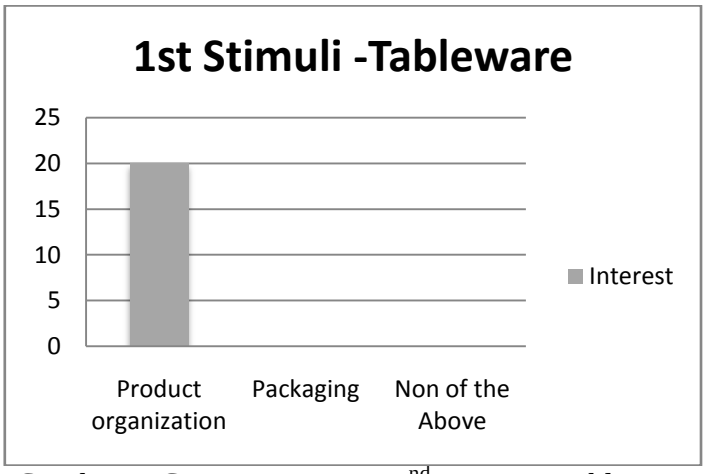
Graphic 4: Average Corrugator activation Tableware



Graphic 5: Average arousal level of Skin Conductance Tableware

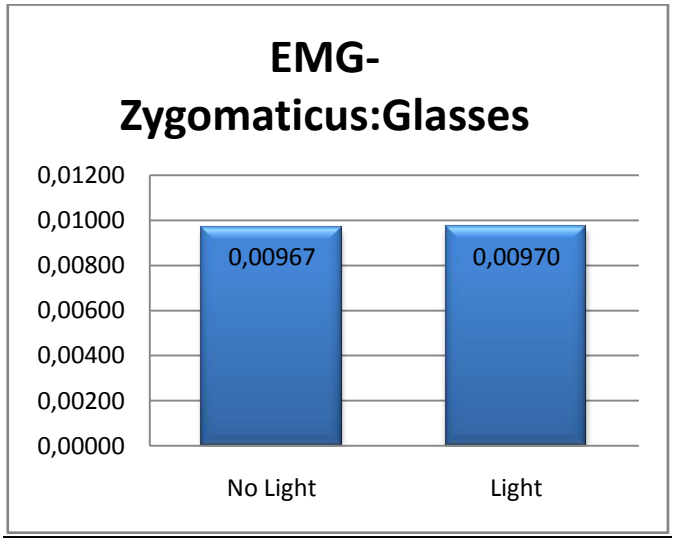


Graphic 6: Cognitive answer 1st question Tableware

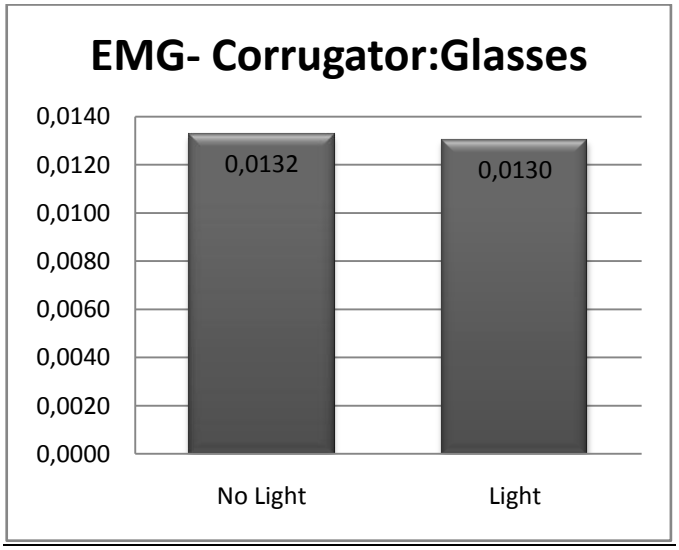


Graphic 7: Cognitive answer 2nd question Tableware

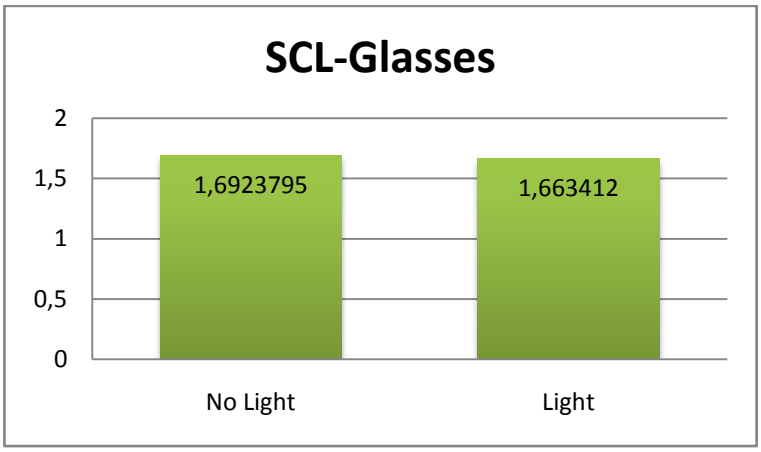
Glasses Stimulus



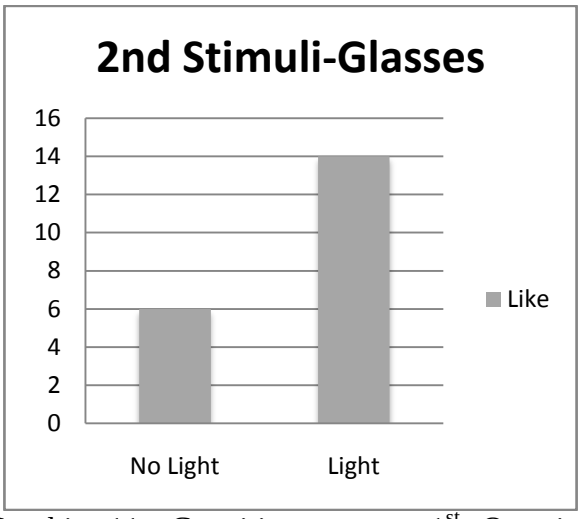
Graphic 8: Average Zygomaticus activation Glasses



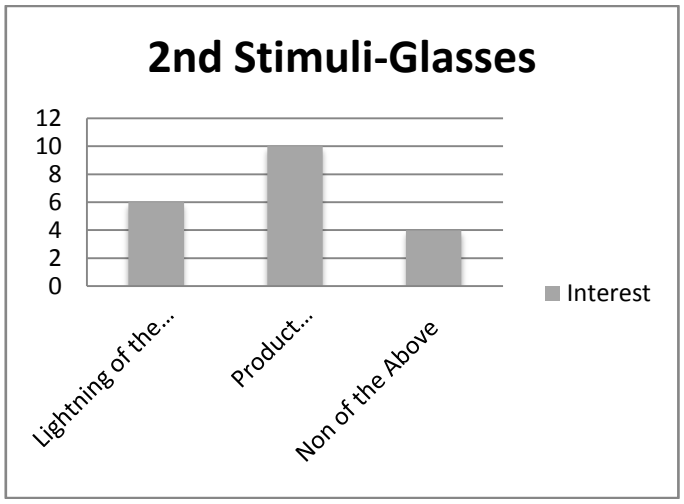
Graphic 9: Average Corrugator activation Glasses



Graphic 10: Average arousal level of Skin Conductance Glasses

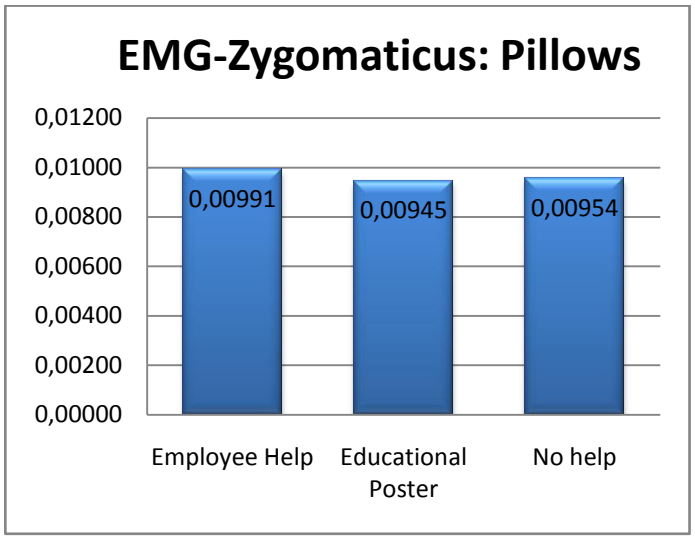


Graphic 11: Cognitive answer 1st Question Glasses

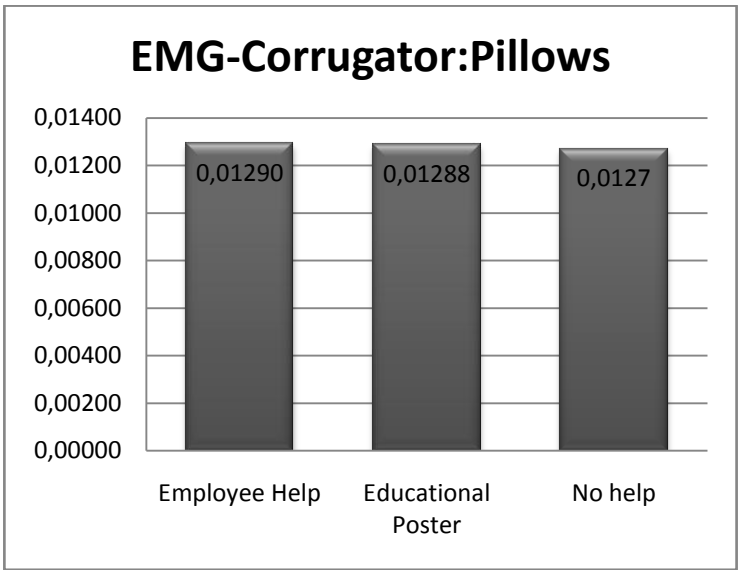


Graphic 12: Cognitive answer 2nd Question Glasses

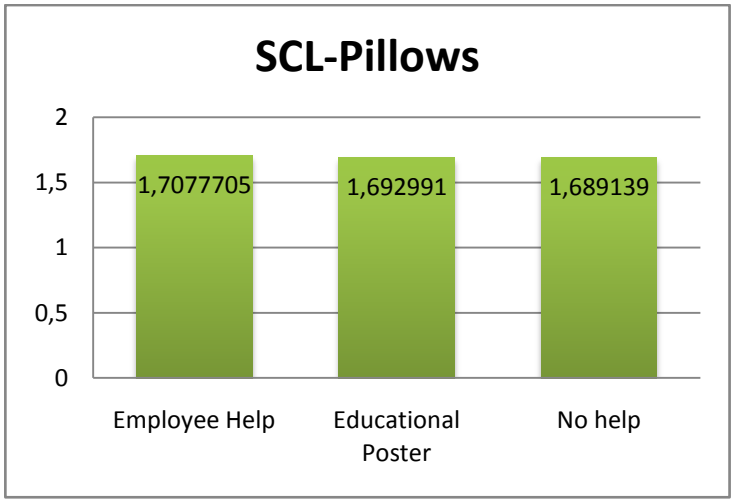
Pillows Stimulus



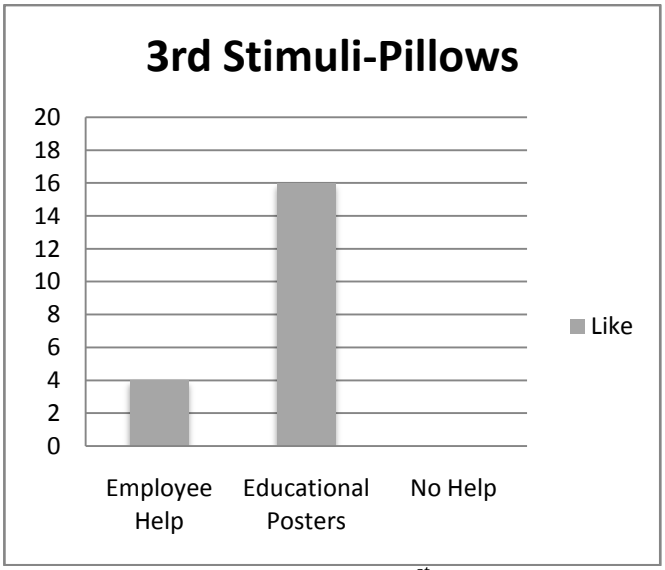
Graphic 13: Average Zygomaticus activation Pillows



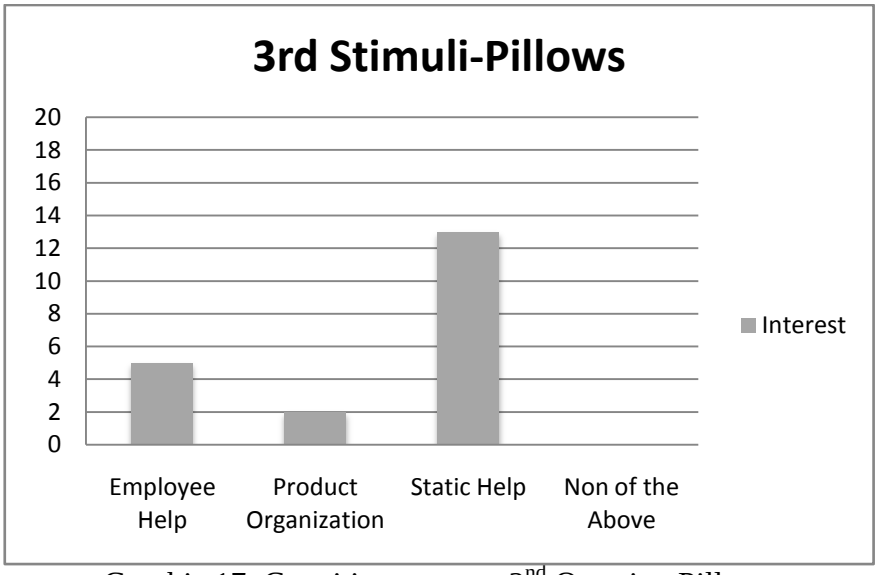
Graphic 14: Average Corrugator activation Pillows



Graphic 15: Average arousal level of Skin Conductance Pillows



Graphic 16: Cognitive answer 1st Question Pillows



Graphic 17: Cognitive answers 2nd Question Pillows

6.2 Spss Outputs

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Disoganized (Zyg)	,010131	20	,0045624	,0010202
	Organized (Zyg)	,010156	20	,0047102	,0010532
Pair 2	DIsorganized (Corrug)	,009673	20	,0043982	,0009835
	Organized (Corrug)	,009700	20	,0044685	,0009992
Pair 3	No Light (Zyg)	,013285	20	,0067995	,0015204
	Light (Zyg)	,013292	20	,0063726	,0014250
Pair 4	No Light (Corrug)	,013249	20	,0070248	,0015708
	Light (Corrug)	,013029	20	,0067473	,0015087

SPSS Output 1: Paired Samples Statistics (EMG)- Glasses and Tableware

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Disorganized (Zyg) - Organized (Zyg)	-,0000250	,0007146	,0001598	-,0003594	,0003094	-,156	19	,877
Pair 2	Disorganized (Corrug) - Organized (Corrug)	-,0000265	,0004429	,0000990	-,0002338	,0001808	-,268	19	,792
Pair 3	No Light (Zyg)-Light (Zyg)	-,0000071	,0015758	,0003524	-,0007446	,0007304	-,020	19	,984
Pair 4	No Light (Corrug)-Light (Corrug)	,0002191	,0006087	,0001361	-,0000658	,0005040	1,610	19	,124

SPSS Output 2: Paired Sample Test (EMG)- Glasses and Tableware

Within-Subjects Factors

Measure:MEASURE_1

condição	Dependent Variable
1	Employee Help (Zyg)
2	Educational Poster (Zyg)
3	No Educational Help (Zyg)

Multivariate Tests[b]

Effect		Value	F	Hypothesis df	Error df	Sig.
condição	Pillai's Trace	,126	1,301[a]	2,000	18,000	,297
	Wilks' Lambda	,874	1,301[a]	2,000	18,000	,297
	Hotelling's Trace	,145	1,301[a]	2,000	18,000	,297
	Roy's Largest Root	,145	1,301[a]	2,000	18,000	,297

a. Exact statistic

b. Design: Intercept

Within Subjects Design: condição

SPSS Output 3: Anova for repeated measures (EMG-Zyg)-Pillows

Within-Subjects Factors

Measure:MEASURE_1

condição	Dependent Variable
1	Employee Help (Corrug)
2	Educational Poster (Corrug)
3	No Educational Help (Corrug)

Multivariate Tests[b]

Effect		Value	F	Hypothesis df	Error df	Sig.
condição	Pillai's Trace	,206	2,334[a]	2,000	18,000	,126
	Wilks' Lambda	,794	2,334[a]	2,000	18,000	,126
	Hotelling's Trace	,259	2,334[a]	2,000	18,000	,126
	Roy's Largest Root	,259	2,334[a]	2,000	18,000	,126

a. Exact statistic

b. Design: Intercept

Within Subjects Design: condição

SPSS Output 4: Anova for repeated measures (EMG-Corrugator)-Pillows

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Disorganized (SCL)	1,6154085	20	1,27958019	,28612283
	Organized (SCL)	1,6123785	20	1,33743291	,29905909
Pair 2	No Light (SCL)	1,6923795	20	1,40920820	,31510853
	Light (SCL)	1,6634120	20	1,41069809	,31544168

SPSS output 5: Paired Samples Statistics (SCL)- Glasses and Tableware

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	DIsorganized (SCL)-Organized (SCL)	,00303000	,17780092	,03975749	-,08018339	,08624339	,076	19	,940
Pair 2	No Light (SCL)-Light (SCL)	,02896750	,11884616	,02657481	-,02665421	,08458921	1,090	19	,289

SPSS Output 6: Paired Samples Test (SCL)- Glasses and Tableware

Within-Subjects Factors

Measure:MEASURE_1

condição	Dependent Variable
1	Employee Help (SCL)
2	Educational Poster (SCL)
3	No Educational help (SCL)

Multivariate Tests[b]

Effect		Value	F	Hypothesis df	Error df	Sig.
condição	Pillai's Trace	,019	,178[a]	2,000	18,000	,838
	Wilks' Lambda	,981	,178[a]	2,000	18,000	,838
	Hotelling's Trace	,020	,178[a]	2,000	18,000	,838
	Roy's Largest Root	,020	,178[a]	2,000	18,000	,838

a. Exact statistic

b. Design: Intercept

Within Subjects Design: condição

SPSS Output 7: Anova for repeated measures (SCL)-Pillows

6.3 Excel Data

Stimuli		Tableware		Glasses		Pillows		
		Disorganized	Organized	No Light	Light	Employee Help	Educational Poster	No help
Version A	1azig	**0,010**	0,009	**0,011**	0,010	**0,00886**	0,00870	0,00873
	2azig	**0,0129**	0,0125	**0,0121**	0,0119	**0,0116**	0,0111	0,0110
	3azig	**0,013**	0,012	**0,012**	0,011	**0,0111**	0,0109	0,0108
	4azig	**0,0135**	0,0131	**0,0129**	0,0125	**0,0153**	0,0148	0,0141
	5azig	**0,0051**	0,0048	**0,0078**	0,0075	**0,0080**	0,0078	0,0077
	6azig	0,0078	**0,0080**	0,0067	**0,0074**	**0,013**	0,006	0,008
	7azig	**0,0033**	0,0031	**0,0035**	0,0033	0,00347	**0,00357**	0,00349
	8azig	0,006	**0,008**	0,0108	**0,0113**	0,0116	0,0118	**0,0119**
	9azig	**0,0077**	0,0076	**0,0073**	0,0071	**0,00704**	0,00698	0,00690
	10azig	**0,0074**	0,0068	**0,00589**	0,00586	0,0054	**0,0055**	0,0051
Version B	1bzig	0,0128	**0,0131**	0,0119	**0,0120**	0,0117	**0,0119**	0,0118
	2bzig	0,0116	**0,0123**	0,010	**0,011**	0,0087	0,0092	**0,0096**
	3bzig	**0,0037**	0,0034	**0,0036**	0,0035	**0,00378**	0,00365	0,00371
	4bzig	**0,0054**	0,0052	**0,0050**	0,0049	0,0049	0,0047	**0,0052**
	5bzig	**0,010**	0,009	0,0037	**0,0040**	**0,0043**	0,0037	0,0035
	6bzig	0,015	**0,016**	0,013	**0,014**	0,0113	**0,0117**	0,0114
	7bzig	0,0106	**0,0110**	**0,012**	0,011	**0,0139**	0,0130	0,0136
	8bzig	0,0091	**0,0092**	0,0085	**0,0086**	0,00806	**0,00829**	0,00810
	9bzig	0,0216	**0,0221**	0,0206	**0,0210**	0,0198	**0,0202**	0,0200
	10bzig	0,0158	**0,0163**	0,0159	**0,0161**	**0,0160**	0,0159	0,0158
	Mean	0,0101	**0,0102**	0,00967	**0,00970**	**0,00991**	0,00945	0,00954

Table 6: Excel data of EMG (Zygomaticus) per stimuli and candidate.

Stimuli		Tableware		Glasses		Pillows		
		Disorganized	Organized	No Light	Light	Employee Help	Educational Poster	No help
Version A	1acor	**0,027**	0,025	**0,030**	0,028	**0,0247**	0,0238	0,0246
	2cor	**0,0280**	0,0276	**0,0273**	0,0272	**0,0268**	0,0265	0,0262
	3acor	**0,0092**	0,0090	0,0092	**0,0093**	**0,0091**	**0,0091**	0,0090
	4acor	**0,0114**	0,0108	0,0107	**0,0111**	0,0109	**0,0113**	0,0107
	5acor	**0,018**	0,017	**0,01374**	0,01373	**0,0165**	0,0163	0,0160
	6acor	**0,010**	0,009	**0,0095**	0,0094	0,00922	0,00916	**0,00962**
	7acor	**0,015**	0,014	**0,0173**	0,0157	**0,0155**	0,0153	0,0151
	8acor	0,0075	**0,0076**	0,0075	**0,0078**	0,0078	**0,0082**	0,0073
	9acor	**0,0077**	0,0076	0,00795	**0,00800**	0,0076	0,0077	**0,0079**
	10acor	**0,0160**	0,0159	**0,0161**	0,0158	0,0154	**0,0162**	0,0149
Version B	1bcor	**0,02071**	0,02067	0,0204	**0,0205**	0,01982	**0,01987**	0,01985
	2bcor	0,0076	**0,0077**	**0,0076**	0,0072	0,0078	0,0077	**0,0080**
	3bcor	**0,023**	0,022	**0,024**	0,023	**0,023**	0,021	0,022
	4bcor	0,0078	**0,0082**	0,0074	**0,0076**	0,0076	0,0075	**0,0083**
	5bcor	0,0093	**0,0097**	0,0089	**0,0094**	0,0089	**0,0102**	0,0088
	6bcor	0,0092	**0,0094**	0,00906	**0,00910**	**0,0096**	0,0091	0,0089
	7bcor	**0,008**	0,006	**0,008**	0,007	0,0070	**0,0075**	0,0058
	8bcor	0,00751	**0,00754**	**0,00782**	0,00776	**0,0079**	0,0078	0,0076
	9bcor	0,0156	**0,0160**	0,01539	**0,01543**	0,01520	**0,01524**	0,01508
	10bcor	0,008	**0,014**	**0,0079**	0,0078	**0,0080**	0,0078	0,0079
	Mean	0,013285	**0,013292**	**0,0132**	0,0130	**0,01290**	0,01288	0,0127

Table 7 : Excel data of EMG (Corrugator) per stimuli and candidate.

Stimuli		Tableware		Glasses		Pillows		
		Disorganized	Organized	No Light	Light	Employee Help	Educational Poster	No help
Version A	1a	2,69	**2,93**	**3,41**	3,04	**3,09**	2,77	2,55
	3a	0,493	**0,494**	0,50	**0,51**	0,52	**0,55**	0,53
	2a	**3,30**	3,18	**3,07**	2,92	**2,89**	2,73	2,64
	4a	**1,89**	1,28	**1,07**	0,84	**0,96**	0,93	0,86
	5a	0,362	**0,365**	**0,43**	0,41	**0,403**	0,3985	0,3999
	6a	**1,97**	1,88	**1,96**	1,89	1,89	1,84	**1,91**
	7a	4,50	**4,76**	5,27	**5,44**	5,71	5,88	**6,02**
	8a	2,78	**2,97**	**3,07**	3,03	3,197	**3,20**	3,11
	9a	1,02	**1,06**	1,20	**1,27**	1,33	1,37	**1,38**
	10a	**0,41**	0,398	0,42	**0,43**	0,48	0,51	**0,57**
Version B	b1	2,06	**2,07**	2,02	**2,04**	1,99	**2,01**	2,00
	b2	**0,70**	0,69	0,74	**0,81**	0,76	**0,81**	0,79
	b3	**0,50**	0,47	0,66	**0,68**	**0,65**	0,63	0,64
	b4	3,75	**3,76**	3,93	**4,03**	3,91	3,78	**3,99**
	b5	**1,57**	1,54	1,48	**1,50**	1,29	**1,43**	1,36
	b6	**0,58**	0,55	**0,69**	0,66	**0,83**	0,76	0,79
	b7	2,40	2,56	**2,39**	2,27	2,43	**2,50**	2,47
	b8	**0,50**	0,46	**0,63**	0,58	**0,84**	0,73	0,78
	b9	**0,29**	0,28	**0,31**	0,30	**0,34**	0,335	0,333
	b10	0,549	**0,55**	0,61	**0,63**	0,65	**0,69**	0,67
	Mean	**1,615**	1,612	**1,692**	1,663	**1,708**	1,693	1,689

Table 8: Excel data of SCL per stimuli and candidate

6.4 Questionnaire Sample

Portuguese Version: (applied to the sample)

Questionário Cognitivo do Projecto Tese do Msc. BA

Nome do Candidato: _____

Idade: _____ **Sexo:** _____

Versão Visionada: _____

No 1º Filme qual foi a opção que mais gostou?

1º ☐ 2º ☐

O que lhe suscitou mais interesse foi?

A)Organização do produto ☐ B) Embalagem do Produto ☐

C)Nenhuma das anteriores ☐

No 2º Filme qual foi a opção que mais gostou?

1º ☐ 2º ☐

O que lhe suscitou mais interesse foi?

A) Luminosidade do produto ☐ A)Organização do produto ☐

C) Nenhuma das anteriores ☐

No 3º Filme qual foi a opção que mais gostou?

1º ☐ 2º ☐ 3º ☐

O que lhe suscitou mais interesse foi?

A)Apoio da funcionária ☐ B) Organização do Produto ☐

C) Apoio estático ☐ D) Nenhuma das anteriores ☐

Data: _____

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English Version (Not applied to the sample)

Cognitive Questionnaire for the Master Project of the Msc. BA

Name of the candidate: _____

Age: _____ **Gender:** _____

Visioned Version: _____

In the 1st Movie which version you Like?

1º ☐ 2º ☐

Which interested you the most?

A) Product Organization ☐ B) Product packaging ☐

C) None of the above ☐

In the 2nd Movie which version you like?

1º ☐ 2º ☐

Which interested you the most?

A) Product lightning ☐ B) Product Organization ☐

C) None of the above ☐

In the 3rd Movie which version you like?

1º ☐ 2º ☐ 3º ☐

Which interested you the most?

A) Employee help ☐ B) Product Organization ☐

C) Static Help ☐ D) None of the above ☐

Date: _____

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6.5 Pictures of Stimulus

Tableware Stimulus

Photo 1: Disorganized Environment

Photo 2: Organized Environment

Glasses Stimulus

Photo 3: Focusing No-Light Environment

Photo 4: Light Environment (1st shelf)

Pillows Stimulus

Photo 5: Employee Help (Educational experience)

Photo 6: No Educational Experience

Photo 7: Educational Posters