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Perceptions of marketing professionals from the largest companies in Portugal regarding neuromarketing

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Master in Marketing

Supervisor:

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Invited Assistant Professor, Department of Marketing,
Strategy and Operations - ISCTE Business School

November, 2020



**BUSINESS
SCHOOL**

Department of Marketing, Strategy and Operations

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Abstract

Neuromarketing is an emerging discipline that is continuously growing, as the advantages it can give to consumer behaviour knowledge is increasingly recognized. The aim of this study was to get to know and understand the opinion, knowledge and the specificities regarding neuromarketing by the leading marketers of large companies in Portugal. To meet this goal, a comprehensive literature review was first conducted, followed by an empirical research with in-depth interviews. It was possible to conclude that marketers interviewed have an overall positive perception of neuromarketing, although the entanglement already found in the literature review was noticed more intensively within these professionals, as a lack of knowledge relatively to the full extension of this discipline could be observed. Regarding the ethical issues, an awareness and concern for the consumer was detected, although not applied to the usage of neuromarketing within the marketers' own companies. They also have a positive perception of neuromarketing's future, as a majority wish to proceed applying it in their companies. Managers who intend to apply neuromarketing should be aware of its advantages and limitations, besides knowing how to deliver methodological rigour. In order to obtain valid and reliable analysis, it is suggested to managers that research done should be conducted with experts, such as neuroscientists.

Keywords: Marketing; Neuromarketing; Consumer neuroscience; Marketing Professionals; Perceptions

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M31 – Marketing

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Resumo

O neuromarketing é uma disciplina emergente que está continuamente a crescer, uma vez que as vantagens que pode dar ao conhecimento do comportamento do consumidor são cada vez mais reconhecidas. O objetivo deste estudo foi compreender e conhecer a opinião, o conhecimento e o detalhe relativamente ao neuromarketing por parte dos grandes marketers das grandes empresas em Portugal. Em função dos objetivos de estudos e a revisão de literatura, a metodologia escolhida foi a pesquisa exploratória e qualitativa realizando entrevistas em profundidade realizou-se primeiro uma revisão exaustiva da literatura, e realizou-se uma pesquisa empírica com entrevistas em profundidade. Foi possível concluir que os profissionais de marketing entrevistados têm uma percepção globalmente positiva do neuromarketing, embora a pouca claridade de certos tópicos já encontrados na revisão bibliográfica tenha sido notado de forma mais intensa nestes profissionais, uma vez que se pôde observar uma falta de conhecimento relativamente à extensão total desta disciplina. Relativamente às questões éticas, foi detetada uma preocupação com o consumidor, embora não aplicada à utilização do neuromarketing nas próprias empresas dos profissionais de marketing. Os profissionais de marketing também têm uma percepção positiva do futuro do neuromarketing, uma vez que a maioria deseja aplicá-lo nas suas empresas. Os gestores que pretendam aplicar o neuromarketing devem estar conscientes das suas vantagens e limitações, para além de saberem como proporcionar rigor metodológico. A fim de se obter uma análise válida e fiável, sugere-se aos gestores que a investigação feita deva ser acompanhada com peritos, tais como neurocientistas.

Palavras-chave: Marketing; Neuromarketing; Profissionais de marketing; Percepções

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M39 – Outro

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1. Introduction

Marketers consistently try to develop the best strategies to sell their products and services to a target audience. With an increasing customer-oriented strategy focus within companies, especially as the number of brands and fierce competing increases, making it harder to differentiate, the effort of understanding consumer' behaviour is more important than ever, and to deliver a meaningful experience during the whole customer lifecycle. Thus, campaigns are produced, and millions of dollars are spent every year (Morin, 2011; Venkatraman et al., 2015). However, these often fail, as traditional research methods used are not reliable when testing and predicting the success of these investments, by depending on consumers' disposition and capacity to articulate their feelings when advertisements are shown to them (Morin, 2011). This limitation is particularly augmented by the fact that many processes happen at the unconscious level (Camerer & Yoon, 2015).

As famously quoted by neurologist and neuroscientist António Damásio, "We are not thinking machines that feel, we are feeling machines that think." Using neuromarketing, marketers can delve into that, particularly, to gain knowledge on the underlying cognitive and emotional processes that occur with various marketing stimuli, and how to refine these stimuli. Insights obtained can help, for example, to develop strategies that enhance advertisements messages' effectiveness by improving certain elements, but also for product development, branding, pricing, segmentation strategies and many other advantages, and particularly, to predict choice in consumers. Neuromarketing can help brands stand out in an overcrowded competitive world. These applications have been increasingly recognized, as research in marketing-related domains and academic programs have grown, but also the number of neuromarketing companies, neuromarketing divisions in renowned advertising agencies and marketing research companies, such as Nielson and Ipsos (Hakim & Levy, 2019; Plassmann et al., 2012, 2015). Despite such improvements, many limitations still exist that stall neuromarketing's development and reliability as a discipline. Ethical, conceptual and methodological issues evidence contradictions in perspectives between marketing researchers, academics, marketers and the media (Breiter et al., 2004; Eser et al., 2011; Gonçalves, 2016; Lee et al., 2007, 2017).

Thus, in this study, focus is given to the perception of marketeers who work in large companies, that consequently have more means to impact the advances made on the empirical side of neuromarketing. Specifically, the aim of this study will be to identify the perceptions of

marketing professionals from the largest companies in Portugal regarding neuromarketing. Given the scope of this research, the target will be marketing directors or managers from the largest companies in Portugal.

For simplicity purposes, the consumer neuroscience term will not be employed, with the neuromarketing term being the only one used throughout this study and will be distinguished of the contexts mentioned when required.

1.1 Research Problem

Privacy concerns, manipulation, lack of transparency, protection of test subjects and the validity and reliability of neuroscientific findings are part of many discussions evolved around the ethical issues in neuromarketing (Ariely & Berns, 2010; Lee et al., 2017; Lim, 2018; Murphy et al., 2008). However, as neuroscientific tools have still several limitations in what they are able to study and deliver, certain ethical issues are considered unfounded (Stanton et al., 2017).

Also, conceptual gaps are also found in literature, such as in neuromarketing's own definition, as there is not yet a widely accepted full definition, and neuromarketing and consumer neuroscience are used interchangeably, lacking clarity in its proper use (Ramsøy, 2019).

Furthermore, in the literature reviewed, there was no consensus in what are considered neuromarketing techniques. Some researchers refer neuromarketing as including brain imaging tools (Lee et al., 2017), while others also include other physiological tools, from eye-tracking to hormones (Plassmann et al., 2015; Stanton et al., 2017)

Although it is an area with a wide potential for researchers, companies and consumers, these limitations mentioned can affect the acceptance and use of neuromarketing in academic and commercial contexts (Lim, 2018). As such, it is important to build a strong foundation to be regarded more seriously. As also mentioned by Lim (2018, p. 213), “academics and marketers who are interested in using neuroscience for marketing endeavours may end up abandoning their pursuit of neuromarketing research when they are not able to locate good practical guides (or methodological primers) or subject-matter experts who are willing to collaborate with them.”

Koller (2010) conducted a research where consumers' perception regarding neuromarketing was studied, and Eser et al. (2011) studied the same topic relatively to three groups, in Turkey: neurologists, academics and marketing professionals. A master's dissertation made by

Gonçalves (2016) applied the same objective focusing only on the academics and marketing professionals in Portugal.

However, to date and to the author's awareness after reviewing the literature, the perception of large companies regarding neuromarketing has not yet been studied. As in Portugal, for example, they represent a significant share of the Gross Domestic (GDP), they have the power to boost the Portuguese economy, and the resources to apply new techniques such as neuromarketing (Carvalho, 2019). It is relevant to understand the extent of knowledge within this embryonic area not only in a commercial setting where ultimately neuromarketing is aimed at, but also amongst significant market players who have more funding for Research and Development (R&D) and innovation, and more impact on the market and consumer behaviour. Thus, a gap can be identified in the literature as no empirical research has been conducted previously considering marketing professionals' perspective from relevant large companies.

1.2 Objectives

Eser et al. (2011) study showed the perception of three groups in Turkey, mentioned previously, while Gonçalves (2016) focused on academics and marketing professionals in Portugal.

Therefore, the research problem will be *to identify the perceptions of marketing professionals from the largest companies in Portugal regarding neuromarketing*. Hence, the research question is outlined as: *what are the perceptions of marketing professionals from the largest companies in Portugal regarding neuromarketing?*

Thus, three objectives are established:

1. Understand how neuromarketing is being perceived and used within relevant large companies, given its advantages and limitations;
2. Identify the main ethical issues considered by marketing professionals from the largest companies in Portugal;
3. Outline neuromarketing's future within Portugal.

1.3 Structure

The first chapter presents the main topics and limitations encountered in the literature review, that help delineate the research problem presented subsequently. In the second chapter, a literature review is carried out, extensively exploring neuromarketing as a field, neuroscientific methods used in neuromarketing, relevant neuromarketing studies within the field are

presented, followed by neuromarketing research done applied to the marketing mix elements, and the ethical issues and limitations encountered in neuromarketing. In chapter three, the appropriate methodology for the research purpose to fully understand the neuromarketing panorama and perceptions will be outlined. Subsequently, research will be conducted, and results analysed in chapter four. Lastly, conclusion of the research problem and objectives are developed, followed by the portrayal of the managerial and theoretical implications, the limitations of the study and suggestions for future research.

2. Literature Review

2.1 Neuromarketing and Consumer Neuroscience

Humankind is not a merely a rational specie, as once was thought by John Stuart Mill in the 19th century, a concept that still endured until recently in traditional economics with its rational models. Quite contrarily, humans are constantly influenced by cognitive biases that they are unaware of in their daily lives (Ariely, 2009). Over 90% of the information we receive daily is processed subconsciously within the human brain (Zurawicki, 2010). As our irrational side has a major impact in our decisions, it is of the utmost importance that a company understands their customers better by studying the underlying neural processes that affect the decision-making process and consumer behaviour. In fact, neuromarketing may serve the consumer, as its findings may help deliver products that the consumer truly wants (Hubert & Kenning, 2008).

Although there is still a great deal of information and certainty to be gained from the different functions and connections of our brain regions, a lot of research has been done the last years to shed light on this, contributing to marketing-related knowledge. Neuromarketing is still widely considered an emerging field, especially as it still contains significant limitations (developed further) that stall its development (Agarwal & Dutta, 2015; Fisher et al., 2010; Harris et al., 2018; Lee et al., 2017; Morin, 2011; Plassmann et al., 2012; Ramsøy, 2019).

Neuromarketing and/or consumer neuroscience came from the merge between neuroscience and marketing, and has seen its popularity widen increasingly in conceptual and empirical research (Lee et al., 2017). The term neuromarketing was first used in the early 2000's by Ale Smidts (2001), in the "*ERIM Inaugural Address Series Research in Management*" for the Erasmus Research Institute of Management. In 2007 the term was used and developed in a scholarly publication, by Lee, Broderick, & Chamberlain (2007), and Fugate (2007).

Since neuromarketing is a relatively new area of study, besides lacking a framework for theory development in research and other issues further developed, there is not yet a consensus between the definition of neuromarketing and consumer neuroscience (Lee, Chamberlain & Brandes, 2018). The commonly used concept is from Lee et al. (2007), where neuromarketing is defined as the "application of neuroscientific methods to analyse and understand human behavior in relation to markets and marketing exchanges" (p. 200).

Despite not existing a differentiation between the terms neuromarketing and consumer neuroscience amongst the majority of researchers, and in contrast to Lee and colleagues, some

researchers such as Hubert & Kenning (2008), Javor et al. (2013), Milosavljevic, Plassmann, & Ramsoy (2012) and Plassman et al. (2015) find it significant to do so, relating neuromarketing to a commercial market research, and consumer neuroscience to academic work. For example, Hubert & Kenning (2008) define consumer neuroscience as comprising “the scientific proceeding of this research approach”, and neuromarketing as the “application of the findings from consumer neuroscience within the scope of managerial practice” (p.274).

Using the term consumer neuroscience, Reimann et al. (2011) define it as: “the study of the neural conditions and processes that underlie consumption, their psychological meaning, and their behavioral consequences.” Ariely & Berns (2010) define neuromarketing as: “the application of neuroimaging methods to product marketing” (p.1). Morin (2011) has described neuromarketing as: “an emerging field that bridges the study of consumer behavior with neuroscience” (p.131).

Lee et al. (2018) consider that all papers reviewed relative to neuromarketing revealed having a very simplistic understanding of the previous definition given by Lee et al. (2007). Specifically, by typically focusing on neuromarketing as the “application of insights from neuroscientific methods to marketing problems”, the authors refer that neuromarketing should also be seen as “the derivation and testing of behavioral predictions from neuroscientific *theories*” (Lee et al., 2018, p.14).

Also, researchers such as Fisher (2010) have not only also pointed the existence of conflicting terms, where neuromarketing either seen as a scientific field, or a business, but in addition, that the foundations of neuromarketing are very unclear to understand if neuromarketing is considered in fact an academic field or not. In reality, neuromarketing is claimed that it is a subfield of neuroscience, neuroeconomics, psychology, to economics, marketing, decision neuroscience or social neuroscience. (Plassmann et al., 2012; Smidts et al., 2014). Thus, demonstrating the fragility that neuromarketing still possesses in its foundations.

Solnais et al. (2013) consider that decision-making, reward processing, approach and withdrawal motivation, emotional processing, attention and memory are the neuroscientific foundations of consumer neuroscience. These topics are the basis of many research conducted in conceptual and empirical neuromarketing. Research in this area itself covers a broad range of topics within the marketing mix elements, discussed further on.

There are various benefits that consumer neuroscience and neuromarketing can bring to marketing. Plassmann et al. (2015) identified five main benefits in using this method such as:

identifying behaviour mechanisms that help validate, refine, or extend existing marketing theories; measure implicit processes in decision making; dissociating between different psychological processes; understanding individual differences and improving predictions of behaviour. By being able to reveal consumers' individual differences at a neural level, marketing professionals can identify and create new market segments (Camerer & Yoon, 2015; Hubert et al., 2018).

Neuromarketing is still a new and controversial topic, where some researchers believe it is worth the investment (Fugate, 2007; Lee et al., 2007; Plassmann et al., 2012; Venkatraman et al., 2015) while others are more cautious in their judgments (Ariely & Berns, 2010). Regarding perceptions given this volatile area, Koller (2010) conducted a research using a functional magnetic resonance imaging (fMRI) technique to understand the consumers' perception of neuromarketing, willingness of participating, health or ethical reservations felt, besides perceived risk, and intrinsic and extrinsic motivations, showing that neuromarketing research, specifically using fMRI, was not widely accepted. Eser et al. (2011) expanded their target study to marketing professionals, neurologists and academics. Marketing professionals and neurologists were found to more positive perceptions regarding neuromarketing than academics. It was explained that the neurologists are more familiar with neuroimaging techniques and that marketing professionals are more adaptable to new circumstances as they tend to strive for competitive advantages.

Despite the troubled beginning, vast developments in neuromarketing and consumer neuroscience research have been carried out, with very interesting findings for marketing. Notwithstanding, the lack of a consensus definition in both these terms reveals the embryonic stage in which this area is still in. It is important that there should be not only a consensus in its definition, but also a distinction in the usage of the terms 'neuromarketing' and 'consumer neuroscience', as suggested by researchers such as Hubert & Kenning (2008) and Milosavljevic, Plassmann, & Ramsay (2012).

2.2 Neuroscientific methods used in neuromarketing

Methods such as self-reports, focus groups, face-to-face interviews, and surveys are the typically chosen tools when studying consumer behaviour in marketing research. Although having its benefits, one of the major limitations of using these traditional methods is the assumption that participants are fully able to accurately describe their own cognitive processes, especially as most of the time they are unconscious (Morin, 2011). Besides, these methods are

also highly susceptible towards biased responses due to aspects such as peer pressure, incentives or time constraints (Morin, 2011). Contrary to what happened in a farthest past, there has been an increasing interest and effort to merge social sciences with biological sciences (Shiv & Yoon, 2012). The role our brain has in our everyday decisions and tasks is undeniable, and traditional measures are not able to delve into our unconscious processes. Neuroscientific methods enables researchers to access and understand the neural processes intrinsic in consumer behaviour. (Camerer & Yoon, 2015; Plassmann et al., 2015; Venkatraman et al., 2012). These alternative methodologies allow companies and researchers to obtain more accurate insights in a wide array of marketing research topics, such as understanding what elements are most effective to generate purchase or other marketing objectives (Camerer & Yoon, 2015; Hakim & Levy, 2019; Morin, 2011).

Despite existing ethical and technical issues (discussed further on), neuroscientific methods have become an accepted viable tool to use in marketing research (Lee et al., 2017).

As with traditional research methods, each of the neuroscientific techniques offer different types of measurements and responses, with advantages and disadvantages depending on the research objectives and psychological and biological variables chosen to measure, where “fundamentally different inferences” can be drawn (Shiv & Yoon, 2012, p.3).

However, it is still unclear what methods are included in neuromarketing as authors such as Lee et al. (2017), Javor et al. (2013) only consider those that measure neural activity within the brain, such as fMRI and Electroencephalography (EEG), while others expand these tools to physiological tools such as eye-tracking, hormones, skin conductance (SC), galvanic skin response (GSR) and many other methods (Daugherty & Hoffman, 2016; Hakim & Levy, 2019; Harris et al., 2018; Lim, 2018; Plassmann et al., 2015; Venkatraman et al., 2015).

There is a general consensus between researchers that neuroscientific techniques are tools that should not be used separately when conducting marketing and consumer behaviour research, but instead serve as a complement to the existing traditional research techniques (Plassmann et al., 2015; Venkatraman et al., 2015). For that reason, there should be a discernment on when to apply or not a specific neuroscientific tool (Plassmann et al., 2015).

Depending on the researchers' objectives, it is possible to choose tools from functional magnetic resonance imaging (fMRI), electroencephalography (EEG), magnetoencephalography (MEG), eye tracking, biometrics (such as galvanic skin response, pupil dilation and heart rate), transcranial magnetic stimulation (TMS), transcranial direct current stimulation (tDCS), positron emission tomography (PET) to single-neuron recording and pharmacology (Plassmann & Karmarkar, 2015).

fMRI is the most commonly used neuroscientific technique in neuromarketing and consumer neuroscience research (Kenning et al., 2007; N. Lee et al., 2017; Plassmann & Karmarkar, 2015; Reimann et al., 2011).

The most popular neuroscientific tools used by researchers in marketing research will be further developed.

Functional magnetic resonance imaging (fMRI)

Functional magnetic resonance imaging or functional MRI (fMRI) is a non-invasive scanner that allows to observe where neural activity occurs, by detecting changes in oxygenated blood flow, when presented with a specific stimulus (Morin, 2011). The advantages fMRI provides makes it the most popular technique in “affective, cognitive, and social neuroscience” (Reimann et al. 2011, p. 610).

In terms of benefits offered, fMRI has a high spatial resolution, increased depth of processing (which helps to study psychological processes during information processing) and is also able to create a brain scan in less than three seconds (Camerer & Yoon, 2015; Kenning et al., 2007; Reimann et al., 2011; Venkatraman et al., 2015).

Other benefits of using fMRI to conduct research is that it is able to sort out activity in small structures, measure the whole brain, and differentiate signals from neighbouring areas (Karmarkar & Plassmann, 2019; Plassmann & Karmarkar, 2015). These characteristics and the precise measurement it provides, therefore offers many advantages to marketing research (Reimann et al., 2011). According to Karmarkar & Plassmann (2019), fMRI provides a superior comprehension of marketing stimuli responses (such as relative to brands and price) by localizing neural processes active during the decision-making process, consumption tests, “market level prediction and/or population level behaviour”, and also learning “socially relevant stimuli and value learning” (Karmarkar & Plassmann, 2019, p.176).

On the other hand, fMRI is considered physically restrictive, with a lower temporal resolution (related to time between the activation in the brain and its measurement), with high measurement costs, a relatively complex data analysis and can lead to reverse inference interpretations (explained further on) (Camerer & Yoon, 2015; Karmarkar & Plassmann, 2019; Plassmann & Karmarkar, 2015; Poldrack, 2006; Reimann et al., 2011).

Its limitation in analysing rapid processes can make it useful in research that involves dynamic processes such as watching TV advertisement, where an increased attention must be given from participants (Lee et al., 2017).

Electroencephalography (EEG)

Electroencephalography is a non-invasive test that measures electrical patterns and changes from brain activity through electrodes that are placed in a subject's head (Kable, 2011).

When processing thoughts, our brain uses a network of neurons that communicate with each other by sending signals through electrical currents. Hence, increased brain activity is created by a rise in electrical signals derived from intensified neuronal communication (Farnsworth, 2019). EEG will capture this electrical activity happening at a given moment from a vast number of neurons, not being able however to descry electrical changes in single neurons (Farnsworth, 2019).

Following fMRI, EEG is a recurrent choice when conducting advertising research (Venkatraman et al., 2015; Wang & Minor, 2008). This neuroscience method offers benefits such as high temporal resolution, a relatively low maintenance and fairly cheap support, making it an often-chosen tool between neuromarketers (Kable, 2011; Morin, 2011; Reimann et al., 2011; Telpaz et al., 2015; Venkatraman et al., 2015).

Recent EEG bands are especially fast on recording brain activity (up to 10,000 times per second), which allows researchers to keep up more efficiently not only with the speed of our thoughts but also with information retrieved from our five senses (Morin, 2011).

Its equipment allows participants to move more freely and engage in stores and social environments, enabling a more realistic experience and results (Karmarkar & Plassmann, 2019). It is also very little invasive, and can “detect positive/ negative arousal, decision conflict, attention, language processing and some memory effects” (Karmarkar & Plassmann, 2019, p.176).

However, EEG has limitations in its use, such as a lower spatial resolution and narrow depth of processing, which means that it is hard to distinguish certain neural areas and pathways accurately (Bagozzi and Shaw, 2017). It cannot find with precision the location of neuron activity, particularly in the deeper and older structures of the brain (i.e. subcortical structures, such as the nucleus accumbens) that are responsible for relevant cognitive, affective, and social functions. Thus, EEG is limited to measuring cortical brain activity (responsible for motor, visual and sensory functions) (Harell, 2019; Telpaz et al., 2015).

Eye tracking

Eye tracking is a non-invasive device that uses an infrared camera that captures a subject's eye movements and gaze, by not only identifying where the subject is looking at (i.e. fixation points), but also at the constant changes their eyes may make from one point to another (Ghaoui,

2006). In other words, aspects such as fixations (moments when eyes are fixed in a single location, or concealing information), and saccades (quick eyes movements that promptly shift the point of fixation) are the main measurement metrics that disclose how attention is processed with a given object (Augustine et al., 2011; Castagnos & Po, 2010). Eye tracking is often used with a fixed-position camera in screen-based studies, or a head-mounted equipment in ambulatory studies and studies of mobile devices (Smith & Marci, 2016).

Modern eye trackers nowadays also have to capability to pinpoint the positions of both pupil and cornea, with the use of an optical camera that has an infrared or near-infrared light which induces corneal reflection (Smith & Marci, 2016).

Eye tracking can be combined with pupillometry and implemented to study both attention and information pursuit in social environments and interpersonal communication (Karmarkar & Plassmann, 2019; Plassmann & Karmarkar, 2015). Besides this, blink rate can also be measured (Borys, 2014). According to this author, there are three types of video-based eye-trackers: the static eye-tracker (most common), the head-mounted eye-tracker and the head-tracker.

Eye tracking can help to understand key aspects in marketing such as advertising effectiveness, what designs work or not when producing products, packaging and its different elements, the best layout and position for products in displays and shelves to increase sales, or design simpler user-friendly websites and *apps* that enhances user experience (Karmarkar & Plassmann, 2019; Plassmann & Karmarkar, 2015). Hence, it is considered a great tool to measure visual attention (Karmarkar & Plassmann, 2019; Venkatraman et al., 2015) .

It's one of the cheapest methods used in advertising research, with a high temporal resolution and delivers an efficient comprehension in temporal processes (Venkatraman et al., 2015). According to these authors, by capturing participants' gaze during an advertisement observation, researchers can use eye tracking to trace participant's information processing, its order and duration.

According to Karmarkar & Plassmann (2019), one of the limitations of eye tracking devices is that it cannot “measure inferences, valence of the response, thoughts, or emotions” (p.176).

Despite being able to present feedback on the effectiveness of elements in advertising, product placement or packaging, this method is commonly used simultaneously with other technologies (Smith & Marci, 2016).

Magnetoencephalography (MEG)

The expensive alternative to EEG, MEG captures and measures fluctuations in magnetic fields at the scalp that are created by neuronal activity, by augmenting and mapping them out (Kable, 2011; Morin, 2011). Since these magnetic fields are far weaker than the earth's magnetic field

and fluctuations caused by environment noise, it requires highly sensitive sensors called SQUIDS (Superconducting Quantum Interference Devices), and an advanced noise cancellation technique (Kable, 2011).

The MEG setup consists of a fixed helmet incorporated with more than one hundred detectors, that is set on top of the subject's head (Kable, 2011).

Its capacity and sensitivity to changes in magnetic fields makes it superior in its temporal resolution, and although similar to EEG, MEG has a higher quality in its spatial resolution since the magnetic field is less affected (i.e. distorted) by the skull than the electrical field (although still limited) (Ariely & Berns, 2010; Kenning et al., 2007; Morin, 2011; Plassmann et al., 2007). Similarly to EEG, MEG is limited to detecting activity at the brain surface and generating images relative to subcortical areas (Morin, 2011). Despite these limitations, MEG can still localize activity that occurs in deeper brain structures better than EEG (Harris et al., 2018; Kenning et al., 2007). According to Morin (2011), MEG should not be the method of choice when analysing higher cognitive and emotional functions (localized in the cortical and subcortical areas of the brain respectively) in marketing research studies. It is suggested that MEG presents greater benefits when measuring activity in “areas known or expected to produce activity given specific tasks rather than to conduct exploratory experiments” (Morin, 2011, p. 134). Since MEG is not a portable scan, it is only able to assist marketing research in a laboratory setting (Lim, 2018). This scanner also has other limitations such as its high measurement costs and complex data analysis (Kenning et al., 2007; Lim, 2018; Morin, 2011).

2.3 Relevant neuromarketing studies

Plassmann & Karmarkar (2015) gathered a list from consumer neuroscience academics' perceptions of the most influential publications in the field. This chapter gathers the top-5 results, and also includes Venkatraman et al.'s (2015) study, for being, as put in Karmarkar & Plassmann (2019) words, “the largest-scale demonstration of predicting market-level behavior to date”, with the cooperation of academics, companies, and the Advertising Research Foundation (p. 183).

Coca-Cola / Pepsi experiment:

During an fMRI study, McClure et al. (2004) showed how cultural messages, and especially cultural influence and brand knowledge, can shape our perceptions and behavioural preferences at a neural level. Specifically, the experiment was conducted between two famous sugary

drinks, Coca-Cola and Pepsi. Two conditions were conducted, an anonymous test of Coca-Cola and Pepsi, and a brand-cued delivery of also both beverages.

According to the researchers, when judgments are created solely on sensory information, activity in the ventromedial prefrontal cortex (VMPF) can predict people's preferences. Surprisingly, they discovered that brand knowledge and cultural information had more impact in consumers' preference than just sensory information when comparing Coca-Cola with Pepsi. These two factors were able to bias preference decision and activate distinct areas related to memory processes (the hippocampus and the dorsolateral prefrontal cortex) and the midbrain, specifically, favourably to Coca-Cola.

Neural Processing of Products and Brands vs Humans

A 2006 study done by Yoon et al. (2006) found that neural processing of products and brand is different. Using an fMRI, the researchers investigated how semantic judgements were processed between products/brands and people, particularly if the neural processes involved were alike. Results showed that human descriptor judgements had a greater activation in the medial prefrontal cortex (MPFC), and for products, activation was higher in the left inferior prefrontal cortex (LIPC), an area related to object processing (Yoon et al., 2006). This study showed evidence that contrarily to earlier theories, judgements about people and brands are made with distinct mental processes.

Neural predictors of purchases:

A study done by Knutson et al. (2007) was able to find that brain activation can predict purchases, specifically by characterizing the neural predictors of purchasing. Based on the microeconomic theory that purchases are influenced by product preference and price, the study only focused on people's purchase decision processes formed with their previously established preferences.

Using fMRI, Knutson and colleagues were able to detect the neural circuits related to product preference and price, and how its neural activation could predict purchase decisions. Test participants saw a labelled product for four seconds, followed by the product's price for another four seconds, and then were asked to choose to purchase the product or not. The results showed that product preference activated the nucleus accumbens (NAcc) (a region related to anticipated gain), while excessive prices activated the insula (a region related to anticipated loss, abandon intention, physical pain anticipation, among others), and the mesial prefrontal cortex (MPFC) (related to gain outcomes), was deactivated. Each of these neural correlations

demonstrated to be independently able to successfully predict purchasing seconds later, much successfully than self-reports (Knutson et al., 2007).

Wine, price and experienced pleasantness

During a wine tasting experiment, Plassmann et al. (2008) demonstrated how taste can be influenced by price at a neural level.

Thus, the task consisted of six trial types: \$5 wine (wine 1), \$10 wine (wine 2), \$35 wine (wine 3), \$45 wine (wine 1), \$90 wine (wine 2), and neutral liquid. The wines were administered in random order, simultaneously with the appearance of the price cue. Subjects were asked to focus on the flavor of the wine during the degustation period and entered taste pleasantness. Unbeknown to the subjects, the critical manipulation was that the \$5 and \$45 wines and the \$10 and \$90 wines were identical. This manipulation was not revealed to the subjects. Instead, the subjects were told they would be sampling five different Cabernet Sauvignons.

Their participants consumed randomly five Cabernet Sauvignons wines and a neutral liquid, with price cues appearing simultaneously while being scanned using fMRI. The prices ranged from 5\$, 10\$, 35\$, 45\$ to 90\$. However, participants were unaware that the 5\$ and 45\$ wines, and the 10\$ and 90\$ wines were in fact equal. They ended up perceiving the wines with higher price tags as providing a higher experienced pleasantness (i.e., flavour pleasantness and taste intensity). Not only did the participants report themselves these reactions but Plassmann and colleagues also noticed an increase in their blood oxygen level in the medial orbitofrontal cortex, an area associated to “experienced pleasantness during experiential tasks” (Plassmann et al., 2008, p.1050). This study showed how premium prices can change a consumption experience by successfully creating a bias on people’s perception of quality, status and reward within specific products.

Neural activations and music popularity prediction

Berns & Moore (2012) conducted a study using fMRI to predict the relative popularity of music. Adolescents would listen to new songs mostly from unknown artists while having their brain reactions measured. The researchers then compared the actual popularity results based on songs’ sales results three years later. Findings showed that contrary from responses of self-reports of song likability (that did not predict sales), activity from a reward-related area known to predict purchasing decisions such as the ventral striatum (specifically the nucleus accumbens) while people listened to music, was able to predict a song’s popularity, by correlating this brain region activity with the number of songs sold three years later.

Advertising effectiveness using traditional vs neuroscientific methods

While collaborating with various companies and the Advertising Research Foundation, Venkatraman and colleagues delivered the largest study on the use of different measures to predict market-level behaviour and advertising success. Specifically, they tested which measure from neuroscientific methods and traditional methods was most effective in predicting advertising effectiveness, by comparing advertisement responses from each method (Venkatraman et al., 2015).

By collecting responses from 30-second television ads, the researchers would then “relate individual-level response to television ads in the lab to the ads’ aggregate, market-level elasticities” Venkatraman et al. (2015, p.436). Two findings were uncovered: fMRI was found to explain the most variance in market response, surpassing traditional advertising measures, and the ventral striatum (involved in reward processing) was best at predicting market-level responses to advertising. Thus, according to the authors, success in advertising can be considerably enhanced not only by including the traditional but also neurophysiological methods (Venkatraman et al., 2015).

2.4 Marketing Mix and Neuromarketing

Developed in 1964 by Edmund Jerome McCarthy, the marketing mix framework is a staple in marketing management. As such, consumer neuroscience researchers have been studying and contributing to a better understanding of how the human brain reacts to its different elements and develop effective strategies that can influence consumers’ purchase behaviour. The available research done has focused mainly on the 4 P’s of the marketing mix: product, price, place and promotion. In this chapter, selected studies done throughout these different elements will be further presented.

2.4.1 Product

Among the ideas advanced in both commercial and academic marketing heightened through literature on brand personality, is that peoples’ and brands’ traits are processed essentially in similar ways.

As mentioned previously, findings from an fMRI experiment showed the opposite: that consumers do not process information of products and brands the same way as with humans, using different regions of the brain for one or the other - the MPFC and LIPC respectively (Yoon et al., 2006).

A more recent fMRI study done by Chen, Nelson, and Hsu (2015) has been able to corroborate with Aaker's (1997) brand personality framework, by demonstrating “widely distributed set of brain regions previously implicated in reasoning, imagery, and affective processing” related with the five dimensions of brand personality (i.e., sincerity, excitement, competence, sophistication and ruggedness) (Chen et al., 2015, p.453). Participants would observe logos from 44 popular brands four times randomly for four to eight seconds, and they had been asked before scanning to think freely about characteristics or traits that they associated with a given brand. After the scanning phase, participants would fill out a survey with Aaker's (1997) brand association scale (where an assessment of the characterization of 42 traits for every brand was made), familiarity and preference for the 44 brands individually. It was suggested that brand personality traits do exist inside consumers' minds, and that these brand personality neural maps allow researchers to successfully predict which brand a person might be thinking of (Chen et al., 2015).

Also, an fMRI study investigating the neural correlates of trustworthiness evaluations on brands and faces, concluded that brands might not be perceived as having ‘human’ personality traits, and instead be sensed as cultural objects (Javor et al., 2018). In the trustworthiness judgment task, participants were asked to indicate if they trusted the brand or person presented, by pressing a button. Results showed that both the amygdalae and orbitofrontal cortex are strongly implicated in interpersonal trust when test subjects evaluated trustworthiness with faces, but not with brands.

Another study observed that anthropomorphic products were found to fulfil social needs (i.e., provided social connection) to some extent (Mourey et al., 2017). These findings have potential marketing implications for product descriptions and designs, substituting functional descriptor with lifelike ones such as “a helpful assistant” and “friendly” as opposed to functional descriptors such as “long battery life” and “portable” (Mourey et al., 2017, p. 15).

Two studies found that when products' packages are perceived as attractive, not only a higher amount of attention is given, but the brain's reward related regions are activated, working as a reward stimuli for consumers and contributing to brand preference and purchase (Reimann et al., 2010; Stoll et al., 2008).

In Stoll et al. (2008) research, an fMRI was used to study fast moving consumer good packages and how brain processes positive versus negative stimuli, concluding that attractive packages generate stronger affective responses, activate more visual processing and reward processing

areas and lead to positive emotional results. According to the researchers, this might explain why attractive packages can generate increased attention at the point-of-sale, therefore affecting positively fast-moving consumer goods sales. Contrarily, unattractive packages were given less visual attention and processing by test subjects, while also leading to feelings of uncertainty and increased expected risk. Specifically, with unattractive packages an increased activity was found in the insula cortex and frontal lobe, which are regions usually related to processing of stimuli that is aversive, for instance, of “unfair offers or disgusting pictures” (Stoll et al., 2008, p.242). This response naturally has a negative impact on brand equity, therefore Stoll and colleagues recommend that marketing management should measure the attractiveness strength of each single package (Stoll et al., 2008).

In Reimann et al. (2010) research, it was also found that while consumers were choosing brands based on their packages, reaction time grew significantly when seeing aesthetic packages. The nucleus accumbens and the ventromedial prefrontal cortex, associated with anticipated reward and reward outcome respectively (Reimann et al., 2010, as cited in Knutson & Cooper, 2005), were activated when individuals saw aesthetic packages. More importantly, aesthetic packages from unknown brands had a higher impact on the activation of the striatum (part of the nucleus accumbens) and the ventromedial prefrontal cortex, and were chosen by participants over well-known brands, showing that the aesthetics of a package design may be more important than the power of a well-known brand. In this study the researchers observed that the enhanced time was a consequence of a higher affective processing.

Logos of preferred products and brands within sports and luxury brands, have also been linked with activity in the striatum, while the evaluation of value has been related with prefrontal and orbitofrontal cortex activation (Schaefer & Rotte, 2007). The striatum and ventromedial prefrontal cortex are essential in processing each individual’s value perceptions such as preferences, utility and Willingness To Pay (WTP) in products and some of its elements (Karmarkar & Plassmann, 2019).

Various research has been done within neuromarketing to show how visual features such as colour, store shelf lighting and packaging brightness, can influence visual attention, and attention influences choices and purchase intention (Karmarkar & Plassmann, 2019).

Another study found that when individuals made fast decisions, visual components of products (such as colour and brightness of the packaging or store shelf arrangement) were shown to be prioritized over individuals’ subjective preference (Milosavljevic et al., 2012). Particularly, the higher the amount of intellectual activity was required (i.e. cognitive load), the higher this visual

saliency bias occurs, especially if participants did not possess a strong preference among the available choices (Milosavljevic et al., 2012).

A study using eye-tracking and word association has also allowed to understand the importance of creating design elements in packaging, that can work visually in favour of a brand's message in food packaging, for example, in jam jars (i.e., its ridges or some unusual element of the packaging incited more gaze within participants) (Piqueras-Fiszman et al., 2013).

Also, by combining purchase data, neuromarketing research using eye tracking has been done to understand which shelf positions are most effective (such as top-shelf positions) in driving purchase, and the impact that the number of shelf coating has on consumers' brand evaluation (Chandon et al., 2009).

Research has evidenced that marketing placebo effects are increased by "reward-seeking and motivational behaviour" (Plassmann & Weber, 2015, p.505). These researchers found three moderators that influence the consumption experience created by marketing expectancy effects. Consumers with higher levels in reward seeking brain activity, lower awareness of their somatic sensations (related to lower activation in posterior insula) and with greater need for cognition (related to activity in the dorsomedial prefrontal cortex) were found to be more susceptible to marketing placebo effects (Plassmann & Weber, 2015). Not only were Plassmann and Weber able to demonstrate what individual differences influence marketing placebo effects, but also how marketing actions can change both consumers' perceptions and the biological factors present in their consumption and purchasing decisions.

2.4.2 Price

One of the most impactful studies on price was Knutson et al. (2007) on the neural correlates of purchase, mentioned previously.

Using fMRI, Plassmann, et al. (2007) had observed that when participants were communicating their willingness to pay (WTP), it was found that WTP calculations were significantly related to the activity of the right medial orbitofrontal cortex and the dorsolateral prefrontal cortex.

In a study done by Ramsøy, Skov, Christensen and Stahlhut (2018) using EEG, not only did they find that the prefrontal cortex (i.e. frontal gamma asymmetry), specifically the asymmetry in its engagement, was related to WTP, but the study also verified how WTP is related to our emotional responses to different product categories in the brain. Comparing fast-moving

consumer goods (FMCG) with luxury goods, the participants showed a higher WTP for the latter, and a lower WTP was found with FMCG products. It shows that “more positive emotional responses are related to a higher price point for the product” (Ramsøy, Skov, Christensen and Stahlhut, 2018). In the luxury products category, between clothes, bags and shoes, these last two products had a considerable positive relationship to WTP, with higher left than right asymmetry engagement (higher asymmetry scores) in the prefrontal cortex, associated to an increasing WTP for the products.

As previously mentioned, a study by Plassmann et al. (2008) was conducted to show how price can influence perceived taste and quality of wine at a self-reported and neural level.

More recently, Schmidt et al. (2017) went further into these findings with a similar experience also using wine tasting. They concluded that the brain’s valuation system (i.e. ventromedial prefrontal cortex and the ventral striatum), already known to be related to motivation and affective regulation, and combined with the anterior prefrontal cortex, are important players in influencing product experience such as the impact of price when evaluating taste pleasantness.

Karmarkar, Shiv, and Knutson (2015) showed how the timing of presenting a price influences the evaluation of a product’s worth and purchase intention, and the underlying neural processes. Using fMRI, they noticed that when participants viewed products first, they would prioritize on evaluating its attractiveness or desirability, but when presented with the price first, evaluations would focus towards its actual price/quality relation and worth. Distinct patterns of activity occurred in the medial prefrontal cortex (brain region related with perceptions of monetary value), that altered depending on the timing of the price information displayed (i.e., before or after presented the product) (Karmarkar et al., 2015). The authors concluded that showing the price of a product before the product itself can contribute to “bargain-priced products”, when the product is deemed worthy (Karmarkar et al., 2015, p.493).

2.4.3 Promotion

One study using eye-tracking, found that in magazine advertisements, placing the ad on the bottom of the right-hand page next to an article or illustration has been shown to be the best position in terms of capturing attention, along with displaying a limited number of colours (for instance, although red is effective, its amount should also be limited to not overshadow other important elements) and the amount of text inserted in the advertisement (Smit, Boerman, & Meurs, 2015).

Advertising research using EEG has related the occipital alpha activity to attention processes (Pozharliev, Verbeke & Bagozzi, 2017). By using neuromarketing tools, researchers have shown how consumers' attention towards brands and decision-making, to billboards or emotionally engaging TV advertisements in social contexts, can be influenced by the presence of other people, from strangers to family, through social processes known as social facilitation, self-referential cognition, social cognition, social embarrassment, and social reward processing (Ariely & Levav, 2000; Jayasinghe & Ritson, 2013; Kurt et al., 2011; Pozharliev et al., 2015, 2017).

Concerning the effectiveness of celebrity endorsement, different neuromarketing research using fMRI and galvanic skin response, evidenced that using celebrities in advertisements is successful in influencing consumers by evoking more emotional responses, trust and deeper processing than beauty itself (i.e., by using unknown attractive models), and also that when celebrities are seen as 'credible' experts, they have a powerful impact on persuasion (Gakhal & Senior, 2008; Klucharev et al., 2008). Corresponding neural basis and activity linked to these persuasive effects were also found (Gakhal & Senior, 2008; Klucharev et al., 2008). For example, Klucharev et al. (2008) discovered that using experts to present an object causes long-lasting positive effect on memory (in the medial temporal lobe, i.e., hippocampus and parahippocampal gyrus, included in memory formation) and attitude to the object. Brain activity in the prefrontal and temporal cortices was also displayed. Additionally, Gakhal and Senior (2008) found greater electrodermal activity when participants observed celebrity faces in the left hand (related to the right hemisphere of the brain), suggesting that processing of fame is more influenced by emotive process than the processing of beauty, emphasizing the use of celebrities as an important asset in marketing efforts.

Similarly, Stallen and colleagues have not only shown the neural mechanism of fame in female brains (where the medial orbitofrontal cortex was shown to be more activated), but also the benefits in product memory and customers' purchase intention when using celebrities for promoting brands, such as the transfer of the positive affect felt towards a celebrity, being transferred to the product (Stallen et al., 2010). This is caused by the individual's positive memories associated with the celebrity (Stallen et al., 2010).

2.4.4 Place

One study by Hubert et al. (2018) used fMRI and self-reports to test the impact of known trust-assuring (i.e. claims, data and backing) and trust-reducing (i.e. rebuttal) textual elements on trustworthiness evaluations in online offers, how consumers' impulsiveness can influence their

trustworthiness evaluations and the neurological differences between impulsive and non-impulsive shoppers (i.e. hedonic vs prudent shoppers). Choosing eBay as the ecommerce platform, product descriptions with textual information were used, specifically by mixing the previously mentioned trust-enhancing or trust-reducing components, or by not using any textual descriptions at all. Neural differences were found in terms of the “magnitude of the activation patterns” in the dorsal striatum, insula cortex, dorsolateral prefrontal cortex and anterior cingulate (i.e., brain regions already linked to trust and impulsiveness) (Hubert et al., 2018, p.118). The researchers also found that impulsive consumers were more sensitive to the different levels of trust assuring/reducing elements in product descriptions, and more extreme at evaluating positively or negatively product descriptions across their trustworthiness assessments. Contrarily, non-impulsive consumers showed more stability throughout their trustworthiness evaluations.

This study may contribute to create new marketing segments such as a neural market segmentation based on personal traits, for instance impulsiveness, and demonstrates the impact marketing actions can have on a neural-basis, especially on impulsive consumers (Hubert et al., 2018).

Trust is considered an imperative element in purchase decisions, and more so in an ecommerce setting (Corbitt et al., 2003; Doney & Cannon, 1997; Pavlou & Fygenson, 2006).

A study done by Casado-Aranda, Dimoka and Sasncchez-Fernandez (2019) using fMRI, replicated low-involvement online purchases to find which online trust signal was most effective in impacting trust perception, purchase intention, WTP and underlying neural processes. Online trust signals considered were seals of approval (certificates provided by third-party vendors), assurance statements (statements with information about returns, privacy and security policies), and rating systems (customer feedback such as using “stars” based on customer feedback). Researchers found that the use of seals of approval had the most positive impact on trustworthiness levels as they activated brain regions related to reward and expected values, besides lowering levels of perceived risk (Casado-Aranda, Dimoka, and Sanchez-Fernandez, 2019).

In a fMRI study with a small sample of test subjects (18), based on previous scientific reward processing literature, BOLD signals were measured to understand which of the various promotional materials for a well-known chocolate brand were best to increase sales in a supermarket, and if fMRI was indeed an effective tool for the task (Kuhn et al., 2016). Neural

data collected from the fMRI was successful at predicting the degree in which each display material would promote sales.

2.5 Neuromarketing ethics and limitations

Ethically wise, neuroscientific methods applied to marketing can be seen as a way of taking advantage of consumers' unconscious processes, by manipulating consumer to purchase from a given brand (Hubert et al., 2018; Murphy et al., 2008). The existing controversy and main concerns do not come from the application of neuromarketing studies in a non-commercial context (i.e., consumer neuroscience), but from its application in a commercial context.

For Lim (2018), there are two main ethical issues: the protection of tests' participants and "scientific reliability, validity, and transparency of neuroscientific findings" (p. 209).

For many researchers, privacy issues, such as the privacy of thoughts of consumers, consumers' exploitation, data confidentiality, test participants' consent, besides the transparency of the research, are a main concern within neuromarketing applied to the commercial context (Ariely & Berns, 2010; Fugate, 2007; Hubert & Kenning, 2008; Javor et al., 2013; Lee et al., 2007; Morin, 2011; Murphy et al., 2008; Ramsøy, 2019).

As mentioned by Bault and Rusconi (2020), Lim (2018) and Murphy et al. (2008), neuromarketing research is lacking an ethics committee and policies, that not only protect test subjects and consumers' autonomy but help particularly the most vulnerable ones such as individuals with psychological disorders and children. Another important ethical issue considered, is that neuromarketing findings can harm public health, when being implemented by companies that sell junk food, alcohol or tobacco (Ruskin, 2004, as cited in Eser et al., 2011). Lim (2018) and Murphy et al. (2008) also share the concern of the lack of regulation that exists within neuromarketing companies, who may abuse their power, and recommend its implementation.

Some of the ethical concerns that Ariely and Berns (2010) share relatively to neuromarketing are:

- a) Businesses will be able to read the minds of consumers;
- b) Businesses might be solely interested in profit and not the consumers' actual interests;
- c) The results from brain activity collected from small number of participants are extrapolated to an extensive population;

- d) Imprecise results, namely real versus false positives;
- e) Private information turned public, and the lack of choice test subjects have in deciding what personal information they wish to reveal publicly;
- f) Lack of regulation;
- g) Managing public's feedback to neuroimaging's key goal.

Focusing more on the technical limitations, Button et al. (2013), Hubert and Kenning (2008) and Plassmann et al. (2015) also considered the issue with small samples (typically used in neuroscience research) mentioned before, that are then used to generalize to a larger population and may generate false positives. The costs of the neuroscientific methods itself are a limitation mentioned recurrently (Ariely & Berns, 2010; Hakim & Levy, 2019; Marco Hubert et al., 2018; Mirja Hubert & Kenning, 2008; Kenning et al., 2007; Mileti et al., 2016; Reimann et al., 2011; Solnais et al., 2013).

Some limitations considered by Ariely and Berns (2010), Lee et al. (2018), Murphy et al. (2008) and Plassmann et al. (2015), are the extent of the claims made by neuromarketing research that it is able to predict consumer behaviour, and the real acuity of these research results given the own technical limitations found within neuroscientific methods.

The “reverse inference” approach is one of the recurrent fragilities mentioned in neuromarketing research, involving the fallacy that the activation of a certain brain region is necessarily related to a specific cognitive process, which can lead to misleading assumption (Lee et al., 2018; Plassmann et al., 2012, 2015; Poldrack, 2006; Reimann et al., 2011). As explained by Poldrack (2006, p.59):

“(1) In the present study, when task comparison A was presented, brain area Z was active.

(2) In other studies, when cognitive process X was putatively engaged, then brain area Z was active.

(3) Thus, the activity of area Z in the present study demonstrates engagement of cognitive process X by task comparison A.”

It is known that there are various brain areas that have a high activity level, being involved in numerous processes, which adds up to the argument that activation, particularly in certain areas, is not enough to prove the engagement of a certain mental process (Poldrack, 2011).

Poldrack (2011) refers that it is possible to use the reverence approach for hypotheses development, but not as a standalone method to create valid knowledge.

The growing access to more advanced neuroscientific technologies enables inexperienced researchers to conduct investigations while not having the appropriate training and extensive comprehension of the methods used and the underlying brain functions (Ruff and Huettel, 2014, as cited in Lee et al., 2018).

Lee et al. (2018) outlined other limitations in neuromarketing research, such as the existence of high amount of low quality conceptual and empirical literature (preventing significant development in this area); lack of conceptual and philosophical discussions with aspects such as inferential issues and methodological limitations; lack of foundational neuroscience in neuromarketing conceptual and empirical papers and lack of frameworks using neuroscientific research for theory development in marketing. Furthermore, Lee et al. (p.16, 2018) stated that there is a substantial “lack of visible user-oriented methodological primers”, that include aspects such as the availability of comprehensive information of existing neuroscientific methods, their benefits and disadvantages, the standard procedures, instructions on how to obtain and investigate data with different methods, and how to report the empirical results efficiently. All these elements are essential for researchers, especially newcomers, to effectively know how and when to apply these methods in an empirical neuromarketing research, and prevent misleading results by creating quality work (Lee et al., 2018).

However, many fears and ethical issues mentioned in neuromarketing are considered unrealistic, as technology is not developed enough to become a threat to our autonomy and privacy (Stanton et al., 2017).

Authors such as Lim (2018), consider that with time and technological advances, limitations found in neuromarketing may be reduced. Contrarily, Murphy et al. (2008) believes that time might be the exact cause of concern, as with the advance of technology, neuromarketing will be able to become more invasive, referred by the authors as *stealth marketing*.

3. Methodology

Within choosing a research method, it is important to acknowledge the existing limitations and applicability of different research methods in order to set up its validity and reliability (Ellis & Levy, 2009). In the following chapter the methodological structure is delineated with the definition and description of the research approach and sampling techniques determined.

Based on the study objectives and the literature review, the methodology chosen was an exploratory and qualitative research, which will be further explained. Four dimensions were taken into consideration to attain the proposed objectives: neuromarketing concept, neuromarketing usefulness, neuromarketing ethics and neuromarketing future (Annex A).

3.1 Research Context

The aim of this analysis is to study about neuromarketing within literature and the perception of marketing professionals within the largest companies in Portugal. In terms of research, a set of research elements has been developed, to analyse the scope previously defined according to the literature review done in the previous chapter.

3.2 Research Approach

As mentioned before, given the purpose of the study, an exploratory research approach was chosen, as its extendable and flexible approach allows to investigate any innately difficult marketing circumstances (Birks, Malhotra & Nunan, 2016).

To sustain quality in a marketing research, secondary data was first carried out through a literature review, assembled and analysed, as it serves to support the marketing research problem definition, and subsequently develop a research approach (Birks, Malhotra & Nunan, 2016). The preliminary observations obtained from the literature review, together with Eser et al. (2011) and Gonçalves (2016) research, helped define the key variables and correlational insights for this exploratory research. These observations were then analysed with the chosen research method, mentioned in the following subchapter.

3.3 Research Design

The research method chosen for this study was qualitative, as its unstructured design for small samples can produce deeper insights and interpretations, especially as this topic is new and there is still lack of empirical research (Birks et al., 2016).

3.3.1 Method for Data Collection and Script Development

The in-depth interview was the qualitative method chosen given the research problem stated. As mentioned by Birks et al. (2016), the unstructured and more personal approach of the interviews allows to obtain richer insights than focus groups.

The preliminary observations previously derived from the literature review contributed to the development of the script's questions and were analysed through in-depth interviews. As mentioned previously, the script was divided into four dimensions: neuromarketing concept, neuromarketing usefulness, neuromarketing ethics and neuromarketing future (Annex A), to meet the objectives previously established for the study. After the preparation and adaptation of the script for the in-depth interviews (Annex A), the questions were sent via email to pre-selected marketing professionals. The interviews were not able to be carried out face-to-face due to COVID-19 health limitations, so the interviews were conducted via video-call instead, in platforms such as Skype, Zoom and Microsoft Teams.

3.3.2 Sampling Method

The participants were selected based on the research framework and the participants' potential contributions. The sampling technique chosen for this sample was the non-probability convenience sampling technique, as there was a conscious decision of the elements to incorporate in the sample (Birks et al., 2016). Due to the importance of marketing professionals for the future of the neuromarketing in Portugal, and also the fact that these professionals work in companies that belong to a popular reference list, where only companies that generate a significant number of GDP, turnover, exports and employment are listed (where their economic value in Portugal is accentuated), it was decided to analyse the perceptions of marketing professionals with relevant positions (such as directors or managers) from these large companies. The metrics established were based on *Exame | 500 Maiores & Melhores Empresas* (2019) ranking, such as the annual generated turnover, the number of exports made and the volume of employment each company generates. From here, the companies were selected.

For confidentiality and data protection reasons, the names of the companies are not mentioned. The companies belong to the top 80 of the 500-ranking. The companies selected belong to the following main sectors: consumption and associated services, automobile, transportation and logistics, energy and resources, technology, media and telecommunications, food, beverages and tobacco. It is highlighted the top 20 list, where respondents number 2, 3, 4, 7, 9, and 13 are included. The remaining are positioned until the 80th ranking.

The sample of marketing professionals was obtained through the companies listed in the ranking. The email addresses were also obtained from LinkedIn, and the interview requests were sent to a total of 46 email addresses, six of which were misdirected due to the absence of the address. Two follow-ups were carried out through two weeks with the aim of increasing the response rate.

Of the 46 interview requests, 18 marketing professionals accepted the request. Mostly had not conducted a neuromarketing. One of the respondents was only considered in the first question regarding the neuromarketing concept, as in the last questions, the respondent realized that the neuromarketing definition understood was different and had given completely opposite answers from what had been previously said throughout most of the interview, becoming invalid for interpretation regarding the remaining questions.

3.4 Data Collection

The data collection method was based in the in-depth interviews, but in terms of the sources and data, they were both primary and secondary. The literature was the secondary data conducted, and data obtained from these interviews are this study's primary data.

In order to ensure meeting the research objectives, only the perceptions of marketing professionals from preselected relevant companies were studied, and not marketing academics and neuroscientists, as analysed in Eser et al. (2011) and Gonçalves (2014) research.

4. Data Analysis

The subsequent chapter will present the achievement of the objectives set for this study, but also to make it known, by comparison, whether the analysis made through the literature strengthens or weakens the results of this same study. An overview of the results and analysis made is presented after each of the four dimensions previously mentioned.

Weight was put on interpreting meaning beyond what was verbalized. The written transcript was read and reread, the distinctive themes coded, and the findings compared. To limit bias regarding data analysis, three basic steps were approached. After the data was assembled from the interviews, data reduction was initiated. MAXQDA software was chosen as it has a set of tools that allow reducing the research time frame and provides the resources needed for its development (Teixeira & Becker, 2001). Furthermore, this type of software allows exploring more accurately the relationship between data (Teixeira & Becker, 2001). The categorisation and coding were based in the literature review, the answers obtained from the interviews and the categories listed based on the table provided in Gonçalves (2016) research. Primary and secondary coding were used, where the transcript was shortened and categorised, and then grouping the categories obtained into macro-categories with the MAXQDA software. Subsequently, the displaying of data was initiated. Maps were created to gain an overview of the findings. Lastly, conclusions were drawn and verified.

4.1 Neuromarketing concept

The first question was made asking respondents how they define neuromarketing.

Most respondents are aware of some of the objectives of neuromarketing mentioned in the literature review generally speaking, but throughout the interviews certain discrepancies or shallow explanations given, seems to reveal that the real extent of their comprehension towards neuromarketing either seem unclear, or that there is not an in-depth knowledge relatively to this area (Map C.1). There was not a high degree of commonality between respondents regarding their perception of the neuromarketing concept. The notion that neuromarketing is related to understanding how marketing tools influence consumers' perceptions, was the most addressed one overall, by five respondents, along with the perception that neuromarketing stimulates the senses, also addressed by five respondents. Relatively to the first notion, respondent 14 explains, "Neuromarketing as I define it, are techniques used to understand how marketing activities influence consumers' actual perception of a brand or a campaign, whatever you want to be communicating, reducing to a maximum the filters that are automatically placed by us as subjects, by consumers as subjects." Relatively to the second notion, respondent 5 describes neuromarketing as, "the marketing area that stimulates the senses, whichever they are, which then allows those senses to work, leading to the increase of interest in the product and its consequent consumption." Subsequently, neuromarketing was perceived by three respondents, as being able of tailoring offerings using results from stimuli reactions. As respondent 16 explains, "It is the study of the most sensory behaviour of potential consumers, in order to

develop techniques, concepts or assets that have a more appropriate acceptance according to the message we want to convey.”

It was pertinent to see some misinterpretation between two of the respondents. They perceived neuromarketing as sensory marketing, i.e., the stimulation of the five senses (hearing, touch, smell, sight and taste) by using different elements in-store and influencing the consumers’ perception of the brand. As respondent 8 describes, “I can give examples of things I’ve done that I consider as neuromarketing. A few years ago, we created a brand that was in the market, for our energy company, when the market was liberalized, about 12 years ago if I’m not mistaken, and we resorted to neuromarketing a lot. When I say neuromarketing I am referring to the use of the senses. I don’t know if you have that as the definition but that’s what it is: searching for what we have best in our abilities and in our senses. In that time, we also launched a 5-dimension brand: the 5 senses, the sensorial. We introduced smells in the stores with the collaboration of a Portuguese company.”

Respondent 1 seemed to perceive neuromarketing simply as the consumers’ unconscious decision-making, “It’s every decision that we make as consumers, that come from the deepest place in our minds and that we are not aware of most of the time.” While this part is related, the subsequent answer given in another question, made it clearer that the respondent relates neuromarketing essentially as a technique that attempts to understand the consumer’s decision-making, not linked to specific neuromarketing techniques, but as a process that, in fact, is already studied within any traditional marketing research.

The second question made intended to understand if respondents were professionally interested in neuromarketing. Overall, respondents expressed having professional interest in neuromarketing (Map C.2). As in the previous question, the justifications given were diverse and no noticeable commonalities were found. The ability of neuromarketing providing a deeper understanding of the consumer was the most shared reason, for five of the respondents. The advantage that neuromarketing offers in analysing the consumers’ subconscious behaviour was accentuated by respondent 2, “It can act on the subconscious, or at least tries to understand people’s non-conscious stimuli, which are very relevant in the construction of their opinions and the relationship they have with brands or products.” Respondent 13 for example, mentions neuromarketing being relevant for analysing consumer behaviour, especially in an ever-changing world, “I would say that all that is involved with customer behavioural analysis and how we can trigger and induce behaviour is extremely important and extremely complex from

the point of view of the tools that are used, and very relevant from the point of view of a society that is constantly changing, where what was true yesterday is no longer true today.”

The perception that neuromarketing can improve business strategies was also a factor addressed by three respondents. Respondent 10 explains, “The need to improve the effectiveness of our communication and our projects, that leads me to go into this area many times and understand better how the changes we make can have a greater impact on the people who listen to us and read us.”

The third question intended to understand if the respondents follow neuromarketing research developments. Despite the interest expressed by the respondents towards neuromarketing in the previous questions, the majority of the respondents stated that they do not follow neuromarketing research developments (Map C.3).

The fourth question aimed to understand the respondents’ perception relatively to neuromarketing’s stage of development. This is a recurrent topic among researchers such as (Harris et al., 2018; Lee et al., 2017; Stanton et al., 2017), who mostly consider neuromarketing to be at an initial stage. Most of the marketing professionals also perceive neuromarketing as being at an initial stage, with “Initial” response being addressed by ten of the respondents (Map C.4). As elaborated by respondent 15, “I believe it’s not quite here, yet. I don’t know of any other brands, in Portugal, that use neuromarketing and even when I go to some conferences to present our work, I see a lot of surprised faces and even people taking photographs of our slides and then sharing it, so there is interest. But it’s noticeable that it’s not something linked to our daily basis.” The perception that few or no companies resort to neuromarketing in Portugal and that there is a lack of companies that offer these services, was referred by some of the respondents, highlighting the embryonic stage that they perceive neuromarketing encounters in Portugal.

4.1.1 Overview of Results

Rendering the literature review, the lack of a widely accepted definition was observed and is representative of an emerging field such as this one. Also, as referred by Lee et al. (2018), the definitions given in various neuromarketing papers are scant, meaning that newcomers who

read such papers will not fully grasp the purview of neuromarketing, and it may compromise its impact on marketing overall.

A general professional interest was found amongst the respondents, with motivations such as obtaining a deeper understanding of consumer behaviour and improving business strategies discussed, although with no general consensus. This is particularly relevant, because if companies do not show interest in neuromarketing, especially those that have higher budgets as the ones interviewed, then there is no investment done and no development in this area (Gonçalves, 2016).

Relatively to the neuromarketing research developments, despite the interest shown in this area, most of the respondents do not follow research developments, showing that a deeper research on this topic is not made and thus are not updated on recent findings.

Findings from a related question regarding knowledge about marketing research from Eser et al. (2011) demonstrated a different outlook, with more positive responses from marketing professionals. These results also did not match those of Gonçalves (2016) research, as marketing professionals did claim to follow neuromarketing developments.

Regarding the state of development, as seen in the results, most respondents consider neuromarketing to be at an initial stage of development, and some of the respondents expressed that few or no companies resort to neuromarketing in Portugal, that there is a lack of companies offering neuromarketing methodologies and available equipment within the country, highlighting the embryonic stage that neuromarketing encounters in. These results did not correspond to findings from Gonçalves (2016) research, where marketing professionals were more optimistic and believed that neuromarketing has surpassed the initial stage.

However, these findings were consistent with the points of view presented by many researchers in the literature review. (Agarwal & Dutta, 2015; Fisher et al., 2010; Harris et al., 2018; Lee et al., 2017; Morin, 2011; Plassmann et al., 2012; Ramsøy, 2019). Despite having almost two decades of existence, Lee et al. (2017) argue that neuromarketing research has still several important issues that limit its development, although it is a much more widely accepted tool nowadays than initially.

4.2 Neuromarketing Usefulness

The fifth question intended to understand the respondents' perception on the usefulness of applying neuromarketing within their companies. As mentioned by Eser et al. (2011, p. 865),

companies typically search ways to “obtain competitive advantage and adapt to changing conditions in their business”. As such, this question also tries to comprehend if companies perceive neuromarketing as a tool that may help them obtain a competitive advantage or not.

The majority of the respondents perceived neuromarketing as a useful tool for their company, although it was not possible to find a widely common shared reason for this perception, and instead, they were largely diversified (Map D.1; Map D.1.1). The most addressed factor, by four respondents, was that neuromarketing can help develop strategies. As respondent 12 assessed this, besides the optimization of offerings, “This is important for us as communicators, and the way we can communicate at different times with customers, but also for those who manage the shops to optimize the products they sell, the places where they are located, to leverage that cross-selling of products according to the logic behind the customer's purchase.” Respondent 5 claims that neuromarketing can, “(...) give response to a lot of things from the product's intake, to the product's wrapping or even store location, the actual advertisement itself.” Respondent 15 highlighted how neuromarketing can aid in an important aspect such as the right choice of stimuli used in a brand communication, “Nowadays, our reality is that most of us don't even realize how many emotions and stimuli a brand makes us feel. It's very important that the stimuli is the correct one. So it's very useful in that sense, because I can measure all of this whilst also have another campaign analysis and I'll use both to figure out if we are, in fact, going through the right path with our content and, after a call-to-action for purchase, check the impact on sales.”

Factors such as gaining better understanding of consumers decision-making, increasing business, improving offerings and understand consumer behaviour had an even less minority of respondents addressing them, each one addressed by two respondents.

However, four of the respondents did not consider neuromarketing useful for their company (Map D.1; Map D.1.2). Two of the respondents considered that results could be equally achieved with traditional tools. As argued by respondent 17, “From my experience, based on other studies unrelated to neuromarketing, is that people have pre-defined ideas and those do not change with time. So, I think we wouldn't discover a whole lot more with neuromarketing, especially with our type of brand.” It was also interesting one of the reasons mentioned by respondent 11, that by them having a strong brand identification amongst consumers, neuromarketing is not useful yet, “It's not that there isn't such need, but we are not yet in the next step because we still have the benefit of being able to sell through brand identification,

that is, people identify the brand as a quality brand.” Other reasons mentioned were that the company’s product is a commodity, and that the consumers’ behaviour within the company’s market does not require the use of this tool, that is, the consumers’ perception within this market is usually stagnant, so behaviour also does not change and therefore neuromarketing does not add value in this case.

The sixth question intended to understand if respondents have ever applied neuromarketing within their companies. The majority of the respondents (thirteen) have not applied neuromarketing in the companies, an occurrence that could also be found in Gonçalves (2016) research (Map D.2). A following question was asked to four respondents who have applied neuromarketing, to obtain a comprehensive explanation of what was done in the neuromarketing research that was conducted (Map D.2)

Respondent 6’s company conducted a neuromarketing study through the advertising company they typically resort to. Eye-tracking was used for an optimization study on the website, with special attention on how effective the call-to-action button implemented on their website was. The website was then redesigned based on the results obtained.

Respondent 2 described that the company used neuromarketing in store and flyer studies. Specifically, how flyers and the store were perceived by clients, which stimuli captured their attention, what their reactions were to them and what types and levels of communications were more effective.

Respondent 15 explained that the global company has a set of four movie advertising campaigns per year where neuromarketing is used. The campaigns are sent to its different markets globally, such as Portugal, where a panel watches them and reports are created with the different “sensations, emotions and reactions” obtained. Results are then compared with those from other campaigns and countries to “understand which movies worked best and how, as to learn new formulas that will work better for us in the future. We work towards knowing how we can improve in the future.”

Within the respondent 14’s company, an in-depth research using neuromarketing tools was conducted to understand what the brand’s rebranding had brought in terms of consumer perception, with particular concern in seeing if some of the brand's heritage characteristics remained in consumers' perception. Also, the company wanted to assess if consumers’ eyes were looking at the desired places in a graphic piece, what emotions were stimulated in a certain TV or radio advertisement the brand presented, and what perceptions remained in the end

regarding the brand before, and after its change. Respondent 14 adds, “There was a lot of this kind of stuff, which perception remains regarding the importance of the price factor for our brand and the opportunity that the brand gives to the consumer when deciding to buy at our brand, in having good offers, good value proposals”

Subsequently, a following question was asked to understand if they considered that their goals were achieved with the neuromarketing study. This question allows to understand the respondents’ perception of the actual usefulness of neuromarketing put in practice, if it was able to add value to the research done. All respondents considered results achieved, with half claiming it helped improve the company’s performance (Map D.2).

Respondent 14 claimed it reassured the company’s rebranding strategy decision by deepening results found in traditional research tools, adding, “It did contribute to being more incisive in understanding what we had found, what we were provoking in the mind, in the consumer's perception, with that change, (...) they left us more reassured that it had been a right bet in terms of business decision, that we had found a path that made a good balance of everything we wanted to keep in the brand, and of everything we wanted to add to the brand at that point, so it gave us some insights to further improve what we used and what we came to apply, and to improve graphic executions, particularly in certain aspects.”

Respondent 15’s company claimed that they understood how important the first seconds of a movie advertisement are to engage consumers with neuromarketing, “Yes, we know what worked and didn’t. For example, when we start a movie in a certain way, we know we lost the consumers interest if the first seconds of the panel aren’t emotionally connected to the movie, which lets us know that when the campaign is on air, from a digital point of view, those who watch it won’t do so for more than x seconds, there’s a connection and we also realize that we can grab their attention from the beginning, which also translated on the campaign results.

Respondent 6 expressed some apprehensiveness towards the actual value and reliability of the study, “I can’t tell you what it would have been like if we had made another attempt without the eye-tracking. Because we did nothing without it. That is always the problem with A/B tests, you never know, you don’t test against anything, but the results were good, for sure. I don’t recall them being significantly above average, but they were good results.”

The next question asked regarded the limitations that respondents found in the use of neuromarketing. Most of the respondents (ten) considered there were such limitations (Map D.3). Some limitations have been addressed in the literature review, such as costs, privacy

issues, the low statistical significance of research samples, ethical issues and the difficulty in arranging participants. There was not a high number of common responses shared, with several limitations referred instead (Map D.3.1). Three limitations are highlighted. Addressed by four respondents, the cost of neuromarketing studies was considered one of the limitations in neuromarketing. Besides mentioning the investment needed to test models, the profit margin of using these tools was also questioned here, “The big issue regarding neuromarketing is the development cost to test the models in a consistent way (...) and the lack of direct causal relation between the cost and the benefit” (Respondent 5). Privacy issues followed, addressed by three respondents. Respondent 11 explains, “I think that there are mainly ethical issues, and I think that the way we are going and the way we are positioning ourselves regarding the issue of data protection and respect for people's individuality, those who work in neuromarketing will have many challenges in this sense.”

Only a minority, of four respondents, did not consider that neuromarketing has limitations (Map D.3). Three of the respondents did not know if such limitations existed, generally because they did not consider themselves knowledgeable enough in this area.

For the respondents that considered neuromarketing has limitations, a question was asked to understand what could help overcome them, in their perspective. There was not a common response between the respondents, but instead various solutions were presented, starting by time (neuromarketing will become more popular, more relevant, and increase quality in its methodologies as more companies offer these studies), legislation (as it may risk invading privacy), clients' consent, delivery of more efficient results (resulting in lower risk and investment), integrated use of different analysis tools (versatility and diversification is of increase importance nowadays), less visible equipment and technical consistency (so those who use it understand how it works and its limitations) and common sense (each person must make their own assessment) (Map D.3.1.1).

4.1.2 Overview of Results

Neuromarketing research has consistently tried to show how its usage may benefit marketing professionals and companies in various ways, as analysed in the literature review. The majority of the respondents did find the application of neuromarketing useful for their company and although there were no justifications referred that were shared by a majority, the most addressed

one, i.e., that it can help develop strategies, was in line with what authors such as Venkatraman et al. (2012) claim.

As seen in the literature review, studies such as the ones conducted by Milosavljevic et al. (2012), Mourey et al. (2017), Plassmann et al. (2008), Plassmann & Weber (2015), Reimann et al. (2010), Somervuori & Ravaja (2013), Stoll et al. (2008), and others, have shown how neuromarketing may help marketers to develop different marketing elements such products, promotions and pricing strategies, which were included in four of the respondents' response. Understanding consumers' decision-making process was referred by only two respondents, while understanding the underlying mental processes, commonly mentioned in the literature, was not referred by any of the respondents when describing neuromarketing's utility for their companies. Broadly speaking, neuromarketing can provide marketing researchers and professionals with a deeper consumer knowledge (Ramsøy, 2019). Despite also being such a commonly mentioned benefit, this aspect was only addressed by two of the respondents. According to many researchers in the literature review, neuromarketing can also help predict choice at an individual and market level (Berns & Moore, 2012; Camerer & Yoon, 2015; Esch et al., 2012; Plassmann et al., 2012, 2015; Telpaz et al., 2015; Venkatraman et al., 2015) and understand individual differences, or customer heterogeneity (Plassmann et al., 2015; Plassmann & Weber, 2015; Shiv & Yoon, 2012; Venkatraman et al., 2012). It can also assist marketers in the market segmentation process, by being able to understand and analyse the underlying neural individual differences within consumers, and providing new ways of segmenting target markets, such as neural segmentation (Camerer & Yoon, 2015; Hubert et al., 2018; Venkatraman et al., 2012). Plassmann et al (2015) also refer that neuromarketing can reveal differences or similarities between psychological processes and highlight neuromarketing's unique usefulness by being able to measure implicit processes. Of the wide array of benefits mentioned, respondent 2 was the only respondent that mentioned this last advantage in using this technique in the company, specifically by saying it is useful for the "the measurement of non-conscious stimuli". None of these aspects were found within responses given by these marketing professionals.

As discussed in the literature review, neuromarketing has been seen its popularity and use increase among marketing researchers and professionals (Harris et al., 2018; Plassmann et al., 2012, 2015; Venkatraman et al., 2015). Its value is increasingly recognized, as there are more specialized neuromarketing companies founded, and a predominant number of the largest advertising agencies and marketing research companies are creating specific neuromarketing

divisions (Plassmann et al., 2015). Despite this trend, the number of companies conducting neuromarketing research is still low, not only within this analysis's sample, but also in Eser et al. (2011) and Gonçalves (2016) research. Of the 18 respondents, only four have conducted neuromarketing studies. It was not clear what were all the methods used in these studies, but it was evident that at least three of the respondents used eye-tracking as one of the tools. Although not as popular as fMRI, eye-tracking is cheaper and more accessible, typically used in advertising research and is considered a strong tool "to evaluate marketing effectiveness" with its clear results of where people's attention is most driven to (Lim., 2018, p.208). Thus, it is not surprising these characteristics made eye-tracking a favoured tool by most of the respondents who conducted neuromarketing research, with their studies generally related to advertisement campaigns, and one to website optimization. All respondents found that neuromarketing was able to achieve the intended results, although respondent 6 sceptically claimed that neuromarketing studies have a "sci-fi component to it", even though recognizing its scientific validity, and did not wish to pursue further studies.

In terms of the existence of limitations within neuromarketing perceived by the marketing professionals, the majority did find they exist, which is in accordance with the perception of researchers such as Ariely & Berns (2010), Fugate (2007), Harris et al. (2018), Lee et al. (2017, 2018), Murphy et al. (2008), Plassmann et al. (2015, 2019), Ramsøy (2019), amongst others referred in the literature review. Although there were no consensual responses regarding the existing limitations, the three most addressed ones (i.e., costs, privacy and small samples), were similar to those considered by professionals in Gonçalves (2016) results, except for the investigation procedure, which was also a limitation considered in Gonçalves (2016) responses. Rendering the information examined in the literature review, such limitations are also found. The cost of neurophysiological methods is an issue that is often raised, especially depending on which method is used (Ariely & Berns, 2010; Hakim & Levy, 2019; Marco Hubert et al., 2018; Hubert & Kenning, 2008; Mileti et al., 2016; Plassmann et al., 2007; Reimann et al., 2011; Solnais et al., 2013; Venkatraman et al., 2015). Privacy issues have also been a main concern since neuromarketing first emerged, particularly when applied in a commercial context (Ariely & Berns, 2010; Fugate, 2007; Mirja Hubert & Kenning, 2008; Javor et al., 2013; Lee et al., 2007; Morin, 2011; Murphy et al., 2008). The privacy of thoughts and exploitation of consumers are few of the issues mentioned by these authors. Data protection of consumers was an issue considered by the respondents, who referred privacy as a limitation.

While in Gonçalves (2016) analysis, marketing professionals often suggested aspects such as investigation and a wider spread of information and clarification to overcome the limitations considered, not only was there no consensus in terms of suggestions between professionals in this analysis, but none of the solutions presented referred these aspects. Of the solutions mentioned, legislation (mentioned by respondent 11) is supported by authors such as Ariely & Berns (2010), Lim (2018) and Murphy et al. (2008). Client's consent is also a topic referred by authors such as Murphy et al. (2008), who propose that policies protecting research participants should exist, and that amongst other aspects, should include "procedures for informed consent" (p. 298). These authors also suggest the publishing of ethical principles, where elements such as consent documents should be included. The integrated use of different analysis tools was mentioned by respondent 14, and it is a viewpoint that is habitually shared in the literature review, as it is believed that neuromarketing tools can be used as a complement to improve findings from traditional research methods, but not as a unique method (Ford, 2019). The full capacity and efficacy of neuromarketing applications are not yet clear (Plassmann et al., 2015). Time as an element that will naturally help diminish existing limitations found in neuromarketing was mentioned by the respondents 3 and 14. A perspective also encountered in the literature review, as for example, knowledge and tools become more advanced (Lim, 2018; Yoon et al., 2012). Contrastingly, time is seen more as a concern by Murphy et al. (2008), for the exact same reasons.

4.3 Neuromarketing Ethics

The eighth question aimed at acknowledging if respondents have ethical concerns in the application of neuromarketing, and what they are. Ethics is always a hot topic within neuromarketing research, considering that technology is being used to analyse various regions of the brain for commercial interests (Eser et al, 2011).

Ethics is an important topic for the respondents, and as long as ethical principles are respected, most respondents (nine) did not have ethical concerns in the application of neuromarketing within their companies (Map E.1; Map E.1.2). Perceptions contrary to the ones found in Gonçalves (2016) analysis.

Established transparency between the company and participant was one of the reasons mentioned for this unconcerned perspective on ethical issues, "If it's clear for the person that's being evaluated that they are being evaluated then I don't see the problem"(Respondent 2). Another respondent understood that it's not problematic since consumer behaviour research has

always been done, “I don't see why this or that industry can't use neuromarketing to develop. All our lives market research has been done, and market research was no more than trying to understand what people thought of our products. It's not that different from what we're talking about here” (Respondent 10). Trust in the company's ability to respect its ethical values was also mentioned, “Well, I would first like to worry about applying neuromarketing in our company. Of course, we certainly believe that the whole team would do so with the best of intentions, i.e., to cause the benefit to the company without causing harm to the interlocutor on the other side.” (Respondent 16).

Of the rest of the respondents (nine) that considered having ethical concerns, invasiveness was the most mentioned issue between the respondents (addressed three times) (Map E.1.1), “With the system evolution going deeper into people's minds, there could be a few lines that we can't cross and that will have implications” (Respondent 17). The protection and respect of each person's privacy was also mentioned, “The protection data laws are much more restricted now. All of this needs to be handled with care, so that we are not intruding, even if it's not our intention, in each person's life” (Respondent 8).

Consent and respecting consumers were the other two aspects mentioned. “It's fundamental, for us, to maintain that ethical side and it's always used with a panel that authorizes and is aware of the analysis being done, so nothing it done ambiguously. We would never do it in a way that would be unconscious to whoever is being tested” (Respondent 8).

The following question aimed to understand if respondents consider there is a need for a specific legislation within neuromarketing practice (Map E.2). Despite the results from the previous question, and as happened with Gonçalves (2016) study, most respondents (ten) consider that there should exist a specific legislation for neuromarketing, indicating that there is an interest in tackling possible ethical violations in its applications. Having a legislation that can protect consumers was of one the most mentioned reasons (addressed by six respondents), followed by the necessity of establishing limits (addressed by five respondents). Legislation created for neuromarketing was perceived as necessary because of companies' fierce competition and commercial interest, “This is a jungle and brands run themselves over and run over the consumer and don't care. If there is no regulation, at some point the consumer's privacy is invaded, invasive tools are used and they are not a crime, that is, when they are regulated they end up being a crime, but at the moment they are not, but in fact they are extremely invasive tools” (Respondent 11). Legislation was also perceived by one of the respondents as necessary

because of the existence of vulnerable consumers, “It’s important to not exploit de consumer’s vulnerabilities, because not all consumers are strong enough and capable to make their own decisions like they should” (Respondent 1). Five of the respondents did not consider a legislation specific for neuromarketing to be necessary (Map E.3). The existence of legislation for marketing activities was one of the arguments used against a neuromarketing legislation, “I don’t know if it is justified because all marketing activity is already legislated enough. We have to obey some rules, so I don’t see the need for a specific legislation” (Respondent 3). Another perception given was that legislation would not add value and would be incompatible to a productive use of neuromarketing tools, “There would be so many variants, either legislation was so open that it was like it didn't exist, or it was so restrictive that it was obtuse and would therefore inhibit the use of a tool that I think could be useful for everyone” (Respondent 10)

To the respondents who considered there is a need for a specific neuromarketing legislation, a following question was asked relatively to what ethical factors should be regarded. Consent was the most mentioned (addressed by four respondents) as a factor to be taken into account within the neuromarketing legislation (Map E.2.1). It was followed by the preservation of consumers’ privacy (addressed by three respondents), transparency (addressed by three respondents) as well as consumer protection (addressed by three respondents). Consumer protections was the most addressed issue to be taken into account in this legislation in Gonçalves (2016) analysis. Respondent 1 discussed protecting consumers privacy and consent, “Preserving the consumer’s privacy- which implies the possibility that the consumer says no- and to avoid being tangled in processes that they can’t get out of later on.” Respondent 7 highlighted the need for transparency in the legislation to protect consumers, besides consent, “The legislation should foresee means to enlighten any doubts and that protect people from eventual abuse and penalize the offenders. But mostly, it is about protection, consent and more importantly, transparency.” Respondent 11 also argued that, “From a certain moment on, you end up dealing with issues that are really ethical, individuality issues and the preservation of your intimacy that have to be regulated.”

Regarding the last question of the ‘Ethics’ dimension, it was asked if the respondents believed that neuromarketing developments could threaten the autonomy and privacy of consumers. Contrarily to results from Gonçalves (2016) study, most respondents (ten) do not consider that neuromarketing’s development will be a threat towards consumers’ autonomy and privacy (Map E.4).

There was not a consensual answer as to why the respondents don't consider there will be such a threat, instead various reasons were mentioned such as: if there is a legal framework there is no threat; if studies are done with ethical principles there is no threat; as long as tools used are not invasive; people have their own autonomy (and therefore can control what they want to purchase); the necessary legislation and inspection will exist in the future; the study of consumer behaviour and stimuli measurement does not affect consumers; and the respect of participants' privacy is always included in all consumer studies (Map E.4.2). For the five respondents that considered there might be a risk of neuromarketing's development threatening consumers' autonomy and privacy, two reasons were equally contemplated: economic interests, and if no regulation exists (Map E.4.1.)

4.3.1 Overview of Results

Regarding the ethical concerns in the application of neuromarketing within companies, most of the respondents answered that they do not have any. Conferring the literature review, empirical academic research typically does not mention ethical concerns. However, in conceptual papers it is possible to find this topic addressed often. As mentioned previously, concerns arise in the application of neuromarketing in a commercial context, with aspects such as test participants' protection, the invasion of privacy, manipulation of consumers, the lack of regulation and scientific reliability, addressed in both scientific field and media (Ariely & Berns, 2010; Murphy et al., 2008). Indeed, most of these views correlate with those described by the respondents who have ethical concerns regarding the application of neuromarketing within their companies.

Consulting the interviews, the concern for protecting consumers and establishing limits were the main reasons that lead the majority of the respondents to find the existence of a specific neuromarketing legislation significant. A concern also encountered in the literature review, as presented in the previous dimension. However, the protection of test participants was only mentioned by one the respondents, whilst in the literature review more focus on this topic can be found. This may not be surprising as in the previous question, respondents were confident in their companies' existing ethical principles towards test participants, and do not deem this topic worrying.

Rendering the literature review as to what should be included within the legislation, and as also addressed previously, authors such as Murphy et al. (2008) have suggested policies that tackle issues related to protecting research participants, protecting vulnerable consumers and

transparency of the research purpose benefits and risks, which were also the most addressed aspects by the respondents (addressed by 15 respondents). Having internal and external viability in neuromarketing research was also referred by these authors.

Technology used in neuromarketing nowadays is still considered limited, not being able to precisely predict consumers' decision-making, and therefore it is not yet considered a threat to consumers' privacy and autonomy (Fisher et al., 2010). However, Murphy et al. (2008) believe that future developments of neuromarketing technology may create a *stealth neuromarketing* that threatens that, as advances make methods used more precise in capturing consumers' hidden preferences, and easier to manipulate. A perspective also shared within Gonçalves (2016) analysis. Interestingly, this was not observed in the interviews conducted, as a larger number of the marketing professionals do not agree with this opinion.

4.4 Neuromarketing Future

The eleventh question aimed at understanding if respondents consider there is potential for the use of neuromarketing in their companies. All respondents do consider there is such potential (Map F.1). Once again, there is no unilateral consensus in the reasons mentioned. The reason most mentioned (addressed by five respondents) was that these marketing professionals believe that neuromarketing can provide a deeper understanding of the consumer. Optimization of the business was referred by three respondents, followed by the development of strategies (addressed by three respondents), and the professional importance of neuromarketing.

Specifically, in relation to gaining a deeper understanding of consumer behaviour, the subconscious was referred as an area of interest for any sector, besides marketing itself, "I think everyone in the marketing area would like to know specifically, in terms of the consumer, what awakens in their subconscious- which is the area of concern when talking about neuromarketing- when they are exposed to our communication. I believe any area in any sector would like to understand those effects" (Respondent 9). Neuromarketing as a tool that can help set guidelines in the companies' knowledge and relation with clients was referred as very significant to any company, "Everything that has to do with knowledge development, in better understanding our clients' behaviour and the way we should act is highly relevant for any company that develops offers and wants to interact with its clients in the best way" (Respondent 12). Neuromarketing was perceived as a tool that can help develop strategies that benefit both company and consumer, "It only brings benefits to brands and often even to the consumer himself. Maybe the messages, the images, are better worked and for the consumer ends up being

less heavy because he/she doesn't have to bear with advertising often boring” (Respondent 11). Optimization of the business was one reason mentioned by respondent 16 when considering there is potential to apply neuromarketing, “We have every interest in maximizing the impact of everything we do, and I think this is a very valuable tool to work with.”

A subsequent question was aimed at understanding if the respondents believed there is potential for neuromarketing within companies in Portugal. This is an important aspect, because as mentioned by Gonçalves (2016), development cannot truly happen in this area if marketing professionals do not believe in its potential. As in the previous question, the answers were all positive (Map F.2). The wide variety of answers given by the respondents were not conclusive as it was not possible to identify a common response given by a majority. Out of the seventeen respondents, the most addressed reason (by five respondents) was being able to deepen consumer behaviour knowledge (Map F.2).

The penultimate question aimed at understanding if respondents consider that neuromarketing will replace traditional research tools. In Gonçalves (2016) study, the majority of the respondents do not believe that neuromarketing will replace traditional research tools, but instead will complement them (Map F.3; Map F.3.2).

The existence of more superficial level emotions is one of the reasons why respondent 14 consider neuromarketing tools needless to conduct all marketing analysis, “There is so much that happens that is not at the level of deeper emotions and that conditions it, so I am not imagining a scenario where neuromarketing can be a unique tool, I always see it as integrated in a more comprehensive methodology, basically peeling the onions layers.” The lack of reliability of neuromarketing tools was also an argument presented by respondent 15, “They’re complementary because none are a hundred percent trustworthy. In truth, we don’t know if everything is being measured the correct way. I won’t know if the device measured the emotion in the most effective way.” Respondent 16 was unsure of the cost-benefit ratio of neuromarketing methods and the adequacy of applying these tools, “The cost/benefit ratio must always be considered here. I believe that a neuromarketing approach is more expensive. This is normal, because we are also talking about the need to have equipment that is not cheap, and very connected to medicine, and since it is not so widespread either, the law of supply and demand itself will not have impacted on neuromarketing yet. It is important from this point of view and depending on the type of content or asset being produced and the investment in it, neuromarketing may or may not also be the most appropriate tool to calibrate it.”

The last question intended to understand if respondents consider conducting neuromarketing studies in the future. As in Gonçalves (2016) study results, the majority of the respondents do intend to carry out a neuromarketing research in the future (Map F.4). Reasons given were diverse. The two most mentioned reasons were the possibility of having a deeper understanding of consumer behaviour (addressed by seven respondents) and the development of strategies (addressed by five respondents). As argued by respondent 4, “Effectively, if we are able to, in the most objective, almost chemical or physical, way possible prove what is ideal to that particular client, really understand what motivates them, what makes them choose us, then that would be ideal. That would be the dream of any marketeer.” Respondent 15 expressed, “It’s something we like to share, in our more public moments, that we understand the consumer, and offering whatever inspires, stimulates and brings joy to them is important for us as a brand.” Respondent 11 claimed, “I would like to be involved in this process because it helps communication and marketing professionals to have their work more effective, and in the end, if we can be effective in our work as a communication and marketing department, we are helping the brand to sell its product or its service.”

4.4.1 Overview of Results

Assessing the potential of using neuromarketing in the respondents’ companies, responses were all positive. As already referred, reasons commonly shared by most of the respondents were not found.

Of the various reasons mentioned, gaining deeper understanding of the consumer was the most addressed one, followed by the optimization of the business and development of strategies, which are also benefits considered by authors such as Ramsøy (2019) and Venkatraman et al. (2015). Advantages previously mentioned in the literature review and by the respondents in the dimension “Neuromarketing Use” such as prediction of consumers’ decision-making and choice at both individual and market-level, understanding customer heterogeneity and measuring implicit measures were not detailed by the respondents, at least explicitly (Plassmann et al., 2015). Additionally, authors such as Marco Hubert et al. (2018) also consider other potentials such as the possibility of creating more effective segmentation strategies. This was also not referred by the respondents. Once again, this may reveal the lack of knowledge that exists among professionals, where these significant and distinct potentials of neuromarketing are not recognized.

Relating to Gonçalves (2016) analysis, regarding answers towards the question if companies should use neuromarketing and if there is potential for neuromarketing in Portugal, were all positive. Responses in the interviews conducted in this research were also optimistic towards the potential of neuromarketing for companies in Portugal. The responses from the marketing professional on the reasons why were not conclusive, as it was not possible to identify a majority response given. The most addressed justification (by a minority) for this positive perspective was to deepen consumer behaviour knowledge. Its usefulness has already been previously considered by companies and literature review, showing that there is potential of neuromarketing's growth.

Regarding the replacement of traditional marketing research tools by neuromarketing tools, the literature review indicates that such occurrence will not happen, as neuromarketing will serve best as a complement to traditional methodologies. The combination of methodologies is seen as the best strategy to deliver reliable and comprehensive results, and to ensure that each method's strengths and weaknesses are balanced by one another (Camerer & Yoon, 2015). Notions aligned with the perspectives given by most of the respondents.

5. Conclusions, Implications, Limitations, and Further Research

5.1 Conclusions

Concerning the literature review, it was possible to reach some preliminary findings and to identify the main topics where academic neuromarketing research show some topics with relevant gaps and disparities, that consequently may influence the professional context. Those are: concept, methods and methodologies, applications, advantages and limitations.

The fledgling state of development that neuromarketing still encounters in, is noticeable, and as expected, inconsistencies were also found within marketing professionals' perspectives. As in Eser et al. (2011) and Gonçalves (2016) research results, marketing professionals within this analysis also demonstrated an overall positive perspective regarding neuromarketing. However, it is important to understand what this view is based on.

As a recent field, neuromarketing still suffers from conceptual gaps, that can negatively shape its influence on marketing as a whole (Lee et al., 2018). Starting by the lack of a widely accepted definition, to what areas neuromarketing stems from, what methods are included in neuromarketing, the lack of validity and reliability of methods and metrics used, the extent of t

neuromarketing's potential, amongst others (Ariely & Berns, 2010; Harris et al., 2018; Lee et al., 2017, 2018; Ramsøy, 2019).

It was possible to conclude that although demonstrating an overall positive perspective regarding neuromarketing's usefulness and value, these marketing professionals exhibited a limited awareness regarding neuromarketing. Neuromarketing definitions given by the marketing professionals were mostly superficial and ambiguous, as most could also be applied to the definition of marketing in general, or in some cases, to more specific techniques such as sensory marketing. In fact, throughout the interviews some respondents did seem to relate neuromarketing with this technique. Also, neuromarketing was very much associated with the eye-tracking tool amongst some respondents, which may seem to indicate a lack of awareness regarding the extent of neuromarketing's existing techniques. For example, fMRI, the most popular technique in neuromarketing academic research (Plassmann & Karmarkar, 2015), was only mentioned by one respondent, and EEG, the most popular technique in neuromarketing commercial research (Hakim & Levy, 2019), was not mentioned throughout the interviews.

This issue of what tools are included in neuromarketing is found within literature. Starting by Gonçalves (2016) analysis, eye-tracking for example, was not considered a neuromarketing tool, and critique was made towards marketing professionals who referred eye-tracking as such. This perspective is also shared in Eser et al (2011) study. Researchers such as Ariely & Berns (2010), Fugate (2007), Lee et al. (2018), and Morin (2011) only consider neuroimaging techniques that measure brain activity such as fMRI, EEG and MEG as belonging to neuromarketing. However, Camerer & Yoon (2015), Hakim & Levy (2019), Harris et al. (2018), Karmarkar & Plassmann (2019), Plassmann et al. (2015) and Venkatraman et al. (2015) include neuroimaging but also physiological methods such as eye-tracking, facial emotion coding, facial electromyography, biometrics and other methods. These differing points of views can very well end up impacting the narrow perspective that marketing professionals, such as the ones interviewed in this research, have regarding neuromarketing tools.

A professional interest in neuromarketing was indicated amongst the respondents, which is an important factor as it may stimulate neuromarketing's development, particularly in Portugal. There was not a clear reason shared as to why, although the most addressed reason (by a minority) was that neuromarketing allows them to obtain a deeper understanding of the consumer. Generically speaking, this is the main benefit that neuroscientific methods can provide to different settings, namely marketing, so it was expected that more respondents would

answer similarly (Camerer & Yoon, 2015; Javor et al., 2013; Shiv & Yoon, 2012). Researchers have critiqued that it is only possible to understand the consumers' brain but not their behaviour, which has been contested by other researchers such as Plassmann et al. (2015). Given this interest, it was expected that these marketing professionals would follow the latest research developments within this area, as happened in Eser et al. (2011) and Gonçalves (2016) analysis, which was not the case in this analysis. An aspect such as the difference in sample dimensions may help explain the variation in results comparing with Eser et al. (2011) analysis, as their sample had 56 professionals. The same cannot be said with Gonçalves (2016) analysis, as the sample dimension of marketing professionals was 14. This indicated that marketing professionals from this analysis are not updated on recent developments and do not obtain first-hand information from more credible sources such as scientific journals. This can impact their ability to make informed decisions, if and when, they choose neuromarketing tools, as its characteristics, capacities and limitations are not truly acknowledged. Not only may this lead to decrease research quality within companies but also may also lead to misunderstandings and preconceptions that harm neuromarketing's development in a non-commercial context in Portugal. Despite these findings, there is an awareness between a majority of the respondents that neuromarketing in Portugal encounters at an initial stage of development, which is a perspective also shared globally in literature (Agarwal & Dutta, 2015; Fisher et al., 2010; Harris et al., 2018; Lee et al., 2017; Morin, 2011; Plassmann et al., 2012; Ramsøy, 2019). The lack of companies offering neuromarketing services, lack of equipment in the country and the underdevelopment of tools are some reasons as to why these professionals share this view.

As mentioned previously, there are five ways in which neuroscientific methods can be of use to both marketing theory and practice according to Plassmann et al. (2015), which are: identifying underlying mechanisms, measuring implicit processes, dissociating between psychological processes, understanding individual differences and improving predictions of behaviour. This last is considered of extreme value (Camerer & Yoon, 2015). Particularly, by using neural data from small samples, and predict marketing-relevant behaviour, such as choice, at an individual and market level (Camerer & Yoon, 2015). Although respondents did consider neuromarketing useful for their companies overall, these applications, which are exclusive to neuromarketing, were mostly not mentioned by the respondents, which may once again indicate the lack of knowledge these professionals seem to demonstrate regarding neuromarketing. This may contribute to lessen companies' usage of neuromarketing, as its potential is not fully understood. As a recent area in Portugal, this is a picture that is observed in the non-application

of neuromarketing within the respondents' companies. The scarce use of neuromarketing within a professional context was also found in Eser et al. (2011) and Gonçalves (2016) analysis. The few respondents of this study that did apply neuromarketing research, resorted to specialized companies that offered neuromarketing services, mostly using eye-tracking and although not said explicitly, fMRI also seemed to be included in one of the research conducted according to the descriptions given. Overall, the experiences were positive, value was recognized, and it stimulated more interest in continuing its use in the future. It was also pertinent to see that amongst some respondents, there were some misleading notions, such as that companies might also be applying neuromarketing without them being aware and that it was associated with sensory marketing. It was particularly relevant to observe that the willingness to get to know the customer more deeply and have a customer-oriented approach, was perceived as being neuromarketing amongst two respondents. Notions that do not correspond with neuromarketing, as reviewed in the literature. Various limitations are mentioned in neuromarketing research, and the reverse inference issue is quite a relevant one, since one brain region can be in fact associated with various functions (Poldrack, 2006, 2011). Respondents never mention this issue, which not only show lack of awareness for a very significant and recurring topic but might be easily misled by the results as there is not yet enough knowledge within neuromarketing, and specifically neuroscience. All research made is subject to updates on technology and neuroscience, therefore eventually some of the conclusions obtained have to be rethought and revised in light of new discoveries made in these areas. They may add some conclusions drawn so far.

Based on the previous findings the first research objective established, i.e., *to understand how neuromarketing is being perceived and used within relevant large companies, given its advantages and limitations*, was met.

Given the controversy neuromarketing is usually associated, it was expected that a clear majority would have ethical concerns relatively to neuromarketing's application within their companies, which was not the case. Generally speaking, respondents were confident in their company's ethics and implementation in studies conducted. The threat of neuromarketing manipulating individuals was not considered within these respondents, which was also not found in Eser et al. (2011) analysis but contrasted with results obtained in Gonçalves (2016) research. Given that Gonçalves (2016) also concluded that marketing professionals in the analysis conducted displayed a limited knowledge towards neuromarketing, as in this current research, the differing results obtained are inconclusive. Despite this, the value of a specific

legislation for neuromarketing is recognized, and marketing professionals did show an awareness and concern for consumers' protection and privacy. Overall, respondents showed some balance between wishing to study consumers' behaviour more deeply, taking into account the possible ethical threats and respecting the consumer.

Conclusions were drawn that made the second research objective, i.e., to *identify the main ethical issues considered by marketing professionals from the largest companies in Portugal*, achieved.

Future perspectives for neuromarketing are positive within respondents. Overall, respondents did not consider that neuromarketing developments will threaten consumers' privacy and autonomy. Currently, science is not able to fully explain and understand consumers' behaviour based only on the brain, as there is still a lot of uncertainty around its structures and functions, and technology is not sufficiently developed to obtain more incisive and clear results. However, some researchers see the future as a threat, as technology advances and is able to delve more into the consumers' brain, with clearer results (Ariely & Berns, 2010; Murphy et al., 2008).

Most marketing professionals showed there were conditions and interest in applying neuromarketing, aware of the usefulness of neuromarketing tools as a complement, an opinion shared by many in literature, providing more comprehensive insights on consumer behaviour (Camerer & Yoon, 2015; Karmarkar & Plassmann, 2019; Litt & Shiv, 2012; Plassmann et al., 2015; Venkatraman et al., 2015). If these marketing professionals intend to carry out neuromarketing studies, it is important that they are conducted with reliable neuromarketing companies or neuroscientists to avoid methodological errors and misinterpretations, which is an issue common throughout neuromarketing research, thus ensuring validity and reliability of metrics and methods used (Lee et al., 2017, 2018; Ramsøy, 2019). Also, it is important to emphasize that currently there are very few companies that offer these services in Portugal, not only indicating that there is a lack of demand from companies, but also the delay that Portugal encounters in comparing with countries such as the United States, United Kingdom, Italy, Brazil and Netherlands (*Neuromarketing Companies - NMSBA*, n.d.). The third and last research objective, i.e., to *outline neuromarketing's future within Portugal*, was fulfilled.

In sum, marketing professional's perspective regarding neuromarketing was overall positive. This is relevant as it can allow developments within this area, particularly within companies. However, it is not possible to make generalisations as it is a small sample. Despite the positive outlook on neuromarketing, it became apparent that although there is some notion regarding

this area, perspectives given are mostly based on incomplete or even erroneous knowledge. In addition, a pattern occurred throughout the interviews: a wide dispersion of responses given occurred many times, indicating a lack of clarity amongst these marketing professionals. These findings evidence the need of an alignment of the gaps mentioned, within consumer neuroscience literature, for a greater clarification not only between researchers, but also marketing professionals. That will allow neuromarketing to evolve and be used with methodological rigour, with recognition of its full potential and limitations, and informed decision-making on its use and results given.

As established in the introduction, the research problem for this dissertation was to understand how neuromarketing is perceived in the biggest companies in Portugal. Based on the findings reached and presented, it is possible to say that this research goal has been accomplished.

5.2 Theoretical Implications

In terms of theoretical implications, it can be stated that this dissertation contributes to theory by displaying the consequences of a lack of uniformization in neuromarketing conceptual foundation in the current perspective of marketing directors and managers from the largest companies in Portugal.

Being part of an important portion of the country's Gross Domestic Product and employment, these are the types of companies that are financially available to invest in Research & Development (R&D) and new research methods such as neuromarketing, and that can help develop this area within Portugal. The findings from this study highlight the importance of a greater coordination in consumer neuroscience papers in order to overcome existing divergences, that are already found at an international level. There is great need to not only standardize neuromarketing and consumer neuroscience concepts, but also methodologies and tools that are considered neuromarketing. International rules made in collaboration with neuroscientists, academics and marketing professionals regarding ethical issues and regulations would also be useful. It would also be important to promote more training, workshops and conferences related to neuromarketing for greater clarity on this area, not only for large companies, but also small and medium companies to be more aware of what is currently happening in the market. It would also be of interest to stimulate a more thorough education in higher education, not only to train future professionals in the field, but also to allow these students to be more informed about their own consumption, and understand the advantages, limitations and potential threats off these technologies.

5.3 Managerial Implications

Neuromarketing can bring increasing value to companies. Companies can obtain information that is not possible with any other traditional methods, being able to improve businesses with a differentiating approach, meeting consumers' needs more efficiently and becoming more competitive. Neuromarketing literature shows the advantages that neural data might provide to companies.

Amongst many benefits, Plassmann et al. (2015) findings are highlighted again, as companies are able to measure implicit processes in consumers' decision making, distinguish between different psychological processes, understand individual differences and very importantly, improve predictions of market-relevant behaviour. As established in the literature review, it is of most importance that research conducted follows reliable metrics to ensure its validity, as not only the lack of it undermines results and consequently budgets in companies that do not follow this, but it also stalls neuromarketing developments within the field and public perception.

These findings give managers not only a greater awareness of neuromarketing's strengths, conceptual and empirical fragilities, but also the stage of development that neuromarketing is at currently at a national and international level, and the perception of an important part of the Portuguese economic panorama regarding neuromarketing.

5.4 Limitations

Regarding the limitations encountered within this study, the first issue emerged with the topic itself. As a recent topic, there is not yet consensus in opinions given and no universal truths. Quite contrarily, there is a great dispersal and variety of opinions, where each person has his/her own interpretation of the topic. In addition, respondents from this sample not only work in different areas, but also have varying work experiences.

Also, as a non-probability convenience sampling technique, the sample is not statistically representative of the population under study, which implies that the conclusions of this study cannot be generalised (Birks et al., 2016).

A pre-test is advised in-depth interviews in order to identify questions that are more challenging to ask or comprehend (Guest et al., 2017). In this research it was not possible to

carry out the pre-test due to the difficulty in reaching the top executives of these companies in time.

The interview requests were sent by email from the end of June to August, which meant that a lot of the marketing professionals were on holiday and probably did not consult their email and limited the number of adhesions.

The current COVID-19 panorama we are living impacted the whole population, companies included. The consequences for business might also have indirectly caused less availability to participate in these interviews.

Lastly, by conducting interviews via video calls platforms such as Skype, Zoom or Microsoft Teams, which was also decided because of COVID-19, Wi-Fi connection issues occurred, although not frequently. An attempt was made not to interrupt and disturb the participants too often, therefore limiting the understanding of small parts of some interviews. Those parts were revised multiple times, and most answers could be deduced through the respondents' previous and following conversations.

5.5 Suggestions for Further Research

This study's findings originated new questions that might be important to explore.

Regarding marketing professionals' perception of neuromarketing, it would be interesting to see how results would vary in different geographical and social contexts, and different market sectors as the ones analysed. This would also benefit research, as a more comprehensive view from marketing professionals and companies from different contexts would be offered.

Concerning the disparities observed in chapter 2 and chapter 4, there is a need to find a harmonization within neuromarketing. Further exploration on standardizing along with opinions from academics and neuroscientists could provide significant insights to literature. There is great need to standardize methodological foundations and consumer neuroscience and neuromarketing designations, and therefore contributing to increase quality in existing theory, allowing standards to be attained, neuromarketing to become more cohesive as a field and clarifying newcomers.

Another important aspect also mentioned in Gonçalves (2016) study, is that neuromarketing research conducted by neuromarketing should also include neuroscientists, since marketers are not fully equipped in terms of knowledge and do typically do not know the accurate methods to use in research in order to deliver accurate and fruitful knowledge (Gonçalves, 2016; Lee et al., 2017).

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Annex A: In-depth interview script

Concept

1. As a marketing professional, how do you define neuromarketing?
2. Are you professionally interested in neuromarketing?
 - a. Why?
3. Do you follow neuromarketing research developments?
4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Use

5. How do you find the application of neuromarketing useful for your company?
6. In the specific case of your company, have you ever used neuromarketing?
 - a. If you have, can you provide a comprehensive explanation of what has been done and how? (i.e., own resources or hiring this service from companies specialized in neuromarketing)
 - i. Do you consider that results were achieved?
7. In your opinion, are there any limitations in the use of neuromarketing?
 - a. If so, what are they?
 - i. In your opinion, how could these limitations you have just mentioned, be overcome?

Ethics

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?
9. Do you think that there should be legislation regulating neuromarketing?
 - a. Why?
 - b. If such legislation existed, what do you think is important to include?

10. Do you believe that neuromarketing developments could threaten the autonomy and privacy of consumers?

a. Why?

Future

11. Do you consider there is potential for the use neuromarketing in your company?

12. And for companies in Portugal?

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)?

a. Why?

14. Do you think you will carry out any studies using neuromarketing in the future?

a. Why?

Annex B: In-depth interviews

Interview Subject number 1

1. As a marketing professional, how do you define neuromarketing?

Interviewee: It's every decision that we make as consumers, that come from the deepest place in our minds and that we are not aware of most of the time. That is the understanding I have. This is all relatively recent. Back then, when I was in college in the 90's, this was not discussed, neuromarketing was at its early studies, but that's what it is, it's that decision making that we have but are not aware of, meaning, that is not rational, that enters our rationality without us realizing it.

2. Are you professionally interested in neuromarketing?

a. Why?

Interviewee: Like I said, I am the marketing director B2B. Therefore, the decision-making people I talk to, my clients (airlines), obviously make decisions, they think about it, we all think about it, very rational decisions but always influenced by neuromarketing. Obviously, buying a B2B is not like buying a shirt or a perishable product or a low-price product.

In this particular case (aviation center) we are talking about decisions that may involve hundreds of thousands of euros. This way, it's important that those decisions, rather they're are logistic ones, like in this case- to insert a new route or a new Portuguese airport-, they need to be made in the most pragmatic way possible and with specific data. But I believe that even in these decisions, I am absolutely sure that there are neurological influences that will determine the decisions and that's what we have in the selling process, it is what we have to feel when we are presenting the business and then in its different phases. We need to feel exactly that so that we can then act in the best way possible. For example, right now, this pandemic made all the presential meetings a lot more difficult, which then makes it a lot more difficult to understand the clients and their reactions (in the online format).

We are physically distant but most of the time we can see them, sometimes we can't. But we are not physically there, in the same space, which makes it harder for us to understand what's in people's heads. And that is, indeed, a loophole we have, I hope that we will soon be able to go back to normal, but if we can't, I at least hope it won't be as remote and automatized as it is right now.

3. Do you follow neuromarketing research developments?

Interviewee: Once in a while, I have a busy professional life, once in a while, when I see an article, I'll put in my article folder and then, once in a while, I go there and check it out. I don't follow it with great discipline but it's an area that interests me, like all marketing areas. But then we lack time and it's impossible to be interested in everything because then you don't take time for yourself.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: That's a tough question. In terms of literature, of knowledge? I think that, due to the globalization, the consumers, and more specifically the new generation, are very global, so I'm not one of those people that say that Portugal is always behind comparing to other countries. Honestly, everything consumer related and, when I say consumer, I mean those consumers, the Millennials, the Z generation, whatever it is, I don't believe it. Globalization makes that, and I see that through my son that plays with kids from Tunisia and other places so, it's completely different from my generation. Well, obviously I think that by saying this I am also saying that most of the times, we are a little, and by "we" I mean marketing professionals, specifically from bigger companies, conservative. And there's another issue, I believe that the younger generations that are now entering their 30's, starting from high influence places in companies will, obviously bring these new marketing trends in a more pronounced way than the workers in their 50's because it's not in their blood and they still have conservative marketing techniques, more within their comfort zone- they still learnt the 4 P's of marketing.

5. How do you find the application of neuromarketing useful for your company?

Interviewee: It's like I say, every technique that allows us to have a better understanding of the final consumer's decision ability is useful. Now, depending on the branches and on the actual consumer, we have many consumers here, we have the B2B consumer- the companies- basically the airlines and all the companies we have as clients that work in the airports, rather they are rent-a-car's, our stores, our dealers that work to serve the final client- the passenger. There's the B2B, then there's the passenger, who makes the decisions, and the first decision, which is the most important one, is to travel. And to travel they are going to go through our airports. In the past, the airports were only concerned with the passenger, as soon as they walked

through the door. Nowadays, each time we worry more about the path the passenger takes since they start to travel, and the moment they start to travel is the moment they start to look for a destination, it's when they first decide they want to travel and how we can impact, along with our partners like the airlines, the decision the passenger makes to travel. And for us, the airport, we want them to travel because we have the joy, or not, of being a monopoly here, therefore, when the passenger decides to travel and if they are from Lisbon, they will travel through the Lisbon airport. My colleagues, for instance, from the Heathrow, have 5 or 6 airports to choose from, therefore, they have to make the passenger travel and to make them travel through their airport, because they have 4 or 5 contestants next to them. Here, in this case, anyone who wants to travel to or from Lisbon has to go through our airport. So, for us, the issue is how do we influence the passenger to travel and to travel more. Then, if they travel in the airline A, B or C, to us, it is the same because they are already our passenger and as soon as they makes the decision to fly, how do we make them consume the most. That is, the actual flight is secured, but then we have a broad service and product offer at the airport, but it's not really our business, it's a business a bit sui generis, it happens through our dealers but it's how we as a partnership with our dealers can make the passenger consume and generate value to him, through the consumption of goods and services, but obviously to us as well. The involvement with our partners straight from the beginning or before the decision and that is what we do very often with campaigns, with offers, and each time more in an online format. However, I am not one of those people who think that in a few years there will no longer exist the physical, everything will be online, no. There will always be room for the above-the-line and below-the-line, there will always be room for that communication, and each needs to complement the other, and that's what's ever so more important: complementarity.

6. In the specific case of your company, have you ever used neuromarketing?

Interviewee: Yes, I mean, not in an intentional way but we do tend to always try to understand, and we conduct a lot of studies here, in terms of the passenger's experience and we are very focused, now we are very interested in the service design techniques, to comprehend the new passenger, that we no longer label as man or woman, old or young or in business or leisure, it's a very big mix, it's a chameleon. Our consumer right now is chameleon that depends highly on what they're doing, on the way they travel to make their decisions. If they're on a business trip,

possibly the same person has a certain type of actions but if the same person is on holiday, they'll have a completely different set of actions. And we need to understand what drives them and why they decide on certain products and services and we have to be ready to offer those products and services and create needs that most people don't feel. And obviously the implementation of neuromarketing can help us create more value.

7. In your opinion, are there any limitations in the use of neuromarketing?

a. If so, what are they? (previously answered)

i. In your opinion, how could these limitations you have just mentioned, be overcome?

Interviewee: In terms of the concept I don't think so, theoretically, that is. And with a different generation of consumers, I'm one of those who says no. I now think the sky is the limit.

Interviewer: And in terms of the actual practice?

Interviewee: I don't consider there to be any limitations. I mean, possibly in this one there might be, but I think the tendency is that those limitations will be weaker each time. Meaning, everything will become more normal each time and more allowed and what we couldn't do before, now nothing will be off limits

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: There's an issue here we haven't approached, which is the data protection laws. It is a topic that was very hot before COVID and it was accompanied by a great concern for the privacy of each person's life and fear to share private information. I think we will now see, with COVID, as a result of this pandemic, those restrictions being eventually secondary. Not because of the consumption of goods but for a matter of public health. And people have already understood that by following the rules, there has to be a lot of concern from the companies to obey those data protection laws, and maybe a new era will arise where people will open up more and share more, and us, as salesman will be allowed to enter more in people's lives, through a series of things, they needed more data.

9. Do you think that there should be legislation regulating neuromarketing?

a. Why?

Interviewee: I believe we have too much legislation in our country. It seems that when people are disorientated, the first thing they do is legislate, and then, a lot of the times, that legislation is not done correctly. I would say yes (there should be legislation), but let it not be the first thing to be done. Having a good understanding of the problems and only then legislate. Obviously, there HAS to be limits, but those limits honestly already exist in the general law. I don't know, obviously, as a consumer, I want to be protected. We are all consumers. And there's another issue: it's important to not exploit the consumer's vulnerabilities, because not all consumers are strong enough and capable to make their own decisions like they should, "exploited". So, all of that is important. I always tell my team we can't assume that every consumer thinks the way we do. That is the first big mistake marketers make, to look at the client through their own eyes and, each time we see that with these studies that we made that people are very distinct, now more than ever. I think that before, there were 3 or 4 groups that represented 90% of the consumers. Now, we should have 20 or 30. Meaning, there is in fact a multitude of segments that didn't exist in the past, which makes things more difficult.

b. If such legislation existed, what do you think is important to include?

Interviewee: Exactly. That's the kind of protection and intrusion that the neuromarketing will eventually be able to bring in terms of product sale. That intrusion has to be, in some way, ensured. Meaning, it's that fine line of preserving the consumer's privacy- which implies the possibility that the consumer says no- and to avoid being tangled in processes that they can't get out of later on.

10. Do you believe that neuromarketing developments could threaten the autonomy and privacy of consumers?

a. Why?

Interviewee: Maybe. It depends. Unfortunately, sometimes the means justify the ends. It's about a series of values and ethics that have to exist, and which are the values and the business ethics and the corporate ethics? With everything you hear in your daily life, where is that? I believe so, yes, there has to be something, because if we are waiting on the marketers to determine what is ethical and what isn't and what is common sense, then we better not wait, that's the idea I have.

11. Do you consider there is potential for the use neuromarketing in your company?

Interviewee: Yes. Like I said, we have a special business in which we do our business with the final consumer always through intermediates, like the airline. We don't bill foreign countries. It's the airline that bills them. You (the client) travel and afterwards, even when you are at the airport, our business model is 99% through the dealers, the companies that are our clients, that sell products and pay a service to the clients. So, in reality, the passenger is not our direct client, those companies (like duty-free shops, Fnac, Rent-a-Car...) are. So, we obviously want our clients to have the maximum success possible. What we try to understand is what they are doing and if they are treating the client well and providing them with the service and the product they requested, as well as giving them alternatives. So, I see neuromarketing like a technique like any other, that could be used to reach that goal.

12. And for companies in Portugal?

Interviewee: Yes, of course.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)?

a. Why?

Interviewee: I don't believe it will fully replace it, but I do think that the investment that is done now, in these more conservative and out of date studies, the weight of that investment will be significantly less. Because we now realize that we can't take much from those studies so, they will always exist. I think they will increasingly lose their importance. I will not be here to see if in 20 or 30 years they won't be made any more. I find it hard to say yes or no, but they will lose their importance.

14. Do you think you will carry out any studies using neuromarketing in the future?

a. Why?

Interviewee: After we conducted this experiment abroad, that ended in December/ January, we presented it in council in January and our idea was to really develop it. But now, because of COVID, oh well, the world either changed or stopped. At the moment, we are going through a huge containment process in all of our activities because out of the blue, our revenues decreased to less than 95% and we were highly affected by that. Right now, we predict a revenue decrease by the end of the year of 75%, so we are trying to see how we can survive all of this. However, I believe that in the recovery, let's believe that will start next year, all of this will come harder. At the moment we need to pump the breaks. I believe this is the right time, although no one

wanted this, to look at the legislation and understand how we can evolve moving forward. And the new techniques, for instance in the marketing area, that were emerging before all of this, will come back with a lot more strength. That is my feeling. That will cause the old ways, that were slowly being dropped, to be ceased and new ways to arise, and neuromarketing will certainly be one of them.

Interview Subject number 2

1. As a marketing professional, how do you define neuromarketing?

Interviewee: I define it as a market studying technique that analyses people's reactions, emotional or rational, through the measure of brain waves, with specific devices. Basically, being able to understand reactions, feelings (emotional or rational) that people are having at that moment, through the measurement of those stimuli or the reaction caused by them and make decisions based on that information.

2. Are you professionally interested in neuromarketing?

a. Why?

Interviewee: I have resorted to it a few times, here in the marketing department, I think that it is an interesting technique, mainly because it can act on the subconscious, or at least tries to understand the people's non-conscious stimuli, which are very relevant in the construction of their opinions and the relationship they have with brands or products. It is a very interesting tool.

3. Do you follow neuromarketing research developments?

Interviewee: Not actively. I have been following some developments. I know it's an area that has some scientific recognition but that also needs more improvement, concerning, for instance, the size of the sensors, the actual sensors. I don't actively follow the developments of the technique.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: I believe that it is underdeveloped and under-implemented. I know there are tools available in Portugal, but I can't refer to their degree of sophistication versus what's being done in other parts of the world. I also know that in many cases we implement tools and solutions that come from abroad. Some of them we don't have here and the equipment is brought in when

there is a study. Therefore, the development is still very short, at least when it comes to its implementation.

5. How do you find the application of neuromarketing useful for your company?

Interviewee: For what I said before, the measurement of non-conscious stimuli. In our context it is particularly relevant, mainly because we do many different things regarding communication but also because, for instance, a store is a place where there are many stimuli and it's important to understand the underlying hierarchy behind those stimuli, as well as how they effectively work, and neuromarketing can be useful in this very relevant path.

6. In the specific case of your company, have you ever used neuromarketing?

a. If you have, can you provide a comprehensive explanation of what has been done and how? (i.e., own resources or hiring this service from companies specialized in neuromarketing)

Interviewee: We used it basically in store and flyer studies. How the clients perceived the flyers and the store, which were the stimuli they paid more attention to, what were their reactions, what type of communication was more effective, what level of communication was more effective, and those were the assessments we did. We essentially did the Below-the-Line (BTL)

i. Do you consider that results were achieved?

Interviewee: They were interesting and gave us useful inputs that allowed us to improve the performance.

7. In your opinion, are there any limitations in the use of neuromarketing?

a. If so, what are they?

Interviewee: There are some limitations. Technologically, it is difficult for a lay person to understand to which degree the limitations exist and what is their scientific value. Typically, the data is validated by academics, therefore, we end up relying in the data we have, but there's always some level of uncertainty. The real acuity of the data is always something that's not completely obvious for a lay person, and then there's the equipment issue and to the degree to which the individuals themselves are capable of understanding the equipment, especially when they are doing things that they should be doing without being aware they are being assessed. For instance, the shop-along theme, in which they have to walk around with the equipment in their heads, creates some limitations to the technique.

i. In your opinion, how could these limitations you have just mentioned, be overcome?

Interviewee: With less visible equipment and technical consistency, so that the people who use it understand how it works and what are its limitations.

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: If it's done explicitly with whom it is evaluating, then no. But if we are filming with cameras, eventually more, but if it's clear for the person that's being evaluated that they are being evaluated then I don't see the problem.

9. Do you think that there should be legislation regulating neuromarketing?

Interviewee: No. At least not from what I understand, I don't think so, I don't see any need for it to be regulated.

a. Why?

Interviewee: Because the person that is being assessed has to know it, it's hard for them not to. For the people that master the technique I don't see any potential danger to the people. It doesn't interfere with anything, we are measuring stimuli and we have people's consent for it so I don't see the need to regulate.

10. Do you believe that neuromarketing developments could threaten the autonomy and privacy of consumers?

a. Why?

Interviewee: No. It's a stimuli measurement, how they react, I don't feel like that will affect them greatly. The use of marketing to achieve manipulatory ends will always be possible. I don't believe neuromarketing increases that risk. I don't think it's because of neuromarketing.

11. Do you consider there is potential for the use neuromarketing for companies in Portugal?

Interviewee: I think so, yes. There is potential.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)?

a. Why?

Interviewee: I don't think so, I believe it measures different things and also has limitations regarding the level of detail you can possibly reach. It measures a specific component, but it doesn't measure others so I don't think it will replace it, no.

14. Do you think you will carry out any studies using neuromarketing in the future?

a. Why?

Interviewee: I believe so, yes. It is very possible because we need it and it is useful to measure some stimuli, possibly in more chaotic environments, which are also characteristic of my brand. So yes, definitely.

Interview Subject number 3

1. As a marketing professional, how do you define neuromarketing?

Interviewee: Nowadays, we know that the sensations and the sensorial dimension is a very important part in Marketing. It's not by chance that the companies release smells and sounds associated with the brand, so the brand in today's world is not just a visual thing, it's not just a logo. The brand needs to have soul, and to have soul means to have senses, so I would say that the smell and the sound are the most important senses in the characterization and definition of the brand.

2. Are you professionally interested in neuromarketing?

a. Why?

Interviewee: Yes, very much so. As head of the marketing department in my company we have done quite a few attempts to work some of the senses, like the smell, that we wanted associated with the brand. We were never able to be consequent for many reasons, but we have worked with someone that creates fragrances to create the environment we wanted, that is the smell that we wanted associated with the brand. Now, we see that in a lot of stores.

3. Do you follow neuromarketing research developments?

Interviewee: Not as much as I would like to. I don't have much time.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: I think it still has a long way to go. Neuromarketing is usually not the top priority in marketing. I think it is something that some more developed companies have started to pave

their way into. But most companies don't care for it. I can see that in my company, that is a very big company and has worldwide marketing, and has not yet dedicated itself to that area

5. How do you find the application of neuromarketing useful for your company?

Interviewee: I believe that the senses are ever so more important. The client looks for sensations, looks for experiences. Nowadays, we know that all the marketing is based essentially in sensations and experiences. When I advertise a trip, I don't advertise the specific destinies, that's not what the person wants. What we want is the experience, the sensation, what we are going to discover. That is the reason why when we announce a certain destiny, we try to associate it mainly with experiences and feelings.

6. In the specific case of your company, have you ever used neuromarketing?

Interviewer: No, our company has never used neuromarketing.

7. In your opinion, are there any limitations in the use of neuromarketing?

Interviewee: Limitations how? In fact, as communication agencies we don't have a lot of offers to develop neuromarketing, it's not very easy to find those opportunities. Also, it's not a top priority for companies at the moment so, when the budgets are short, we always end up channelling to what we already know, what is obvious or the most traditional option.

i. In your opinion, how could these limitations you have just mentioned, be overcome?

Interviewee: I believe that no too long from now, we will enter that path. Nowadays, all the surveys that we do, especially with the younger generations, conclude that all the communication towards them has to have a lot of neuromarketing, in order to communicate in the most effective way possible. Therefore, I would say that it is a path we are still going through, but we are not there yet. That is where the innovation comes from, and who every brings the latest novelty gets the most notoriety so, in fact, those are the areas that will allow us to gain some notoriety.

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: I don't think so.

9. Do you think that there should be legislation regulating neuromarketing?

Interviewee: When it comes to the legislation from an ethical point of view, I don't know if there is anything specific. I don't know if it is justified because all marketing activity is already legislated enough. We have to obey some rules, so I don't see the need for a specific legislation.

10. Do you believe that neuromarketing developments could threaten the autonomy and privacy of consumers?

a. Why?

Interviewee: No, because I don't believe we will ever reach the point where we can identify the person A or B. We are talking about groups. We are talking about interpreting groups, interpreting segments, niches, so we are not getting information about a specific person. Therefore, we are not threatening any type of data protection rule, we don't enter anyone's person sphere. That is not how I see neuromarketing. Interpreting market niches, working on the sensations and the senses, in a global way, is a form of interpretation of the market segments.

11. Do you consider there is potential for the use neuromarketing in your company?

Interviewee: There is a lot of potential! Every company that sells experiences, that sells emotions and that has several market segments all over the world, with the most diverse clients, I think it makes perfect sense.

12. And for companies in Portugal?

Interviewee: In a general way, I think so, yes. There are companies that are more suitable for it than others: for a company that sells screws, it may not be the most appropriate, but for the companies that sell services and experiences I believe it is very important to know exactly how to use those techniques in the brand's favor.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)?

Interviewee: I would say that it will help, complement. There are things that will probably never be replaced so they will have to complement each other, it will be a step forward in terms of knowledge.

14. Do you think you will carry out any studies using neuromarketing in the future?

a. Why?

Interviewee: I don't think now is the best time to think about that, there are so many problems we are facing at the moment, but it's something that we may do. Like I say, we are very into knowing the client and then communicating not only a traditional way- which is the image-based marketing- but also in a sense-based marketing. So, we need to have some knowledge regarding the client, which we don't have nowadays, and give some robustness to the brand. For it to be not only an image brand but a senses brand. I think that that connection between knowing how to interpret the client and corresponding to it, resorting to vision, smell and to all the senses is the perfect combination. Receiving inputs from neuromarketing and also using the senses, which is also neuromarketing, to deliver to the client. That's how I see them combining.

Interview Subject number 4

1. As a marketing professional, how do you define neuromarketing?

Interviewee: Honestly, I couldn't say. Here, in our company, we have adopted a type of marketing that effectively tries to stimulate the senses and tries to reach people's subconscious, I'm not saying that we are trying to circumvent the conscious decisions, but we do try to go beyond the obvious, which is claiming that our product is better than others, that it is amazing and wonderful, so we try to go a little further than that. And we do that by stimulating sensations and provoking experiences. It has been a few years since we realized we had to make a leap from the traditional marketing and traditional communication towards the experience marketing, in the way of stimulating the senses, which is a path we have been paving. I can't exactly tell you if this is a neuromarketing approach or not, but it's the strategy we have adopted.

2. Are you professionally interested in neuromarketing?

a. Why?

Interviewee: I can't really tell, instead I ask you, you define neuromarketing, or at least give me some information regarding the context and the scope of your study so I can understand better.

Interviewer: To sum up, neuromarketing is the neuroscience techniques applied to marketing. In my thesis I talk about neuromarketing and I do a literature review on what is done, in terms of studies, and how the big companies in Portugal do it. In this case I saw in Exame the top 30 companies in Portugal and I thought it would be interesting to understand what is their marketers' perception when it comes to neuromarketing.

3. Do you follow neuromarketing research developments?

Interviewee: Specifically, about neuromarketing, I confess it's not an area that I explore in detail. Here at our company, marketing, to us, involves product marketing, with the variety management of the models we market here in Portugal. It's a type of marketing that includes all the sales provision department, as well as the commercial action's plan, the marketing that includes distribution, some companies where it's not located, in ours it is located here, and then all the communication department- that is advertisement, the digital and the CRM. In particular, neuromarketing, to be honest, is not something I can say is perfectly included in our strategy, it's something that results from a global strategy and from what we understand, through the studies, we have and that works. I can't specifically tell you what includes neuromarketing and what doesn't.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: I think it is at a very early stage, don't know if that early stage is conscious or not. Meaning, I don't know if it's something that is common knowledge within most of the decision makers in the marketing area. But I also can't tell if some practices it without knowing. I imagine some do it without being aware they are doing it, but honestly, I think it is something very recent, at least from my point of view.

5. How do you find the application of neuromarketing useful for your company?

Interviewee: Since it is not something we explore, I have some trouble referring to its usefulness. As the practical component of something scientific, validated, I tend to have a very measurable approach towards marketing: what is visible, what is analyzed, and not the "trying to see if it works" kind of marketing approach. I tend to adopt a more analytic view of marketing. Believing that it is a science-based marketing I would say that, at some point, it must be useful, but I don't know any of the specifics, to be honest.

7. In your opinion, are there any limitations in the use of neuromarketing?

Interviewee: I can't really say.

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: If neuromarketing stands for something that stimulates, then I have no idea which part of the brain it stimulates but if that eventually crosses the line of what is conscious and what non-conscious, then there might be an ethical question to be raised. We all know that we

are stimulated and that we react, on a conscious or unconscious level, by the several stimuli there are. When we refer to a non-conscious stimuli or a non-conscious reaction, it comes down to the company's ethics and if it comes to it, to our own and the decision maker's ethical code, and I believe this is something that needs to be assessed. I'm not saying there is a barrier and that from this point forward we are out of what is considered ethically acceptable, but there are some ethical questions do be raised.

9. Do you think that there should be legislation regulating neuromarketing?

a. Why?

Interviewee: Every time somebody asks me about the need to legislate, no matter the context, I always tend to hesitate. In case there is no legislation, it is up to each person's common sense. Which, on one hand, is good because it doesn't suffocate the sector or the activity in question. On the other hand, it is quite risky because the common sense and ethics are always very subjective. In the matter of ethics, the questions, especially the ones that may impact the human being in an unconscious way, I tend to be a little conservative and I consider that there should be limits, even if they're just references to avoid crossing the boundaries, I tend to approve those legal boundaries or regulations.

b. If such legislation existed, what do you think is important to include?

Interviewee: It's difficult for me to say since I am not familiar with neuromarketing in that way but I would say that, since we are in a commercial department, where no matter what we do, our main goal is to sell our product or service to our clients or potential consumers. Especially in my company- where we sell cars, the second most expensive product to purchase for a Portuguese family- we are talking about a decision that is inevitably very considered and that we don't make very often in our lifetime. That decision, although we try to maximize it on our favor, also demands that we are aware of what it represents to our clients. I mean, to me, being able to make someone, who doesn't have the means to purchase my product, buy my product, by any means necessary, it is not a good job on my end. I want to have as many clients as possible, but I want to have them for the longest time possible. A client that buys me a car today, but their life turns into a nightmare because they won't be able to pay the credit and gets indebted because of it, is not a good business to me. Because the truth is, they probably won't buy a car ever again. And that is why all the automobile brands want to sell cars to young people, because they are the ones who, in theory, will buy more cars throughout their lives, and we want to promote their loyalty from the first purchase. And that's what I want, I want that

first purchase, and the second one, and the third one, and the fourth one to be conscious purchases, so that when it's time for them to choose again, they will turn to us again. When it comes to neuromarketing, if the interpretation is "let's get into the subconscious and make the person decide without being aware", then it could possibly compromise this process, this chain of conscious purchases. And that is my fear: how to approach this matter, and if it is in fact a conscious purchase.

Interviewer: Yes, in theory that is the ethical question that is raised. One of the things that is discussed is if someone has a mental illness, a child, or is vulnerable for some reason, then they may be more easily influenced and that is the ethical concern with neuromarketing. For example, there is this neuromarketing study where they demonstrated how higher prices activate the pleasure and reward systems in our brains. They did this with a supposed variety of wines, but the wines were all the same. However, people felt more pleased and inferred better quality with the wines labeled as expensive, comparing to the wines labeled as cheap even though they were, in fact, the same. For instance, the frito-lays have also changed their wrappings into something less shiny, because shiny is associated with something less health. And those are some neuromarketing examples.

Interviewee: Yes, and there is that motto that we eat with our eyes so, we are influenced by our senses, which ever they are. For example, in the automobile sector we have a saying that is "smells like new" (Portuguese expression translated literally). There is this big issue for us which is that it is proven that in the client's path there is always a key moment, that we fight to ensure is perfect- the rehearsal moment. It is proven that around 40% of the clients that go through the path without rehearsal buy, comparing to the 60% that do the rehearsal, so, there are 20% more chances of buying if the rehearsal is done. Even though there is a lot of information online, the information a salesman can give to a client, the act of getting into the brand-new car, all equipped and the smell and the driving experience, that's what makes the difference. There is no additional information given at that moment. Obviously, the rehearsal is done with a salesman, but the only difference from being in a chair, a showroom or a dealership is the possibility to be inside the car, and I don't know which stimuli, which brain area it activates, but the person almost teleports into the car they wish to have. And we work a lot on this basis, the experience marketing I referred to in the beginning which is more than some commercial on the television, an outdoor or a salesman speaking, is the actual experience.

Especially when it comes to cars, that are a high involvement product. For instance, the wheel was updated because some studies concluded that its diameter, material or thickness provoke totally different sensations and quality perceptions. Our company, besides the main brand, has a brand that is more accessible and that benefits from all the technology the main brand has, but resorts to the prior generation technology, instead of the latest. They are less equipped cars, simpler, and one of the few updates that was made was the adjustment of the wheel, making it thicker and smaller in dimension, and therefore more appealing. It is a very small investment but makes all the difference, which we were able to see through the perceived-quality inquiries. Because it really is the first thing we touch when we get into a car. It is funny how these things work.

10. Do you believe that neuromarketing developments could threaten the autonomy and privacy of consumers?

a. Why?

Interviewee: As long as they are not evasive in what is each individual's personal choice. Marketing should not be intrusive. It should be accessible in its many ways, but never intrusive. On that matter, I believe there is a lot of legal protection for the consumers, like the GDPR's and all of that, but it should never be intrusive. It should be as available as possible. Obviously, we are all stimulated each minute by marketing actions, no matter what they, but it should be intrusive to the point where someone is exposed without consent, we are talking about a more direct marketing here. In this case, I believe there are barriers that must be respected even to the brand's benefit, because intrusive marketing has a very negative side for the brand.

11. Do you consider there is potential for the use neuromarketing in your company?

Interviewee: Yes, I would say that, since our brand sells high involvement products, like cars, and that have a very big life span. In Portugal, on average, each person renews their car every 13 years, which is a lot, it is one of the longest periods in Europe. The decision to buy a car is a process that takes a lot of months, I am referring to particular clients, families, so, since they are high involvement products, there is a huge potential for neuromarketing because it is not something we wake up on morning and decide to buy, like we would with a t-shirt or a dinner at a restaurant. So, yes, I definitely think so.

12. And for companies in Portugal?

Interviewee: Generally speaking, since we are a country with a lower power of purchase, in terms of the European rate but that simultaneously, maybe due to its southern culture, has a big tendency to consume, I would say so, yes. It's true that there are always ethical questions that come up, but I would say yes because culturally I think, even when compared with other countries' markets, we have a very hands on market and a lot of emotion-based purchases. This means that Portugal, even when compared to Spain, has way better equipped products in the automobile market. High-end versions, even when it comes to engines. In contrast, in Spain, you have way more of a rational purchase. For example, in Spain, you see a lot of white cars, it's not because they like white cars, it's because the color white is free, and the other colors are not. So, because they don't want to pay an extra 300-500€, which is how much it costs to get it painted, they prefer to have a white car. And the same thing does not happen in Portugal, here we value image a lot more. It's not by chance that the premium car brands in the Portuguese market have a much higher weight than in other European markets, except for the German market because premium brands are mostly German. And that is because we value image so much. Therefore, those are all contributing factors that make me believe this marketing approach (neuromarketing), that stimulates the subjective factors that go through our minds, makes sense in Portugal. And it's not just in the automobile industry, I believe it makes sense in a general way because those are mostly cultural factors. Our brain should be prepared to receive that input.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)?

a. Why?

Interviewee: I can't tell, do you mean in the sense of obtaining information, is that it?

Interviewer: Yes

Interviewee: But in what way? Not questioning people?

Can you give me an example of a neuromarketing study?

(...) Interviewer gives example

Interviewee: So, let me give you an example. We did a test, during an exhibit in a shopping center in Lisbon, in which we had a car that was launched last October, exposed with a set of screens, an exposition device and information displayed on tactile screens, and we did a test with one of our partners in which we placed 4 or 5 cameras pointed at the exhibition and the

surrounding exterior area. Those cameras detected the flow, meaning, the people that were walking around in the mall and if they were heading towards the exhibit or not. I don't know if this is neuromarketing or not, but they detected people's facial expressions too. So, basically, the cameras detected flows, if it was a man a woman or a child and the facial expression on three levels: happy, neutral or unhappy. So, it was very funny because we detected a few patterns like, within the people that approached the exhibit there was a first level of rapprochement, they would go in with the family, and then we detected if they were individuals, families with children or without children. We then detected the evolution of the facial expression, in the men's case, it tended to go from unhappy to neutral and then happy, and we detected the people that were standing away from the exhibit approaching but still outside of the vehicle, and then, when they got in the car. They were mostly men (that got in the car), they tended to grow happier as they approached the car. The women were the opposite. I mean, this is common sense, we imagine what the men were feeling when they got out of their way to go check out the car. And it is curious to see the level of satisfaction increasing as they approached the car, while the women were the opposite. Of course, this is a generalization, but it was very interesting to see, this was our first study in this area.

This study took place in an almost live manner and it was funny to see for the first time the reactions, to the car, in terms of satisfaction and contentment. It was also interesting to see the level of satisfaction when they were approached by a salesman and when they weren't. Afterwards, we also did a test in which both the salesmen and the promoters-that have a softer approach- were at the scene. And the reactions were very different depending on the approach, if it's was soft approach or a costumed approach, we never really did harder approaches like the credit card salesman in the shopping center hall kind of thing. Naturally, these are different products but still, we don't have that kind of approach. However, it was curious to see that what mattered were the stimuli, because those increases in the satisfaction levels occurred before the contact, rather it was a salesman or a promoter. And it is interesting to see how the same person, depending on their level of exposure to the product, increased or decreased their level of satisfaction. It's very funny. It was also helpful to see because we did this for several days and the results varied a lot throughout the day. I imagine that is not random. At the end of the day the results were more positive, in terms of approach and satisfaction levels, than let's say at lunch time and I believe that may be caused by the predisposition in which the individuals are while they are at their lunch hour, they might be thinking they have little time, or be thinking about work-related questions. So, it is very interesting in that way and this is a type of marketing

we are very interested in because it allows us to gain a lot of perspective regarding the results of our actions before our potential clients and more importantly, it shows us the results without the influence we have on them. In a focus-group or a survey there is always some level of influence, the perfect measurement in science is the one that is not tampered with, and that is what we tried to do, the people didn't know they were being assessed so it is the purest result we could possibly have. In that sense, it was very interesting.

14. Do you think you will carry out any studies using neuromarketing in the future?

a. Why?

Interviewee: Yes, definitely. This area is very interesting to us. If you tell me that this type of study or like the one you mentioned earlier where an almost medical assessment is made in order to understand the brain's reactions then, yes. I am extremely keen on it, as long as it is done within the ethical boundaries. Because, at the end of the day, the goal is to sell our product in the best way possible. And that doesn't necessarily mean to sell more, but to sell better, according to the market's expectations. It is almost a convergence of interests. Like I said before, I don't want to sell a lot at once, I want to sell for as much time as possible, and that can only be accomplished by that convergence of interests. I want to sell and I want the person who's buying to be satisfied, and satisfied for as long as possible, not just in that first moment, that we call "the honey moon phase", where everything is great, we want it to be prolonged after those initial 5-10 years, so that when the client thinks about renewing, he thinks of us once again. Effectively, if we are able to, in the most objective, almost chemical or physical, way possible prove what is ideal to that particular client, really understand what motivates them, what makes them choose us, then that would be ideal. That would be the dream of any marketer.

Interview Subject number 5

1. As a marketing professional, how do you define neuromarketing?

Interviewee: Neuromarketing is a marketing area that is not yet fully developed when it comes to its potential applications. Basically, neuromarketing is the marketing area that stimulates the senses, whichever they are, which then allows those senses to work, leading to the increase of interest in the product and its consequent consumption.

2. Are you professionally interested in neuromarketing?

a. Why?

Interviewee: I am more interested in its practical component, not so much in its theory. We have conducted a test here, at our company, I will explain it to you in a moment, with a partner that sells advertisement to our stores- which was what he tested. The main goal was to understand how advertisement captures people's attention, and for that, the people had a sort of webcam in their heads.

Interviewer: Was it eye-tracking?

Interviewee: Yes, it was an eye-tracking based device. The people were walking around with a device on their heads that tracked what they were looking at and, somehow, it tried to understand in what way the advertisement captured people's attention. We also conducted a few tests concerning olfactory marketing in the restaurant area. But what was the question?

Interviewer: Are you professionally interested in neuromarketing?

Interviewee: Yes, of course. Let's see, every subject that has the potential to increase business, especially from a sales point of view, even if neuromarketing is very focused on eye-tracking, for example, concerning online shopping, I am very interested in. Trying to find the reasons behind why some products sell more than others and why.

3. Do you follow neuromarketing research developments?

Interviewee: I would say that I do but not in an academic way. Now, when they come from operators to be implemented, we have to implement them even if it is just for a test. The truth is that our company is, at the end of the day, a department store with a lot of different business areas, which is a big advantage because neuromarketing, depending on the business area in question, may provide very different answers. So yes, we try to conduct some tests. This eye-tracking study I was telling you about earlier is one example of that. We also run tests on websites, obviously, to see which areas people look at the most and the least but in this specific case we had an advertisement operator placing certain advertisements on the supermarket shelves, here at the store, and then tried to understand in the midst of all that noise, what messages and what products captured people's attention the most and why. In this way I consider it a very important subject that allows us to understand exactly that, what draws more attention and to what type of people, but we still consider this all very incipient.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: I believe it is still very early stage, to be honest. I think that neuromarketing has a very uneven application. I think that after the models have been tested and there is an actual proposition that allows the sale optimization, everyone will implement it, for example, those eye-tracking techniques on websites, that is something that has been well studied because it generates metrics that are very easily applied and followed, along with a cause-effect report that is a lot more clear than in the physical environment where there is an ad that is more appealing than another, but then, what do we do? Let's establish the impact on the price list, let's work with something that is a wide enough, big data, that allows us to have a more mature model.

5. How do you find the application of neuromarketing useful for your company?

Interviewee: In the way I said before, the big issue regarding neuromarketing is the development cost to test the models in a consistent way, the company needs to have a very clear investment when it comes to neuromarketing. Simple techniques like the one we were discussing, the eye-tracking, in order to be conclusive you have to invest a lot of money, and the sample is very short, it is too expensive and although it requires a technology that is relatively easy to implement, it is still very immature, there is no scale. So, there's that. And that is what I believe to be the main reason, and then there's the reason behind it, which is the on top cost of the development, that is not yet very clear the ratio of that cost versus the return, the profit. Everyone believes neuromarketing generates sales, but how much it generates? we don't know, and it is a lot easier to establish that in the digital scenario than it is in the physical world. Now, neuromarketing can give response to a lot of things from the product's intake, to the product's wrapping or even store location, the actual advertisement itself. All of those questions are possible to answer with neuromarketing. Now, to implement and for it to be a high consumption product in a B2B logic, for the companies to want to implement it, it is not ready yet, it is too green.

6. In the specific case of your company, have you ever used neuromarketing?

a. If you have, can you provide a comprehensive explanation of what has been done and how? (i.e., own resources or hiring this service from companies specialized in neuromarketing)

Interviewee: Yes, all the advertisement we sell inside the store is sold by an advertisement company. Therefore, everything you see inside our store, everything that doesn't include self-promotion, is sold to the suppliers, the brands we sell here, some want to develop advertisement inside the store, because there are studies that defend that the degree of the consumption decision is very high, they say around 2/3 of people decide what they are going to buy inside the store.

Therefore, the brands invest a lot in in-store advertisement, and the sale of that advertisement is conditioned, and this advertisement company was the one who developed the model to try to understand to which degree it influenced sales, so that when they sell that advertisement to the brands, they have a more conclusive model.

i. Do you consider that results were achieved?

Interviewee: They were achieved by a third party, the advertisement company I mentioned, and the truth is that they resorted to those results when selling to the brands. Now, I don't know if they were able to increase the advertisement inflow due to that study, but that study was responsible for having an innovative role in the market, it served as contact to potentially interested brands, it was their marketing work.

7. In your opinion, are there any limitations in the use of neuromarketing?

a. If so, what are they?

Interviewee: Yes, I believe the existing limitations are the ones I mentioned earlier. It's the cost of the model to democratize, if you will, and the lack of direct causal relation between the cost and the benefit.

i. In your opinion, how could these limitations you have just mentioned, be overcome?

Interviewee: Well, that is a very good question. I have never thought about it, but I believe that the risk needs to be lower, and by risk, I mean the investment. Meaning, if we want to start testing, here, in our company, let's say, the website, if we want to test banners and change from a green banner to a yellow banner and we understand through the eye-tracking technique, that also has a cost, that people look more to the green banner than they do to the yellow one, the test is done, there is a direct result and we can measure it. It does not work like that in the physical world. That requires a sample of a few hundreds of people, as well as panel, or very clear data, because even the suppliers may tell us "This soda brand is now changing the can into a silver one" and we say "why?" "because it works better in store, according to this study" and that might happen. But what is good for a soda brand, may not be good for another one. I think this method needs to be implemented as soon as possible so then they can find an impact result logic that is more effective, very aligned with the digital logic I was mentioning before. And that is where the trouble is at.

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: Nowadays, we live in the shadow of RGPD, so everything that concerns data protection has already been implemented two years ago. People will only allow access to their data when consented, it is no longer an opt-out, it's an opt-in. The people that wish to collaborate, will, so, from an ethical point of view, I would say there is no problem anytime someone wants to collaborate in a model, as long as they know what they are doing and what it is for. The person needs to be conscious of their actions, but that's not exclusive to neuromarketing, it happens in a general manner in the advertisement world, it has been so for the past 2 years.

9. Do you think that there should be legislation regulating neuromarketing?

a. Why?

b. If such legislation existed, what do you think is important to include?

Interviewee: Yes, of course. Of course, because the person may want to be a part of the panel, of what is being reported by a test in neuromarketing. People may not be fully aware of what they are doing because neuromarketing may access people's subconscious, I don't know why I am turning left now and why I turn right afterwards, but the truth is that that mere fact may be in the origin of a business model, that I am not aware of but for some reason works the way it does, so we are entering inside what is considered intimate behavior, neurologically speaking. And that, from a legal point of view needs to be legislated, because people have the right to understand how and why they are being studied for.

10. Do you believe that neuromarketing developments could threaten the autonomy and privacy of consumers?

a. Why?

Interviewee: Yes. Privacy from the beginning, for the reasons you know better than anyone, but it is kind of the same logic of: you can't enter a website and if you don't press the "accept cookies" button, this is like the cookies of the physical world. At the end of the day, that's what it is, so as long as people are aware of it, it's okay. Another issue is if people care about it, because cost-opportunity can be an advantage, they might say "okay, very well, I will be more aware of a responsible consumption", but it depends on what you give in return.

11. Do you consider there is potential for the use neuromarketing in your company?

Interviewee: Yes, yes, of course. We are willing to test the models that optimize our business. Therefore, neuromarketing, yes. What is not clear to us is how much a solution like that, in a general way, will allow us to collect workable data, with statistical substance, if is enough to have the return. I believe the profit from neuromarketing is yet to be demonstrated, from a sales point of view, in an advertisement logic of the advertisement test and advertisement campaigns maybe not.

12. And for companies in Portugal?

Interviewee: Yes, of course. I consider it to be an instrument that might interest companies in the sense that, like I said, it may help them to optimize their business. So, for all the reasons I have mentioned before, if we are able to understand the consumer's choices and why he behaves the way he does, we will obviously win, with a potential business. Now, we need a model that is conclusive and that generates those conclusions.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)?

a. Why?

Interviewee: I think it has the great advantage of simulating versus a focus group. Neuromarketing, if well applied, simulates the real shopping environment, of selection, everything from the attention, the consideration, the decision to purchase or not, a lot better. Because neuromarketing can be applied in a real or practically real environment. While the focus group can't, or, in theory, can't replicate the real world as easily, no matter how good its structure is, there will always be someone that influences someone else. It's obvious that de moderator's role is to neutralize those people, but there are more participant people than others, some are more indecisive, others are more shy, so, thanks to neuromarketing, people are in a real environment and it's every person for themselves, which is a lot closer from what really is the decision making process or an advertisement campaign's impact. So, I would think so, it tends to give results that are a lot closer to the real environment than the ones that may be achieved in a traditional marketing research logic.

14. Do you think you will carry out any studies using neuromarketing in the future?

a. Why?

Interviewee: Yes, isolating the price effect of the study itself, I would say so, obviously. It is closer to reality, it is one thing to close people in a store and ask them to talk about our

company's supermarket but it's a whole different thing to have them walk around in a store with an eye-tracking device and having them behave naturally. Obviously, the second scenario has a lot more value.

Interview Subject number 6

1. As a marketing professional, how do you define neuromarketing?

Interviewee: I define it as a, let's not call it science, if we did we would have to say marketing is a science and that's not exactly true, but let's call it a marketing specialization, that resorts to the senses as a way to reach its goals- rather they are intention of purchase or notoriety ones. That is basically it.

2. Are you professionally interested in neuromarketing?

a. Why?

Interviewee: Yes, but I confess I used to be more interested. I separated myself from it because my job function evolved to strategic marketing, less operational, and the truth is I got a little estranged from that reality but, for instance, I remember when we launched our digital projects we were very interested in some of the neuromarketing dimensions. I remember reading some studies regarding the layout of the websites and how they should appear onscreen, and that was inferred based on which screen areas people looked at the most and the least. It was not about the message itself, it was about the area, and those areas could be condition by the actual graphic display of the website or its messages. We were there for a while, but then we thought there was sci-fi component to it, and we left it for later, we didn't pursue it. When I say sci-fi, I am not being literal, because I know the proof is scientific and that people's attention is directed to certain areas that they might not be aware of.

3. Do you follow neuromarketing research developments?

Interviewee: No, I confess I don't, I'm not going to lie. I am not a specialist in that area, not even that curious about it, I admit.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: From what I see, maybe in the same state as marketing, meaning, superficially handled, let's put it that way. Nothing brilliant, I think marketing has gotten worse over the years in our country and I believe that happened because it was outshined by other

considerations, it lost its importance in the business world, in a lot of companies, except for the big ones that have big budgets, but in the remaining ones it did lose some of its importance. The digital shoved it into a corner because now everything is digital and the digital budgets are lower, you spend less making digital, so the companies choose the digital marketing and neglect the other forms of marketing, like strategy and planning. Marketing is the company's strategy, it is not cartoons. Therefore, I believe that marketing has been neglected and underappreciated and that neuromarketing suffers the same treatment by consequence.

5. How do you find the application of neuromarketing useful for your company?

Interviewee: The automobile marketing is a very strong variable in the business because the car is an emotional good. Firstly, it is a high involvement product, therefore, it is always accompanied by a rational component, nobody spends 30 thousand euros just because, but it is simultaneously a good with a huge emotional component. And if it has a huge emotional component, marketing needs to act on it, and neuromarketing even more so, because if we were talking about toilet paper, I mean, Renova has managed to turn toilet paper into something more or less emotional, but if we are talking about some random commodity like a lift or electricity, it is all the same, or even common consumption goods that barely don't have an emotional component, I assume neuromarketing can only act on the immediate intention of purchase, in that moment, that can make you decide between the good A and the good B, no matter how similar they are. But they are able to sell because there is a strong emotional component, because of the brand. It's not the same having an Audi, or having a Dacia or a Hyundai, not that they aren't good, but it's not the same, in terms of evolution. It is not the same because the brand is not the same. Therefore, marketing plays a decisive role in this sector, but it has also been underappreciated over the last few years, and I blame the industry because it relied a lot on the operational marketing, the tactical marketing, in the short-term outcome, invested in sales a lot more than it did in image. Now, I don't know what neuromarketing experiences, you should probably know, could potentially act on the intention of purchase. And they are probably being used at the moment in a dynamic way, because marketing is very focused on the sales, short-term, they worry about the next day, week or month and that is not how it should be. So, I believe neuromarketing is condemned to the same path as marketing is, unless you tell me that I'm wrong and that neuromarketing is expanding, but I don't know, I can't see that happening.

6. In the specific case of your company, have you ever used neuromarketing?

Interviewee: No, we have never used it. Like I told you, we paved that path for a while, but we never returned to it.

a. If you have, can you provide a comprehensive explanation of what has been done and how? (i.e., own resources or hiring this service from companies specialized in neuromarketing)

Interviewee: 6 or 7 years ago we were presented by our advertising company the eye-tracking technique, we were launching something, I can't remember what, but we conducted an optimization study on the website. And we resorted to eye-tracking and I remember that I reconfigured the website based on its conclusions. But I remember it was something very call-to-action, meaning, it wasn't a pretty picture and a lyrical text about car, it was something that had a button to generate a lead, so, it was very call-to-action, the way our eyes interacted with the screen was very important.

i. Do you consider that results were achieved?

Interviewee: I mean, I can't say tell you what it would have been like if we had made another attempt without the eye-tracking. Because we did nothing without it. That is always the problem with A/B tests, you never know, you don't test against anything, but the results were good, for sure. I don't recall them being significantly above average, but they were good results.

7. In your opinion, are there any limitations in the use of neuromarketing?

a. If so, what are they?

Interviewee: I don't know. Like I said, I am not a specialist. I don't have a precise thought on that

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: That I do. But they are the same ethical concerns we have regarding the digital, because digital marketing opened up a lot of communication possibilities, not infinite but very wide, like the segmented communication, hyper segmentation, that raise a lot of ethical issues. And then came the RGPD to polish it, it's like the digital stopped having the freedom it used to have. The RGPD brought some peace to it, which is not a bad thing because we were heading towards a type of communication that we can consider ethically intrusive. And there is nothing as bad as being intrusive. Therefore, all the ethical concerns regarding neuromarketing are pretty much the same, they are limits to the communication and they are limits to the intrusion.

The best messages are the ones we don't have to shout or be in people's heads in order to capture their attention, they do it naturally. The big advertising companies, that's what they do, they attract people naturally and quietly, they don't need to find a mad scientist to get into people's minds against their will. The good advertisement message sells itself. I'm not saying neuromarketing isn't necessary to adjust and segment the message, because we don't all react neurologically in the same way to the same message. So, I agree with all of that as long as it is done within the ethical limits. But about that, except for the privacy invasions led by Facebook and Cambridge Analytica and those personal data scandals that are in fact a threat, especially when it comes to the big ones like Google and Microsoft, I do believe ethics will prevail. Especially because we have a huge tendency to regulate everything in the world we live in nowadays. Legislate everything, there are laws for everything and against everything. It's amazing. For better and for worse. In this case, ethically for the best, so all is good. I'm optimistic in this matter.

9. Do you think that there should be legislation regulating neuromarketing?

Interviewee: Yes. It will have to exist, sooner or later, with the technique's evolution.

a. Why?

Interviewee: Because the person who sells, when comparing to the one who buys, is always trying to find something that will set them apart from their competition. The one who dominates neuroscience will probably penetrate better the consumer's mind. And that is the goal. And if it isn't regulated it will be anarchic, and we can't have that. So, yes, there is a need for that legislation, soft legislation. Just like in everything else, the common sense isn't enough, it might get lost.

b. If such legislation existed, what do you think is important to include?

Interviewee: I don't exactly know what but firstly, I believe that legislation should be included in the advertisement code, there shouldn't be a special legislation just for neuromarketing. If it is communication, and in a certain way, it is, then it should be included in the legal mechanisms that already exist. And the advertisement code is what regulates the advertisement communication. So, what should we include there? Rules that stop the consumer from being influenced by reasons they did not consent for. Meaning, they can be influenced by the behaviors to which they are exposed, obviously. Behaviors that people have, for instance, in front of a screen or in situations in relation to other senses, but they must be aware of it. It is

like giving consent for your data to be used. So, the limits have to be these, they have to stop the consumer from being exploited against their will. I can't do that, and If I do then I must warn them. If I installed a mechanism on my website that monitors where they look at, for example, then I have to warn them about it, they may not want to be a part of it. Nothing can be done against the consumer's will. The only ones who are not aware of what is being done to them are the guinea-pigs, poor things. But we can't be like guinea-pigs, it just can't be. Unless there is something in it for us, then we can choose if we want to be guinea-pigs or not.

10. Do you believe that neuromarketing developments could threaten the autonomy and privacy of consumers?

a. Why?

Interviewee: Maybe, it depends on how that evolves. I repeat, I am not a specialist, nor do I know the exact ways in which neuromarketing will evolve. I am speaking in a general matter and what I say is just that there are values that need to be preserved, like the respect for the consumer's privacy.

11. Do you consider there is potential for the use neuromarketing in your company?

Interviewee: Yes, but like I do in all marketing techniques. Again, we sell cars and we have brands like Volkswagen, Audi, Bentley and Lamborghini, of great prestige. So, I really do think so. But I don't know in which domains. Like I said, I am in the strategic marketing department, but I used to be in operational marketing for a long time, but now, since I am in strategic marketing, I am looking into different domains. So, I am not heading towards the day-to-day campaigns, but I think so, there is potential, of course there is.

12. And for companies in Portugal?

Interviewee: Yes, I believe so, especially because it is a differentiating factor and we need the innovation in the Portuguese companies. Now, which companies are you referring to? If you check the constituents of the Portuguese companies, you will see that 98% are small and medium sized companies. Then, of course, you have the big EDPs and NOS, the big investors, Vodafone's that invest a lot. But like I said, I'm not an expert in that area.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)?

a. Why?

Interviewee: I don't think so, based on the reasons I mentioned earlier. A focus group is very different than all the other conclusions you may withdraw from neuromarketing. A focus group is an organized group in which a group of conscious consumers openly discuss their job in that moment, and they each have different degrees of knowledge, they are not all specialists, they are consumers, normal and basic consumers that have no clue about sectors. So, we are there as consumers. And the organization that characterizes the focus group and what is expected from one seems to me a lot different, even regarding its goals. Of course, the main goal is to understand the insight, what is the idea that should be conveyed to sell our product in the best way possible, that's what a focus group is. And also, what are the reasons to reject and the reasons to prefer it. I believe the goals you have in neuromarketing to be different, they are not so much about what is said, like in the focus group which reports quotes about the product and its competition, it's very verbal. Neuromarketing is not like that. So, I don't see one thing replacing the other, they could for sure complement each other, but not replace.

14. Do you think you will carry out any studies using neuromarketing in the future?

a. Why?

Interviewee: Personally, no. But my job doesn't involve that so, no.

Interview Subject number 7

1. As a marketing professional, how do you define neuromarketing?

Interviewee: Neuromarketing is the science that studies consumer behavior in a scientific way, in order to improve marketing activities, not only in terms of communication but also in the transactional way of products and services.

2. Are you professionally interested in neuromarketing?

Interviewee: Yes, but in an academic way.

a. Why?

Interviewee: Because I see it as a path that is yet to be paved and as something not very well known. We know that people, especially in the area of, let's say, impulse buying, sometimes find it difficult to understand what leads people to buy what they buy. However, in our business what we call the active sale is very important. So, if people need gas, they go to a gas station and then, to us, it's relevant if we can sell, I mean, the shop sales are relevant because of the gross profit we obtain from store products versus gas- where the profit is very low. Therefore,

it is a business with a lot of volume, but very little profit and our results come from the fact that the volume is very big. In stores it doesn't work that way, so the sale is very interesting. When we do active sale exercises, it becomes very clear to us that the salesman outcome depends greatly on the approach they are able to do. So, typically we do what we call imposing a product. A totally different thing is to generate the need when we study that. I remember we studied that many years ago and we registered why some salesman had a totally distinct performance than others, and a gas station has between 500 to 2.000 clients a day, so we registered the number of transactions and the number of clients who had been offered something and then those who had bought something and their performance was completely different. And then, when we observed and spoke to some of them, we came to the conclusion that a lot of it had to do with the approach, with this ability to generate need. I remember a case, that makes this a lot easier to understand, in which we had a promotion back then that was, let's say, a bottle of water, so, we would ask "Luís, how do you do it?" and he would say "every time a new promotion comes in I think of a question to ask the client that will create the need for him to take it, and I try to make it as a question that leads to a positive answer, that is, if the client gives me a positive answer, then he is already more willing when I ask him, so I'll bring up a problem that he would eventually have and he will have to look for an answer". So, he would have an approach like this: "it's really hot today"- dehydration problem- "you are on the road, you should take some water with you" and the customer would say "yes, it really is hot..."- positive answer- and then he would say "if I were you I would take some water with me". And now, I see neuromarketing as something that has to do with sensors and cameras and understanding the behavior when people look at certain products, or at the shelves, what is their customer journey, as a much more scientific thing. Although more empirical, the previous example is still neuromarketing in the sense that it speaks about creating a need. It's not "don't you want a bottle of water? You should take one because I need to sell these"- this is imposing, and it does not work.

3. Do you follow neuromarketing research developments?

Interviewee: Some, yes. There are a lot of things that come to us through the APAM (the Portuguese league of advertisers), that is a part of the international federation, that is highly related to marketing and does a lot of work in that area and then, sometimes either the academy or the companies come to us with some propositions.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: We are still in its early stages. I have the feeling that some of the big distributors are doing something about it in the big distribution because they, at the end of the day, are looking to profit their real estate. So, the shelf they have available represents, to them, a cost. Therefore, they try to optimize it, and they either do it directly, by trying to understand how that optimization is done, or by delegating it on their suppliers or the partner's suppliers, or some even invite their supplier to manage the space in the best way possible in order to generate profit.

5. How do you find the application of neuromarketing useful for your company?

Interviewee: It may be useful in the specific case I mentioned previously, in what we call the non-oil business, which refers to the store sales, because they have a lot of impulse buying, from the moment the person walks in until the payment spot. And then, due to the change in the consumption habits, during the pandemic crises, we verified an increase in the home deliveries which opens up some opportunities for us. In the future, I see it as the convenience business, which, at the end of the day, it is, and the gas station itself. In the future, I see it as the cellphone to the client. So, this is where I get my convenience goods and services from, but then, in order for it to reach the consumer, there has to be a proximity physical network. Because products may be delivered through cars or drones or whatever but there has to be logistical physical bases in the proximities, I believe. Let's say I want to order a freshly harvested lettuce; I have to have a container that produces lettuce nearby. So, the convenience logistics network needs to exist in the future, for us and for our business.

6. In the specific case of your company, have you ever used neuromarketing?

Interviewee: No.

7. In your opinion, are there any limitations in the use of neuromarketing?

a. If so, what are they?

Interviewee: There might be limitations regarding, for instance, data protection. We know that many times it is difficult to do certain things, although it is possible to contour and find a way to collect data, there are ways to process that information thanks to the existence of smartphones, cameras and sensors available in the client's pocket, and it will get even easier as time goes by and technology evolves. A retail worker 50 or 100 years ago was behind its sale stand, the client walked through the door and he already knew what they were going to buy, because he knew that client always came by on Fridays after work to buy codfish. So, he could

start the approach or the transaction or the smart talk about codfish because he knew that was what the client was going to buy. Nowadays, technology exists so we do the same thing when a client walks in through the door, they bring a cellphone in their pockets and I am able to recognize that cellphone and I can have access, through the system, for example, to their latest transactions and display it on the salesman's screen the information that this client comes in to get tobacco, bread and water. That is possible. Now, all of this may be information from past behavior, and it might not be what neuromarketing is all about, in the sense that it works with real transactions, so it's more data management, than neuroscience. But we are heading towards that direction in which I will have my transactional systems, with real past transactions and then I have, let's say, softwares that connect me to the social networks and I can define feelings regarding that client and generate warnings and see comments that the client might be making about my brand and so, I can see my sales dropping with that client at the same time he is saying on social media that he stopped liking my brand or that he was mistreated here or there. So, that will all be useful for a very customer-centric approach. In that sense I see a lot of fast developments in that specific area.

i. In your opinion, how could these limitations you have just mentioned, be overcome?

Interviewee: I believe the existing limitations will be possible to overcome. The rules will have to be respected so, by asking the client's permission to collect their data which, technologically was the big barrier, they will start getting tackled, and that information begins to be accessible and therefore all the companies move into the multi-energy field, regarding the gas station but also the convenience business. But this integrated view of the client and data processing, the assessment of the client's data then connects to neuromarketing in a way that we start having the client's behavior pattern, based on its social media for example, and that allows us to have expectations of what we believe their behavior will be, rather it is in a transactional matter or not. We have places where we have the hospitality located in, regarding the sportive endorsement, for instance, if I have all the systems connected to each other and I know which client lowered the transactions or had problems with my brand, and they were invited to a football game or MotoGP or whatever it is, if I have all that information that could help me establish a connection with my client .

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: No, we just have to respect the already existing rules. Our employees have a lot of training in that area, regarding ethical workshops, compliance workshops, governance, competition laws. Those are areas that require a lot of communication and a lot of dialogue because very often people aren't sure of what can be done and what can't, because most of the time they are borderline situations. I mentioned earlier the inviting a client to a football game issue. In the past, that was normal, nowadays, I have had people in the public administration saying, "only if you write down that that is worth less than 150 euros". So, even though things have gotten easier to solve, there are still difficult situations that concern people's cultural habits. But that is a matter of compliance, it exists and we are trained in that area and people know the rules or they have anonymous ways of obtaining information regarding the data protection, compliance and everything you can and can't do, as well as some legal counseling available.

9. Do you think that there should be legislation regulating neuromarketing?

a. Why?

Interviewee: Yes. There is a lot already with the RGPD. But then I think that, somehow, there are a lot of people out there that are not very aware, and there are abusive behaviors so, in order to protect those people with less education or instruction to be aware of the abusive sale. Even recently we saw the news regarding a company that was condemned of selling contracts in a very abusive way and we know how that is done, they hire external salesman that gets payed by commission and then they become too aggressive while selling and commit errors and illegalities, but then we ask the company and they say "that was outsourcing, we hired that service", well, the consumer needs to be protected. Ideally, the conscious companies would regulate themselves, but there has to be protection.

b. If such legislation existed, what do you think is important to include?

Interviewee: That is a very wide field, regarding the prevention of eventual abuse. The consent issue, it has to be done very clearly and explained what it's for. I remember a few years ago, during a course about these issues, after all the doubts, we reached to the conclusion that the best way is the transparent way. So, imagine I receive a gift, and I have some questions rather it is reasonable or not, I have to inform myself, I send an email to my superiors and to the compliance saying "I was offered this gift and I feel like etc etc..." So, as long as we have that

transparency, the legislation should foresee means to enlighten those questions and that protect people from eventual abuse and penalize the offenders. But mostly, it is about protection, consent and more importantly, transparency.

10. Do you believe that neuromarketing developments could threaten the autonomy and privacy of consumers?

a. Why?

A: As long as there is a legal frame for the situation, I don't see what the problem is. I have some concerns regarding things that might get away from that legal frame, like the case of the countries that belong to the EU that then have servers outside the EU, and even though in some places it is covered by the rules of the EU market, in others it's not, and that's where I have some concerns. For instance, here, we have a lot of trouble in doing things and collecting certain data that we know Google or Apple have access to without any difficulty, but we can't, because that is not legal, but they can and they have it.

11. Do you consider there is potential for the use neuromarketing in your company?

Interviewee: Yes, in many of the areas we discussed.

12. And for companies in Portugal?

Interviewee: Yes, there is also potential. In Portugal I think that, because of its dimension, we are a small market and have a dimension problem. This used to constitute a bigger problem in the past, because of the products we have in the Portuguese market- niche products. By marketing in the global market, they are no longer niche products. In the past, centuries XV and XVI, we were capable of looking for those markets outside this country, in a time when it was difficult to work the global market. Now, when it is easy, we need to develop that ability and once again go abroad and do things outside of this country.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)?

a. Why?

Interviewee: In part, yes, they will continue to be necessary but there will be a great evolution and I think that Artificial Intelligence, that we didn't discuss, will be a key component in anticipating trends and understanding word clouds and searched words through our conversations in social media, and guessing tendencies and needs for products and services

through those tools. I will be watching the behavior evolution or the emergence of new trends and that will lead me to develop new products.

14. Do you think you will carry out any studies using neuromarketing in the future?

a. Why?

Interviewee: Here, like in many multinationals, a big part of the new developments is in the mother's house. Which doesn't mean we won't conduct an experiment here or there once in a while.

Interview Subject number 8

1. As a marketing professional, how do you define neuromarketing?

Interviewee: That doesn't exist. It starts off ruining marketing, that is for college, definitions are very important in college. I can give examples of things I've done that I consider as neuromarketing. A few years ago, we created a brand that was in the market, for our energy company, when the market was liberalized, about 12 years ago if I'm not mistaken and we resorted to neuromarketing a lot. When I say neuromarketing I am referring to the use of the senses. I don't know if you have that as the definition but that's what it is: searching for what we have best in our abilities and in our senses. In that time, we also launched a 5-dimension brand: the 5 senses, the sensorial. We introduced smells in the stores with the collaboration of a Portuguese company. And now, when neuromarketing is mentioned, it refers to an attempt to influence our tastes, our meaning the consumers, our clients, and I believe it should be the other way around: we should try to understand what is in their minds and what are their needs, instead of try to create a story. I believe this storytelling component is very important nowadays when it comes to marketing: knowing how to tell a story, but it has to be the story people want to hear, otherwise they will shut down. I think this part is more significant to me in everything you could possibly create, rather it is campaign or an event because nowadays, you can't launch a campaign, although that is not common in Portugal because of its costs, but I think that a campaign launch has to be with real people. A few years ago, I tried to launch a campaign that would be recorded with real people on the streets in real situations, and not very pretty situations, filmed with big budgets in studio. The problem is: the costs are very high and then there's always that legal and formal component and the data protection issue. But if people know what they are doing, they will no longer be genuine, and we won't be able to understand what they want, what they are looking for. And I believe that represents the biggest challenge

marketing and communication will face over the years to come. We have to innovate, surprise people but with things they effectively want. Nowadays, when you speak about creative agencies, you speak about one agency, when you think about creativity it is in terms of how things are presented, and I believe that creativity goes way beyond that. It's the way the campaign relates to people. Our company is going to launch a campaign regarding its new App and the teaser is going to be released today, it's a campaign that aims to present the new app, but it is not more than that. I work at a department where we don't have the so called "consumer experience", you either get to your office or your house and have our product, or you don't- which is rare. So, the whole "consumer experience" does not exist here. The closest we have is the satisfaction index, and people complain about our product being expensive but that happens in every other country in the world.

2. Are you professionally interested in neuromarketing?

a. Why?

Interviewee: I am interested, but not because of its definition. I think that is a very academical thing, I think you need to have a definition that makes sense when you're studying but then you will have to create your own definition of what is neuromarketing. 15 years ago no one knew what a stakeholder was, nowadays everybody speaks about stakeholders, it is a big world and you can fit anything into it. I am convinced the same is happening to that part of the neuromarketing, a lot of the marketing's future and its campaigns. It's an area that some people are working on but can't live on its own. You are probably thinking of neuromarketing on the consumer side, but you also need to think about the people that will work with you, on your team or in agencies, how are they going to position themselves. Because if we are talking about a sensorial component in terms of the consumer behavior, in order for us to be able to provoke them, they have to be engaged, they can't just be passive receptors. But this is my opinion, I have no problems in saying what I think but I haven't been in the academic world in years.

Obviously, if I had a company that had a final product, it would be completely different, the motivations we would have when creating a campaign or how the consumer is going to perceive us, or how is he going to interact with us, it would be very different, our product is an utility, we can create side products but at the end of the day we are selling an utility.

3. Do you follow neuromarketing research developments?

Interviewee: Yes, actually, 5 years ago when I was in Harvard, one of the modules we had was the case study (the methods in Harvard, I was enclosed there for 3 months). They would give us cases and we had to figure out how we could influence the consumer and how the whole ecosystem where the consumer is will behave, the companies and the marketing professionals.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: I think that, a lot of the times due to lack of money, we end up thinking about it when we start thinking about launching a campaign but then, when it comes to its execution or implementation, it is not a reality.

5. How do you find the application of neuromarketing useful for your company?

Interviewee: Remember what I just said earlier: we are selling an utility. I try to communicate that we have a good energy, our energy, the energy we produce, people's energy. That is the story, that is the rationale behind what I've been telling all these years, even before, when I was in another energy company, I started telling it in a very early stage. It is obvious that what we do here is trying to meet the consumer's needs. I will give you an example: we have 3 big areas where we have sponsors- the marathons and athletics, that we have had for years, and that is our energy, it is where we interact with people, and when you conduct a study to see what people most connect with marathons and athletics, the answer is our company. We added everything related to it all over the country. That's not all, we have had to cut our budget, and that is a constant war you have within the organizations. Then, we entered the music business, about 9 years ago, now, at the moment, we are very comfortable with the position we've established in this domain. But it's all about the budgets. Another area we are have entered is surfing, and that is all part of the experience, the activations we take to these different events is part of the experience. We are trying to appeal to people's feelings. Some are viable, some aren't. but it's an attempt the teams that work with me have to make, creating a relationship marketing, more perceptive, more within the consumer's behavior, of what we want the consumer to do and the response we want to our challenges. However, like I said, I don't have a product, if I did, I would act in a totally different way

6. In the specific case of your company, have you ever used neuromarketing?

Interviewee: Not in an isolated way, no. I believe that ends up being something inherent to when we are thinking about a campaign and its challenges- that we will present at the briefing with the companies that will enter the contest. I have a campaign that is not ready yet, I haven't done an institutional campaign in 4 years, and this is the time to launch it. Once again, I will try to do what I wanted- for the campaign to be done with real people- so that I can reach the consumer's feelings. I would defy a set of things and maybe then, neuromarketing will be more present in the sense of understanding what they want, and they do something for us, and we give something in return. Because that is life, we give with one hand and distribute with the other one. I think that is what I'm going to try to do, but it depends on the conditions of the market itself. This stoppage we've been having and that you've seen in the press, in terms of advertisement. But just so you know, our company is never present in the top 20 companies that advertise most in Portugal, so we wouldn't start now, during this COVID phase. So, we try to feed on this communication marketing, this relational marketing in a more connected way with the partnerships we have, in terms of events, media, challenges we launch, so that people feel some proximity and we are not just a light switch. Many times, we are associated with, not a light switch, but the absence of energy, when you get there and you don't have it.

7. In your opinion, are there any limitations in the use of neuromarketing?

Interviewee: No, I believe you have to be very careful in the sense that our freedom ends when the next person's starts. The protection data laws are much more restricted now. All of this needs to be handled with care, so that we are not intruding, even if it's not our intention, in each person's life. It's a motto I have: our freedom ends when the next person's starts, and then society needs to organize itself in this manner.

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: I do. That's what I was telling you about, when I say data protection, I am referring to ethics. I am one of those people that is able to sleep at night with my conscious clear and I am sure there are a lot of ethically correct people in the market. I am sure I am ethically correct, because of my colleagues, even my so-called competitors. I will never resort to means that may harm other people, that I won't do. Even in my team, we do a lot of things internally, like in any other organization and people always feel that we have more employees than in other organizations, but we use actually have a lot less.

9. Do you think that there should be legislation regulating neuromarketing?

Interviewee: When you legislate, rather it be to restrict neuromarketing or regulate it, it's always a double-edged sword. Because if you have the clear perception of where the line is, then there's no need for legislation. More often than not, legislation creates entropies within the organizations and then in the neuromarketing's development itself. Nowadays, we live in a world where each time there's a greater specialization within each area, it started in areas like medical science, law, engineering and now marketing, that has been increasing in the last 20 years. Now you have people specialized in the brand, brand studies, influencer's data etc. So, all of these areas end up being regulated many times by the common sense, only when there's trouble you resort to legislation. There are organisms and institutes that try to regulate the use of marketing and its rules. Now, I believe that having a legislation that is too specific may restrict the potential innovation that marketing could bring.

10. Do you believe that neuromarketing developments could threaten the autonomy and privacy of consumers?

Interviewee: No, like I said, as long as our freedom ends where the other person's starts. Nobody wants to be overwhelmed by anything, rather we are talking about neuromarketing or anything else. Very often, things said in a subtle way and more within what is the perception of the consumer's wants and needs, are more accepted and less considered intrusive. However, if we try, through very aggressive advertisement campaigns, to make them consume a certain product, then we are being intrusive. Some people, as well as the law, defend that products that are not selling baby products can't use a baby's picture. And, even though we have no problems in court regarding this issue, there are always reporters saying that we used baby pictures, so we haven't been using them just so we don't feed this gossip. Because it is obvious that the energy is present from the moment they are born, and throughout their lives, and we are not advertising a product, but there will always be people ready to criticize, that's normal.

11. Interviewer: Do you consider there is potential for the use neuromarketing in your company?

Interviewee: Yes, of course. It has to be integrated very well between the institutional marketing department and the commercial marketing department, and we need to see how we can maintain a strong brand, how we can influence people's consumption habits. Which we have done, a few years ago, there was this soap opera "Morangos com Açúcar" where we had the characters being more efficient when it comes to electric consumption, and sometimes a

card with the name of the brand would pop up. But this was done in a very subtle way, like: “let’s leave the house, have you unplugged the box?”- these were the messages we tried to convey, but it wasn’t appreciated back then but it is a reality, everything consumes. The world is getting more electrical by the minute, if we never unplug, the electric current is obviously still there.

12. And for companies in Portugal?

Interviewee: Yes, of course, but it has to be integrated within the company’s strategies regarding neuromarketing and communication. And that has to be foreseen because for that job to be done, there will have to be studies, and for the studies to be done, there has to be an investment, we need to have companies willing to do those studies. Internally, you can’t have teams developing studies, they can conduct one here or there but they can’t be on in everything, it’s impossible.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)?

a. Why?

Interviewee: Not entirely, no. I think they will cohabit for a while and learn from each other, because you will have to resort to things that are already being done today. I believe it will create the so-called Artificial Intelligence, in terms of what the consumers want and are willing to receive. And I think it will be very important, but you need to feed off what’s already here. Now, there’s room to take those areas out of the organizations.

14. Do you think you will carry out any studies using neuromarketing in the future?

a. Why?

Interviewee: Yes, I do think about it. But the future.... We contribute a lot to what our future will be. You are now finishing your studies and then you will enter an organization or a company. I think future is the right word, and the future only belongs to God, but we need to make it happen. Of course, it depends on the organization you’re inserted and its strategy. Our company is considered a small company in Portugal, it is way bigger abroad, but people are not aware of that. In fact, I spend most of my time abroad, I have been here almost made prisoner because of the COVID. But travelling around gives me a totally different perception of what the world is.

Interview Subject number 9

1. As a marketing professional, how do you define neuromarketing?

Interviewee: Neuromarketing...that is always complicated because the definition itself is very subliminal, am I right? I define it as the creation of positive associations between brands and products, in a non-explicit way, that we represent to people.

2. Are you professionally interested in neuromarketing?

a. Why?

Interviewee: In the automobile industry it's not something we work on. Especially when it comes to markets because I believe the brands have that concern, but not the markets. The automobile brands, when treated nationally, invest a lot more in consideration and in things that are directly linked to the immediate sale, meaning, there aren't many actions that imply neuromarketing, although some have more impact than others.

3. Do you follow neuromarketing research developments?

Interviewee: No.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: I really can't say because since it is not an area we are familiar with and I don't follow that marketing area either. I believe that the Portuguese market, when it comes to marketing, is considered mature so, from what I see in other areas, there are a lot of positive evolutions in this neuromarketing field.

5. How do you find the application of neuromarketing useful for your company?

Interviewee: The neuromarketing's definition itself goes way beyond studying the aspects that influence the consumer's decision so, indirectly, I believe it might be useful, yes. A campaign's aim is to convey positive associations- and this is very important because these positive associations influence the consumer in different ways, it impacts how they see the product and in consequence their purchase decision. I believe that, indirectly, every marketing action does it. But not in the automobile sector, because they are very oriented towards the conversion and not very oriented towards notoriety. We don't have the notoriety issue but when we launch a

car, then you have to work those aspects either through the design or the desire- these are all neuromarketing's characteristics. They are stronger than the ones you see on the street, that are usually about the price, the rent or the equipment, so, in regard to those campaigns, I believe so. However, never in the many years I have done campaigns have I ever said "look, we need to work the neuromarketing here"- but indirectly, I believe so.

7. In your opinion, are there any limitations in the use of neuromarketing?

Interviewee: Limitations, how?

Interviewer: Limitations regarding the techniques or the results you can achieve

Interviewee: Regarding neuromarketing, I believe that to be hard to measure- its efficiency. We have done those tests that were conducted all over the world, through MRI machines, where you see the neurological impact of some campaigns, but I never measured those type of results. I can't tell you if there are limitations inherent to neuromarketing, because it is difficult to measure its direct effects. It is something we all believe exists. It exists because we are playing with people's perception regarding a certain product or the campaign we want to do.

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: In what way?

Interviewer: By using any technique or any type of study in your company.

Interviewee: Ethical issues... we, as a matter of principle, in the many ways we interact with the consumer, the ethical dimension is the first thing we discuss. In a brand like ours, most of the campaigns are defined on an international level so, it is not really our domain, because most of the times, we are declining, regarding my personal decision as head of the marketing department.

9. Do you think that there should be legislation regulating neuromarketing?

a. Why?

Interviewee: Of course. Firstly, we are ever so more in a stage where there's legislation for everything. Secondly, any study that resorts to neuromarketing techniques must be legislated,

since we are talking about an individual in particular. So, yes. Nowadays, the RGPD is probably responsible for making that an obligation for the companies.

b. If such legislation existed, what do you think is important to include?

Interviewee: We are only talking about studies to assess neuromarketing's efficacy in terms of legislation, right? I believe confidentiality is the main requirement any legislation should secure, and that is obviously good to decrease people's exposure, and also, it allows the studies and projects that are based on those results to be a lot more credible. So, I believe the person's confidentiality is the key factor.

10. Do you believe that neuromarketing developments could threaten the autonomy and privacy of consumers?

a. Why?

Interviewee: If we have legislation with the requirement previously mentioned, then I don't think so.

11. Do you consider there is potential for the use neuromarketing in your company?

Interviewee: Yes, of course. For instance, I think everyone in the marketing area would like to know specifically, in terms of the consumer, what awakens in their subconscious- which is the area of concern when talking about neuromarketing- when they are exposed to our communication. I believe any area in any sector would like to understand those effects. But this also involves something we all have to face- the budget issue. And right now, to us, that would require an extra budget, so unfortunately, we will not be able to explore that.

12. And for companies in Portugal?

Interviewee: The same thing I just said. Although, I believe there are products and sectors that- you should know this better than I do- have resorted to neuromarketing studies to make campaign decisions.

Interviewer: Yes, there are, I know that the Chevrolet uses, or at least used, neuromarketing, for instance.

Interviewee: That is an automobile brand, you see?

Interviewer: Yes, exactly!

Interviewee: But they actually left the Portuguese market many years ago, in 2010 or 2011. They actually left Europe, not just Portugal, and they are a big American brand that stays active, so all those marketing sciences, that mostly come from the USA, they have access to, so it is not surprising that they've done that.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)?

Interviewee: Yes, I think so. At least I believe it can complement.

Interviewer: a. Why?

Interviewee: Because, at a subconscious level, maybe we will be able to observe and measure things we otherwise wouldn't if we were talking about a focus group- where people speak in a more reasoned and rational way- and the subconscious tells us more. It is exposed to sensations, to feelings, and that is possible to measure in neuromarketing, but not in a focus group. I can say I am happy and still be completely depressed, right? So, I believe some associations are not visible in the focus group and in other direct methods- when you are aware of what you are saying. For instance, if here, at our company, some client tells us they don't want to buy the car because they don't like it when the problem is in fact its price, maybe, a neuromarketing study would show us that they would be more influenced by the design or the way the car appears in the film, some "love brand" feeling. So, it is clearly complementary. If we had that study, for example, here at our company, I could say "look, the problem is this: they like the car, I am sure of it, they just can't afford it" and that would allow me to develop a financing campaign or a wider financing deadline, that would allow the client to buy the car that, although not admitting, we know they like. So, yes, I think so, I think it is totally complementary.

14. Do you think you will carry out any studies using neuromarketing in the future?

a. Why?

Interviewee: I hope so, or I think so, based on what I just said. However, I am aware that this is not a sector where we commonly resort to neuromarketing, to which you may reply "that is one more reason why you should do it", but I also confess that, due to budget issues, I've never explored it with the agencies we work with.

Interview Subject number 10

1. As a marketing professional, how do you define neuromarketing?

Interviewee: Well, I think I have to make a pre-conversion here, which is, in the context of what I know of neuromarketing, it is not a science that we use intensively in our daily activity throughout the year, at least at the local level. I am sure, and sometimes I have access to some things, that our company as a group uses this tool to identify business possibilities and adapt the products to their consumers. Therefore, I do not use it locally in a direct way but indirectly through the studies we conduct in the company. The way I see neuromarketing is the ability to study how our customers react to stimuli and to tailor our products to these possible stimuli and presumed desires of each person. As a person involved in marketing, I always believe that I can stimulate what I like best, what I mean is, we also have the ability to influence and direct people's attention to what we like, but certainly they always have their purpose and always have what affects them in a more intense way. And that's important to understand for someone who wants to get across a message, whether it's to sell something, whether it's to create an expectation, to create an interest, to direct an opinion, this does not have to be only about selling things, in fact selling is not limited to products. This is the way I look at neuromarketing, being that at a local level and not using neuromarketing, we have a set of tools that allow us to understand how, for example, our communication impacts people more, or less, and which influences what we are going to do next, or even what we are going to maintain. Let me give you a very simple example: when we analyse the audience profile or when we analyse people's reaction to certain communication pieces, we can adapt either the place we are at, or the music, or the tone, the light, the colour of our pieces to improve the receptivity of our communication, not necessarily a very in-depth neuromarketing approach, it has the same principle, which is to use the reaction that our clients or future clients may have, to improve our approach. Here we are talking about the communication approach, but it is also about how we can shape our products even locally, because of course our cars are made in Germany, but there are some things that we can do locally, whether it is tampering with the configuration of the cars, this is very much the case, for example, in our demonstration cars. Our demonstration cars are usually intended to create more impact on the people who drive them, and therefore have a set of features, either visual or sensory, in the act of driving, that make a person feel more enthusiastic about the product even though the car that you buy is not exactly the same as the one you tried. But the experience we provide makes you gain more affection for the brand and therefore feel more connected and more committed to the car. I believe it makes sense to link this with our activity because the way we look at marketing at a local level is like a service, I really like the

word service, it's like a support service to our activity, which is selling cars. It doesn't have to be completely biased towards the need to sell, but it certainly has that purpose because the purpose of marketing is to sell, especially here in our case.

2. Are you professionally interested in neuromarketing? And why are, or aren't you?

Interviewee: I have read some things about neuromarketing. I have never received training on neuromarketing, so it has been my curiosity and also the need to improve the effectiveness of our communication and our projects, that leads me to go into this area many times and understand better how the changes we make can have a greater impact on the people who listen to us and read us. Even to the level, for example, of experience at the dealership, because it doesn't have to be just a presentation, a television commercial, a billboard can also be the experience that is lived throughout the purchase cycle, because we know very well that there are key moments in our cycle of interaction with the client, some that mark more than others, and it is essential not to stop doing certain things. I give a very simple example, the moment of delivery of a new car is a high moment in the cycle of contact with our brand, for example, and there we invest in some sensations, in some environment that is created around the delivery of the car because it is a moment that we know is remarkable as well as, for example, a trip to the workshop is always an unpleasant moment, because everybody likes to buy a new car but nobody likes to leave the car to the workshop, even if it's just to do the simple maintenance that everybody knows it needs to be done, and minimize the impact of that experience, I won't call it traumatic, but more difficult on our customer, it's very important, and sometimes it's commercial measures that have a very deep impact. I'll give a very interesting example that is, for some years now the normal maintenance of our cars is included in the price of the car for four years, and the normal exchange cycle is around 4, 5 years, which means that if you buy a car, all the normal maintenance every time I put it in the workshop, when you pick it up you have nothing to pay. And this creates an élan around the relationship with the brand and creates a sensation of uncomplicated use of the car, which brings many benefits in terms of notoriety of the brand and also the connection and affinity they have with our brand. Sometimes we are working with a lot of affinity very fine analyses in the media we use, and then there are other kinds of measures that can have exactly the same kind of impact, which is why I say, it is not only in a TV commercial, but also in the real experience of contact with the brand that these sensations are very important.

3. Do you follow neuromarketing research developments? In this case you have already answered me, you told me that you are paying attention...

Interviewee: Yes, because of what I do and also out of curiosity. I like some areas that have to do with knowledge, with the human brain and also with personal development, and this science has a lot to do with getting to know ourselves, getting to know our brain, the way we chain certain events and how we let them produce emotions in us. These are all things that are very, very interesting for those who work in communication or who by the very nature of what they do or want, wish to convey a certain message. The areas of NLP, for example, are also very much linked to the way we communicate and how we leave our presence in someone, whether in gestures, or in tone, or in body expression, and are areas that I naturally follow. And they all gravitate around what we are talking about, which is how someone reacts to a particular stimulus and what can I do with that stimulus.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: I think most companies look at this, at least those I get to know a little bit, as something still a little alternative. I won't call it esoteric, because I don't think it is that either. Exceptions are made to good marketing departments, which exist, sometimes neuromarketing is even more present in small companies, start-ups, more linked to entrepreneurship because they always look for more innovative things and more effective ways to do the same thing, to get out of the status quo of the way of thinking and look for diversified ways to pass on the message, but I would say that neuromarketing tends not to be very present in the marketing departments of large companies, and the same is not true, for example, in advertising agencies and creative agencies, with which we all work. So I would say that in-house, or inside our house, this is not something that is very present but the knowledge ends up entering and I like the creative part very much, and I interact a lot with the creative agency, and sometimes things as simple as, we need more silence, less silence here, we change the colour, we don't change the colour, we put words, we don't put words, and this, has everything to do with how the message will arrive, whether we let it breathe or not, how deep we want to leave our imprint on the consumer, and these insights come and materialize into something, but they come mainly from the agencies that are more sensitive to this issue, and they have to use it to deliver messages, because then this leads to the levels of notoriety and affinity that people will get with our products, and these are KPIs that are constantly being analysed within the marketing

departments. So, I would say that the genesis is not very present, but the result invariably ends up being, especially when we talk about larger companies that have great control over the variables of their business, as is our case. I think it ends up appearing honestly. It's not something that is on the minds of the marketing departments of companies now. It usually isn't. At least what I know and know about the company, and I also know some colleagues in the company's competition, I've been in the competition, those that I haven't been in, I know them because our market is small. I also know the retail networks, which in some cases are already quite large companies with many people and already with a dedicated marketing department. I think that some concepts that are rooted in people's heads, and that's what I call, that can be found on page 2 or 3 of the textbook, is what is impossible not to know, but then things like the effect of light, the effect of colour, the effect of tone, of the volume with which the message is delivered, are no longer present in one's head, at least on a daily basis. So in short, I would say that I believe that there is a lot of room for growth for these inputs to be part of marketing departments and produce a positive effect, which is naturally what is intended.

5. How do you find the application of neuromarketing useful for your company?

Interviewee: As I explained earlier. For now, I find it very useful. I'll give you a current example regarding our communication: because of the brand we are and the segments we want to use, we have competition like everyone else in the market, and our struggle is to capture people's attention. Our main concern is that our communication pieces are seen by more people or reach people who have more affinity with our brand. And for that, we have to understand and get to know our audience better and adapt the communication to our audience. Music is a very important factor, for example. Choosing the right music. Besides music, all the rest of the sound that can be part of a communication piece, namely being connected to cars, nowadays the sound that a car makes is not indifferent, because of the growing electric mobility, for instance. The association with nature awakens feelings in people, who can connect them more, or less, to a car. Something as simple as, if I want to communicate electrical sustainability, I can't put motor noises, or if I put it, it must be the sound of the electric motor eventually associated with a nature sound. They exist in our mindset and are used in the mindset of who is producing these pieces. So that's the way we use them, and I think there's plenty of room to use this kind of stuff. I don't know about other industries because I've always been connected to the automotive industry in various brands, in various functions, but in this particular recent case, I think we are all working on this electrical mobility issue and how we can awaken people's interest in this topic, without it being just another car advertisement. Whether it is through the sentences we

use, whether it's through images. And I confess that we are experimenting here. Because we are in this phase, and for example, not on purpose, we are going to start on Saturday a communication campaign in which we have been investing a lot of time, it is a campaign with two phases and it has exactly to do with electrical mobility, and what kind of things do we put, if we play with sounds of nature, because we also have to consider the values of the brand. We have to incorporate this into our message, and just because now it's electric, the pleasure of driving does not have to be lost, but that pleasure is usually very much linked, in our case, to a certain dynamic, to a certain agitation. That's why the music we use is important to convey this. Then we have the sustainable part. I think in many people's minds you see the little birds and those futuristic songs. And this is difficult to blend, between a very dynamic approach, with this very quiet thing, and sometimes I think we've been passing along this image that this electric thing has to be a little bit cold, and I'd like to change that as far as our brand is concerned. It doesn't have to be at all cold, but there is a mindset ingrained that it has to follow strict rules, whether it's white or grey, and that it doesn't make any noise. It doesn't have to be that way. But in fact there is that association, and you have to be aware of that and realise that if you come here and throw a stone in the waterhole, you run the risk of either attracting everyone's attention or ostracizing a large part of the audience, and so it's a fine line that requires experience, as in many marketing situations, I think you have to try and risk being mistaken, as often happens. But that's not very different from life.

6. In the specific case of your company, have you ever used neuromarketing?

Interviewee: Not directly, at least locally. I'm sure it is with my colleagues at central level, where the marketing strategies for the group and the brand are actually developed. In fact, this turns out to be very interesting because when we start looking at the industry, we see that in reality there is no one who does things in an isolated way, and as I look at the industry and evolution, we see things changing from one year to the next, even things as simple as colour trends, which are used in the various brands, and from light for example. I like cinema a lot, but I especially like photography, and the trend of the moment is high contrast photographs, with dark areas of shadows, and we start looking at what is appearing in brands and what appears on Instagram, because today things are no longer disconnected, and suddenly everything starts to look similar. Everything starts to appear with a certain resemblance, and with a certain shade. I'm talking about marketing photography and commercial photography, it's not the photography we use to shoot our friends, although I follow some photographers, more, or less amateur, and they start incorporating these trends too because nowadays these

things don't take long to appear. In the past a photographic trend took a long time to spread. Now it's a matter of a few months and suddenly Instagram, the feeds, start to have a certain resemblance and this messes with our heads. Then we just have to choose which approach to take: not take the risk and follow trends and that's fine, but you end up becoming indiscernible; or do something different, capitalizing on that difference and drawing attention because of that difference, at the risk of people not liking it. Anyway, I usually think that those who take risks get better off because even if it doesn't work, they learn from it.

7. In your opinion, are there any limitations in the use of neuromarketing?

Interviewee: No. I don't think so. I don't even see how, because we can eventually think of some ethical issues, but it seems to me that if people are approached, even when we are studying the topics, straightforwardly, I don't think there is any problem with that. We are talking about getting to know society and getting to know the human being and integrating that. We have always done that, which is not very different from doing an autopsy, maybe this is a bit of an overstatement. I'm just opening up the body to know how it works, here you don't have to open up the brain to understand how it works. It is necessary to talk, and humanity has evolved with this in various themes, not only in neuromarketing, not only in medicine. So I don't think it's a problem in the first place. We can discuss perhaps one situation or another, but I don't think that a generalization makes any sense in this case.

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: I don't think so. I think it has to do with the way we use things. I'll give you a very funny example that is, NLP, most people look at NLP as a tool, and sales teams look at NLP a lot as a tool for influencing the interlocutor. It is true that NLP can be used to do this, it can be used to analyse micro expressions, it can be used to analyse behaviour, it is true. NLP also studies this, but NLP in its essence is a tool for personal development. It will change me or not, as I wish, and it can change my attitude towards the world and towards certain situations. It doesn't have to be a tool to manipulate. Like neuromarketing, it can be a tool for me to learn about the attitudes and reactions of certain people and to adapt my communication. It does not necessarily have to be a bad thing. So I don't see why this or that industry can't use neuromarketing to develop. All our lives market research has been done, and market research was no more than trying to understand what people thought of our products. It's not that different from what we're talking about here.

9. Do you think that there should be legislation regulating neuromarketing?

Interviewee: I don't think so, at least as far as I know, I don't see any need to do so.

Interviewer: Why?

Interviewee: Because like many other sciences and many ways of acting in society, we have other examples of sciences that do not have to be regulated. It is the same thing as saying that we needed to regulate meditation. You can do it, but only for ten minutes because if you don't, then you might get hurt. These are practices that can be used to develop our business, and I don't see where legislation can add any value. Can't I know a certain individual to a certain depth? I think the interviewee should have the responsibility to say: " Look, maybe I don't want to answer anymore". It is not a legislator who has the ability to know the depth of the intervention, or to say that it is legitimate for a company to know this or to stop knowing it. I don't see where legislation can add value, not least because there would be so many variants, either legislation was so open that it was like it didn't exist, or it was so restrictive that it was obtuse and would therefore inhibit the use of a tool that I think could be useful for everyone. And sometimes we talk about neuromarketing from a perspective of trying to reach more people and sell more things, etcetera. But it can also be used to minimize risks, for example. So it can even have a use that is didactic and constructive and increase people's safety when using any product. For example, any practice, this does not have to be just to sell something else, it is the same logic of NLP. It doesn't have to be just to manipulate the interlocutor. It may be to develop my behaviour in response to an adverse situation, for example, and I don't see where the legislation would add value.

10. Do you believe that neuromarketing developments could threaten the autonomy and privacy of consumers?

Interviewee: I don't believe so.

Interviewer: Why?

I've seen people who bought things they didn't really need. But this is very subjective, because the only person who can define whether or not they needed it, is the person who buys it. I have no legitimacy to judge anyone's purchase. I can admit that sometimes there are people who are so impacted by a certain brand, for example, that they make efforts that put other things at risk to get that product, and we in cars see that many times, but that's no different from banking and

real estate and so on. It is not the legislator who has to regulate that in my opinion, so I don't see that there is any danger in that.

11. Do you consider there is potential for the use neuromarketing in your company?

Yes. Interestingly, we are changing our CRM strategy, that is, the way we want to deal with the relationship with our customers, and that, for example, seems to me to be a big window of opportunity to increase the level of knowledge of our customers and it doesn't have to be, what are the most sordid thoughts they have when they go driving. But it is about practices and it is about, for example, sensations that can be pleasant to them when they contact us. And again, even going back to our previous questions, I think this is a good use of what neuromarketing is. In other words, improving the user experience with our product, and so yes, I see the possibility to use it even locally. We don't develop cars, and even the communication campaigns, the base, its structure, is provided centrally and then adapted in Portugal, having ourselves some flexibility to do some things. The direct experience with the product, with our dealers and with our services and everything else, can be influenced if we know the best way to please our customers. And sometimes taking a helicopter view at our services, it can allow us to see how small changes, which don't necessarily have to cost any money because that's the big concern especially at the moment, can improve the quality of our service and at the level of our brand, and we're doing that in terms of our CRM strategy, for instance.

12. And for companies in Portugal?

Interviewee: I believe that all companies that want to know their customers better and in what ways they can best serve them, have the benefit of these developments. Because neuromarketing can be so much: I'm going to change the colour of this ad because this colour moves this person more around this time of year; as it can be: I know that people have more affinity (I'm going to say a nonsense) in entering shops on the left side because it makes them circulate in a way that is more pleasant for them inside my shop. This has everything to do with the stimuli I provide to each person. This is as much for selling cars as it is for a pharmacy, because a pharmacy is also a business, and a big one. And that's why there's a limit to everything because neuromarketing, if you look at it, is a science that wants to get to know the human being in a deeper way and tries to understand what it is that moves us. To buy potatoes or to buy a house, all of this affects us, it is clear that in more emotional products the application of neuromarketing can produce a greater change. Going to the grocery store is more innocuous

than buying a house, for example. I know of some real estate training courses, and these courses have a lot to do with how you deal with people, with the words you say, or the preparation of the whole visit to a house, for example. So these things have more or less incorporation probably if the product is more or less irrelevant, or if it represents a more remarkable experience in each one of our lives. To buy potatoes, if there are many grocery stores, I am more detached, although even then if I feel good in a certain grocery store I will come back. I believe that the grocery owner's sensibility to this kind of matters is not as strong as for very large businesses. To say it can be used in anything, of course it can be used in anything.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)?

Interviewee: I think they have the potential for that, but it'll be different.

Interviewer: Why?

Interviewee: Because it is a more effective tool and because it goes deeper into the analysis it carries out. It is true that I can build a really intelligent questionnaire, that makes counter-questions and that revolves around it and so on, but neuromarketing tools allow to have a deeper and more genuine knowledge. And that's why I believe there is room to replace some of these tools. It is also true that it is a less known area and with less supply capacity, at least for now, and so things happen in a gradual way and maybe more innovative companies have much more appetite for this kind of knowledge, and also have another willingness to invest, and so yes, I think there is potential to replace. As far as our industry is concerned, it's the same thing as saying whether there is the potential to replace all traditional cars with electric cars, for example. Yes, there is potential, but not everyone is in the same position to adopt the change. Not all people benefit from the technology yet. So I would say there is potential for growth, adapted to everyone's needs. Maybe if we have this conversation five years from now, the scenario will be different and these kinds of tools will be more common tools within the national context.

14. Do you think you will carry out any studies using neuromarketing in the future?

Why will you, or why won't you?

Interviewee: Yes, I think it is in our plans, or it may be in our plans, things related to the experience of our customers, namely in dealers. That face-to-face experience, that is personal, that has to do with the shopping experience and with the experience of using the maintenance

services and so on. Even when it comes to buying, and the pandemic has really changed that, the traditional shopping experience of a car or any other product, in which we were going to a shop, has been changing and changed a lot in the last six months, and the way of buying is different. A few years ago we were seeing a gradual withdrawal from the stands. People were going, but they were going in a final stage. And if people are only going in a final stage, I need to work on the previous stages, which has a lot to do with digital and so on. And right now we're already in the next phase which is: " what if I sold a big part of my cars only digitally?" This is a big change of mindset. What was important in the direct contact with the person at the car dealership, and that was very relevant because 90 percent of the sales were done this way, suddenly is not so important anymore. I have to study more about what the digital buying process is and why, for example, a certain customer leaves my website at some point. And just reducing that dropout rate can have a big impact on sales, but I need to understand why he leaves, and sometimes customers leave for very simple reasons, and we often make changes to our site and realize, for example, that the average time on the site decreases, because sometimes all it takes is a simple photo that is not so appealing. To give another example, I invest in ads on Facebook, which are our biggest source of contact with a customer, I direct him/her to some page where I collect the data and contact the customer in the future. We feel that the type of key visual we use, or the type of image we use on the various data capture pages, has an influence. For example, the amount of data we request from a customer has a direct influence on the degree of success of the data collection, and we often even do some tests where we build two or three different forms for the same purpose, they are active on the site for a few days and then we abandon those with the lowest success rate. And this allows us to understand, sometimes even by segment, what people' affinity is with certain types of images: with more colours, with less colours, with more people, with fewer people, cars running, still cars. That's why at this stage we will have to use tools that show us the way, and I think that neuromarketing tools have a strong possibility of being used in our journey in the coming years

Interview Subject number 11

1. As a marketing professional, how do you define neuromarketing?

Interviewee: I'm not exactly a marketing professional, I'm a communications professional, I'm more connected to communication, and our department is also a communications department, not a marketing department. Still, we support the marketing area but through communication tools, that is, we do not work directly with the commercial and sales areas because we are the

communication department. I don't have much knowledge about this area of neuromarketing. It's not a working tool.

For you to understand, we at our company have several Marketing areas, and in Lisbon, which is where I work, we have two Marketing areas working, which are two areas that are more related to the sales part of air conditioning, heat pumps. In fact, there's a kind of relationship here, it's not that we use it on a daily basis, we don't talk about neuromarketing when we're at our meetings.

We do not talk about pure and hard neuromarketing, it is not a concept that is part of our conversations, but I think that in a certain way it is present because it ends up being a tool that is basically present in our work, because in one way or another, we study our consumer's behaviour, and when I talk about our consumer I do not only talk about the area I was telling you, the areas of heat pumps, or air conditioning, but then we ourselves as a communication department try to understand who is on the other side, so that we too are able to deliver products, and when I speak of products or services, so to speak, it doesn't necessarily have to be a part of a car, it doesn't have to be an air conditioner, it doesn't have to be an appliance.

Often it has to do with content that we produce and then obviously this also leads to purchase because we are here influencing the consumer's perception of a particular brand, and obviously the communication work influences in some way the consumer's buying behaviour, i.e. when a consumer, a person, goes to a shop to buy a product or buy a service from the our brand, they usually go because they have seen some kind of communication, and this communication has influenced their behaviour or their willingness to buy. And from that point of view, I believe that this neuromarketing tool is relatively related to our work, because we basically study who is on the other side, what the consumers' expectations are, what their background is in social terms, how they react to certain information content, what kind of information they like to see. In other words, I am not sure, but in fact there is a need to create a kind of relationship with the consumer through expectations he has, memories that he has. Also, because we are a brand that has been on the market for many years. And there is a kind of relationship here, there are many people who remember our brand when they were younger, or when they were children, and we try to work on these kinds of factors as well, basically to influence the act of purchase.

2. Are you professionally interested in neuromarketing?

Interviewee: Yes, and I believe it is the future, and if we go deeper into the issue of neuromarketing, we will see that it is not only this superficial approach that I have been talking

about here, that deep down what we do is not to explore even I would say ten percent of what the potentialities of neuromarketing are, but if we go deeper that already happens in other brands. In our case it doesn't happen because I believe that it happens more in the brands that are present in supermarkets and that there is also a need to understand shopping behaviours and what customers look at, how they behave in a certain aisle of a certain supermarket, how they visualize the products, which shelves are they are most interested in. And I think this has more to do with those big retail products, but I also believe that this is the future because today it is very difficult to understand consumer behaviour, because they are all very different from each other, that is, we can't work marketing in a pretentious way, so to speak, because if some time ago brands were selling because customers had no other choice, because they dominated the market and that didn't force them to be really inventive and be close to the consumer, I think that we are now going through another phase, which is, at a certain point we managed to touch several different consumers through a closer relationship, because I think that from the moment that brands realized that we had to be closer to the consumer, had to relate to the consumer, had to produce content that somehow sensitized the consumer, today that is not enough, i.e., the consumer has passed that phase. We have seen that making videos with normal people is no longer enough, we have seen everything, in terms of marketing, in terms of what is the influence of consumer behaviour, we have seen it all. So we have to move on to the next step, and that next step is to study the consumer in depth in what his behaviours are, and to study the consumer that way, we have to find tools that take us to a higher level, and we have to study, namely, what his background is, what are his behaviours. We see, for example, the tools that allow us to go and see where the consumer's eyes are directed to during a purchase at Amazon, what they do, and what are the things that attract their attention, the pop-ups that attract more attention, the images that attract more attention. All of this is information that allows brands to create very strategic content and to work on marketing in a very strategic way that is then translated into the purchase. But I think it has to do mainly with the challenges that the consumer himself places on brands, which is, we had a level where there was no competition, the brands did not need to make an effort, that is, when they worked marketing they worked it in a very macro way, so to speak, and they fired the tools towards a consumer that not even the brands knew very well, they fired everywhere and then reached who really had interest. Then, we went through a phase of individualization of the marketing itself, in which we knew that we had to create the content and that we had to work with marketing goals in a very personalized way, because only then will we be able to reach the consumer because the consumer sought to create very personal relationships with the brand, and I think we are already going through that next

phase, that is, we have already created that personal relationship, we have already worked that relationship to exhaustion, and at this moment we have to go through other paths that allow us to know our consumers in an even more detailed way, so to speak. Only through these tools and Neuromarketing in particular, do I think it will be possible to really know who is on the other side.

3. Do you follow neuromarketing research developments?

Interviewee: Yes, I read some things but I don't follow it very often, because in fact, my work is a little distant from this marketing area, because as I told you, I don't really work in the Marketing area, the Sales area, I don't worry too much about that area, I worry more about the Communication area, and especially after the PR part, but in any case I think it makes sense to realize how the machine works for you to be effective too when people ask for your support. And deep down, when you create messages, usually marketing people are more connected to the pure and hard selling part and its tools, as tools to help the buying behaviour, they come to us to work the messages, because deep down, that part is more related to the area of communication I think.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee : I don't know the reality very well in the Portuguese market, I know that especially in the American market, things are very advanced and that studies have been done, and that tools have been worked in order to make the tool more effective and take more advantage of neuromarketing. Here in Portugal I don't know, I believe that big retailers are working on this, especially SONAE, Jerónimo Martins, I believe that they do these studies because I think they have to. But I don't believe that other brands have the necessary tools and also the necessary resources to be able to apply the tools. I don't know, but I would say that if it were a reality in Portugal, it would only be with the big retailers, I think.

5. How do you find the use of neuromarketing useful for your company?

Interviewee : I believe that neuromarketing is extremely useful, as brands have once again stopped understanding customers, that is, they no longer know what they really want. We are all so different, we all have so many sources of information, and it is not only that, today you compete with millions of brands, not thousands, you open a social network, and you constantly have brands communicating with you, and the consumer is also a bit tired of this invasion, so

to speak, by the brands, because Facebook and Instagram are no longer social networks but brand networks. And in that sense, exploring other tools that allow you to perceive the consumer and what the consumer wants effectively, I think it makes perfect sense, and it is the future for brands and it is their way of also being prepared for the future, because otherwise they are overtaken by brands that are probably communicating more effectively or have more effective marketing tools, because having a shelf on a large surface today is not synonymous with anything. 10 years ago, having a shelf at checkouts meant a big investment for the brand, and it meant that people were buying from that brand. Today it doesn't mean anything, you can pass a shelf at checkouts and you don't buy it. And those tools are completely outdated, because applying those kind of marketing tools to your products today, is not analogous with anything at all. Today's shopping behaviour is influenced by many factors, and less by this factor, which is what is most visible. And I think you've also passed the brand identification stage, i.e. you're already on another level, it's not just brand identification. Often you don't buy a product with which you identify yourself, today you're looking for products that have a social or ecological purpose, so you're already at the next step.

6. In the specific case of your company, have you ever used neuromarketing?

Interviewee: At an international level I believe so. Because we work a lot on artificial intelligence tools and data collection, data analysis as well. In other words, these are tools that we use for our own products, but I believe that we then use them in other contexts as well, not least because we work a lot the industry area, and we also have a very strong means of consumption area. So, I believe that these are also tools that we use internationally. And probably used in countries like China and America where Markets are bigger, but in small Markets like Portugal, it's not that there isn't such need, but we are not yet in the next step because we still have the benefit of being able to sell through brand identification, that is, people identify the brand as a quality brand. We have been present in Portugal for over 100 years and we have always been identified as a brand with a lot of quality. Also, we are still a country, maybe I shouldn't say this but the truth is, we are still very much an old people's country, and these people still identify themselves a lot with these kind of brands, they are reliable brands that have crossed several generations and that have passed through these people's whole life. It is no wonder that people still identify our company with a slogan created for advertising, that our brand is good and people identify that slogan, and we don't have that need to work on those kind of tools yet, because we sell the product since people identify with the product and the brand. But I believe that in the future this will stop happening, and actually, this is already

happening, that is, people no longer buy just because they identify with the brand, there already has to be an additional effort, but in Portugal we are not yet in that next step, which is to study the consumer in depth in what his psychology is, his sociology and his anthropology. In other words, we have not yet reached that point.

7. In your opinion, are there any limitations to the use of neuromarketing?

Interviewee : I think that there are mainly ethical issues, and I think that the way we are going and the way we are positioning ourselves regarding the issue of data protection and respect for people's individuality, those who work in neuromarketing will have many challenges in this sense because unfortunately our society is moving to an extreme, that is, from what we see in other countries, that people by whatever attitude, whatever action happens that hurts people's individuality, there is always a revolt and people think that this should not happen. If we go to these kinds of extremes, and I think we see that in other fields of industry and commerce, where you go to a shop and you have to be warned that you are being filmed, whereas when you arrived at any shop a few years ago, people asked you for your phone number and an e-mail to add to their database to send you advertising, and today that is no longer possible unless you authorize it. All that in these kinds of tools, that is, they were also marketing tools and now they are limited by these issues, and I think that the exact same thing is going to happen with Neuromarketing. That is, they may be applied, but they will have to be applied with limitations and at some point, they will have to be regulated.

i. How could these limitations you have just mentioned, in your opinion, be overcome?

Interviewee: There are always steps that have to be taken and I believe that it will happen and maybe what is happening in other countries is that brands use neuromarketing as a testing tool, that is, probably the big chains in the United States use these tools as testing tools and are still in the analysis and testing phase. Conclusions will emerge and probably other tools that are more effective with the consumer will be applied. But at some point when this starts to be used more generally, most probably governments, the legislator will realize that it is necessary to regulate the activity because otherwise there are no limits since you can use Neuromarketing tools that are not invasive but at some point you can also use artificial intelligence, data analysis, video, voice capture, motion capture etc, and other types of even more invasive tools that enter into the domain of invasion of privacy and ethical issues, and at some point there will need to be an awareness by regulators to regulate this type of activity. Otherwise there are no more limits. You had to regulate the issue of flyers and leaflets in people's mailboxes because at a

certain point, you had more leaflets than letters. And when I say that, I say with other things, even advertising on television and radio always had to be governed by certain rules because at a certain point brands did what they wanted and said what they wanted. So I think that this is the way.

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee : Yes, also because we are governed by very strict rules regarding the relationship with the consumer and we position ourselves as a brand that is governed by ethical principles and that has its mission, vision, its values very well defined and applied in the relationship with the consumer. In fact, we put the consumer ahead of our activity. First comes the consumer, then our activity. In short, this is the way we work and in this sense I believe that yes, we first worry about respecting the consumer and this is how we develop our tools and I think this is how it will continue to be, in other words, we can even apply neuromarketing tools in our activity, to perceive our consumer, but I think this will always happen within the ethical limits and always respecting the consumer, at least on the Bosch side this will happen.

9. Do you think that there should be legislation regulating neuromarketing? If yes or no, why is that?

Interviewee : Yes, without a doubt. I think that's the way to go because, in fact, there must be limits, which you know as well as I do, that basically what brands are looking for, and above all, these big retailers that have a huge competition more and more, are always looking for more and more effective tools, which will ultimately lead to the purchase. This is what brands are looking for, and you know as well as I do, that this is a jungle and brands run themselves over and run over the consumer and don't care. If there is no regulation, at some point the consumer's privacy is invaded, invasive tools are used and they are not a crime, that is, when they are regulated they end up being a crime, but at the moment they are not, but in fact they are extremely invasive tools. I now suddenly remembered an example that was used in the early days of Neuromarketing, that I don't know if it was Coca-Cola but it was one of those brands that used micro images in a movie trailer in the cinema, where in the middle of the trailer there were images of the Coca-Cola bottle or the Coca-Cola brand (I don't remember anymore) in micro seconds and people didn't have that perception and, deep down, they are being swept away with the brand, which is the worst thing you can do in ethical terms because the person doesn't even have the perception that they are being invaded with advertising. You have those

kinds of examples, that if it's not regulated, you don't have the slightest perception of what you're being invaded with advertising. Basically, this is an invasion of your individuality, because you have no choice whether you want to see it or not, you are simply being invaded with this type of advertising and if it is not regulated, if there is no such regulation, the brands will obviously adopt these tools to the point of exhaustion and will use them without any kind of criteria. And the only one who is harmed, is the consumer himself.

b. If such legislation existed, what do you think is important to include?

Interviewee: Limitations on the use of this type of tools. Because deep down, you can use the data you collect, but only to a certain extent because otherwise you end up invading privacy. Above all this, and limitations to the exploitation of the types of data that are collected, because basically, it is personal data, and you know that with the increasingly widespread use of tools using artificial intelligence, data analysis, data collection, your individuality ceases to be a secret, and from a certain moment on you end up dealing with issues that are really ethical, individuality issues and the preservation of your intimacy that have to be regulated.

10. Do you think that neuromarketing developments could threaten the autonomy and privacy of consumers? And why?

Interviewee: No doubt, that's what I told you. I think that when you discover a certain tool, no matter how much you don't want it, there will always be those who want to explore it to its limits. And that happened with the atomic bomb issue, which serves a purpose that is beneficial, which is the creation of energy, but then also when it is exploited to the point of exhaustion, we have the atomic bomb. The issue of chemical tools, chemical weapons, in other words, if you go to the war industry you have several examples where you have tools that could be used for good and that have been exploited to exhaustion to be used for evil. And in this case, the issue of video surveillance is a good example. The issue of video surveillance, which would serve to protect people, is eventually used for surveillance to limit people's movements, to control people's movements and people's behaviour, and there are already regulations regarding video surveillance, because for example, you do not enter a shop without being warned that the camera is working. And neuromarketing is exactly the same thing, because otherwise what will happen is that you will realize that neuromarketing has other potentialities besides those that are used for brands to optimize their tools, and then they will obviously be used for less ethical purposes. Maybe to influence consumer behavior, to kill brands at the expense of others, and

all this has to be very well regulated because otherwise a cell is created here again as it was at other times when advertising was not regulated and when marketing was not regulated.

11. Do you think there is potential for neuromarketing in your company?

Interviewee: All the potential, for any brand. If well exploited and if well used, it only brings benefits to brands and often even to the consumer himself. Maybe the messages, the images, are better worked and for the consumer ends up being less heavy because he/she doesn't have to bear with advertising often boring, and maybe at some point you will realize that having a promoter doing sampling in a supermarket makes no sense. Maybe with the help of neuromarketing, we will find out that in fact, this tool does not make sense for certain brands. From that point of view, I think it does.

12. And for companies in Portugal?

Interviewee: As I told you at the beginning, I believe it makes more sense for brands linked to big retail, because the buying behaviour is not exactly about a need, because you don't buy a chocolate over others because it is a need, you buy because somehow you identify with the brand. And in this sense, I think that neuromarketing can help because it is much more difficult for you to understand your consumer's behaviour, and what your consumer's motivations are than, for example, when buying a household appliance where there are not so many brands, and when you buy, maybe you buy for the sake of quality, as I told you. In the case of our brand, it is mainly the question of quality and brand identification, as a brand with quality. When we talk about chocolates, where you have 50 different brands, or when we talk about toothpaste, where you have 50 different toothpastes, then maybe it makes sense to use these tools to understand what the consumer's motivations are.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)?

Interviewee: No doubt about it. Because I think that will happen, it is inevitable. And why is that? Because many of these tools have already become obsolete. They make no sense at all. And then it's what I told you: the behaviour, the motivations, the environment around the consumer, it's totally different to what we had when we applied those tools. These tools were effective when we had 50 brands on the market and we didn't have Instagram bombarding us with brands and products constantly, and through a questionnaire, you could understand more

or less what the consumer's motivations were. And even so, these tools were not totally effective, because you have variables that are very personal, very individual, that you do not control. Neuromarketing will allow you to perceive these individual factors, that you cannot perceive through those tools because you are already using other types of tools in neuromarketing that go much further, that allow you to perceive those small variables, that you cannot perceive otherwise. And it is not through a questionnaire or a focus group that you will be able to understand these kinds of things.

14. Do you think you will carry out any studies using neuromarketing in the future?

Interviewee: It is possible, of course, if the tools actually evolve. I'm not saying it happens in our company, but even if there is this possibility of using these kind of tools in our company, it makes perfect sense, and obviously I would like to be involved in this process because it helps communication and marketing professionals to have their work more effective, and in the end, if we can be effective in our work as a communication and marketing department, we are helping the brand to sell its product or its service. In that sense, I think so. I think it's the future, deep down it's the future.

Interview Subject number 12

1. As a marketing professional, how do you define neuromarketing?

Interviewee: I think it has to do with how our marketing tools influence the “neuro perception something”, in the way the consumer can understand what we are trying to convey to him. I think it has a lot to do with the sensations we feel through a particular communication, creating sensations in the consumer and in the person we have on the other side of our interlocutor.

2. Are you professionally interested in neuromarketing? a. If yes or no, Why?

Interviewee: I think any professional has to have some interest, because if we want to create lasting relationships with our consumers, we can't just go through pricing. For me, it's a bit ungrateful because the product we try to sell is a commodity, so it lives on price and location, which are things we can do very little in terms of communication. Anything that is done through rational choice, price, and our core product lives a lot from that, from the choice and price comparison that today's consumer does in a very fast way in any mobile phone app. So it's hard and we feel it when we try to create a campaign and when we think: let's design something here that creates a more emotional relationship with the consumer! With a commodity it is very difficult to create such an impact more related to neuromarketing. But we think about it

obviously, because I think that's where brands get their loyalty and here we have just one product working that emotion component in a simpler way.

3. Do you follow neuromarketing research developments?

Interviewee: I confess that not much.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: As I say, I haven't seen much lately on this subject, but from what I've studied and seen at one time, even for the studies, especially consumer behaviour, we were well evolved and there are already a number of tools that allow us to observe the purchasing behaviour and study a little more about this neuromarketing component, and what is behind the purchasing decision, which is basically what we are interested in. From what I saw last time, we were a little bit more focused on this topic, we were already quite advanced in terms of analysis tools.

5. How do you find the use of neuromarketing useful for your company?

Interviewee: We are very curious in understanding choice, and what is behind the customer's choices. As I said earlier, we have a commodity, and therefore the customer goes to the gas station out of necessity. It's a basic need like any other, but once inside the shop, everything he buys in addition to our core product has to do with that behaviour and those choices. This is what interests us, to understand how customers move around inside the shop, and for a long time I have been very keen to understand above all the differences in consumer buying behaviour when they go alone, when they go with a child, how a woman or man behaves inside a gas station, that I'm absolutely sure that they behave differently because of the slight observations we've made, we've already managed to understand that, but I'm sure that knowing the logic behind these movements within the shop, we'd be able not only to enhance the product and sales in shop, but also to have more assertive answers in terms of crossover products. I am sure that a parent who picks up a child from school and goes to a gas station to refuel, makes a completely different circuit than when he goes there in the morning before going to work, having a quick coffee and paying for the fuel. And I think this has a lot to do with neuromarketing, the choices and options he makes inside the station. I think it would be very interesting to know and to understand everything that is behind these behaviours. I think this is important for us as communicators, and the way we can communicate at different times with

customers, but also for those who manage the shops to optimize the products they sell, the places where they are located, to leverage that cross-selling of products according to the logic behind the customer's purchase.

6. In the specific case of your company, have you ever used neuromarketing? I understood you haven't?

Interviewee: No. The analyses we have made have a lot to do with consumption experience, and we have already conducted some, nothing very deep, very complicated, but above all, the observation serves as a basis for our analysis, for our daily work, which are residual things and not based on scientific data..

7. In your opinion, are there any limitations to the use of neuromarketing?

Interviewee: I would risk saying yes, especially now that we are impacted by data protection regulation issues. And it also has a lot to do with costs, because these studies have a price, and the organization sees no immediate return, so they are always second choices in terms of marketing budget.

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: This is a tough issue. I think that today, without knowing it, we are constantly being evaluated in how we are, this might not be exclusive of marketing, it is increasingly a reality. We are being monitored and this has to do with what we are talking about here, with people's behaviour. We've done these tests in our shops: a customer comes in, we have a certain software that detects whether it's a man or a woman, so the product that appears on the screen is more or less directed at them, and in retail there are already a lot of things in these developments, and I think that always raises that question. We are just doing a momentary analysis and this momentary analysis returns a product suggestion that will generally be more adapted to that female person of age x. It's all very relative. We see what women of age x consume, so we presented that product. If this might be ethically questionable, I don't think we are really getting into a fundamental ethical issue, it is true that we are doing an analysis there, but it is a momentary analysis, there is no data collection. So, I think it's all very relative. I think it is probably more questionable if we switch on to a children's channel, and the way in which advertising is working the minds of the little ones in ethical terms, may be more questionable.

I think it's more questionable if we do a basic research on the internet and then be completely bombarded with ads about that product, I think it's more serious than this issue of analysing purchasing behaviour through sensors, software. It takes a balance between things for ethical issues not to be so pressing.

10. Do you think that neuromarketing developments could threaten the autonomy and privacy of consumers? If yes or no, Why?

Interviewee: It is always a development risk because it depends on the common sense of who uses this technology. I think that as in anything, you can cross borders, there is such risk, but it also depends a lot on the limits of the person on this side. Maybe you and I wouldn't cross certain boundaries. Maybe other people who are willing to sell can cross it, but that's a complicated question, because I think there is such a risk.

11. Do you think there is potential for neuromarketing in your company?

Interviewee: I think brands are increasingly looking for ways to get to know their customers and consumers better. Not only because the competition is huge, but because the consumer is more and more informed, our opportunity for contacts is more limited, because I think we increasingly have a consumer who has less patience for second chances. So the better we know him/her, the higher our success rate. I think that if there is a budget, brands will use more and more any tool that allows us to know the customer better, and therefore neuromarketing is undoubtedly one of them.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)?

Interviewee: To complement. Because an analysis I perform of the purchase observation does not give me a logical classification for me to understand later. And that logical justification will only be achieved by questioning the person: but why did you do this and not that? Until they are really accurate, and I think that can take some time, I feel that they have to be complementary.

14. Do you think you will carry out any studies using neuromarketing in the future? If yes or no, why?

Interviewee: Yes, we have already researched prices, and as I tell you, in our budget balance we always must use what we can deliver. Every year we do a market survey to assess brand awareness. Especially because we still need it, we still need to understand how we are evolving

and how we are growing. I think that when we are comfortable with our position in terms of brand awareness and brand attributes, maybe then can we channel part of our budget to study a bit better the consumer and not so much the results from what we achieve.

Interview Subject number 13

1. As a marketing professional, how do you define neuromarketing?

Interviewee: It is a very interesting word, because for me neuromarketing has everything to do, when I look at this word, which is a big word, it has to do with the combination of a set of perceptions and understanding of knowledge especially in the knowledge area. It is how we combine a set of information in order to adapt our offers to what the clients aim for, or what society needs. Therefore, I see it in a broader sense, the gathering of a set of skills that can then respond to an interaction that can be achieved in an offer that meets the expectations of customers. So it's quite broad because from the point of view of the whole neurological part, it has to do with feelings and how this somehow manages to activate or awaken knowledge and behaviour on the part of clients. It is an extremely fascinating area, so I would say that it is probably still not a very disciplined area from the knowledge point of view, the way work is done, because I think there is a lot that can be gathered in this area of neuromarketing. But perhaps it is not yet that common the way we work integrally across all these areas. We use it a little here, a little there, but in the end there is no so-called Neuromarketing hat, at least that's the vision I have without much science, but that's what I understand, that's what you can call neuromarketing.

2. Are you professionally interested in neuromarketing?

Interviewee: As I was saying, we work with client databases, where the intelligence part is very relevant. I would say that all that involves customer behavioural analysis and how we can trigger and induce behaviour is extremely important and extremely complex from the point of view of the tools that are used, and very relevant from the point of view of a society that is constantly changing, where what was true yesterday is no longer true today. Often those La Palices that we knew "ah no but the customer's behaviour will be like that" is no longer so. So today, I would say that the more tools we have to be able to analyse the behaviour of our customers in an immediate way is all valuable, because it is not enough just to have information, it is very important to know how to manage it. And knowing how to manage requires a very large investment from a technological point of view, in order to be able to take that data and to be able to work on it and transform it into an analysis of what our customers are telling us with

those behaviours. Often for us, they are transactions, we don't see the customer like that but we see the transaction, we analyze the behavior, but I would say that an investment from the point of view of companies is very relevant, and it is very significant what you can extract.

3. Do you follow neuromarketing research developments?

Interviewee: Not much, I confess. We have been working more with the intelligence area in our CRM and segmentation area and we have done a lot of work on that, but usually all these areas are more developed at the central team level and we end up benefiting in local structures with a lot of this knowledge that is developed at the central level. Just to give you a bit of context, our company is a multinational company with a lot of dimension, however from a local point of view not all geographies have the same presence, in Portugal we have about 107 employees. We have a very relevant position from the point of view of market share, of being the number two in the energy area, we have a network of almost 500 gas stations. We have already reached 500 gas stations this year and yet we have a relatively small structure because we also benefit from many central structures which end up providing input from the research area point of view, so to speak, and from having more knowledge so that we can streamline the operation at local level. This whole area is very much worked on at the level of the central structures, which then support the local partners. We follow what happens from the national market point of view, but we absorb a lot of what comes from the central teams.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: I think things have evolved. There has been an evolution from the point of view of provision of resources and awakening of awareness. Particularly, I'll mention again the database issue, where suddenly data was key, and still is for organisations, but then the capacity to work on it is lacking. I think what happened many times was, there was a rampant race to get the data, then we had data protection with a change in data policy, which came to shrink a bit and do a lot of cleaning on the information that the companies had, but I think there is still a huge lack of capacity to interpret that data and analyse it correctly and turn it into actions that can effectively give value to the company. Because, as I say again, it is an area that requires a very large investment. Having a database, analysing it, that is, keeping that database active, is not collecting the data and then doing nothing with it, but having an active database, being able to analyse and then being able to apply that knowledge, there is a very large investment by organizations both in technology and in human resources in order to be able to put that

knowledge to the service of the business, and usually these are things that take time. Often what happens, and I see it a lot in the organization, is that everything that has to do with the behavioural part takes time. In other words, we must give time to observe behaviour. And somehow we're even following the food industry, we're at a very relevant level of frequency from the point of view of customer behaviour, for example, while I tend to go to the supermarket every day or every week, I go to a gas station two or three times a month. Compared to other types of consumption it is a high frequency because, for example, I don't buy clothes every day, I don't go to the pharmacy every day, fortunately, but I mean, most other sectors don't have such a high frequency, which despite being three times a month, is a high frequency. With the natural exception of the food industry area, but the reality is that I need to take the time to observe behaviours happen, to see reactions happen. Often the urgency of having a business response to be able to fight competition, or whatever, is so fierce that in fact we don't have that necessary time, but it is very important for organisations to realise that we have to give that time to see things evolve. And to be able to have an analysis, to be able to see that evolution from a behavioural point of view.

5. How do you find the use of neuromarketing useful for your company?

Interviewee: Just to get an idea, we have a database of nearly 2 million active customers with our loyalty program card. For about seven years now we have a partnership. And that's a lot of information. It is one thing to have a critical mass, but then the next step is to know how to work it in a disciplined way and integrating all the valences from a knowledge point of view, where neuroscience is effectively relevant to be able to transform this into value for the company. Working with databases of this nature and conveying it and conducting surveys and analysing other types of interactions with clients beyond what the transactions tell us, requires an inter-discipline and an investment from the point of view of large structures.

6. In the specific case of your company, have you ever used neuromarketing?

Interviewee: As I told you, probably yes, in the central teams, not locally. So not on that designation, we have other initiatives where we collect information, but in a structured way as I was saying. We don't have that history even though we absorb a lot of the information that comes from the central teams.

7. In your opinion, are there any limitations to the use of neuromarketing?

Interviewee: I believe that there are always limitations in all areas of knowledge. I think that today we have at our disposal such a vast area of knowledge that we end up saying that there is one area that is more limited than another, it doesn't make much sense because I think these things should be seen in an integrated way. I think that from the point of view of the marketing professional or any other professional, but specifically here as a marketing professional, trying to use only a certain information or a certain science to be able to analyse and decide on your work, is very short. Today we live in a world of great versatility, of great interdisciplinarity, and that is very relevant, not to be limited from the point of view of our knowledge analysis. I think that what is important is to find in each area the relevant expertise to combine these initiatives. This is also because professionals are being asked to be more and more versatile, because I think what is important here is to make a discipline of what I want to get from this area, what I want to get from another and to be able to combine this information in the best way. I would say not using a knowledge-tight area to be able to focus, but rather diversification.

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: Always. I think ethics is something that is part of our values, and everything we do has to do with our policy, and ethics is one of them. I would say it is very important to know how to use any discipline or any science or any activity with the fundamental values that companies govern, and people in particular. Therefore, ethics is part of our code of conduct. It is reflected in everything we do. Therefore fundamental, not only in this area but in all of them.

9. Do you think that there should be legislation regulating neuromarketing? If so, why?

Interviewee: I think that there are important areas that legislation helps us to limit some fields from the point of view of potential abuse. Of course, we know that these fields, these limits, are always exceeded, that is, whenever it is possible to establish these limits, it then helps us to intervene if things are not used in the right way. So I think that it is not from the perspective of castrating the best of science or of a particular discipline one can get, but I think that it is very important, especially with the extension of knowledge, as far as we can go, I think that it is important to have legislation that helps to mark out the fields of intervention.

Naturally, with the developments that one can work with, it is also important to allow things to evolve in the right direction. But I think that in that perspective, to have some concrete definition of legislation, I think that is a good thing.

If such legislation existed, what do you think is important to include?

Interviewee: I think that everything that has to do with people's information today has been attempted but not in a fully disciplined way with data protection. Because I think it ended up becoming excessive. I think things weren't well done. What I think is that there must be a respect for people's privacy and this legislation must be in place and the client must be given the right to exercise these rights, with balance, because in reality people have this right. But we also notice when people see value in giving their data, from the point of view of retribution, we, from a company's point of view, can only give more to a customer if he/she also gives us more. Of course, there are limits, but the power to turn on or off the tap, let's call it that, will always be on the customer's side, it's something that is important for me to be able to keep my privacy. This is something that assists us. So, I think there is a lot of work to be done on this area, because let's see, I think it is still an area with a lot of undiscovered activities, and a lot of limits yet to be established. So anything to do with the area of protecting the individuality of information, which is a big challenge because if we look a little bit into the future we can't do anything without the data, we can't work if there's no data to work with, and of course that imposes, or jeopardizes, people's privacy. So, it is a difficult dichotomy to solve. If on the one hand I don't want to be exposed, on the other hand everyone knows what I do. So, I think that we have yet to work out which areas are fundamental for regulation, but naturally the area of data protection is a very important one.

10. Do you think that neuromarketing developments could threaten the autonomy and privacy of consumers? If yes or no, why is that?

Interviewee: I don't think so. I think that if you do things with respect and with the ethics that we talked about earlier, I think they can only help. Because I think the knowledge is so deep and so huge that we still have so many areas to work on as long as they are done with the proper ethical principles without overcoming those barriers. So by having the right values, you get the best that science can give us in the service of knowledge. If we do it that way, I think we all can win.

11. Do you think there is potential for neuromarketing in your company?

Interviewee: Yes, I think I already answered that. I think that everything that has to do with knowledge development, in better understanding our clients' behaviour and the way we should act is highly relevant for any company that develops offers and wants to interact with its clients in the best way.

12. And for companies in Portugal?

Interviewee: I think I will say again, anything more that we can have to be able to analyse, interpret and understand that what our clients tell us is fundamental. It is difficult to maintain these communication structures, and looking at the Portuguese business structure, which is about 90 percent SME's, the investment effort that is required to maintain these structures of analysis and knowledge about commercial activity is heavy. On the other hand, I think that the big challenge that exists, because I still think it is a very important discipline, I think that we have to create ways to be able to put that knowledge at the service of smaller structures, as is the case of our Portuguese business structure, that is, how can I provide accessibility to a smaller company to be able to benefit from that area of neuromarketing. And not only make this something that big companies can use because you have to invest resources and because it is expensive, and because this kind of knowledge requires more investment. I think the big challenge is that in Portugal it is important, but there has to be an adjustment of how I can make this knowledge available to smaller structures.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)? If yes or no, what is the reason?

Interviewee: Marta, honestly what I have seen is that we often group things together in the way we work. But then we see tools and the ways they interact, and they are all there from a principles point of view, we just call it different things. I think we can't forget, especially in the marketing area, that we have a great wealth in the way we analyse our customers and we have many tools. As time goes on and society itself evolves, even what the customer does today, with the speed at which he/she demands information, for example, gives us the ability to adjust all the tools we have at our disposal. So, I think it is wrong to use only one instead of the other, we have to be attentive and understand what are the instruments that we call in totality neuromarketing, or that we call another type of discipline. I think the important thing is to go to the essence and understand what tools are within these areas and pick out what suits us best. Of course, there are some that are more outdated and that we use today. I think that throughout

these six months that we have all lived, there has been a lot of evidence that technology can, in a much faster way, be applied to many challenges that we have, so the fact that we think today: "Oh no, I was only going to do a face-to-face meeting, but now I can turn on the computer and talk to that person". If you look at it, it was in such a short period of time, that suddenly people got used to talking with the computer and people who never had that regularity, and suddenly the human being gets adjusted and is even more comfortable. By chance, you spoke about the focus groups, during the epidemic we had to prepare the launch of a campaign, and one of the problems we had was: "How are we going to do a focus group in the digital area, we never did it, how are we going to do it now?" But, it happened, we did it, we ended up gathering that information. I think the human being has a great capacity to adapt, we just need to help discipline these changes and get the best out of them. I don't think it's a science that's going to end the other, no, I think there are natural evolutions, that are result from a greater development of knowledge of each of the disciplines, of technology, of the human being's own behaviour, which end up helping to format, because then it ends up being a little bit of a trend issue, and we don't end up extracting the best that something new has. I believe we should always build on what we already have and not try to categorize. Of course, I understand that from a marketing point of view, there's a bit of a trend issue: "ah now we're going to use this and everybody's talking about it". In fact, if we look at the essence of them there is a lot that already exists and that has been improved.

14. Do you think you will carry out any studies using neuromarketing in the future? If yes or no, why is the reason?

Interviewee: It is much more important for us to analyse and evaluate customers and what they are thinking and doing. During a transition process, where the company is undergoing such a transformation, it is even more important to stay close and have the tools to be able to assess the customers' perception of the change the company is making. So, in all areas, not only in the reputation area, but also in the offer area and the new way we are organised, how are customers then able to react to these new realities. This is certainly an area with potential.

Interview Subject number 14

1. As a marketing professional, how do you define neuromarketing?

Interviewee: Neuromarketing as I define it, are techniques used to understand how marketing activities influence consumers' actual perception of a brand or a campaign, whatever you want to be communicating, reducing to a maximum the filters that are automatically placed by us as

subjects, by consumers as subjects. In other words, when you conduct opinion polls about what the effect of a particular communication, execution or perception of a brand is, people respond by taking into account not only what they really feel about that brand, but also what their responses will project from themselves to others, and to themselves, so when I give certain responses I am projecting an image of myself to those who are listening to me. It may just be the interviewers, or if it is a focus group, for example, a wider audience, or even if it is a debate that accompanies people. We build an image of ourselves and the answers we give even to ourselves, if no one was listening to us, build a narrative of what we believe we are. What neuromarketing does, from my perspective, is to eliminate these two filters, and they are two different filters: one is our projection of our image to others, and the other is the projection of our image to ourselves. What neuromarketing does is to try to go deeper into what people actually feel about certain aspects that are under study, or that are targeted by neuromarketing. So it studies more deeply the sensations that people have about a certain brand, campaign, communication, whatever, that is the target of the subject, and it is a very interesting tool for that, but it should be used by professionals understanding what it is, that is, the consumers' subsequent decisions, which is what we are ultimately trying to influence when we do marketing in general, they are not only derived from what those deep sensations are, they are also derived from the other two filters that I mentioned: the filter relating to the image I project of myself when I make this decision, and the image I project of myself to others when I make that same decision. Deep down, neuromarketing gives us a deeper understanding of the consumer and how what we are doing influences what he or she feels, but it does not give answers to all the questions because the other two filters are still present.

2. From what you have just mentioned, I can conclude you are professionally interested in neuromarketing...

Interviewee: Yes, I have used it several times.

3. Do you follow neuromarketing research developments?

Interviewee: I follow it, but from a distance. I think the right answer is, I don't follow. Because I know it exists, I know it's there and I know it's a tool used when there's a precise need. I try to use these tools to give me more insights and more information about what's going on in that deep layer of, say, consumer perception, but I don't read articles about it every week or every month, definitely not that. I know it's a tool that's there, even when I see traditional studies I try to disassemble, say, the variables that I have to study, I try to study, I try to understand that

dimension, the various levels of depth that can be there in terms of the answers that we are getting. As I say, I have already used it several times, and I intend to use it more in the future when a circumstance arises where this deep analysis is relevant, and obviously neuromarketing has these advantages that I have mentioned, but it also has some disadvantages that are: it is a deep, and therefore time-consuming study, typically done with fewer people and which requires a high degree of involvement from those people. It is something that is interesting as a complement to a more comprehensive study, that is, when neuromarketing is applied in studies, it has principles that are even relatively intrinsic to communication professionals, it is almost instinctive to use some of the principles that are behind it, such as tampering with the deep emotion centres of the human being, it is almost a discipline that is studied at the level of psychology, that integrates the practices of marketing and communication professionals in particular. But when it is necessary, or when it makes sense to conduct a study due to the characteristics of neuromarketing, I tend to use this in addition to other tools, with other types of methodological approaches at the research level, to have a more comprehensive view.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: Very much at the beginning. I don't know what development stages you define conceptually so I can fit in, but I first worked with neuromarketing seven years ago. At that time I believe that in Portugal it was really the beginning of that discipline, even at the academic level. A few years later, four years ago, I started working again and there were already more approaches, more companies, more professionals, working with these tools, so it was already a little more widespread, but I think it is something that is still very much in the beginning. Few people know, few people are aware of how to use it without getting into fallacies in various ways. It's not a crystal ball that gives all the answers because the other filters are still there, as I was saying before, but it's a crystal ball that can really give more visibility about what goes on in the different layers of depth, because we are all kind of an onion, we have a series of layers and this is a tool that allowed us to go a little further.

5. How do you find the application of neuromarketing useful for your company?

Interviewee: I find it very useful provided it is properly targeted to specific challenges. As always in all consumer research tools, the way we research has a brutal influence on the results, which is why it is very important to know how to be knowledgeable and have experience in marketing studies, because there are many fallacies that occur if we do not structure the research

we carry out with the proper markers, thus oriented to a clear objective from the start, trying not to constrain the result of that research with the perceptions of the researcher him or herself, so we also try to work with partners, and at our company we work with partners both in neuromarketing and other areas of consumer research. This helps us to distance ourselves, obviously we will have more expectations than that partner about the results of that study, and so we are probably worse evaluators of a good methodology, or of a good working method, than someone who is a professional in the field and works both for our company and for other companies. We try to limit the bias that always exists in these scenarios, and that also exists in neuromarketing. But back to your question, it can be a very important tool, as long as it is used for conscious purposes and its potential and limitations are taken into account.

6. Having already used neuromarketing, can you provide a comprehensive explanation of what has been done and how?

Interviewee: We did a neuromarketing research when we rebranded the brand in 2016. We did in-depth research on what this rebranding had brought to the brand. There was a big challenge, which was not to lose anything of the brand's heritage in certain aspects of consumer perception, and to add new aspects. It was when the brand celebrated its 20th anniversary that this rebranding was carried out, and it was aimed at transforming the brand in the sense of making it more technological, more inspiring, but not losing the feeling of proximity and good price, and what was done was a work of communication design both above-the-line and below-the-line, graphic design, all to meet what were suspected to be good options to deliver this result. At the level of creativity too, of media, radio and TV, and then we went to study what had been the impact of this change in the post-campaign. It wasn't a pre-test, it was a bit of a post-test. We had already made the change, and we studied with various tools. We did traditional studies, focus group studies, questionnaires, etc., to have a qualitative and quantitative perspective, and then we complemented that with neuromarketing analyses with a much more restricted sample of consumers. To do this, we asked a partner to form a kind of consortium between a so-called traditional market research company and an academic neuromarketing company from the University of Minho with whom we had previously contacted, and asked them to collaborate in order to create a methodology that had all three aspects: qualitative, quantitative, traditional and neuro, to make a proposal that would be consistent and subsequently there would be a research result that would integrate the different aspects that these various methodologies bring us, and therefore, specifically in neuromarketing we study things like: are we or are we not getting the eye of the consumer to go to the right places in front of a graphic piece, to the places that we

want? What emotion are we stimulating most when we see this TV spot or this radio spot, and what perceptions remain in the end regarding what the brand was before and what the brand is now. And, therefore, there was a lot of this kind of stuff, which perception remains regarding the importance of the price factor for our brand and the opportunity that the brand gives to the consumer when deciding to buy at our brand, in having good offers, good value proposals, so this was the kind of stuff that we studied with the neuromarketing tools.

i. Do you consider that results were achieved?

Interviewee: Yes. They deepened the results we were finding in traditional qualitative and quantitative studies. In general, it did not contradict anything that was found in those studies, but it did contribute to being more incisive in understanding what we had found, what we were provoking in the mind, in the consumer's perception, with that change. So I think that they were fully achieved, they left us more reassured that it had been a right bet in terms of business decision, that we had found a path that made a good balance of everything we wanted to keep in the brand, and of everything we wanted to add to the brand at that point, so it gave us some insights to further improve what we used and what we came to apply, and to improve graphic executions, particularly in certain aspects. I can even tell you that I wish I could re-run such a study soon, to understand what has changed in the meantime. As it was four years ago there were many things that happened and it would be interesting to understand what has changed since then in the consumer's perception, using again a combination of methodologies, because one thing is what we feel in the depth of our being and our emotions, and another thing is how we use it to make decisions. And then these other two filters that I mentioned are involved, and are super important to determine whether I decide to buy here or there, buy this or that, spend x or y. There is so much that happens that is not at the level of deeper emotions and that conditions it, so I am not imagining a scenario where neuromarketing can be a unique tool, I always see it as integrated in a more comprehensive methodology, basically peeling the onions layers. We have a layer, which is what people say when questioned in a group, socially influenced by others (because we all are), even if we are in confinement. We are highly influenced by what we hear, read, and project from ourselves to others, and so we're going to try to eliminate that and do a more quantitative questionnaire, where we use the clues we collect in this scenario to investigate in terms of numbers, what are consumer and thought groups, not all people being the same, and then we're going to try to understand more thoroughly how we're affecting people, to see if we're affecting them in the best way possible at the deepest level, so that then the surface layers act on those deeper layers, which we already know is the case. So

I wish I could use this tool, this line of scientific knowledge once again, in aggregation with others, to understand what people are feeling right now about our brand and how it performs in the market. I don't have that predicted in the near future, there are many big challenges here, this is quite time-consuming, it needs a lot of dedication, time is always in dispute with other things and therefore I don't have that predicted, but I would like to.

7. Do you consider that there are any other limitations to the use of neuromarketing, in addition to those you have already mentioned?

Interviewee: I don't know how it is now, but four years ago we had difficulty in recruiting, for example, people who were willing to participate in the study, and so the timings were longer because we had a lot of withdrawals. What my experience with neuromarketing has shown me is that, it is difficult to recruit, and we have many last-minute dropouts. I don't know if that has changed in the last four years, but there were a lot of people who were scared of the paraphernalia it takes to do these studies, and even having agreed at first, when it comes to the moment of truth, they say, "hmm, I don't feel like getting these extensors in my head, I don't think so", and then walk away. So one of the limitations is the difficulty in time and money, because this naturally translates into cost, of having a minimally comprehensive sample. We are always talking about a totally different reality here from other market research methods, but you must have a sufficient number of people for these studies, and the profile of the people cannot be the psychology students either, because that is another classic difficulty here: for a long time, the people who were most willing to participate were those who knew the tools best, that is, almost exclusively students of psychology, neurosurgery, neuroscience, who are obviously not representative of an average Portuguese. Although the concept of representativeness is very different at this level, we don't need to have a socio-economic representativeness of age, gender, etc., as we have in others because there is a deeper layer in which we are all more alike. I am not an expert on this subject, but I can tell you what is the minimum diversity that we have to guarantee in this small sample to study this level of depth and be able to draw conclusions for a human. That is one of the limitations, the difficulty of making it happen in timings and within costs that are feasible. Another difficulty that I have is, until the time that I investigated this seriously, there was not a company, there was not a partner that did all this, that combined the so called traditional methodologies with this one, and it was my job and my team's job, as a client, to choose from the various usual market research partners, the one that we thought had the most suitable profile for this collaboration, with a company that was very different in nature, that of neuromarketing. The company also had to be flexible

enough to understand that the results had to have at least a common thread and consistency. So, trying to be more objective regarding the limitations: the first is the cost and time I mentioned before, the difficulty of doing it in practical terms, and the second is to find companies in the market that dominate the various study techniques, so that they can bring a complementarity between them, being aware of the good and less good things of each of these methodologies, and using them in articulation to take advantage of what is positive, and minimize what is negative.

i. In your opinion, how could these limitations you have just mentioned, be overcome?

Interviewee: I think they will be overcome in time. They are probably better now than four years ago when I used these methodologies, because as neuromarketing is more known, there are more people working on it, there are more experiences of combining these methodologies with others, there will be more clients interested in using these tools and this will stimulate more companies to know how to do it, and to do it well.

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: This is a very important issue. That's the good thing about working with academia, from my perspective as a client. I knew quite well the team that was working on these realities in academia, who were working so that the studies done could become commercial proposals, proposals that are sold to companies that buy these studies. Everything I heard and discussed with them in terms of ethics made me rest assured from two perspectives: a purely conceptual one, which is, those people were absolutely aware of their ability to influence their own results if they did certain things, and therefore consciously did not enter that territory. The team was very fond of the college ethics committee that supervised them. I've done experiments in which simply to give it a try, I've tested influencing responses and I've succeeded. That's why it's essential to have a committee outside of me, that defines rules for me, that sets methodologies for me, that puts limits on me, so that this might become a commercial product, because if I influence decisions, in reality the study is worth zero. That is why at the ethical level I think a lot of questions arise here, and not only here, but also in a series of areas involving these biomedical evolutions, because at the end of the day neuromarketing is a bit like that, you will study the areas of your brain that are stimulated, that have reactions to certain stimuli, and the next step is: "so if I inject an electrical impulse here from this side, what happens next?" And that is the principle of all developments of bionic limbs, bionic functions, to everything from

diseases to aging, to physical and emotional disabilities. So the ethical issue is absolutely fundamental, it will have to be developed radically in the coming years, not only by neuromarketing, which is a very small part of that issue, but by all that science will allow us to do in terms of intervention in our bodies. It can start by being used to improve our lives, certainly with good intentions, but it can also achieve other kinds of goals if there is no such ethics. Where goodness is at stake. The issue of ethics is a huge one, much more comprehensive than neuromarketing. Fortunately for neuromarketing, the only thing you have to worry about is that you have sufficiently firm and clear rules to ensure that the outcome of that study is not being influenced, or is as little as possible, by the study itself. Basically, if you think about it, it is exactly the same thing that happens to us in traditional methodologies. Only in traditional methodologies, our ability to influence the subject's response is limited, it is he or she who influences these responses by those filters, those onion layers that he or she has. As neuromarketing goes deeper, it can, if misused, influence more. Fortunately, it does not hurt anyone at all. The topic of ethics will be much more critical and worrying in disciplines like biomedicine and its biomedical solutions, because if the result of a neuromarketing study is no good, eventually some company made wrong decisions, and someone did not optimize things as they could have optimized, but at the outset it did not hurt anyone - whereas in other areas it can be really serious. I think this ethical issue is very important. Everything was very experimental at the time I used neuromarketing, but I was very rested in working directly with the academic environment, where this supervision was not my responsibility at all, because technically I don't know how to do it, nor do I have to know. I just have to be confident that someone is doing it for me in a reliable way.

9. Do you think that there should be legislation regulating neuromarketing?

Interviewee: I think so. I don't know if it is legislation, I don't know if it is specific to neuromarketing, if it is more comprehensive, I confess I haven't thought about it, but clearly there must be rules, there must be limits, that is obvious. Who should set them? I am not sure. I haven't thought about it, I don't know if this can be just another discipline of everything concerning interventions in the human body. Or if there has to be legislation. Because legislations are made by different entities. If it is a more medical subject, it is certain entities that do it, if it is a more professional ethics subject, it is others. I don't even know if it doesn't need to be a joint thing, but clearly there must be legislation, whoever the legislator is.

b. If such legislation existed, what do you think is important to include?

Interviewee: That the research methods are non-invasive. From the neuromarketing perspective, there are two ways: first, to preserve the health and balance of the individual. We do not want anyone traumatised or suffering from having participated in studies. So this is obvious. Specifically speaking of the commercial side of neuromarketing, i.e. as a marketable product, it is essential that this legislation includes rules, principles, and limits that make the results of the study not influenced by the methodology of the study, or as little as possible. This means that the study has to be done from a passive rather than an active perspective, in the sense of studying the stimuli and not provoking them, and I can't say much more than this because we are going to enter into very technical terms. The ethics of the company itself, or of the team that is carrying out this study, is essential. You cannot have a motivation for the outcome of the study because otherwise you will be able to influence it relatively easily.

10. Do you believe that neuromarketing developments could threaten the autonomy and privacy of consumers? If yes or no, why?

Interviewee: I don't think so. Because there will be all these laws, these ethics committees and these concerns. Therefore, I think it is essential that there is a supervision of those who are using these methodologies, as companies, that they follow them seriously, that they comply with it. Once there is this legislation, which I think there will be, I don't think it puts people's health or privacy at risk. Privacy yes, but to the extent that the person has agreed to participate in the study. When I said, "Yes I agree that you study which areas of my brain are stimulated or not in a given reality", I am giving up my privacy at that level. Of course all the work is anonymised, nobody knows who I am, this will not be labeled on me in any way, as is already the case with other study methodologies. I believe that if properly ethically monitored and enforced when applying these ethical restrictions, I do not think it will put the consumer at risk. Anyone who thinks it does, will choose not to participate.

12. And for companies in Portugal?

Interviewee: Yes, I consider.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools?

Interviewee:

No. Complemented, for all the reasons I mentioned before.

14. And as you said, you are interested in carrying out a neuromarketing study in the future.

Interviewee: Yes.

Interview Subject number 15

1. As a marketing professional, how do you define neuromarketing?

Interviewee: I believe marketing is a science and an art, so it's the capacity, linked to some creativity and concrete conditions, to make people buy our products. So I define neuromarketing as the ability of measuring the stimuli from our consumers and being able to react, or act, with campaigns that stimulate those precise cerebral points.

2. Do you have a professional interest for neuromarketing? Why?

Interviewee: I do and we do in fact apply it! In our company, neuromarketing is used in the evaluation of certain campaigns, but not all. Globally, we have a set of campaigns in a year in which we can use neuromarketing. We'll have a panel watching our movies, either creative or advertisements, which then gives us a report on what sensations, emotions and reactions were had and that makes us act and understand how we can improve, or maintain, some of our creative aspects. It's something we use, so I'm quite interested in it.

3. Do you follow-up with neuromarketing research?

Interviewee: I don't go into that level. I know about its importance, I've been to a few conferences and realize it's not just something IKEA is working on, a lot of other brands are developing in that sense. It's very interesting to use neuromarketing, not only in an advertisement campaign analysis, which is what we do, but also on a store experience level. There are a lot of tests with goggles that measure what people are looking at and also what sensations they have in a certain environment. For example, when someone visits an IKEA store. That would be a next step, but we're not quite there, yet.

4. As a marketing professional, how do you consider neuromarketing's development in the Portuguese market?

Interviewee: I believe it's not quite here, yet. I don't know of any other brands, in Portugal, that use neuromarketing and even when I go to some conferences to present our work, I see a lot of surprised faces and even people taking photographs of our slides and then sharing it, so there is interest. But it's noticeable that it's not something linked to our daily basis.

5. How do you consider neuromarketing useful for your brand?

Interviewee: Very useful, since it allows us to evaluate in two ways: this one, where we can understand, in an emotional point of view, what worked during the movie, from the beginning there's interest, surprise, boredom, happiness, anger, so its possible to know what worked and what didn't, what catches peoples interest and what doesn't. Nowadays, our reality is that most of us don't even realize how many emotions and stimuli a brand makes us feel. It's very important that the stimuli is the correct one. So its very useful in that sense, because I can measure all of this whilst also have another campaign analysis and I'll use both to figure out if we are, in fact, going through the right path with our content and, after a call-to-action for purchase, check the impact on sales.

6. Could you explain more in-depth how you used neuromarketing?

Interviewee: Yes. I believe we have four movies/creative content in a year, which are negotiated with our global company with whom we make the analysis. We submit the advertising campaigns which gives us a reporting based on a Portuguese panel, that watches those movies, and after getting all that information we can make a bench marketing with other markets and creative contents, not just from Portugal but also the united kingdom, Sweden, amongst others, and understand which movies worked best and how, as to learn new formulas that will work better for us in the future. We work towards knowing how we can improve in the future.

7. Do you consider those goals attained?

Interviewee: Yes, we know what worked and didn't. For example, when we start a movie in a certain way, we know we lost the consumers interest if the first seconds of the panel isn't emotionally connected to the movie which lets us know that when the campaign is on air, from a digital point of view, those who watch it won't do so for more than x seconds, there's a connection and we also realize that we can grab their attention from the beginning, which also translated on the campaign results.

8. Do you think there are limitations in the use of neuromarketing?

Interviewee: Depends. I don't have the technical knowledge to know, effectively, if the way its measured is the most correct.

Interviewer: Do you think it is?

Interviewee: I don't think there's limits, and there is the possibility of doing even more. I don't have the knowledge, yet, to know what's the next step.

9. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: Yes. It's fundamental, for us, to maintain that ethical side and it's always used with a panel that authorizes and is aware of the analysis being done, so nothing is done ambiguously. We would never do it in a way that would be unconscious to whoever is being tested.

10. Do you consider it necessary to have a neuromarketing legislation? Why?

Interviewee: I think there should always be a legislation that regulates advertising communication as a whole, from the way we produce content to the way we measure it. And this is another of the examples, another module actually, which obviously need legislation and whoever is part of the panel need to be conscious and informed about neuromarketing, so yes, absolutely.

a) What would you consider important to include in the legislation?

Interviewee: Data confidentiality, obviously, and the ability to protect children. It doesn't make sense to use neuromarketing on children. Somethings need to be protected and there is a very specific legislation for child marketing. But I'd say, within the youthful or senior group, there should be regulatory protection measures.

11. Do you consider neuromarketing advances to be a threat to autonomy and consumer privacy? Why?

Interviewee: I don't believe so. Actually, it'll depend on the perspective. If we were to create some sort of gigantic panel that would measure people's emotions and reactions when they enter our store, without their consent, or even when they look at their phones, that would be very invasive and could be potentially dangerous. From my experience, though, our panels always know the reasons behind doing such measurements and knows their information is confidential, anonymous and without any type of personal repercussion, so I think it's very safe.

12. Do you think there's potential for neuromarketing in other Portuguese companies?

Interviewee: I think there's a lot of potential in various levels and business categories. There are a lot of possibilities, especially since we know and understand that creativity in Portugal is quite patternized and we all end up doing similar things. If we were to open more to what people expect and risk with different contents that could be tested with people, before risking producing it, we would probably have a growth on creativity.

13. Do you think neuromarketing will replace the traditional marketing research tools? Like questionnaires and focus groups?

Interviewee: They're complementary because none are a hundred percent trustworthy. In truth, we don't know if everything is being measured the correct way. I won't know if the device measured the emotion in the most effective way, or if the questionnaire was answered with intention or if the cross was put in without much concentration and that happens a lot in the whole of the panel, we're not always sure if people are answering with intention or not. I'd use it as a complement.

14. My last question, will your brand be using more neuromarketing studies in the future?

Interviewee: Yes, I'd like to do more tests than just these four, negotiated between the markets that we're present, but, for now, they seem enough and very informative and interesting. It's something we like to share, in our more public moments, much understanding the consumer, and offering whatever inspires, stimulates and brings joy to them is important for us as a brand. Maybe if everyone had that ambition, we could improve the country's panorama and that could bring positive consequences for the economy, which is very related to the communication effect. If the communication is negative, the impact is negative, if it's positive, the impact is positive. So, if all of us, from an advertising point of view, invest more on communication, that will generate movement on action, and we'll be able to influence society, which seems like a good cause.

Interview Subject number 16

1. As a marketing professional, how do you define neuromarketing?

Interviewee: It is the study of the most sensory behaviour of potential consumers, in order to develop techniques, concepts or assets that have a more appropriate acceptance according to the message we want to convey.

2. Are you professionally interested in neuromarketing?

Interviewee: Yes, I think it is extremely interesting. I confess that we have no use in our day-to-day business, but I would like that very much. Maybe you will help me find better updates for this or a better way to apply.

3. Do you follow neuromarketing research developments?

Interviewee: From time to time. I always try to keep a little updated on the different trends that are emerging and be a little familiar with all the terms, all the research, all the terms related to marketing, to feel updated, but I confess that I do not specifically follow this term.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: In the Portuguese market I will say that I do not think it is still very widespread. I don't know, and I gave the comment earlier, so many companies that provide services in this area that say, "OK, you want to develop a campaign, so we have here a focus group where we will apply these techniques of neuromarketing to understand what impact the materials or the alternatives that you are considering have on people". From time to time we buy from market research, consumer panels, and I've never had any company talk to me about this term.

5. How do you find the application of neuromarketing useful for your company?

Interviewee: Obviously this would greatly improve our results and the impact we create with our actions on end consumers. From this point of view, it would be extremely interesting, of course

6. In the specific case of your company, have you ever used neuromarketing?

Interviewee: No, we never appeal. We are still very much in the digital focus and trying to understand the behaviour of people within our sites. So: see if the mouse goes to the right, if it goes to the left, what kind of buttons people press more or less, how much time they spend, what makes people jump from one page to another or just go away. Obviously, this is not neuromarketing, but it is also an attempt to know people's behaviour and motivation. Therefore, at a very low level.

7. In your opinion, are there any limitations in the use of neuromarketing?

a. If so, what are they?

Interviewee: Well, we can talk about ethical limitations, in the sense that it is not the intention to manipulate, but to better link the message that we want to convey to people. If the black background has had a more positive impact than the white background, I don't think that is ethically reprehensible. We try to find ways to get the message across better and be better accepted and create a more positive memory. I think that's the job of brand management. Obviously, we don't want this to be manipulating people and leading to behaviours that are not correct or buying things that are not relevant. We want to create a positive impact. We want to maximise all the communication that we produce and that we exercise with all our consumers.

b. In your opinion, how could these limitations you have just mentioned, be overcome?

Interviewee: I think this has a lot to do with common sense, with the individual assessment of people because surely, they have opened many fine lines which, if there is no common sense, can be crossed.

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: Well, I would first like to worry about applying neuromarketing in our company. Of course, we certainly believe that the whole team would do so with the best of intentions, i.e., to cause the benefit to the company without causing harm to the interlocutor on the other side. As I told you earlier, I think it is something that is not yet very well disseminated. At least, we are constantly confronted with different kinds of offers from different types of companies and agencies that come to us to promote their services, whether it's communication, consulting, digital development, out there, and we don't have cases, I don't remember any, that bring this approach of neuromarketing. We work with many market research companies that propose focus groups, consumer panels more or less large, retail panels. Now, bringing application methodologies and neuromarketing tools to the table has never appeared to me.

9. Do you think that there should be legislation regulating neuromarketing?

Interviewee: I believe that there should be legislation governing the communication of companies, and within that, there should also be principles applied to the manipulation or non-manipulation of people. Now specifically for neuromarketing, I don't think so.

Interviewer: Why?

Interviewee: Because I think that neuromarketing should be seen as one of the marketing approaches in this respect, so I think it should be legislated by the whole and not individually.

10. Do you believe that neuromarketing developments could threaten the autonomy and privacy of consumers?

Interviewee: No. I don't think so.

Interviewer: Why not?

Interviewee: It will be one more way of studying behaviour as it exists today, like the focus group, it is also an analysis of people's behaviour and stimuli. Obviously, it is probably more fallacious, but the basic principle is the same. The neurolinguistic approach of NLP, which is part of many formulations, can basically be "as dangerous" as neuromarketing.

11. Do you consider there is potential for the use neuromarketing in your company?

Interviewee: Yes, of course. We have every interest in maximizing the impact of everything we do and I think this is a very valuable tool to work with.

12. And for companies in Portugal?

Interviewee: In general, of course, yes, of course. Notice that even multinational companies that develop campaigns, or actions, products, services for the multinational environment, obviously then have to make slight adjustments because our values, our criteria will be different from a Swede, or an Australian or a South African. So, regardless of whether you could do this on the basis of a global perspective, then you have to adapt to the differences you will find in each region of the country.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)?

A) Why?

Interviewee: Well, the cost/benefit ratio must always be considered here. I believe that a neuromarketing approach is more expensive. This is normal, because we are also talking about the need to have equipment that is not cheap, and very connected to medicine, and since it is not so widespread either, the law of supply and demand itself will not have impacted on neuromarketing yet. It is important from this point of view and depending on the type of content or asset being produced and the investment in it, neuromarketing may or may not also be the most appropriate tool to calibrate it. What do I mean by this? I will make an investment in a

5,000 euro TV campaign, I cannot spend 5,000 euro on neuromarketing to calibrate the campaign. So there has to be a balanced allocation here.

14. Do you think you will carry out any studies using neuromarketing in the future? A) Why?

Interviewee: Well, I would very much like to do that. I hope there will be an interesting opportunity for us to apply. I think it is very important that we eliminate the dependency on what we just think is right without concrete data. We all think many things, and sometimes it is good, and it is a way to demystify these absolute truths, to use science to validate certain assumptions. From this point of view, I think it is very healthy for companies to be able to invalidate those truths they give as absolutes for many years in a row, because those truths may cease to be so at one time or another.

Interview Subject number 17

1. As marketing professional, how do you define neuromarketing?

Interviewee: Basically, neuromarketing is almost a hidden marketing or an implicit marketing. We make a lot of decisions without being aware of them, which leads us to certain choices and, to me, neuromarketing is correlated to that, with our unpremeditated decisions and set of actions that we do not dominate rationally. In other words, actions and choices that live within us and unconsciously lead us to decisions without us fully grasping the reason behind it. That's the perception I have about those stimuli that may direct us toward a certain shopping habit, and not only, that aren't implicit in our rationality.

2. Do you have a professional interest with neuromarketing?

Interviewee: Yes, we've made some experiences in our offices but never fully completed them. Basically, in Oporto we had a Marketing consultancy company, which is the company that had the most advances in that area. I'm not sure if the company that lead the studies was the same as this one, but they had an annual marketing meeting here in Oporto, and a lot of neuromarketing studies were done and we were going to participate a few times in the analysis of adverts, on how people react while watching an advert with electrodes connected and all of those things. We ended up not doing it, because those studies are generally quite expensive, at least back then they were, so we didn't go through with them. Most of the videos we use are international videos, and those studies in-house have all been done, so even if we had different results, we wouldn't stop using them in Portugal.

3. Why do you have an interest in this area?

Interviewee: I find it interesting, or I did at the time, because it gave us a few perceptions that we didn't have. Normally, when we work on an advert, we envision the audience will have a specific behavior but, with neuromarketing, we can understand which areas in the brain are activated with that advert. We understood that we could activate a specific emotion but did not realize it could also bring in a set of associated perceptions, and that's only possible with an in-depth study of the mind. In practical terms, we have a lot of benefits. Maybe not right now, but in the future, it will be something to have in consideration more and more.

4. Do you keep up to date with the developments on neuromarketing research? I imagine you do...

Interviewee: No. Whatever I know is by talking to Rui, the guy from the marketing consultancy, who is a big fan of it. I'm not exactly a fan, or someone who's up to date with the area. What I do know, is that more and more brands are like ours, and it's hard to be different. That's why we need to resort to other areas like neuromarketing, which is more of a profound science, a deep mining, so to speak, and try to gain knowledge and leverage the brand in other ways, to get to people's minds with an unconventional approach. That's the perception I have and why I think it's interesting. If you ask me if I keep up with the science itself, then no. I had contact with a few studies in the last two, three years, but have not been close to the subject.

5. As a marketing professional, in what state do you consider neuromarketing to be in the Portuguese market?

Interviewee: Back then, a few brands were already testing it. Nowadays, the cost of entry is higher than a market study, like a campaign evaluation. Neuromarketing, besides only being done to a small group of five to ten people, was almost the same price as broader study. Not almost, it was more expensive. What normally happens is that most of the brands fall for the rational and the cheaper option, for budgeting reasons, and there are not a lot of brands in Portugal with capacity to do so. As for international brands, like ours, most of the materials come from abroad, so we don't feel much of a need to do those studies here. The brands that I knew were doing neuromarketing studies were mostly big national brands, like SONAE, that depend on only themselves and were using neuromarketing to gain some knowledge on the company and they also had the capital to invest in that market. At least, that's the impression that I have, I'm not sure if in the last two, three years, things have changed.

6. Have you ever used neuromarketing in your company?

Interviewee: We never used it here. In a European level, from what I know for the campaign and product evaluation, they use it all the time. I was trying to remember the name, but it's those qualitative tests with samples of the products, they don't use neuromarketing but "like or don't" tests and cameras that watch the subjects. It's a more classical approach. What maybe is more similar to neuromarketing is on a digital level. They use eye-tracking, even though it isn't neuromarketing, it's more advanced, and click tracking, to understand where the audience's eyes focus on when looking at adverts. Apart from that, I don't think they use it, but I can't be sure, so I can't give a precise answer.

7. Even if you have not implemented it, do you think it could be useful given the expectations you might, or not, have?

Interviewee: That's what I was saying. I think for the automobile market, in terms of the values that are associated, and the impressions transmitted, they're quite stagnant throughout the years. People's perceptions of a brand rarely change. Maybe, nowadays I can't say same, especially with Tesla's entry to the market, and other similar brands. Even though I believe in the alteration of perceptions, a few studies we did a couple of years back pointed to the opposite. For example, Volvo has been associated to security for years, even if it weren't the most secure brand, people still connect the two. Or like our company with quality, there's a loyalty to the brand because of that association, and that has been true for the last twenty-five years. With Tesla, we have a new discussion that didn't previously exist, which is the electric cars. That could change the perception on automobile brands, because there will be a lot changes in the coming years, as will the cars, so that will lead to a differentiation of values. But right now the values remain the same. That's why I say the same thing about neuromarketing, what we could get from this could be either a validation of those emotions connected to the brand, and the feelings and perceptions that people have, or eventually bring in some extra knowledge of other emotions indexed to the brands that we did not know about. From my experience, based on other studies unrelated to neuromarketing, it is that people have pre-defined ideas and those do not change with time. So, I think we wouldn't discover a whole lot more with neuromarketing, especially with our type of brand. Other markets and recent brands, like uber and even Apple, may not have these attributes solidified, so maybe there's more information to extract from there.

8. In your opinion, are there limitations in the use of neuromarketing? If so, how do you think they'll overcome?

Interviewee: I can't answer correctly because I'm not knowledgeable enough about it. But I'm sure there are limitations. If we think about it, everyone says we only explore and use a small part our brain. With the evolution that's been happening in various medical and scientific areas, I believe there will be better ways to improve neuromarketing. But I do not know how that works. I have basic knowledge on electrodes and sensors, similar to the practice of lie detecting tests. But I believe that, as those approaches have developed, so will the terms of neuromarketing, and with that we'll encounter other limitations. That's more or less the logic.

9. Do you have any ethical concerns regarding the application of neuromarketing in your company, if you eventually used it?

Interviewee: Yes. From what I knew, two or three years ago, the ethical implications were still low. With the system evolution going deeper into people's minds, there could be a few lines that we can't cross and that will have implications. I'm not sure, but one of the areas that will probably use something similar to neuromarketing, not just in regard to our company, will be the autonomous cars. One of the main discussions about them is precisely the decision making, since the systems themselves are quite good already. Tesla has already done it, you can do a full trip without the need of driving. However, the systems won't go any further, and actually our company is one of the most advanced because of our decision making, which is, in case of an accident, who determines the action. These types of decisions are ethical, and from my point of view, will need a neural study. Even a person's decision in a moment is based off of subconscious actions, and those aren't neuromarketing reasons, they're neural reason. So that type of study will be important in these decisions, and to get to a conclusion that doesn't exist yet. Right now, it's hard to decide who're responsible, the man or the machine. And crossing the line will be hard, and the moral aspects of it will be crucial in defining the answer. Or maybe we won't get to any conclusion, maybe in the future we'll be connected to a machine and our mind will communicate directly and it won't be a rational decision. There are too options, so I don't know.

10. Do you consider it necessary to have a legislation to regulate neuromarketing? Why?

Interviewee: Not during this phase. I don't think it's evolved enough, and in Portugal it's not common practice, so it doesn't require a regulation. It may be something for the future. The use of neuromarketing may imply a delicate crossing on some limits, and I do think we need to protect everyone's privacy, but right now I'd say people who subject themselves to this type of action is quite voluntary. It's similar to the market studies, whoever participates does it freely

and knowingly that some aspects may not be the most comfortable, but they always have the chance of leaving. If there is that chance to leave whenever you want, during a neuromarketing study, I think the ethical part remains safe. I don't know how these studies work and if they leave the subjects in a latency state, but its important that the subjects can choose to leave if and when they feel uncomfortable. I agree, however, that in a medium-long term there will be a need for a legislation.

b. If there was such a legislation, what would you think is important to include?

Interviewee: I'd need to know more about the topic to give an opinion. But I'd say, make it a priority to keep people's freedom and freewill safe, meaning physical and freedom of thought and action. If that doesn't happen, we will encounter serious ethical issues, so I'd say that should be the number one priority on a legislation regarding neuromarketing. The rest would require more knowledge on the topic.

11. Do you consider the neuromarketing developments a threat to the autonomy and privacy of the consumers? Why?

Interviewee: Yes. Because all communication and marketing companies, whether they choose neuromarketing or traditional studies, are trying to understand their consumers and by that, we can condition their options. The more we know, the more we can control their options. That has happened with a series of markets, and with the legislation of GDPR data. Markets and brands have access to data and can know their clients and consumers better. If you add neural data to that, then there's a risk of total autonomy. That's a big risk and its actually already starting to happen. Every digital advert is conditioned and directed towards us, limiting us, even if unconsciously, to that specific product. Before we had that with the TV, but it's getting worse nowadays with the online tracking and remarketing.

12. Do you see potential in the use of neuromarketing in your company?

Interviewee: Yes. I think there's potential for every brand. Like I said in the beginning, the biggest problem with neuromarketing is the entry barrier when it comes to study costs, since they're quite high and, in my opinion, the result was a bit dubious back then. What I mean is, when I had access to a few studies we were in the process of deciding or not to advance with neuromarketing. However, the conclusions weren't that different from a traditional study, we had a few additional conclusions, but from my point of view they lacked statistical numbers to validate them. That's one of the problems with neuromarketing, we need at least thirty answers

in a statistical study to have a margin of error in the analysis and but neuromarketing studies always had less than ten people. So, in terms of statistic it gave us some qualitative perception of the data, but in terms of quantitative extrapolations we had that handicap. If that's not fixed, we may have some qualitative advantages, but not quantitative, and nowadays everything's a number. Without that validation we can't extrapolate the results to a bigger extent.

Interviewer: In that case, there is also potential for Portuguese companies...

Interviewee: Yes, but with these problems. The example of Sonae, which I know has used it in the past, is still limited since they haven't done a lot of studies, at least from what I know from two, three years ago. Also, they did some studies consistently and other not. We still need to mature this area, it's in a very beginner's phase.

13. In your opinion as a professional, do you think neuromarketing will substitute the traditional mechanisms in marketing research?

Interviewee: I do not think so, because of the ethical aspect. Even if the studies got cheaper, they will always be expensive, and we have never been able to do a sampling of 200, 300 or 500 people with neuromarketing so, at least in a near future I don't think it'll happen. And that type of study, questionnaires, has big samples and in a short term it won't be possible to have them here. And then we have the type of questions, a more classical approach to the product, and we still need to do them because they're basic and the foundation of the studies. We don't need neuromarketing to do them, because people answer them clearly. So I don't that basis of marketing will disappear, at least in the coming years. Maybe in a hundred years or so, when everyone has a chip in their skin or head, but for the next 20 to 25 years I think we'll keep a traditional approach that doesn't interfere with any ethical aspect, where people answer freely and it's also easier to collect answers. It will always be easier to fill out a questionnaire in a screen than to have something in your head doing it automatically. I wouldn't mind doing one neuromarketing study but I would never do it monthly like I do with questionnaires, so I'd say they subside. Until there is a chip or special glasses that answers with a wink.

14. Do you think you'll carry out any neuromarketing studies in the future? Why?

Interviewee: It depends. We're all quite dependent on the basis of the institution, the needs and discoveries we have wouldn't make a big impact. In a particular situation, something more local or with a different set of specificities, we may ponder the use of those studies. But, in a clearer way, not immediately. It would always need to be in a particular situation. If you asked me if

we'd do market research, I'd say yes. As for neuromarketing studies, I'd say it depends on the product and the situation, its more conditioned than the traditional approach. It's not a no, it's a maybe.

Interview Subject number 18

1. As a marketing professional, how do you define neuromarketing?

Interviewee: We don't use this term much in our company. In fact, it is a term that not only you, but some professionals in Portugal have even been talking and looking for more information. Curiously, the other day a journalist asked a question about the same thing, about neuromarketing and neuroscience and the impact on brands, etc. The truth is that in my opinion, neuromarketing is applied in our daily life even though we do not use the term, and it has an important function of accessing layers of the consumer's subconscious, which in a more rational way we cannot. I think there is a work to be done here, and we use it through partners, mainly by trying to access, for example, the consumer outside the standard search formats, trying to access it through other experiential approaches, other types of questions that make us understand what is behind the rational answers. I would say that more or less to start with

2. Are you professionally interested in neuromarketing?

Interviewee: Yes.

Interviewer: Why?

Interviewee: I think that I use it, as I have commented, on a daily basis through practice, experience and the different approaches that different partners bring us. For example, talking about experience marketing, talking about old-fashioned below-the-line and above-the-line terms, those kinds of concepts are much more rooted. I think it is super important and I have interest.

3. Do you follow neuromarketing research developments?

Interviewee: I don't necessarily follow, we do our research very ad hoc, with different partners as I was commenting. Some of them certainly use neuromarketing for the consumer approach, but currently we do not buy specific and named tools as neuromarketing. Not that, not yet.

4. As a marketing professional, in what stage of development do you consider neuromarketing to be in the Portuguese market?

Interviewee: Well, I can't answer that precisely because we don't use that science with a comprehensive knowledge. But I would say that as for other marketing areas, I feel that Portugal still has a chance to advance further to align itself with markets, such as the US. There is a market, as in Brazil itself. There are now more humanistic approaches that I perceive, and I follow more through Brazilian researchers, for example, than from Portugal itself. I am also aware of super interesting partners, who are Portuguese and who are helping us a lot to understand the consumer and to access the consumer through design-thinking perspectives, of thoughts much more oriented to the consumer as a person, than necessarily relating him as a person who consumes. So I have experience on both sides. I would say by inference, that I think there is still more ground for Portugal to go through for sure, compared to other markets that I know of, as I have already commented, but I also have good experiences. I am a bit divided.

6. In the specific case of your company, have you ever used neuromarketing?

Interviewee: neuromarketing". We access it through methodologies that are based on it and we don't necessarily consider it as a platform, as a block, or we consider it when we talk about trade-marketing, when we talk about experience marketing, that is, I believe that today you are at another level of access of nomenclature. We access it without often knowing that we are accessing it. When you access, as I was saying, a methodology that uses design-thinking as a consumer tracking platform, you are using neuromarketing as a science within that framework. So the name neuromarketing doesn't come at first, but the methodology used does, so I will tell you that we use it, but without naming it as such.

7. In your opinion, are there any limitations in the use of neuromarketing?

Interviewee: In what sense are you asking about restrictions on use?

Interviewer: For example, either using the methodologies, techniques, or even the research itself, or perhaps the financial part, or the information that is obtained, if you consider that there are limitations to it.

Interviewee: It's something I never stopped to think about. But I think that if we had to go deeper into this topic, I would think of a restriction that is also very much addressed today, which is the ethics and data protection issue regarding information, i.e., to what level can you access and to what level is this really part of something that is known to the consumer, accepted by the consumer, I think that would be the big issue to go deeper and for neuromarketing to advance. Regarding the investment being a limitation, I wouldn't agree. I think companies are

increasingly needing to get out of the superficial and deepen their knowledge of the human being as an individual, and I think companies are not reducing costs in that sense because the competition is getting bigger every day. We all know that people often don't look for brands anymore, and when they do, they want real, purposeful, transparent brands. They demand that companies have truths, that they be much more connected to the human being and not to profitability and to the brand itself, and that they bring flags, and transparency, ethics, true purposes for people and for the planet. From the moment that brands can create that connection, I notice that investments are not being reduced for that, on the contrary, they are increasingly necessary. For me the limitations are more in the ethics and information data policy aspect itself than in investments.

- i. In your opinion, how could these limitations you have just mentioned, be overcome?

Interviewee: I believe so, I think there is a lot to discuss there. The further progress is made, the massification of information also generates a greater need for the media and brands to also adapt to how to access the consumer and the human being, on Facebook, for example. Google is leading the way in this, which is the one that captures the most information and generates controversy about it. I think this is being overcome in accordance with the challenges and barriers that are imposed, but I realize that it is a one-way street and that this is not going to block access and the continuity of neuromarketing as a science, on the contrary, it is going to be increasingly fundamental.

Interviewer: For example, in this case, to overcome the ethical issue, is there any way you think it can be overcome?

Interviewee: This is not my area of expertise. My perception is that yes, I think it is us as a company who have the responsibility, to have the best legal support and the need becomes ever greater. The RGPD law itself is there to show that, that companies need it and have to be monitored in order to understand how to access the consumer without being abusive, the commitment to ethics between the parties and the investment in developing themselves, as a company that puts transparency as something that is doable and how the barrier will be crossed. The means for this are with external support, at least our company has done this. For example, we now have adequate laws in every country in the world, including Portugal, on all the information we collect from the consumer in a super transparent way and it is accepted by the consumer before any action he or she takes, he or she needs to answer whether or not he or she

accepts to go ahead with the information. This movement has been happening and has been legislated, I think that the legislations here will enforce the change.

8. Do you have any ethical concerns regarding the application of neuromarketing in your company?

Interviewee: Yes, we must understand what needs to be done in order to be able to access the consumer in a clear way, that he/she accepts and knows exactly the rules of the game. With the Data Protection Act, we have learned that there are many things that we now access from the consumer in terms of data, than just from the website. It even involves various spheres of the company and we are organising ourselves in all countries to respect consumers' privacy. Another thing is that we work with consumer goods, we don't sell services, so our level of demand is much lower than, for example, a telephone company, which I'm sure cares more about that or something like Facebook. And they have to worry about it all the time. Our level of access to consumer information is aimed much more at building relationships with the consumer than it is to use data at a more intense level.

9. Do you think that there should be legislation regulating neuromarketing? If yes or no, why?

Interviewee: I believe so. I think that research nowadays, from the traditional research point of view, is far away from anything to do with the GDPR law, I think the internet has raised a concern that we didn't have before. I think that question is valid and makes you think. I believe that when we seek deeper access to the understanding of the consumer as an individual and access the subconscious etc., the question of consumer acceptance as an internet policy is very important. So I'm thinking yes, but I don't know how to really go about it. So I prefer not to express an opinion because I imagine that you are going to follow the mirror of what is being done by the legislation, which we are already familiar with from the GDPR, but I have neither the depth nor the knowledge to say more than that.

Interviewer: If such legislation existed, what do you think is important to include?

Interviewee: That the consumer knows exactly the end, why he is being accessed, the real reason, and that he also accepts that his information be led to a level he does not know. Because today the biggest problem is precisely that all the information we provide, for example to Facebook, actually ends up in the hands of a number of other companies, so that's the big scandal. I think that already makes the consumer worry much more than before, before we went to a research in a genuine way, we made some money participating, and we left. You didn't

have this concern that it goes beyond that. I think that nowadays the consumer does. So I would say it's the same issue, you have to have clarity and transparency of information for the consumer, of what information does he really want to give, and that he is aware that this information can get to any layers, for him to also approve it or not.

10. Do you believe that neuromarketing developments could threaten the autonomy and privacy of consumers? Why?

Interviewee: I really don't know. I think everything depends on the dosage of it. As I told you today, my level of access to neuromarketing, and I've studied about it a little bit, goes in different nuances, it goes from in-depth research and that can bring a level of threat to the consumer's privacy, but it also allows you to access the consumer, for example, through sensory stimuli. I'll give you another example of a neuromarketing application that I do in my job. Nowadays we have some brand experiences, mainly regarding olive oil, which has such an interesting sensorial effect, that accesses so many important and emotional issues of the consumer. In the brand activations we conduct, we try to pass through the five senses of the consumer, where I am also accessing other layers of the consumer. I don't see that this, for example, can cause any threat to the consumer. When we talk about research, about how to understand and access them, perhaps in a purer, more crude way, let's say, then yes. But I understand that neuromarketing also goes through various stimuli. You don't necessarily need to focus only on the research issue itself. The important thing is that the participant needs to know exactly what he or she is being accessed for. The benefits of neuromarketing are many, such as this example of the use of the senses, so that they can be exposed to other experiences, which I think that when you look at it from this angle, it is more than useful for the consumer, so he/she won't see harm, he/she will see the benefit of it. So I see more benefits than harm, but the focus I would have would be much more on the ethics and transparency of information issues.

11. Do you consider there is potential for the use neuromarketing in your company?

Interviewee: There always is. And I think that as a science, of us understanding the complexity and comprehensiveness it can have, I think we apply it in a much more practical way and more by experience, as I was saying. We end up applying it when we enter semiotics, when we look at colours so that they can impact the consumer's consciousness in some way, when we test the senses. I, for example, studied neuromarketing in college, and that was a long time ago too. I believe that the evolution of the subject's knowledge can make the professionals of today, and

the future, more preconditioned to use it as a platform, and not in an empirical way as I already access. But I think it is super important to grow. I think our company has the potential to use more and more. I think if you start listing everything we do here, you'll say: "wow you have a lot of neuromarketing!", we often don't name it that way, but I think it's got everything to do with it. So yes, talking about branded consumer goods, brands that are on the consumer's table every day, there is no doubt that there is great potential to grow usage.

12. And for companies in Portugal?

Interviewee: No doubt about it. Even more so because of what we talked about at the beginning, that Portugal can be a pole of greater access of vanguard and innovations. For example, we usually approach international companies, but when I did a recent work for the corporate brand, we did a rebranding job, and given that our company is Portuguese, I made a point of looking for a Portuguese company. I had a lot of difficulty in finding one, but of the several I saw within that research process, I found only one that I felt confident in, that had this side of accessing the consumer and involvement of the methodology, with a more sensitive view of the topic, much towards the neuromarketing end. The company has a design-thinking work and works on many brands from the point of view of brand strategies. I managed to find this Portuguese company but the normal for our company is always to access from abroad, we go for an English, American, Brazilian company. In fact, I think that not only more offers are missing in Portugal, but maybe our challenge is to really look for them, because they exist. That's what happened, I went after them, I found a lot of them that didn't have that framework, they did a much more superficial search, from the point of view of almost a business plan, which is something I could do as a marketer and that's not what I wanted, I wanted a company that looked at the consumer with a different framework, and that company does that. So it was a nice surprise, now I usually point them out to everyone, but this is to show that Portugal can be a vanguard there, for example.

13. In your opinion as a professional, do you think that neuromarketing will replace traditional marketing research tools (i.e., questionnaires, focus group, market research)? If yes or no, why?

Interviewee: They can, as generations of marketing professionals update themselves and universities incorporate this knowledge more seriously into professionals. Because that's what I was telling you earlier, I graduated 20 years ago, and 20 years ago I didn't have that science as a discipline, I studied ethics, advertising, economics, but I didn't study neuromarketing. But I believe so, because people nowadays are different from before and will be increasingly

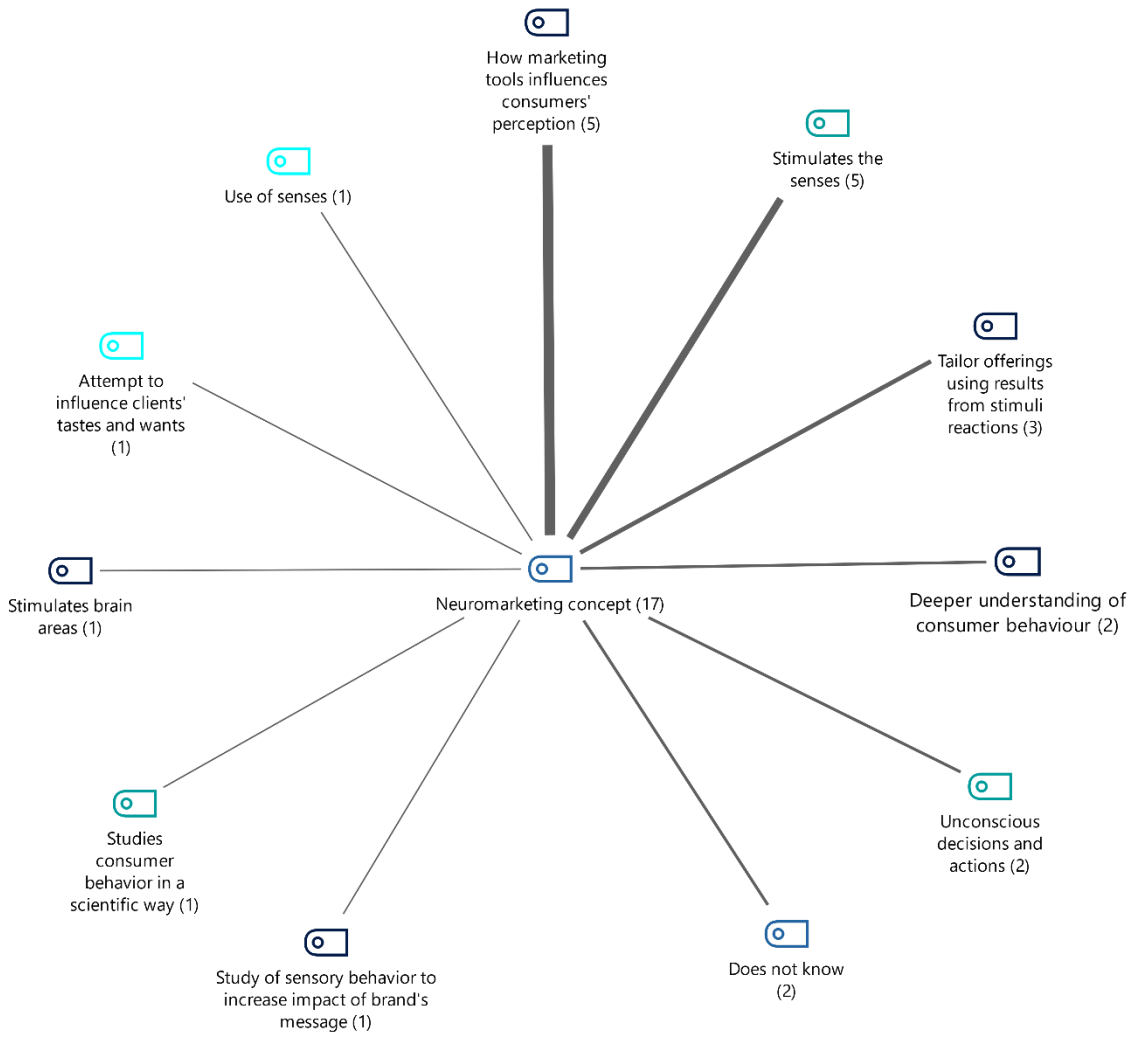
different. Of course, there is the issue of brands no longer fitting as a label, people want flags, they want truth. Neuromarketing will bring a much more sensitive and profound knowledge of the consumer. It's been a long time since I believed in the "quali" research format in focus groups, for example, it's been a long time since I applied that. I've never liked it. But if you ask me if it will last, I think it still will, mainly because of the mentality of professionals from the past, who still see the methodologies they have always used as reliable. The research institutes are still big, there are still a lot of huge companies and until they update themselves it will take a long time. By not updating themselves, this makes many professionals still follow them. I think today there are still few professionals who take risks and go after a more inventive or different study, and look for more quick wins. For example, we have dinner parties, we call it dinner joiner, which is precisely this question of trying to understand how the consumer really relates to the food at the moment he is actually feeding himself, and not at the moment of verbalization of the food. It's one thing when you comment on cooking oil, when you're talking to me in a meeting, saying you don't fry, you don't have any fries at home; another thing is when I'm actually following your dinner in a more genuine and fluid way, without asking you any questions, but watching what you are actually doing, what you have in your kitchen, what you really relate to, the yearnings, the fears, the day-to-day, your problems when it comes to sorting out the family's meal, and when you are thinking of a more interesting meal for the end of the week. So, we have been testing more from experience. I am sure there is much more to neuromarketing than traditional research. That's why I'm telling you, we don't use the name, but we already apply it in a number of ways.

14. Do you think you will carry out any studies using neuromarketing tools such as fMRI, electroencephalography, or others in the future?

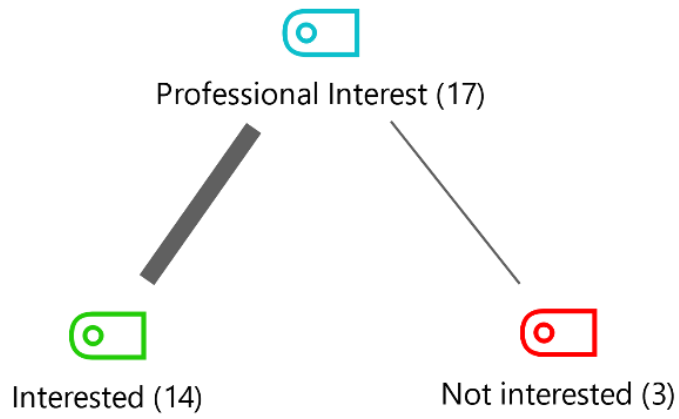
Interviewee: I have even seen questions related to this, until recently I was watching a live on Instagram, where a scholar was talking about it. I don't know honestly, if I had this option at the table, I'd rather follow a more fluid journey of the consumer as he/she is, where he/she doesn't leave his/her environment as much, I'll try to be as less invasive as possible, I'll try to observe and access what I see and not force questions. I think I'd rather go that way, I think it's a little too conditioning, it may be that science shows me other truths, that it says there are things that the consumer can't even imagine, and that he/she will never verbalize or ever will, and to really reach the subconscious. It may be that there are super interesting things coming out of it, but even from the live I watched, as I was saying, this scholar said that these behaviors that we force into the brain, into the understanding of the consumer's subconscious, end up

showing up by repetition. If you have more time and consistency, you can get it in the same way, so sometimes I think that to avoid going down a path like this, there are methodologies that you could access anyway, with the same levels of results, without having to go that way. I think it's a bit too aggressive, almost like a hypnosis technique, that the person feels that something is going to happen to them. Also, on the ethical side that we were commenting on, to what extent then does the consumer not feel invaded and then have a worse relationship with the brand, and the company, and society. Anyway, I think there are pros and cons. Today, if you gave me that alternative, I would look at these options with a little bit of distress.

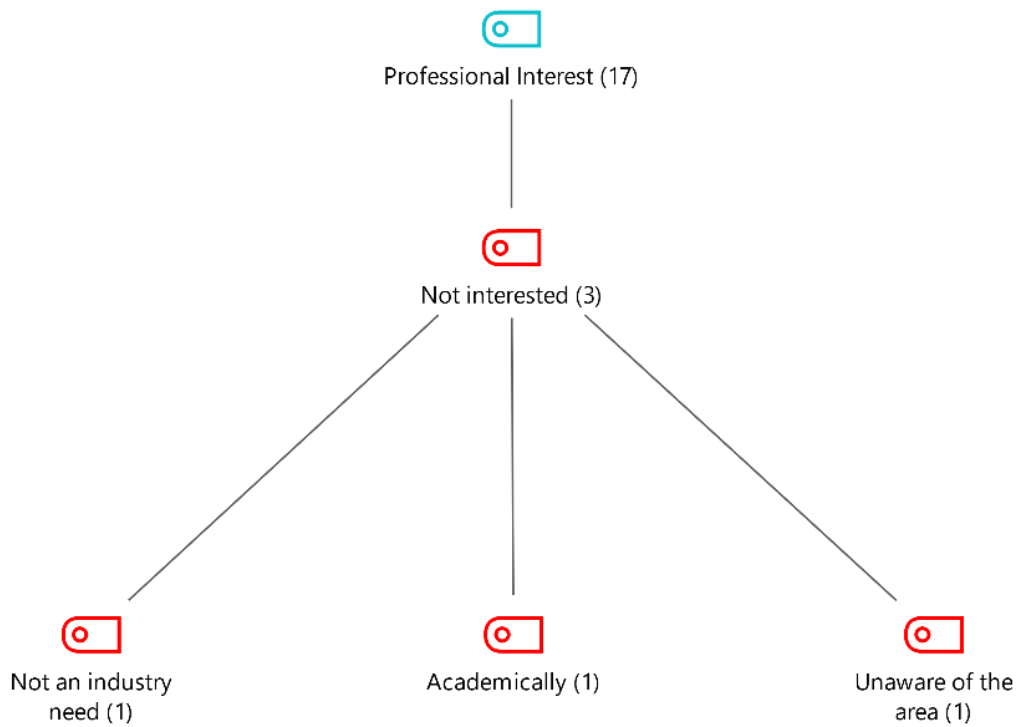
Annex C: Retrieved segments for neuromarketing concept



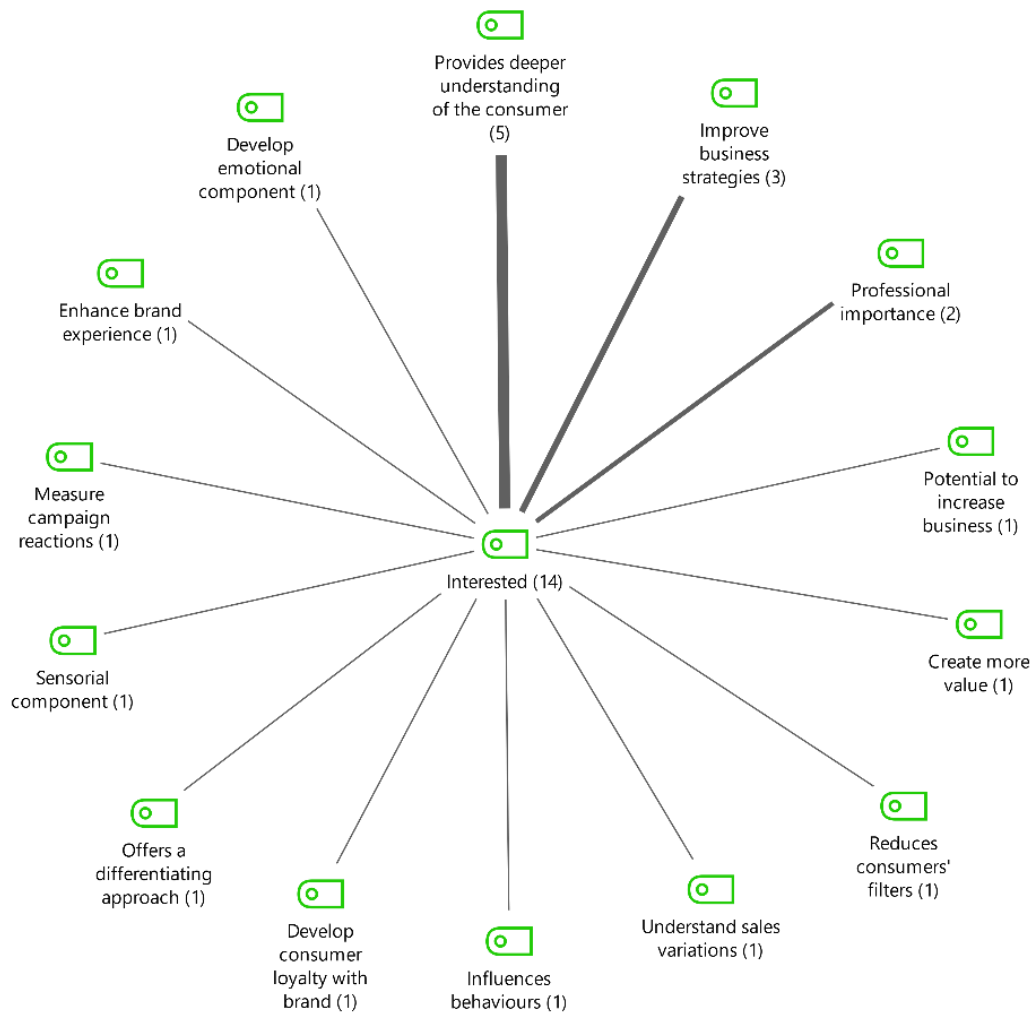
Map C.1 Neuromarketing concept – Definitions



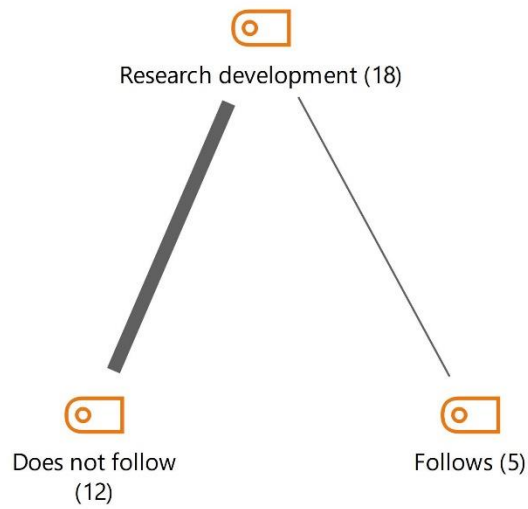
Map C.2 Professional Interest –
Number of marketers interested vs
not interested



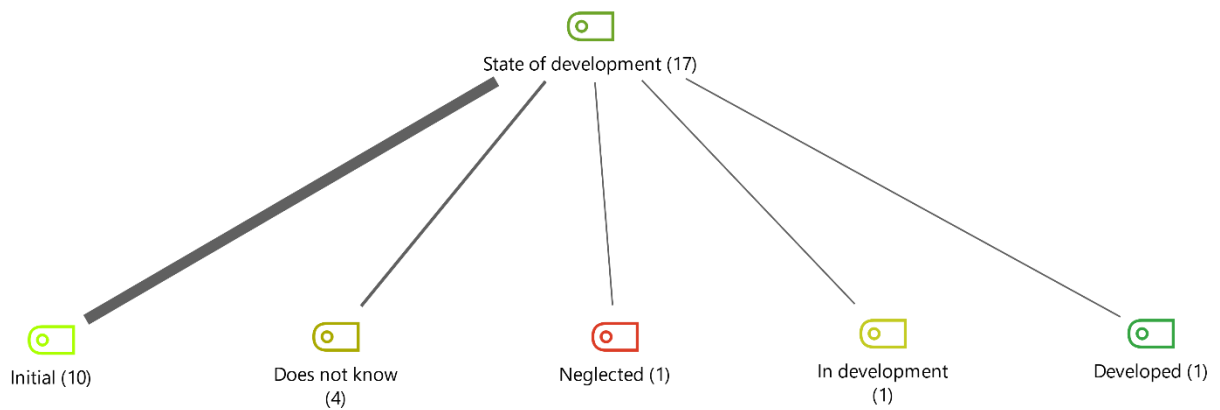
Map C.2 Not Interested –
Reasons mentioned



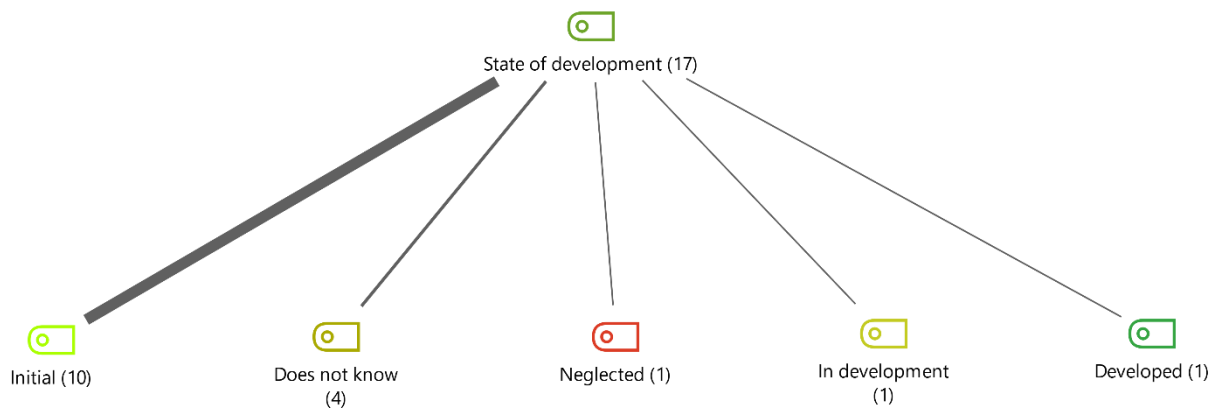
Map C.3
Interest – Reasons mentioned



Map C.4 Neuromarketing Research developments following

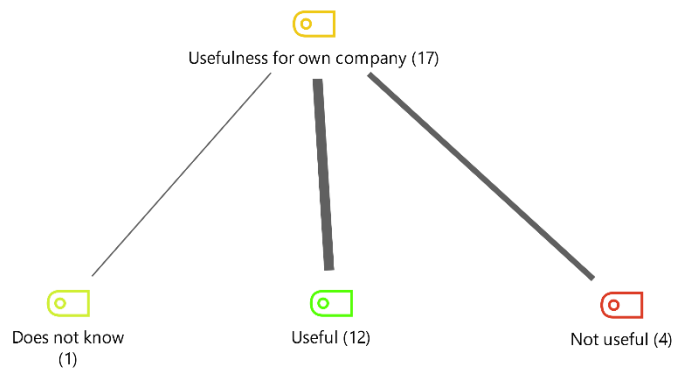


Map C.5 Neuromarketing State of development

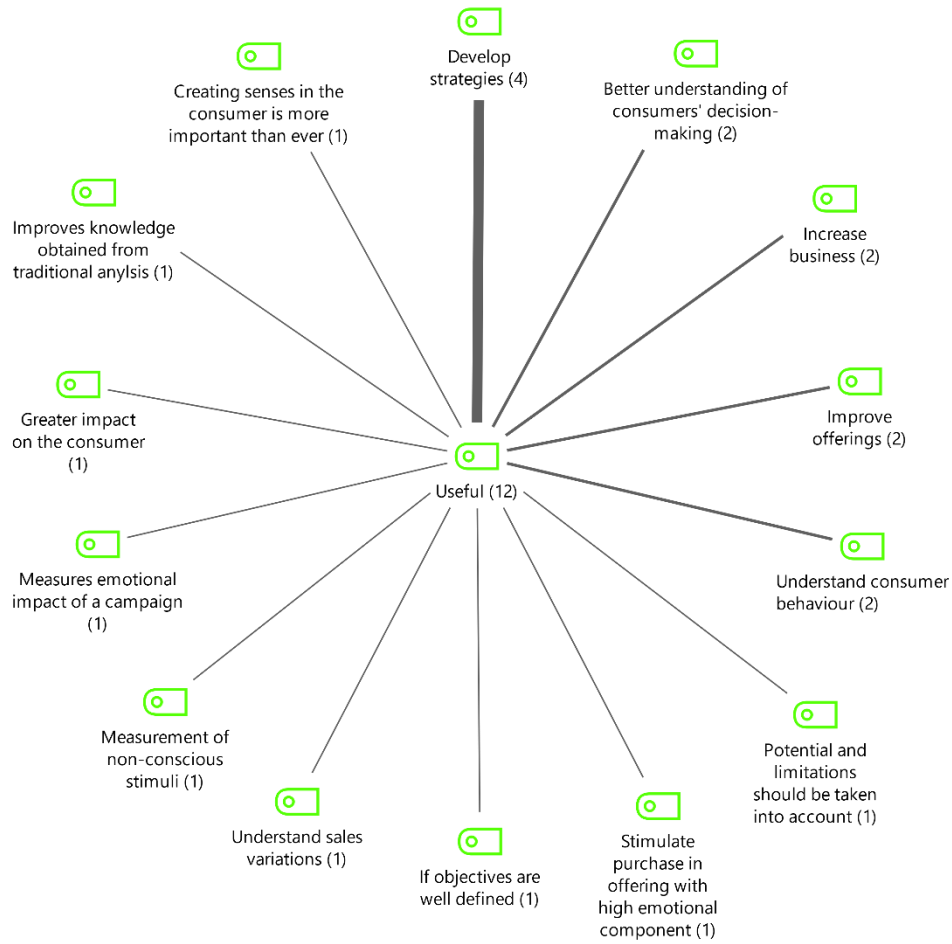


Map C.5 Neuromarketing State of development

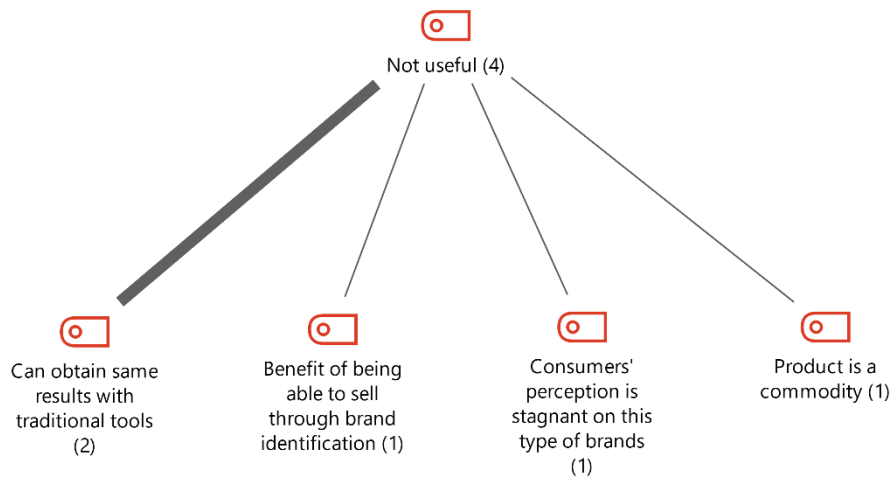
Annex D: Retrieved segments for Neuromarketing Usefulness dimension



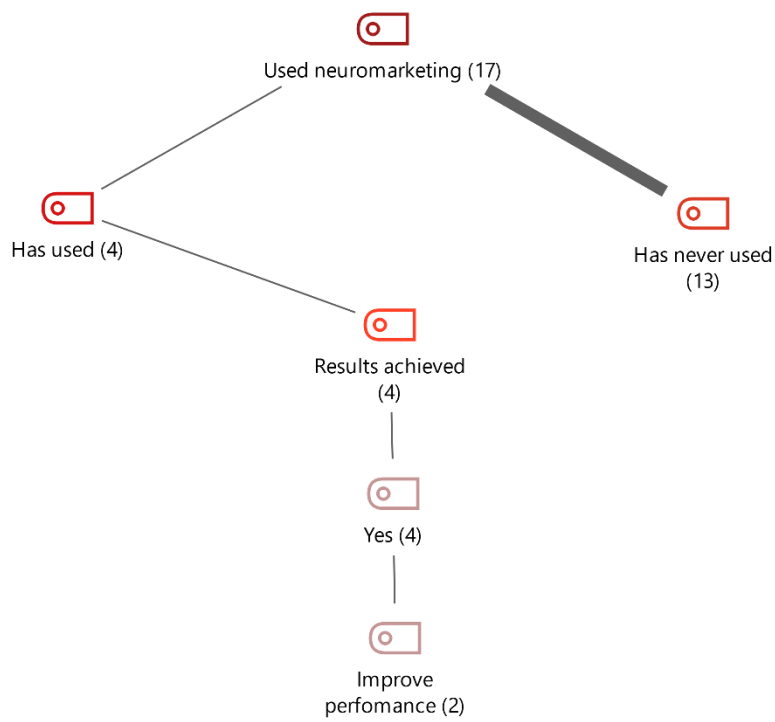
Map D.1 Neuromarketing Usefulness for respondents' companies



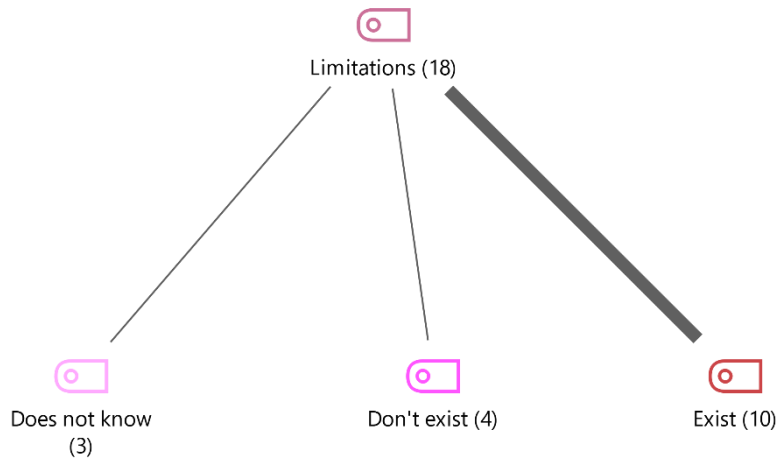
Map D.1.1 Respondents who consider neuromarketing useful for their companies



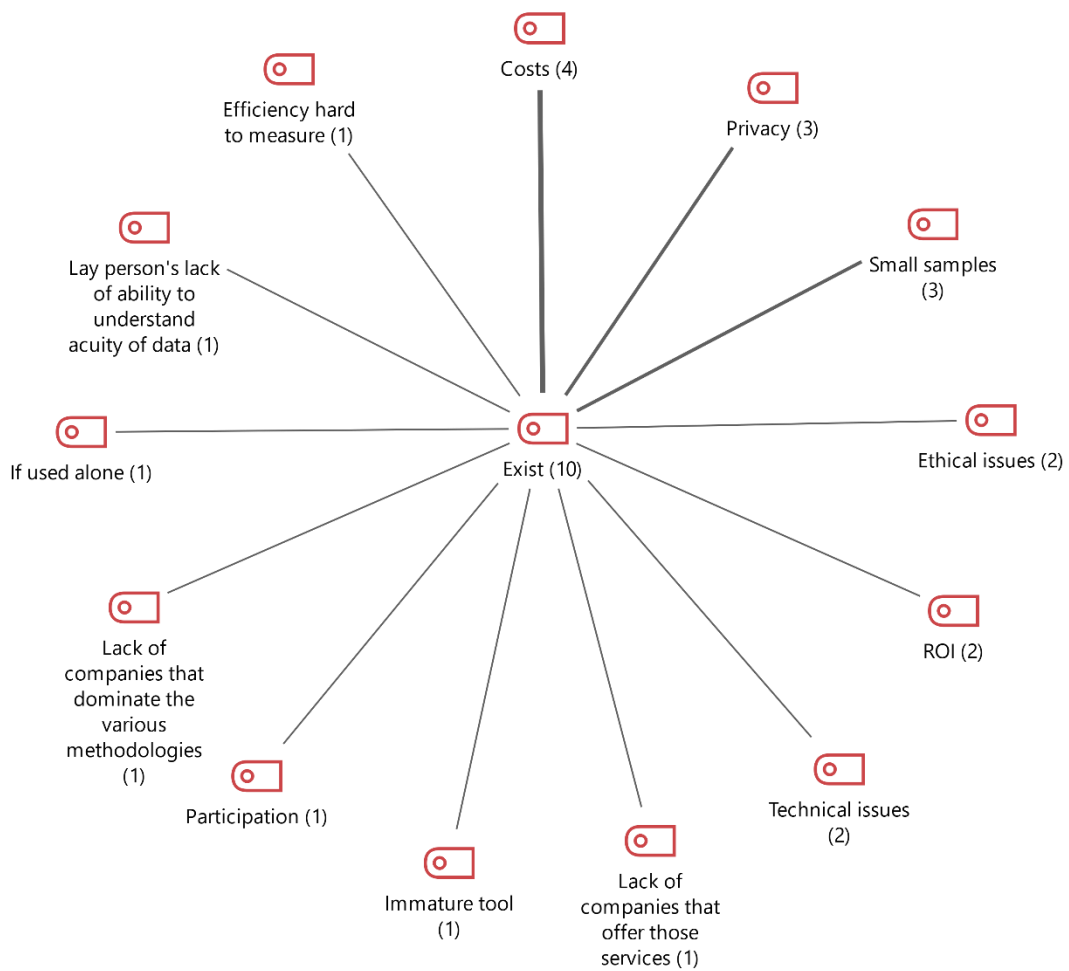
Map D.1.2 Respondents who do not consider neuromarketing useful for their companies



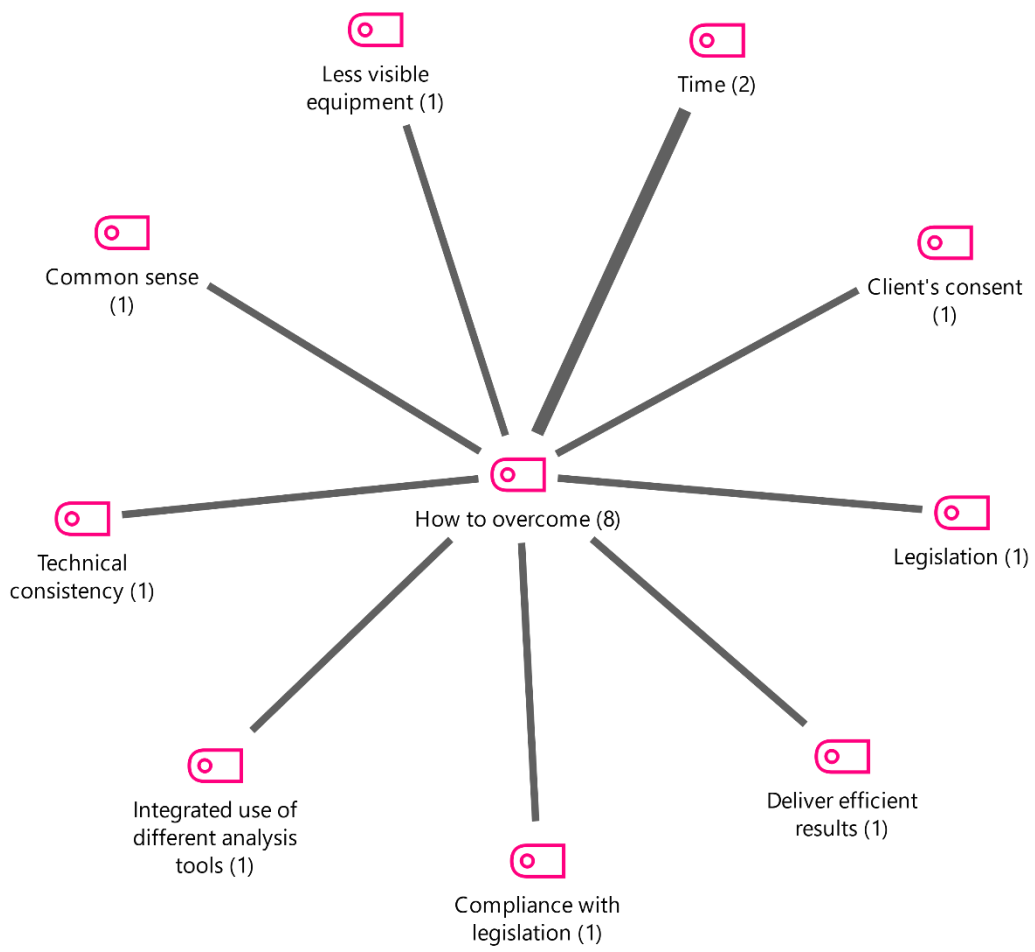
Map D.2 Neuromarketing usage within companies and results



Map D.3 Neuromarketing

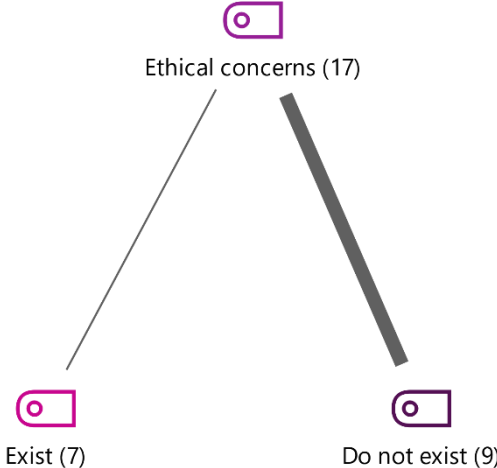


Map D.3.1 Existing Neuromarketing

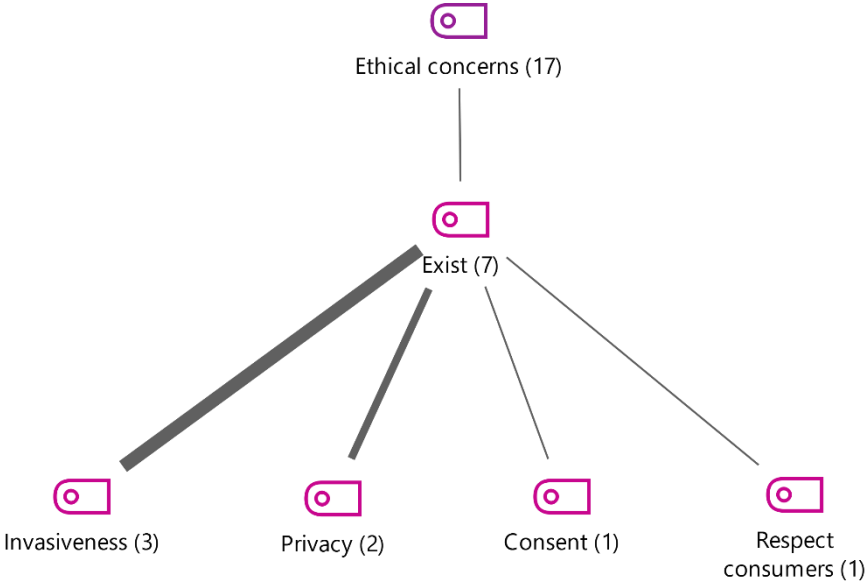


Map D.3.1.1 Solutions suggested for neuromarketing

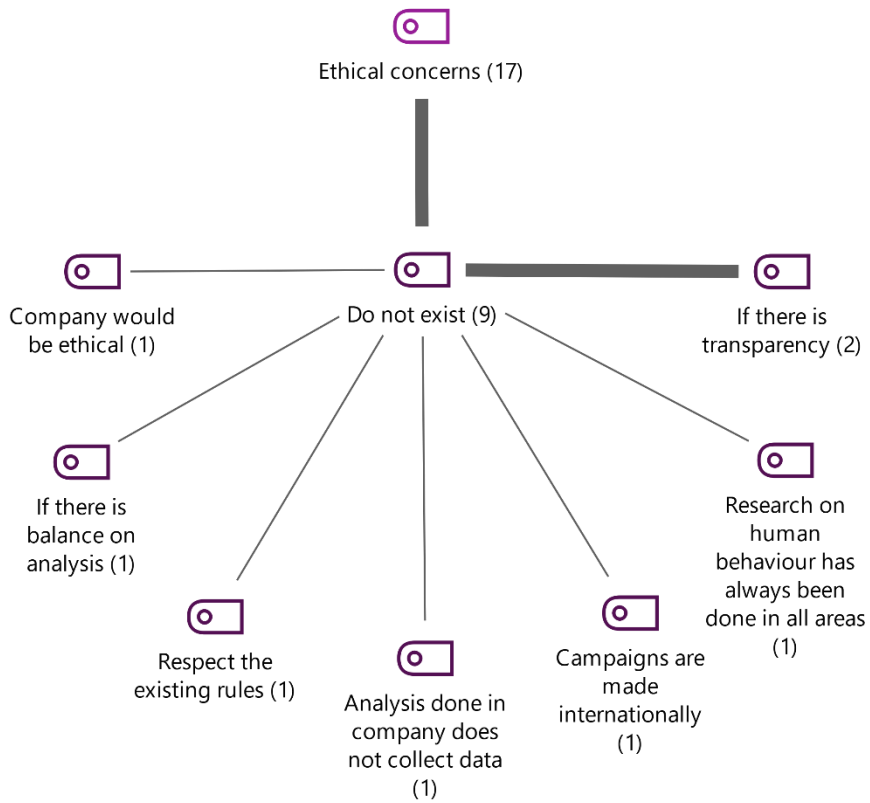
Annex E: Retrieved segments for Ethics dimension



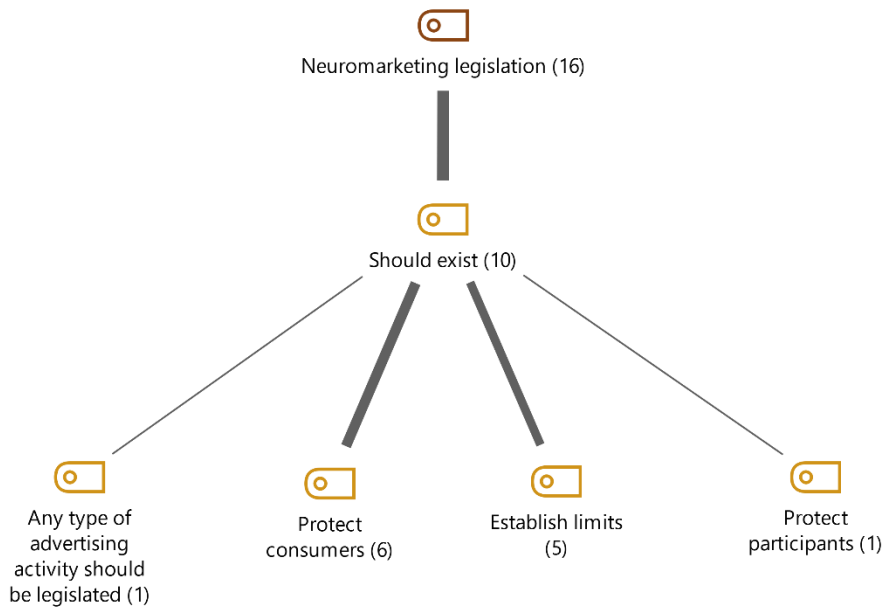
Map E.1 Ethical concerns regarding neuromarketing use in respondents' companies



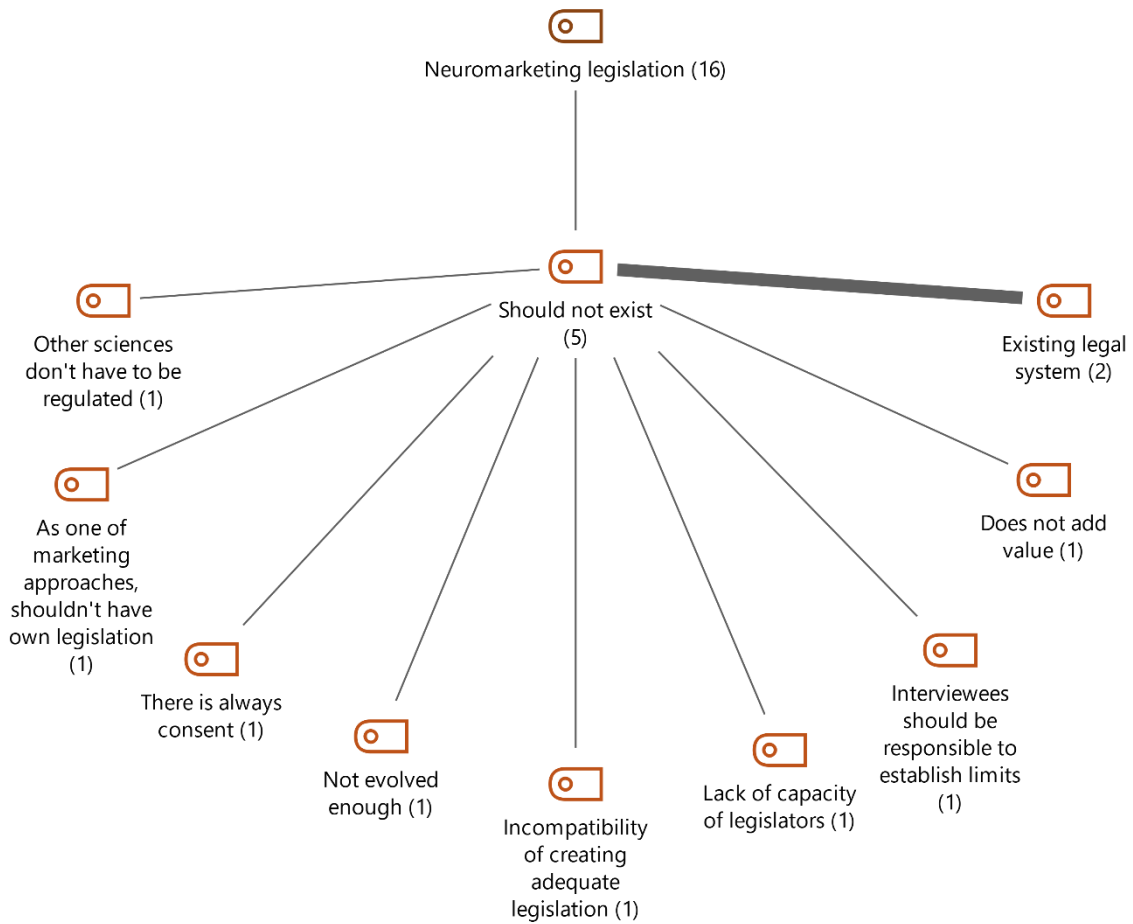
Map E.1.1 Ethical concerns regarding neuromarketing use in respondents' companies –



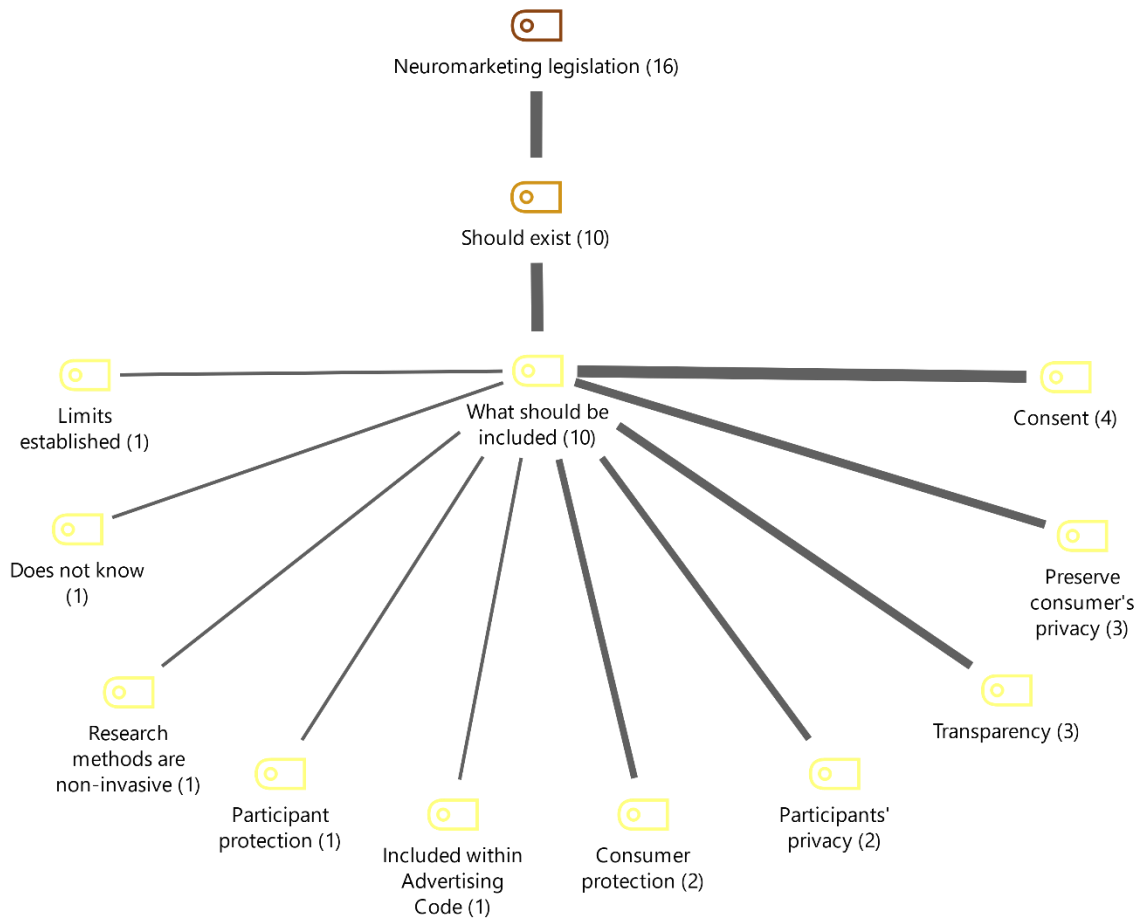
Map E.1.2 Ethical concerns regarding neuromarketing use in respondents' companies do not exist – Reasons



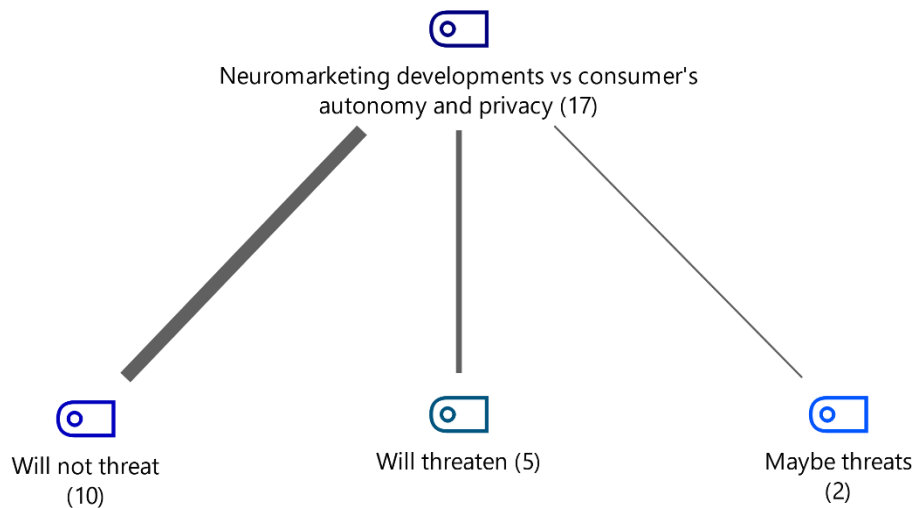
Map E.2 Neuromarketing legislation should exist – Reasons



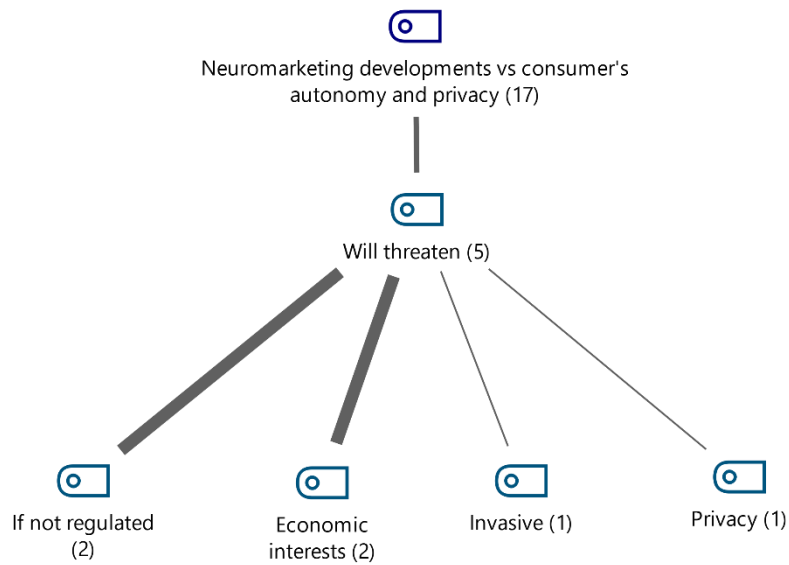
Map E.3 Neuromarketing legislation should not exist – Reasons



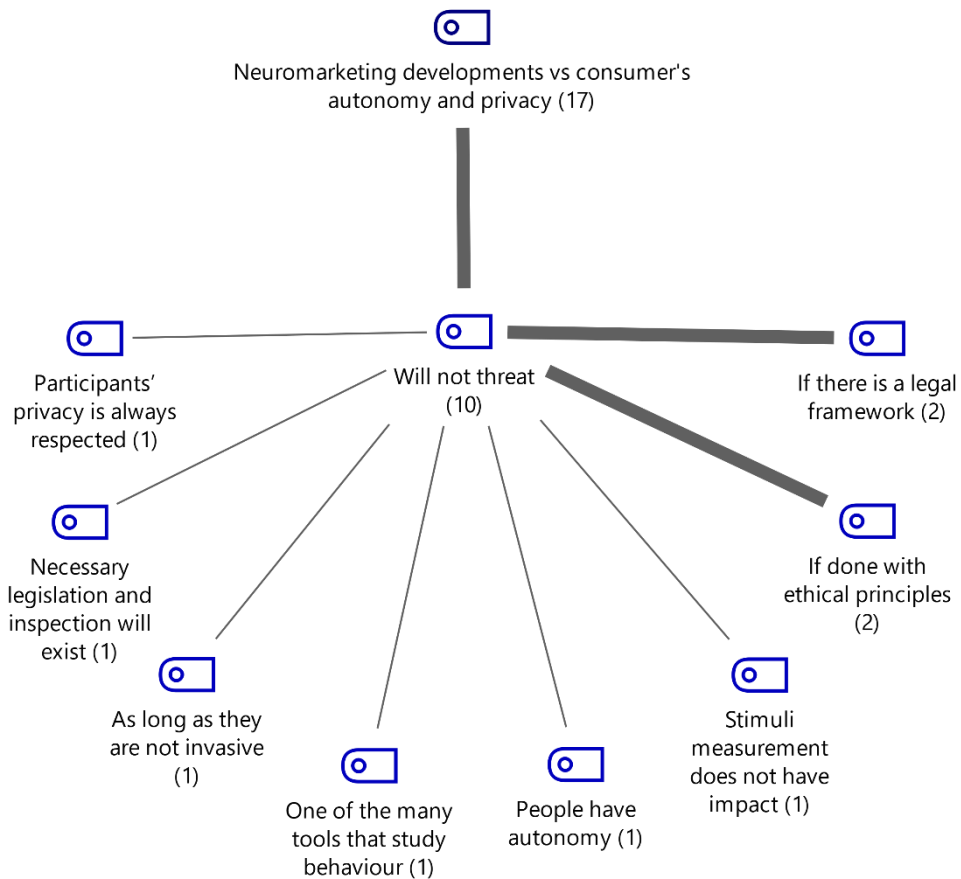
Map E.2.1 What should be included in a specific legislation for



Map E.4 Neuromarketing developments threatens consumers' autonomy and

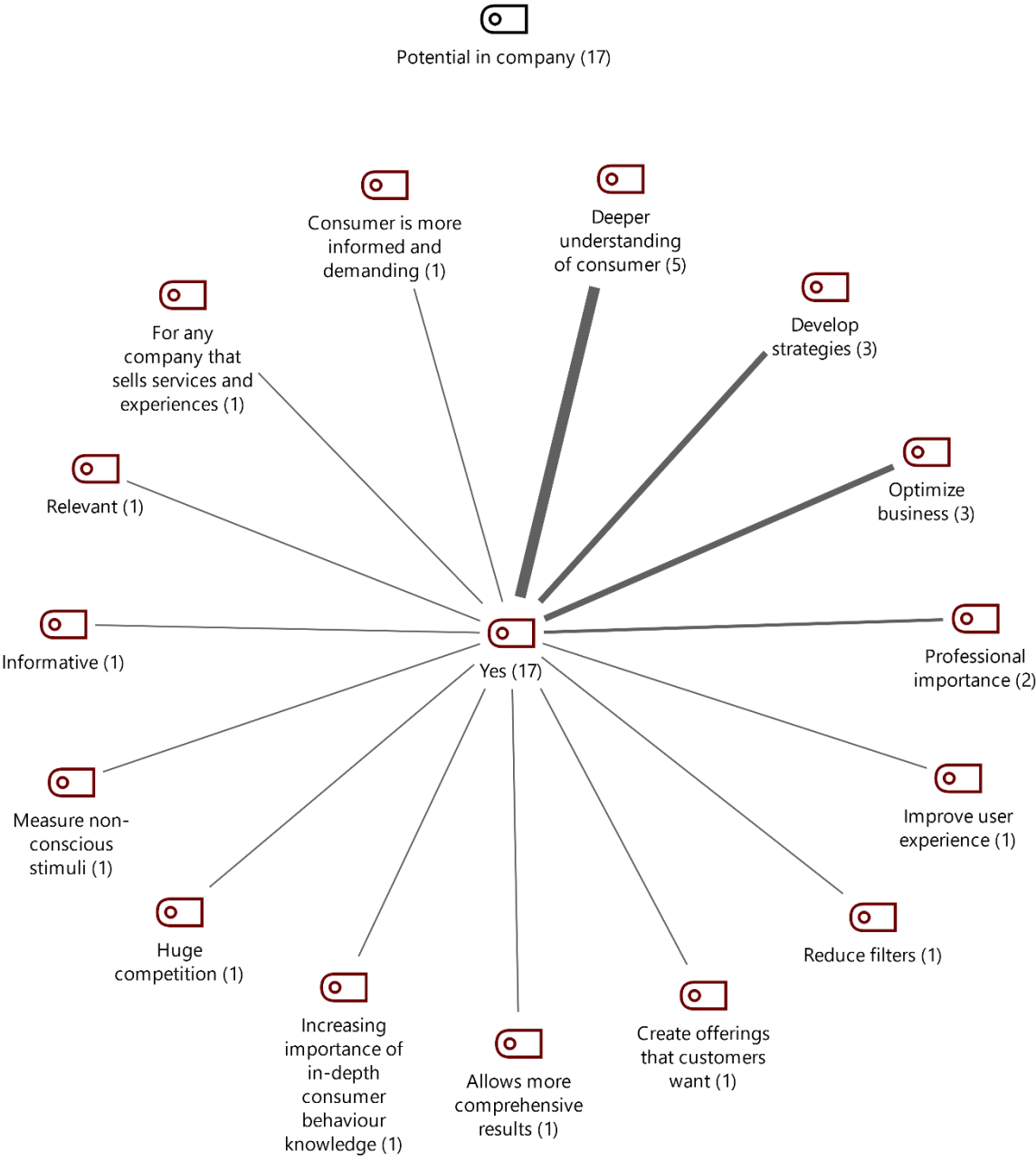


Map E.4.1 Neuromarketing developments will threaten consumers' autonomy and privacy – Reasons mentioned



Map E.4.2 Neuromarketing developments will not threaten consumers' autonomy and privacy – Reasons mentioned

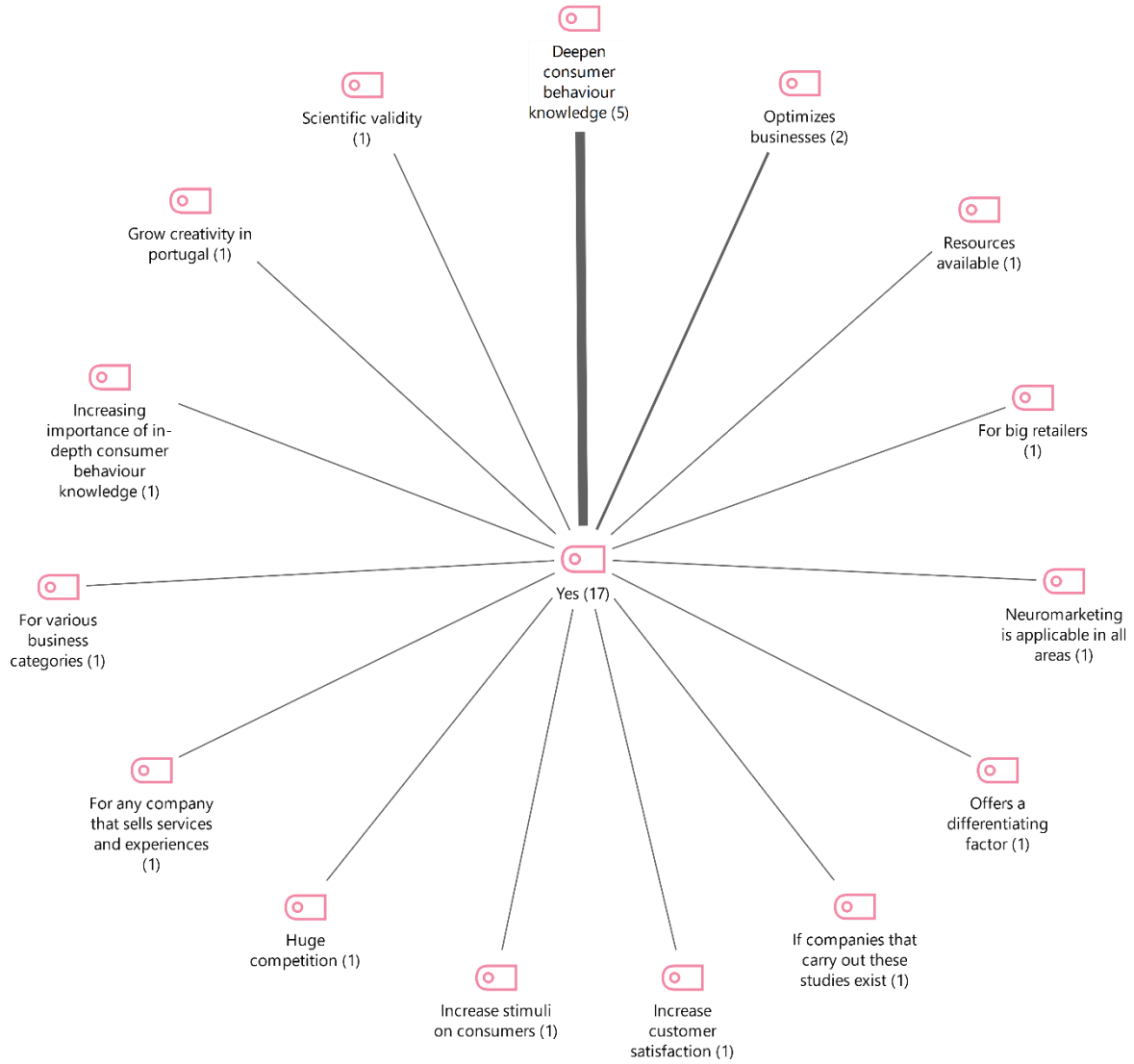
Annex F: Retrieved segments for Future dimension



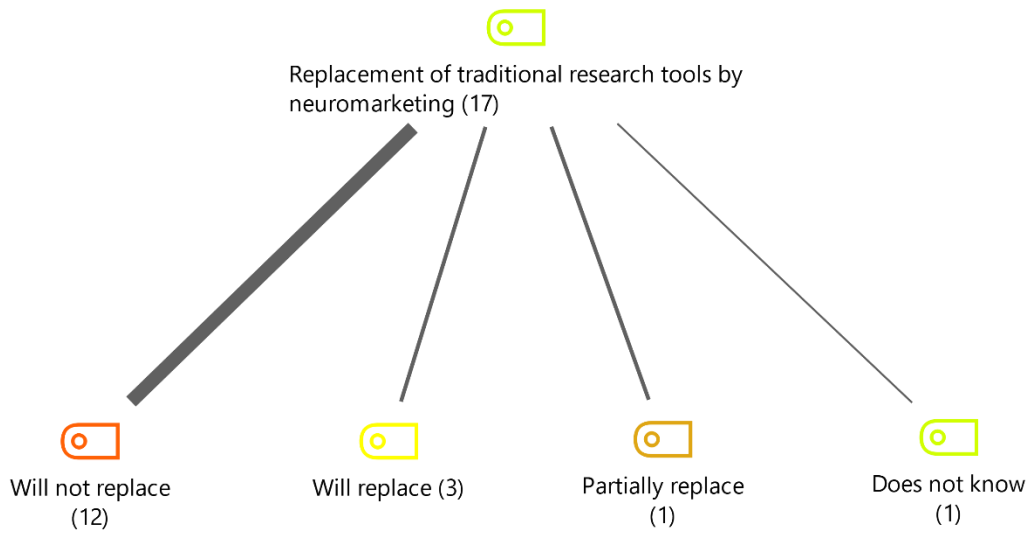
Map F.1 Potential to use neuromarketing within respondents?



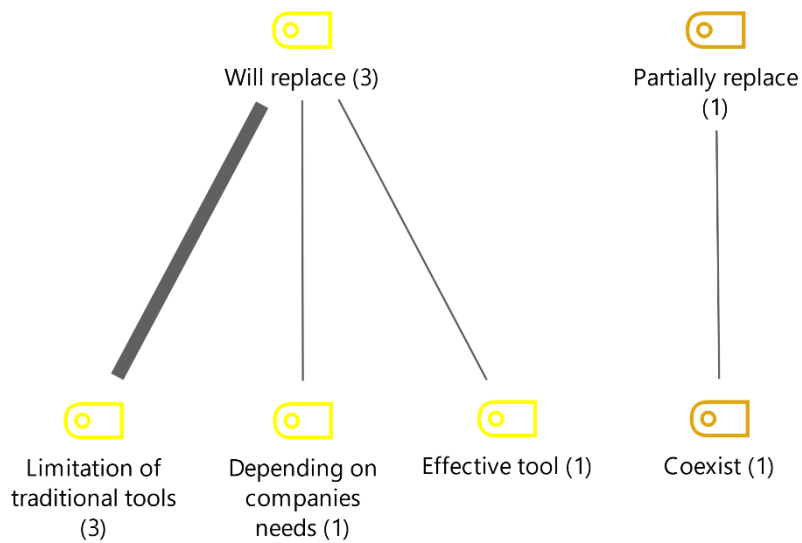
Potential for companies in Portugal (17)



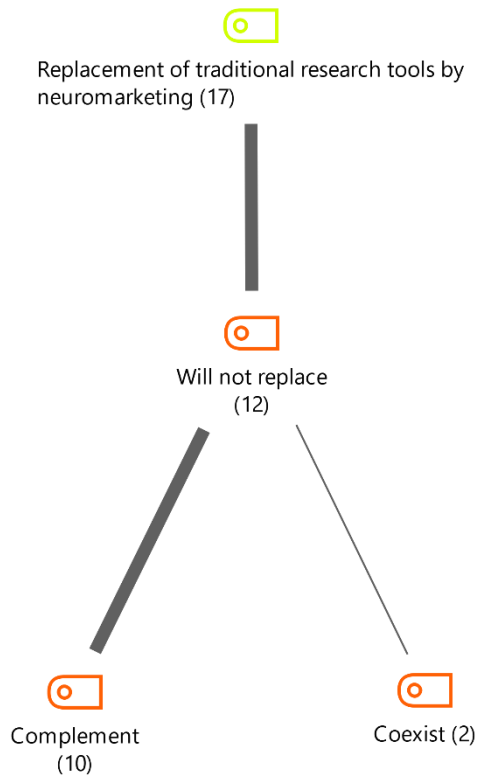
Map F.2 Potential for neuromarketing within



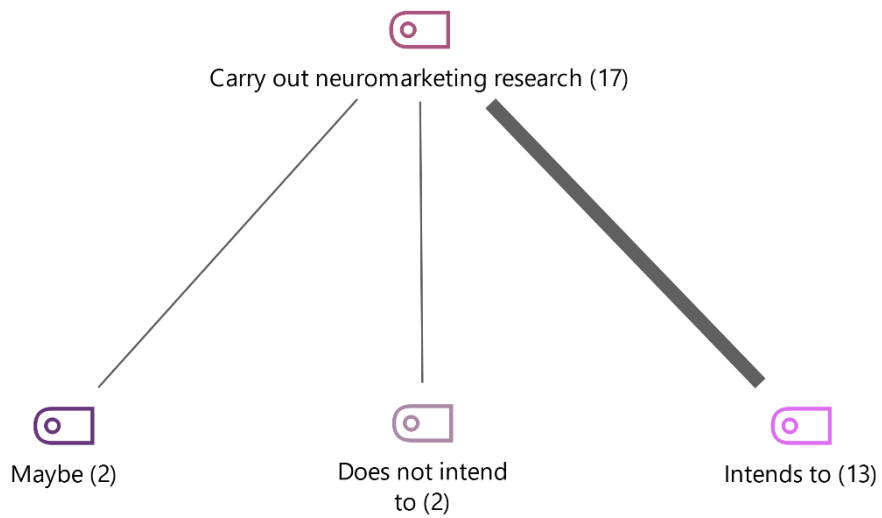
Map F.3 Replacement of traditional research tools by



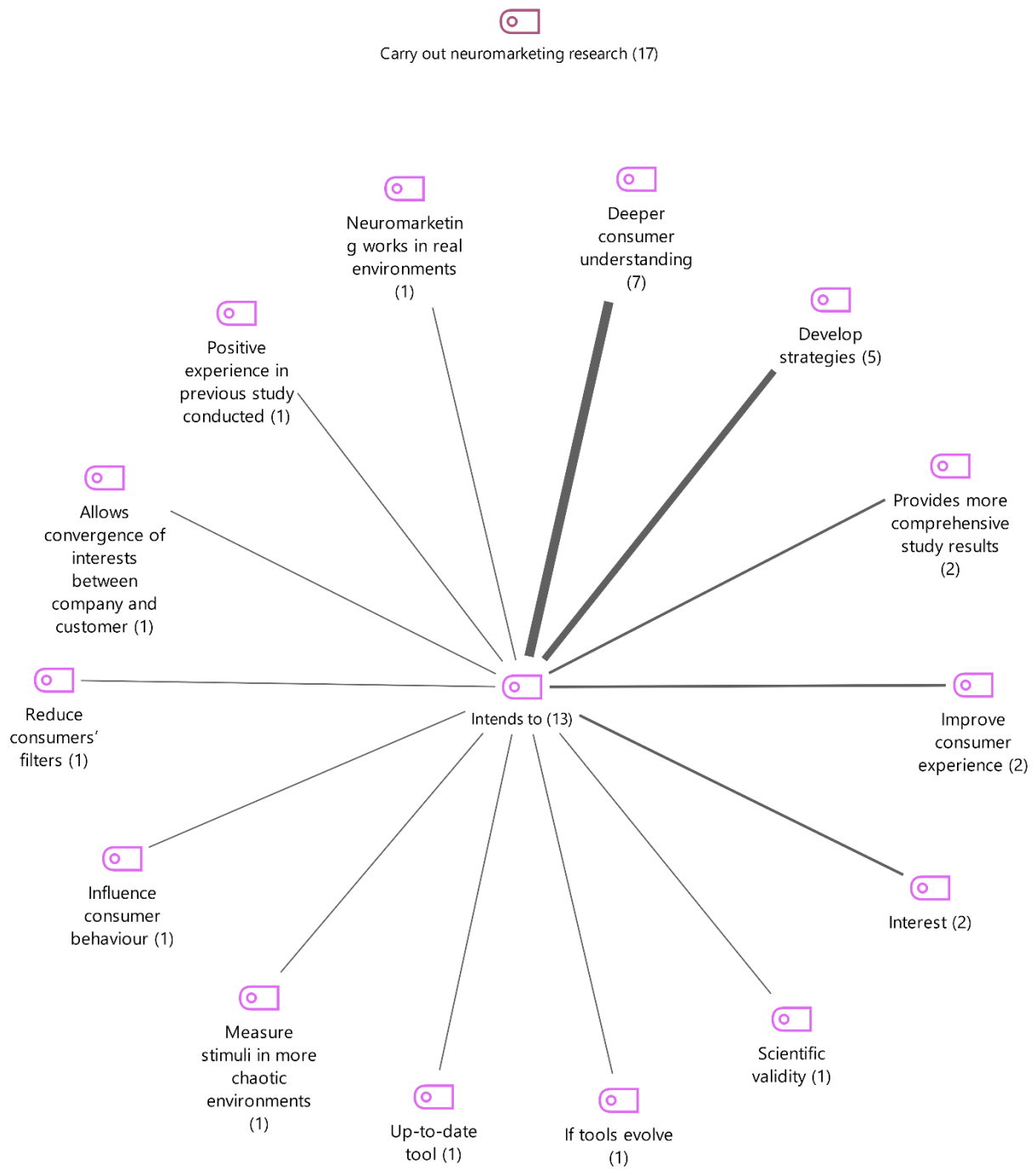
Map F.3.1 Replacement of traditional research tools by neuromarketing – Reasons mentioned



Map F.3.2 No replacement of traditional research tools by neuromarketing



Map F.4 Intention of respondents' carrying out neuromarketing research



Map F.4.1 Intention of respondents' carrying out neuromarketing research – Reasons mentioned