



ISCAC | 2024 Bárbara Gonçalves How does the application of neuromarketing techniques impact consumer behavior and decision-making in Portugal? –



Instituto Politécnico de Coimbra
Instituto Superior de Contabilidade
e Administração de Coimbra

Bárbara Gonçalves

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Coimbra, April 2024



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Bárbara Inês Silva Gonçalves

**How does the application of neuromarketing
techniques impact consumer behavior and decision-
making in Portugal?**

Dissertation submitted to the Institute of Accounting and Administration of Coimbra to fulfill the requirements necessary for obtaining the degree of master's in marketing and international Business, under the supervision of Professor Madalena Abreu.

Coimbra, April 2024

STATEMENT OF RESPONSIBILITY

I declare that I am the author of this dissertation, that it is an original and unpublished work, which has never been submitted to another higher education institution for obtaining an academic degree or other qualification. I also attest that all citations are properly identified and that I am aware that plagiarism is a serious lack of ethics, which may result in the annulment of the present.

“A mente que se abre a uma nova ideia jamais voltará ao seu tamanho original”.

-Albert Einstein

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RESUMO

O neuromarketing utiliza técnicas poderosas e desempenha um papel significativo na forma como as campanhas de marketing são hoje criadas e que serviços e produtos são necessários ou desenvolvidos. Uma vez que o neuromarketing é o estudo do processo de compra do consumidor, os profissionais de marketing utilizam-no de acordo com os desejos e necessidades dos consumidores.

O estudo pretende determinar se os consumidores estão conscientemente envolvidos no neuromarketing ou se são inconscientemente influenciados pelas suas táticas. Interpreta dados demográficos, mede a sensibilização dos consumidores para o neuromarketing em campanhas de marketing e avalia as percepções da sua eficácia no comportamento e na tomada de decisões. Também explora possíveis preocupações e implicações comportamentais e examina perspectivas éticas e legais sobre o neuromarketing.

Para obter uma compreensão mais completa do tema investigado, foi elaborada um questionário que incluía questões qualitativas e quantitativas. Os resultados, quando agrupado por geração, mostraram que as gerações não desempenham um papel fundamental na influência da consciência ou da opinião dos consumidores. Além disso, o uso de técnicas de neuromarketing não levanta preocupações éticas.

Palavras-chave: Neuromarketing, consumidor, comportamento do consumidor, processo de tomada de decisão, geração, *product placement*, *endorsement*, preocupações éticas

ABSTRACT

Neuromarketing uses powerful techniques and plays a significant role in how marketing campaigns are created today and what services and products are needed or developed. Because neuromarketing is the study of the consumer buying process, marketers use it in accordance with the wants and needs of consumers.

The purpose of this study is to determine whether consumers are consciously engaging with neuromarketing or whether they are unconsciously influenced by its tactics. It interprets demographic data, measures consumer awareness of neuromarketing in marketing campaigns and assesses perceptions of its effectiveness on behavior and decision-making. It also explores potential concerns, and behavioral implications and examines ethical and legal perspectives on neuromarketing.

In order to gain a more complete understanding of the research topic, a survey was designed that included both qualitative and quantitative questions. The results, when broken down by generation, showed that generations do not play a key role in influencing consumer awareness or opinion. Furthermore, the use of neuromarketing techniques does not raise any major ethical concerns.

Keywords: Neuromarketing, consumer, consumer behavior, decision-making process, generation, product placement, endorsement, ethical concerns

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LIST OF ABBREVIATIONS AND ACRONYMS

AMA - American Marketing Association

EEG - Electroencephalogram

fMRI - Magnetic Resonance Imaging

WHO – World Health Organization

ITA – International Trade Administration

GDPR - General Data Protection Regulation

EU - European Union

INTRODUCTION

Neuroscience is discovering new ways of understanding many areas of scientific knowledge. Among these, its contributions to understanding the functioning and impact of advertising on potential consumers must be highlighted and studied (Couson Célia & Vayssttes Emilie, 2013).

In fact, neuromarketing helps marketers and companies to better understand and adapt to consumers. It helps them to understand how consumers choose this or that product. Using powerful techniques, neuromarketing plays a significant role in how marketing campaigns are created today and what services and products are needed or developed. As neuromarketing is the study of the consumer buying process, marketers use it according to the wants and needs of consumers.

The study of neuromarketing has been crucial since its emergence in the 1990s (Couson Célia & Vayssttes Emilie, 2013). And since then, consumers have been heavily exposed to marketing campaigns that use neuromarketing insights (Wicinski, 2022). In this context, it's important to determine whether consumers are aware of this level of exposure.

Furthermore, as technology advances and the internet and social networks are increasingly used in marketing, techniques using neuromarketing data, such as celebrity/influencer endorsements and product placement, are becoming more prevalent and attracting more investment (Xavier, 2023). In this context, it is crucial for companies to find out whether the consumer's awareness of the use of neuromarketing techniques and potential ethical issues influences and changes the consumer's decision-making process.

Therefore, the main research question of this study is to determine whether the consumer is aware of neuromarketing and still chooses to be influenced or is unaware and therefore susceptible to blind influence.

Put in a different way, the main questions of this study are therefore whether consumers are aware of these techniques and whether they have ethical concerns about their use. Other objectives of this study include interpreting demographic data and assessing consumers' awareness of the existence and use of neuromarketing in the campaigns they are exposed to on a daily basis. It is also important to understand whether consumers believe that neuromarketing techniques work and whether this perception changes their behavior and decision-making. In addition, it is important to understand

how consumers view neuromarketing techniques from an ethical and legal perspective, to understand if there are any concerns and if this leads to a change in behavior.

In summary, neuroscience has significantly contributed to multiple fields of scientific knowledge, including advertising and marketing. Neuromarketing techniques have become increasingly prevalent, and it is crucial to understand whether consumers are aware of their use and if they have ethical concerns about them. This thesis aims to address these questions by conducting a literature review on neuromarketing and using a survey to gather data on consumer awareness, perception of the effectiveness of marketing techniques, and ethical concerns. The results of this study will provide insights into how neuromarketing impacts the consumer decision-making process and whether ethical concerns affect consumer behavior. Overall, this research should contribute to understanding the role of neuromarketing in modern marketing campaigns and its implications for consumers.

Literature Review

1 Marketing – An overview

According to (Bartels, 1951,327) marketing is defined as “that field of study which investigates the conditions and laws affecting the distribution of commodities and services. It is the institutionalized function of providing consumers with goods for their use”. This definition focuses primarily on the distribution aspect of marketing and the physical movement of goods and services from the producer to the consumer. During this period, it was essential to employ sales strategies to promote the production inventory that was not being quickly purchased by the market. The primary objective of marketing during this time was to deplete the stock.

The definition of marketing has evolved considerably in recent times, encompassing a wider range of stakeholders and activities. The field of marketing itself is expanding in tandem with the growth of companies and the technological tools that are increasingly influencing the way marketing is conducted. “Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large.” (America Marketing Association (AMA), 2017). The field of marketing has evolved considerably over the years, becoming a significant and integral part of many companies.

To be different from their competitors, organizations must offer their value purpose, no longer classifying their customers as only consumers, but as people with values, beliefs, and good with society, and to change their current reality and a better world (Santos et al., 2020)

Marketers have long been aware of profound changes in how consumers research and buy products. However, a failure to change the marketing focus to match that evolution has undermined the core goal of reaching customers at the moments that most influence their purchases. The shift in consumer decision-making means that marketers need to adjust their spending and view the change not as a loss of power over consumers but as an opportunity to be in the right place at the right time, giving them the information and support they need to make the right decisions.

The word "marketing" has its origins in the Latin term "*mercare*," which referred to the act of selling products in the ancient Roman Empire, as stated by (T. Santos et al., 2009). While some literature claims that marketing emerged in the 19th century, there is

evidence of its basic principles dating back to Ancient Greece. Some historians believe that marketing has existed since the beginning of trade, as it was a crucial aspect of commerce as civilization developed. Commerce relations can be observed in the history of the Roman Empire, Islamic nations, and Portuguese discoveries of the 15th and 16th centuries.

During the 17th century in England, the industrial revolution caused a significant shift from agriculture to industry, which led to the development of new techniques by English businessmen. These techniques later inspired American and European industries. Thanks to the industrial revolution, production levels increased significantly, allowing for national and, eventually, international exports. This desire for expansion led to the emergence of skilled marketers.

Throughout the 19th century, the realm of production was primarily governed by economic and market laws, which led to high demand and absorption of goods by the markets. However, in the early 20th century, Marketing emerged as a distinct area of expertise compared to other commercial activities. Despite being a new discipline, Marketing has undergone numerous changes and transformations, evolving alongside market development, and creating new perspectives that distinguish it from other organizational practices. As the liberal economy gained dominance over the markets, rules between shareholders shifted, thus paving the way for the emergence of Marketing.

The Marketing field can be described in 4 main Eras since it formally started (Wilkie & Moore, 2003): The period previously to the formal beginning of the field is described as “pre-marketing”; this first Era occurred from 1900-1920; the production era, where the demand was lower than the capacity of production, and the resources, and the businessman were focused on production (Wilkie & Moore, 2003); Second Era occurred between 1920-1950, the Era of sales, where the first signs of excess in production were starting to show, with companies using aggressive techniques to sell and avoid having high stocks of production and where the formalization of the field started; The third Era, from 1950-1980, post-world war II the US economy was thriving, and the introduction of the television allowed reaching consumers massively. It also marks the birth of consumer behavior and marketing research as the introduction of computers made analyzing and distributing large-scale surveys possible (Wilkie & Moore, 2003). Finally, in the fourth Era, the fall of Communist economies and the rise of the internet caused significant disruptions in marketing practices, leading to rapid development. The internet enabled

marketing journals and theories to expand globally, resulting in collaboration between marketers worldwide. As a result, marketing has expanded dramatically, especially in academia. This growth led to a greater demand for marketing professors, and the influx of marketing students brought greater diversity in thought and ethnicity. However, the specialization of academia resulted in a shift towards marketing subsets, such as marketing ethics, consumer policy, and consumer economics. The number of research-based marketing journal outlets doubled between 1980 and 1984, leading to a significant increase in the pace and quantity of marketing-related information (Wicinski, 2022).

Thanks to technology and international interest in marketing research, marketing has significantly developed in terms of information and application (Kotler et al., 2021). However, the COVID-19 pandemic had a significant impact on businesses worldwide. It was causing a supply chain disruption due to sudden shifts in consumer buying behavior. There was a rapid shift from Brick-and-Mortar shopping to eCommerce shopping due to social distancing, forcing companies to quickly make their products or services online to stay in business (Wicinski, 2022). During this time, marketers had to adapt quickly to present their services and products to consumers effectively. The pandemic has accelerated digitalization and forced the consumer to change to digital; this fast change, combined with advanced technology and big data, can result in innovative consumer behavior research and a new marketing paradigm.

Scholars and businesses have extensively researched marketing to establish a connection with customers and increase sales. A significant development in this field was the integration of neuromarketing with neuroscience in the 90s. With the evolution of society, marketing has also evolved from mass marketing to a more personalized approach, aided using neurosciences.

2 Consumer Behavior

Consumer behavior is a field that has been extensively studied since the inception of marketing. It emerged as a discipline in the mid-20th century, and systems models of consumer behavior began to appear in professional journals in the late 1950s and early 1960s (Sirgy, 1985). In 1969, the Association for Consumer Research was established, and a yearly conference was inaugurated to facilitate the sharing of marketing research from a consumer perspective. This event marked the culmination of the growing interest

in the topic, formalizing it as an area of research within the field of marketing (Malter et al., 2020). The importance of marketing and the need to understand why consumers make certain decisions were the driving forces behind this development. Prior to this, marketing was primarily focused on selling products, with little attention given to the needs and preferences of consumers.

Alongside the evolution in the field, many definitions were drawn. Kotler and Armstrong claim that "Consumer behavior refers to the buyer of final consumer-individuals and households who buy goods and services for personal consumption" (Kotler & Armstrong, 2010, p. 159). Solomon adds to this definition and explains consumer behavior as the study of processes that occur when individuals or groups purchase, use, or dispose of products, services, ideas, or experiences to satisfy needs and desires (Solomon, 2006).

People are influenced by psychological and sociological factors when making purchasing decisions. The psychological factors impacting decision-making include information processing, learning, perception, motivation, personality, attitudes, and lifestyle factors. Sociological influences usually include culture, subculture, social class, group dynamics, socialization, reference groups, and family influences (Sirgy, 1985).

Consumer behavior is vital to marketers and businesses, as understanding consumer behavior can help them develop effective marketing strategies that meet the needs and wants of their target customers. By studying consumer behavior, businesses can gain insights into consumer preferences, buying habits, and decision-making processes, which can help them design products, create advertising campaigns, and set prices that appeal to their target customers.

Overall, consumer behavior is a complex and dynamic field influenced by a wide range of factors, and its study is essential for businesses, marketers, policymakers, and researchers alike (Sirgy, 1985).

2.1 Consumer Behavior evolution

Since the 1960s, consumer behavior has engaged multiple authors, marketers, and researchers. There are now thousands of articles and books in this field and counting. However, this was only sometimes the scenario of consumer behavior subject, despite the

rapid adherence in the 60s. Despite these facts, the awareness of the consumer's importance started earlier. Adam Smith wrote: "Consumption is the sole end and purpose of all production; and the interests of the producer ought to be attended to, only so far as it may be necessary for promoting that of the consumer." (Adam Smith, 1937, p. 625). The consumer behavior topic was optional since marketing strategies were not needed. The system production was absorbed entirely then, and only price and quantity were considered.

Marketing began its steps about 1900, but it mostly followed the lead of economists in dealing with the consumer. Despite some contributions like Arch Shaw in 1912 or Paul Nystrom in 1929, marketers needed to understand the importance of these works (Walters, 1979).

According to C. Glen Walters, the consumer started to be perceived as one of the main focuses of Marketing with the book *Basic Marketing* by E. Jerome McCarthy (Walters, 1979).

To M. Joseph Sirgy, consumer behavior discipline evolution can be seen in maturity levels. The study of consumer behavior was initially closely tied to traditional marketing, which focused on mass marketing economic goods. The approach to studying consumer behavior involved systematically observing, constructing models from those observations to predict future behavior, and empirically testing those models. Systems models of consumer behavior were developed in the late 1950s and early 1960s (Sirgy, 1985).

A new stage of the consumer behavior discipline emerged with the implementation of the marketing concept, which shifted the emphasis from maximizing profits to consumer satisfaction. This led to a shift in focus from the output-oriented study (systems science approach) to the input-oriented study (theory generation approach), with consumer behaviorists turning their attention to fields like psychology, social psychology, and sociology to develop consumer behavior theories (Sirgy, 1985).

In the late 1960s, integrated models of consumer behavior began to emerge, with Nicosia and Howard and Sheth (Howard & Seth, 2001) presenting influential models (Reina Paz & Rodríguez Vargas, 2023). Both models emphasized the individual's needs, motives, beliefs, personality, and attitudes as controlling consumer behavior, with the individual interacting with family members, reference groups, and culture through

communication. Hansen's cognitive theory of consumer choice behavior, Bauer's risk perception/risk reduction theory, and Engel, Blackwell, and Kollat's model of the consumer decision cycle also stood out (Sirgy, 1985). At the time, the purchase was viewed as a decision process. However, the relationship between consumer and marketing actions was not well established (Walters, 1979).

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In the following phase, consumer behavior shifted its focus to public policy issues related to consumer protection and satisfaction after the consumerism movement. This level of analysis has a twofold goal: to maximize business profits in exchange for consumer satisfaction and to protect and educate consumers to offset business abuses (Fox & Kotler, 1980; Sirgy, 1985; Sternthal & Zaltman, 1974).

The next phase of the consumer behavior study involves the application of marketing principles to the nonprofit and public sectors. Nonprofit organizations have increasingly conducted consumer behavior studies to understand the behavior of their target audience, including their needs and preferences. Social marketing, which involves promoting social ideas or behaviors, has emerged as a distinct study area within consumer behavior. Studies have been conducted on various noneconomic goods, including voting behavior, litter control, and energy conservation, to elicit a social response. The study of consumer behavior has broadened to incorporate noneconomic goods at this stage (Fox & Kotler, 1980; Sirgy, 1985).

Additionally, advances in computer technology have allowed researchers to simulate consumer decision-making processes and create computer-based models of consumer behavior. The study of consumer behavior continues to evolve and expand, incorporating new theories, research methods, and applications in a constantly changing Marketplace (Sirgy, 1985).

In the 2000s, marketing was changing from customer-centricity to human-centricity, balanced with corporate responsibility in a profitable way. Companies need to share their mission, vision, and values with team members to be competitive. Companies

need to create value for their customers and stakeholder partners. They started by addressing customers in their full humanity and with their concerns in mind (Achrol & Kotler, 2012; Kotler et al., 2010).

With the rise of social media, researchers have become interested in how it influences consumer behavior. For example, it has been studied how the increasing use of mobile devices affects consumer behavior, including how consumers search for and purchase products (Lurie et al., 2018). Studies have shown that social media can affect consumers' purchase decisions by providing them with product information and influencing their perceptions of brand credibility (Hajli, 2014). As consumers become more aware of environmental and social issues, researchers have examined how these concerns impact their consumption decisions (Vermeir & Verbeke, 2015).

With the growth of big data and the use of AI in marketing and advertising, researchers have started to investigate the use of machine learning algorithms to understand consumer behavior better (Shao et al., 2022). However, Big data may need to be more effective in addressing the affective/emotional, embodied, and multisensory aspects of experiences or knowledge (Rokka, 2021).

Consumer behavior has evolved significantly over the past few decades, driven by various social, economic, and technological changes. Researchers have made significant discoveries on consumer behavior, including the role of emotions, the impact of social media and mobile technology, the importance of sustainability and ethical concerns, and the influence of social norms and social influence. The rise of big data and artificial intelligence in marketing and advertising has also enabled researchers to understand consumer behavior better. Ultimately, studying consumer behavior is critical for businesses to effectively market their products and services, build strong brands, and maintain a competitive edge. As consumers continue to evolve, so will the study of consumer behavior, with new insights and discoveries helping to shape the future of marketing and advertising.

2.2 Consumer behavior theoretical perspectives

Consumer behavior is a complex and dynamic field that looks to understand why consumers behave as they do. To gain a deeper understanding of consumer behavior, researchers have developed several theoretical perspectives that offer different ways of

explaining and interpreting consumer behavior. These theoretical perspectives draw on various disciplines, including psychology, sociology, and economics.

While economic, behavioral, cognitive, and social perspectives are commonly used to study consumer behavior, it is essential to note that various other theoretical perspectives are available. These perspectives offer unique frameworks for understanding the complex processes that shape consumer decision-making, including attitudes, beliefs, personality, social norms, culture, and learning. By examining consumer behavior from multiple perspectives, researchers can gain a comprehensive understanding of the factors that influence consumer choices.

The economic perspective inherited from its mother science rigidity, also known as the "economic man," assumes that consumers are rational decision-makers seeking to maximize their utility and satisfaction by choosing the best products or services that meet their needs and wants (Markin, 1979).

The behavioral perspective focuses on the environmental cues and stimuli that influence consumer behavior, such as rewards, punishments, and reinforcement (Foxall, 1992).

The cognitive perspective suggests that consumers are rational decision-makers who process information to make informed purchase decisions. Emphasizes the mental processes involved in consumer decision-making, including attention, perception, learning, memory, and problem-solving. It challenges the explanations provided by the behavioral approach (Bray, 2008).

The social perspective suggests that consumer behavior is learned through socialization and observation of others. It looks at the impact of social and cultural factors on consumer behavior, such as reference groups, social class, family, and culture. They provide different ways of understanding and explaining consumer behavior.

Each perspective has its strengths and limitations, and researchers may use multiple perspectives to understand consumer behavior better. Using these theoretical perspectives, researchers can better understand consumer behavior and develop more effective marketing strategies. Businesses can also use these perspectives to understand their target markets and develop products and services that better meet their customers' needs and preferences. Overall, theoretical perspectives on consumer behavior play a

crucial role in advancing our understanding of consumer behavior and shaping the practice of marketing and advertising.

2.2.1 Consumer behavior models

Throughout history and as a result of investigation and research, numerous writers have studied consumer behavior and identified various types of buying. These buying types have been integrated into different theoretical models of consumer behavior, which aim to elucidate individual and collective consumer behavior in social and economic domains. Furthermore, the theoretical understanding of behavioral models has undergone significant changes in the past half-century.

In the 1960s, the field of consumer behavior began to gain traction as a subject of study. Notable figures, such as Jerome McCarthy, Nicosia (1966), and Howard & Sheth (1969), appeared during this time. Howard & Sheth (1969) developed the Purchaser Behavioral Model, which investigated the decision-making process of selecting a particular product or brand. Although widely examined and applied by researchers, empirical testing has revealed limitations in its predictive ability. The model suggests that consumer behavior is influenced by stimulus-response, learning, and cognition. In 1989, Howard reviewed and updated the model to enhance its clarity and ease of understanding. The Consumer Decision Model identifies seven key factors that play a role in the consumption process and its interrelationships, including information, brand recognition, attitude, trust, intention, purchase, and purchase satisfaction. This updated model provides valuable insights into consumer behavior. (Reina Paz & Rodríguez Vargas, 2023).

In their Model of Consumption Values, Sheth, Newman & Gross (Sheth et al., 1991) argue that consumer choice is determined by a multiple consumption values function based on five distinct value dimensions: functional, social, emotional, epistemic, and conditional. In 1993, Schiffman and Kanuk proposed the Basic Consumer Decision-Making Model, which aims to simplify the decision-making approach without considering complex decisions but is extensive enough to cover both simple and complex decisions. In 1995, Raju introduced the A-B-C-D Paradigm Model (Access-Buying Behavior-Consumption Characteristics-Disposal) to understand consumer behavior in global markets. The four initials in the model refer to the four sequential stages used to

represent any culture's purchasing and consumption processes (Reina Paz & Rodríguez Vargas, 2023).

According to Kotler & Keller's (Kotler & Keller, 2006) Purchase Behavior Model, marketing stimuli consist of four key variables: product, price, distribution, and communication. Additionally, external variables not directly controlled by the purchaser, such as economic, technological, political, and cultural factors, also play a significant role in purchasing (Reina Paz & Rodríguez Vargas, 2023).

In conclusion, understanding the consumer behavior process is decisive for companies to develop effective marketing strategies and succeed in the marketplace. By analyzing consumer behavior, companies can identify consumer needs and preferences, develop products and services that meet those needs, and tailor their marketing messages and activities to resonate with their target audience. Additionally, studying consumer behavior helps companies to anticipate and respond to changes in consumer behavior, enhancing their competitive advantage. Overall, a deep understanding of the consumer behavior process can lead to increased customer satisfaction, loyalty, and repeat business, contributing to the company's long-term success (McGregor, 1995; Singh, 2020).

2.2.2 Consumer decision-making process

Consumer behavior refers to the actions and behaviors of consumers as they purchase, use, and dispose of goods and services, in other words, consumer behavior refers to a sequence of steps that consumers take before, during, and after purchasing a product or service. These steps are influenced by many social, economic, environmental, and motivational factors. Consumer behavior also includes broad issues such as consumer information processing, consumption value, or consumer ethics (Lim et al., 2023).

The consumer decision-making process is the process that individuals go through when making a purchase decision. The decision-making process includes several stages: problem recognition, information search, evaluation of alternatives, purchase decision, and post-purchase evaluation. The study of consumer behavior helps marketers understand how consumers make decisions and what factors influence their behavior. By understanding the consumer decision-making process, marketers can tailor their marketing efforts to meet the needs and preferences of their target audience (Solomon et al., 2010).

Some purchases are more important than others, some decisions are made instantly, and others may take several hours or days for the customer to make a decision. (Solomon et al., 2010). Most decision-making processes have 5 phases (Markin, 1979):

1. Problem recognition and identification
2. Information search
3. Evaluation of alternatives
4. Choice or commitment
5. Post-choice and commitment activities

The process begins when the consumer sees a change in his/her current state or condition. The first step is crucial that the consumer has a clear understanding of the issue or change starting the process so it can be appropriately identified and defined (Lunenbourg, 2010). Marketing stimuli often trigger the problem, and internal and external factors influence the customer's decision (Couson Célia & Vayssttes Emilie, 2013).

Consumers tend to search for as long as they need until they can make an informed decision, so the extent of the search does not outweigh the rewards of doing it, which in economics is perceived as "utility." After recognizing a need, the consumer searches for information called a "pre-purchase search." Nevertheless, the information research step can be used outside of the purchase when shoppers like to search for information just for fun or because they like to be up to date; this would be an "ongoing search." Information sources can be internal when the consumer relies on their experience. Even when this source is used, it is often supplemented with external sources like advertisements, friends, or others (Solomon et al., 2010).

This step would include the identification of alternatives; some consumers already have brands in mind, others don't, but they will probably select a few among all available options; that would be the evoked set. Usually, members of this evoked set (brands, products) have similar features. The alternatives to be considered are influenced by how the person mentally groups products (Solomon et al., 2010).

Eventually, the consumer decides among the alternatives he has selected. Rules and pros/cons lists may help the consumer make the decision. Are often used heuristics or mental rules to simplify the decision. When a consumer makes the same purchase constantly, that could be honest loyalty to the brand or simply inertia because it avoids spending time choosing an alternative (Solomon et al., 2010).

After making a purchase, consumers typically evaluate whether it met their needs or solved their issues. A post-purchase evaluation determines the confidence in the product and can set grounds for repeating the purchase, beginning a loyalty relationship. The decision-making process is complex and dynamic and involves several stages. Consumers take more or less time to make this process, depending on the importance of the choice. Some purchases are automatic and only go through some phases (Solomon et al., 2010). Today's society has many alternatives and many choices to make. By analyzing consumer behavior, marketers can identify the factors influencing their decision-making and use this data to create marketing campaigns and products that appeal to their target audience. Therefore, studying consumer decision-making processes is essential for businesses to succeed in today's competitive market.

3 Neuromarketing

Neuromarketing was developed to aid in the complex task of understanding consumer behavior. According to Wilson et al. (2008), neuromarketing is “the application of neuroscientific methods to analyze and understand human behavior in relation to markets and marketing exchanges”. The combination of neurosciences with marketing made a new way of doing marketing, by measuring signs of the brain to develop insights into the expectations and preferences of a consumer. Neuromarketing is seen as the application of neuroimaging to market research (Lee et al., 2007).

Neuromarketing is a relatively new field that emerged in the late 1990s and early 2000s. However, the roots of neuromarketing can be traced back to earlier research in neuroscience and consumer behavior. The term "neuromarketing" was coined by Ales Smidts (Couson Célia & Vayssttes Emilie, 2013), a professor of marketing research at the Rotterdam School of Management, in 2002.

In the 1990s, researchers began using brain imaging technologies such as functional magnetic resonance imaging (fMRI) to study the brain's response to various stimuli, including advertising and marketing messages. This research demonstrated that different parts of the brain are activated in response to different types of stimuli and that these brain responses can predict consumer behavior.

Neuromarketing constitutes a fusion of various disciplines embodying molecular biology, electrophysiology, neurophysiology, anatomy, embryology and developmental biology, cellular biology, behavioral biology, neurology, cognitive neuropsychology, and

cognitive sciences (Zurawicki, 2010). The recognition that the vast majority of our behaviors are determined subconsciously drives the neuromarketing field.

Human decisions can be analyzed on different levels, either from a biological view to a neurological perspective or a behavioral and psychological angle (Strieder, 2022). According to Harvard marketing professor and author Gerald Zaltman, ninety-five percent of our thoughts, emotions, and learning occur without conscious awareness, (Dooley, 2011).

Throughout the years marketers have looked to the consumers as they could be able to explain why they chose A or B and explain that choice with words. We know now that is not true, since most of the buying process happens subconsciously.-As stated by Roger Doodly, in his book *Braininfluence*: “Modern neuroscience has brought us tools that help us see inside our brains and open up psychology’s black box.” (Dooley, 2011).

Neuromarketing uses neuroscience to understand the biological basis of behavior. The nervous system, which controls all actions of the body, can be grouped into sensory, integrative, and motor functions. The brain is the most complex structure in the body and understanding its anatomy and neurofunctional architecture can help understand daily functioning, creative processes, and adjustments to declining processing abilities. The brain consists of many areas in charge of various tasks and can be divided into three main areas - the Reptilian brain, the Mammalian brain, and the Homo Sapiens brain, according to "The Triune Brain" theory. Although the theory has been scientifically disproven, it still finds support from some Neuromarketing authors. (Strieder, 2022; Zurawicki, 2010).

Therefore, neurosciences are used to comprehend the relationship between consumer behavior and marketing changes, and with this, marketers hope to produce better insights based on non-subjective data. This is a clear advantage in comparison with traditional marketing techniques, as the results are not dependent on the subject’s ability to express their point of view (Lee et al., 2007)

The application of neuroscience to marketing research gained traction in the early 2000s, as companies such as Coca-Cola, McDonald's, and Google began to invest in neuromarketing research. Neuromarketing research has since expanded to include a variety of methods for measuring brain activity and other physiological responses, such as eye tracking, skin conductance, and heart rate variability.

To give response to this demand neuromarketing has seen two waves that have sought to analyze the human unconscious reasoning: the first wave was the closest to neurosciences and so focused on “direct studies” analyzing brain activities, e.g. through

the use of Electroencephalography (EEG) or the more modern functional Magnetic Resonance Imaging (fMRI); and the second wave concentrated on “indirect studies” analyzing changes in a human's physiological state, e.g. facial expressions, eye-movement, skin conductance, rate of inhalation, and heart rate. However, neuromarketing faces a number of issues and concerns, including the costliness and complexity of its state-of-the-art techniques like EEG or fMRI. Such techniques require laboratory set-ups and so do not lend themselves to day-to-day market research processes, being far away from the companies lives. As an answer to this, a third neuromarketing wave is rising as innovative enterprises are developing ways to use low cost devices or even mobile phones to carry out in-home neuromarketing measurements. (Probst et al., 2014).

As neuromarketing continues to gain popularity and recognition, it has become a valuable tool for understanding consumer behavior and decision-making. The field has already provided insights into the brain's role in processing marketing stimuli, and its potential applications in advertising, branding, and product design are considerable. However, the ethical implications of neuromarketing are a concern, with issues of privacy, informed consent, and manipulation still being debated. Additionally, the validity and reliability of the research methods used in neuromarketing studies require further investigation. Nevertheless, as the field progresses, it will be essential to address these challenges to ensure that neuromarketing is used ethically and responsibly.

3.1 Contributions from Neuromarketing

It is essential to understand that neuromarketing techniques are not directly employed in marketing campaigns. Instead, the insights generated through research utilizing these techniques provide valuable results that help marketers develop their strategies and predict consumer behavior when exposed to particular marketing stimuli.

As Weng Lim posits, neuromarketing contributes to the understanding of human behavior by examining the stimuli defined by marketing, or in other words, the marketing mix (product, price, promotion, place, people, prices, and physical evidence). This marketing mix can be researched in multiple ways using only some of the elements of the marketing mix. As asserted by the author in his work, neuromarketing is generally regarded among scholars as a method to validate, refine, or extend previous marketing

theories, thereby providing deeper insights into the subconscious mind of the test subject. (Lim, 2018).

The application areas in neuroscience address consumer behavior and marketing research, withdrawing from the research goals and providing field-changing insights, shaping marketing practices.

Neuromarketing is based on the idea that buying behavior is mainly subconscious; variables like beauty consciousness, photos, and visual presentations significantly influence buying decisions when choosing aesthetic products. The neuromarketing insights help companies better understand customers and reinforce their brands, making predicting consumer response in launching new products or advertising easier (Bhardwaj et al., 2023).

The neuromarketing notoriety brought the attention to the consumer, where physiological responses such as thirst, hunger, and the relation with the market are measured using neuromarketing tools, validating and completing marketing solutions. A fitting example is storytelling. The neuromarketing research contributed with a set of best practices that can be followed, adding that by being a non-invasive technique that can lead to greater confidence on the consumer's part (Stasi et al., 2018).

It is evident that neuroscience has the potential to provide insights that can be utilized in various fields, including marketing, research, and the development of more effective methods for understanding consumer behavior. The application of neuroimaging to marketing problems can facilitate a comprehensive understanding of the impacts of marketing techniques and provide insights into crucial issues related to business relationships. (Lee et al., 2007).

3.2 Neuromarketing techniques

A review of neuroscience literature suggests that neuromarketing is the application of neuroimaging to consumer behavior and the response to advertisements and brands. However, the literature also reveals a broader scope of research that extends beyond a response to products, brands, or advertising, and encompasses consumer behavior in general. (Lee et al., 2007).

Neurosciences use neuroimaging techniques to study the brain. Despite the imaging technology appearing first, on a medical level, such images of the human body's interior constituted an initial revolution. However, those images remained relatively rudimentary, and the organs were more "guessed at" than observed. Then came the marriage of physics and computer science at the end of the last century. Also, at the end of the 20th century, neurosciences tools were applied to study consumer behavior and its relations with marketing and the markets (Bihan, 2014)

The objective of neuromarketing research is to gain a deeper understanding of consumers and their decision-making processes, including the areas of the brain responsible. This field of study is gaining traction in both academic and business settings.

3.2.1 EEG

EEG, or electroencephalography, is a non-invasive brain imaging technique that records the brain's electrical activity at the scalp's surface. It was first introduced in 1929 to record brain activity.

An EEG device is typically a cap with multiple electrodes or sensors attached to the surface of the head. It assesses electrical field shifts via the electrodes on top of the subject's head. This tool can measure the impact and value of a marketing stimulus by obtaining a series of metrics, such as engagement, awareness, attention, or memorization.

Scientists at Harvard Business School conducted an EEG study and discovered the primary factor that drives sales for Cheetos, a brand of cheese puffs/crisps in the US. Researchers let the study subjects try Cheetos while being connected to EEGs that could measure their electrical variations revealing the feelings they were experiencing. Reportedly, the consumers enjoyed the cheese dust that stuck to their fingers when eating the crisps, as their neurons fired at the moment of sensing the sticky cheese powder (Carmen Nobel, 2013).

A disadvantage of EEG is that it only measures the outer layers of the brain, while it is not possible to reach the deeper areas of the brain as with fMRI. On the other hand, EEG lets consumers move with no restrictions during the study, allowing it to be applied in a lab environment and real-life scenarios such as in supermarkets.

3.2.2 fMRI

The fMRI stands for Functional magnetic resonance and is a well-known tool for Neuromarketing. fMRI is extensive medical equipment employed to explore the brain processes by the changes linked with the blood flow. The method of fMRI makes the participants lie down in a magnetic tube that is nothing less than a scanner tracking the variations of blood oxygenation in the brain. When the brain is confronted with a task, it requires energy. The harder one area of the brain has to work on that task, the more oxygenated blood it requires, which is then visible via fMRI (Strieder, 2022).

Despite showing relevant data, this also has disadvantages, such as being costly, restrictive, intrusive (the patient must lie down and be still inside a machine), and immobile. That is why fMRI in Neuromarketing is rare (Singh, 2020).

3.2.3 Eye Tracking

This neuroscientific tool differs from the techniques previously described in that it is not focused on the brain but rather on the eyes, their movements, and the changes in the size of the pupil in response to visual stimuli. It is possible to track what the consumer is paying attention to and identify patterns.

According to Zurawicki, the movements of the eyes can be categorized into fixations and saccades. When the eye movement pauses in a particular position, there is a fixation; saccade is a switch to another position. A sequence of fixations and saccades is referred to as a scan path. Scan paths are used in analyzing visual perception, cognitive intent, interest, and salience (Zurawicki, 2010).

The application of the results goes across packaging design, testing advertisements and video material, testing prints, and image design, testing how the consumer filters information, and determining the hierarchy of perceptions of stimulus material. Retail can make use of eye-tracking for testing shelf layout, testing in-store reactions, and testing product placement (Singh, 2020).

These are some of the more relevant tools used in neuromarketing. Nevertheless, there are others like Galvanic Skin Response (GSR), Electrocardiogram (ECG), Steady-State Topography (SST), Positron-emission tomography (PET), Magnetoencephalography (MEG). The tools for neuromarketing are also used in the medical field for the same thing, however, with a completely different goal. Those

mentioned above and described techniques have different advantages and weaknesses; combining some of the tools, considering the research goals, can provide more insights and a complete result than producing superior results compared to using only one specific technology (Zurawicki, 2010).

3.3 Marketing tools using neuromarketing

Neuromarketing is an emergent interdisciplinary field of study that aims to unravel the mysteries of consumer psychology. It involves the use of advanced neuroimaging technologies such as electroencephalography (EEG), functional magnetic resonance imaging (fMRI), and eye-tracking to measure and analyze brain activity in response to marketing stimuli. By tapping into the subconscious mind of consumers, neuromarketing can provide valuable insights into the emotional and cognitive processes that underlie consumer decision-making, and thereby help businesses enhance their marketing performance (Mohammad Osman et al., 2015). The predictive power of neuromarketing lies in its ability to identify the neural correlates of consumer behavior and to forecast the likely outcomes of different marketing strategies. As such, neuromarketing has emerged as a pivotal catalyst for driving sales growth and competitive advantage in the global marketplace. With the increasing adoption of neuromarketing techniques by marketers worldwide, it is poised to become a game-changing paradigm in the field of marketing research and practice (Quevedo et al., 2018). A multitude of techniques fall under this category, yet product placement and celebrity/influencer endorsement were selected for analysis due to their exponential growth in recent years and their straightforward nature, which allows consumers to form opinions and experiences based on their own experiences.

3.3.1 Product Placement

The effectiveness of traditional advertising has been doubted due to the oversaturation of traditional advertising and advances in advertisement-filtering technology. Consequently, product placement has become a popular advertising format in recent years as an alternative way to reach audiences. A growth rate in the global

product placement industry has been accomplished over the past decade, and it is estimated that the industry will be worth over \$21 billion by 2019. (Guo et al., 2019)

Product placement is the purposeful incorporation of commercial content into noncommercial settings, which refers to a product plug created through the fusion of advertising and entertainment (Williams et al., 2011). Research on product placement has primarily focused on the execution characteristics of the placement, aiming to understand how these elements affect the audience's attention, memory, and persuasion. Elements that increase the audience's attention to the placement also affect the route through which the placement is processed, thereby affecting the persuasive outcomes of the placement.

However, research has also shown a dissociation between memory and persuasion effects. Just because a placement is remembered does not necessarily mean it is persuasive, especially if it is perceived as a shameless attempt at influence. On the other hand, a not remembered placement may still be persuasive (Russell, 2019).

The research on product placement has identified audience awareness as a critical moderator of its impact. The increasing prevalence of product placements across entertainment contexts has made audiences more aware and skeptical of them. Therefore, studies on their impact should measure and control consumer attitudes toward product placement. Negative attitudes towards product placement can not only affect the processing and impact of the message itself but also ruin the overall experience.

To ensure transparency and prevent unethical practices, regulations have been put in place that require the disclosure of paid placements (Russell, 2019). Applying neuromarketing insights to product placement makes this technique more efficient since it can now influence the consumer's subconscious and measure the effects more accurately using neuromarketing techniques.

3.3.2 Celebrity Endorsement

The phenomenon of celebrity endorsement has been the subject of academic study for approximately the past half-century. This technique is employed by numerous companies that allocate considerable financial resources with the objective of leveraging the fame, popularity, and influence of celebrities to enhance brand awareness and sales. Although there are numerous instances of successful celebrity endorsements, it can be a

risky strategy if the celebrity's qualities are inappropriate, irrelevant, or undesirable (Erdogan, 1999).

The existing literature is inconsistent regarding the features that create the "best" celebrity. To date, it has failed to create clear and reliable guidelines to help create these types of marketing campaigns (Erdogan, 1999; Schimmelpfennig & Hunt, 2020). The study by Schimmelpfennig and Hunt (2020) posits that no single theory is able to provide a comprehensive explanation of celebrity endorsements. Only a comprehensive framework encompassing all theories can account for the observed patterns. However, despite two decades of research, there has been little change in the theoretical landscape.

Four main endorsement theories have been proposed (Schimmelpfennig & Hunt, 2020). The first is the source credibility model, which suggests that the endorsement is more effective if the celebrity is perceived as trustworthy, knowledgeable, and an expert in the product category. It can be reasonably assumed that consumers are more likely to accept and act upon an endorsement from a trusted source. (2) The source attractiveness model is concerned with the attractiveness of the celebrity endorser, encompassing physical appearance, personality, and likeability. The underlying assumption is that consumers are more likely to be influenced by an endorsement if they find the celebrity attractive and appealing. (3) The match-up hypothesis posits a congruence between the celebrity endorser and the product being endorsed. A favorable match between the celebrity and the endorsed product can enhance the credibility and likeability of the celebrity, thereby increasing the effectiveness of the endorsement. For instance, a sports celebrity may be employed to endorse a sports drink. Finally, the meaning transfer model posits that celebrity endorsement functions by transferring the meaning of the celebrity to the brand being endorsed. A celebrity's personality, image, and reputation can positively affect the brand's image, making it more desirable to consumers. For instance, a stylish celebrity endorsing a fashion brand may transfer their sense of style to the brand (Erdogan, 1999; Schimmelpfennig & Hunt, 2020).

Despite its long-standing prevalence in marketing, there has been a paucity of developments in the field of celebrity endorsement. Neuromarketing offers the potential to measure how consumers respond to celebrity endorsements using brain imaging, thereby improving the effects of the endorsement on consumer behavior. This represents an opportunity to further develop this technique and enhance its practice.

3.3.3 Influencer Endorsement

The advent of social media platforms has significantly transformed the landscape of marketing and communication. One significant consequence of the advent of social media platforms is the rise of influencer marketing. This form of marketing leverages the social influence of certain individuals, known as influencers, to endorse products, services, and ideas.

The advent of social media has facilitated the emergence of influencers, individuals who have amassed a significant following on various platforms, such as Instagram, YouTube, and TikTok. These influencers typically have a niche focus and attract an audience that is interested in their content. Conversely, celebrities have achieved public recognition and popularity through their work in sports, entertainment, or other institutional settings. In general, they have a more extensive reach and appeal to a more diverse audience. Celebrities often have a broad and diverse audience across different demographic groups and geographic locations. They may also have a considerable number of followers on traditional media platforms such as television, movies, or music (Gräve & Bartsch, 2022; Schouten et al., 2020).

In contrast to celebrities, influencers are often perceived as more accessible, relatable, and authentic. They are perceived as individuals who have constructed their brand and engage with their audience on a more personal level. An essential aspect of influencer engagement is the establishment of a personal and authentic connection with their followers. Furthermore, they frequently engage with their audience, respond to comments, and provide personalized recommendations. This sense of authenticity and relatability renders influencers more approachable and trustworthy to their followers. (Gräve & Bartsch, 2022; Schouten et al., 2020)

The article posits perceptual differences between influencers and celebrities regarding attractiveness, credibility, expertise, and familiarity. The study indicates that influencer endorsements in social media are more effective when they are subtle, authentic, and less perceived as manipulative. Conversely, collaborations with celebrities may be more efficacious for intrusive advertising in social media (Gräve & Bartsch, 2022).

The findings of the study by Schouten et al. (2020) indicate that participants identified more with influencers than with celebrities, felt more similar to influencers than to celebrities, and trusted influencers more than celebrities. In terms of the effectiveness

of an advertisement, a number of factors must be considered. These include the degree of similarity between the endorser and the target audience, the extent to which the audience wishes to emulate the endorser, and the level of trustworthiness associated with the endorser. These factors serve to mediate the relationship between the type of endorser and the effectiveness of the advertisement, although this relationship is not always consistent. Contrary to expectations, the moderating effect of product-endorser fit on the relationship between endorser type and expertise or trust was not observed.

The direct investment in advertising with influencers in Portugal increased by 66% over the course of one year, reaching a total of 20 million euros. A study by the Human-to-Human agency indicates that the growth of influencer marketing in Portugal is notably rapid in comparison to the average growth observed in Spain (22.8%) and the United States (27.8%) in a mature market. The study projects that by 2023, investment in influencer marketing in Portugal will reach 25 million euros. The research also indicates that Instagram required 12 years to amass 15,000 influencers, whereas TikTok achieved a similar number in just six years, representing 80% of the creators on Instagram (Xavier, 2023).

It is also important to note that the distinction between influencers and celebrities is not always clear-cut, as celebrities may also have a significant presence on social media and engage in influencer-like activities. Similarly, some influencers may gain mainstream fame and recognition, thereby blurring the distinction between the two categories (Schouten et al., 2020).

In conclusion, while an invaluable tool in the marketing landscape, influencer endorsement is a complex phenomenon. It presents a significant opportunity for businesses and consumers alike, offering a more personal and relatable form of marketing. Nevertheless, it also necessitates the implementation of rigorous ethical standards to guarantee transparency and safeguard vulnerable demographics. As social media continues to evolve, the influence and impact of influencer endorsements are likely to continue growing. This warrants further study and careful regulatory attention.

3.4 Ethical concerns and Implications

The ethical implications of neuromarketing can be a subject of debate. On the one hand, neuromarketing can provide valuable insights into consumer behavior and

preferences that can help businesses improve their products and services. However, there are also concerns about the potential for neuromarketing to manipulate or exploit consumers (Murphy et al., 2008; Wilson et al., 2008).

Since neuromarketing was born, many have drawn attention to ethical issues. Multiple authors identify ethical issues with neuromarketing research; The ethical issues related to neuromarketing can be divided into two main categories.: 1) informed consent from the research subjects; 2) privacy concerns and protection of the consumer autonomy and independent thinking if neuromarketing reaches a high level of effectiveness (Fortunato et al., 2014; Murphy et al., 2008; Wilson et al., 2008).

One ethical concern is related to informed consent. Participants in neuromarketing studies may need to fully understand the nature of the research or the potential consequences of sharing their brain data. Additionally, there is the potential for the data collected to be used for other purposes beyond the intended research, such as targeted advertising or surveillance. Capable of collecting information that the subject does not know he is giving; the individual's privacy can be compromised. Without ethical considerations and responsibility, neuromarketing studies could lead to complicated situations where researchers receive a large amount of data without the participants realizing what information they gave away. (Fortunato et al., 2014; Lee et al., 2007; Murphy et al., 2008; Wicinski, 2022).

Another ethical concern is related to privacy. Neuromarketing studies often involve collecting personal information, such as demographic data or medical history, which raises questions about how this information will be used and who will have access to it. The insights collected from the consumer's subconscious mind would give information about consumption preference to an individual level, removing their defense mechanisms, posing a significant threat to consumer's autonomy, and providing companies with great power to influence the purchase decision. Consumer purchasing behavior and trigger mechanisms would not be a secret anymore, allowing companies to invade and manipulate private thoughts (Fortunato et al., 2014; Lee et al., 2007). When companies use neuromarketing information to manipulate consumer behavior in a way they are unaware of the subversion, Murphy and her colleagues refer to this as stealth neuromarketing (Murphy et al., 2008).

Ethical implications in neuromarketing can be even more pressing when the group of subjects is particularly vulnerable, like children, patients with mental problems or psychiatric disorders, or even prisoners. These groups are more easily deceived or

negatively affected by the technology or the outcomes of the studies (Ulman et al., 2015). These groups should be protected, and the studies that include them should be investigated. Ulman claims that brain imaging techniques could help understand how children learn and that knowledge could be used to improve learning or any other thing on scientific grounds. However, the commercial use that the information could have for children, or any other vulnerable group does not defend or justify on ethical grounds. (Luna-Nevarez, 2021; Ulman et al., 2015)

Since there is space to use neuromarketing unethically, the studies and their applications must be controlled scientifically, ethically, and legally against possible misuse. To reap the benefits of neuromarketing, businesses and consumers must be protected, and a regulatory framework needs to be developed. These frameworks are usually developed in the form of company regulations, third-party regulations, or governmental regulations (Wicinski, 2022).

The authors defend that ethical and beneficial relations between the involved parties can happen. The main point passes through the protection of the parties involved, disclosure of goals, protection of vulnerable populations from marketing exploitation, risks, and benefits, accurate media and marketing representation, and internal and external scientific validity. Although many ethical codes for neuromarketing have emerged in the last few years, no official organization regulates this research. "The need for transparency and the ethical implications of neuromarketing is calling for more monitoring, ethical codes, and formal protective regulations." (Luna-Nevarez, 2021).

3.5 Neuromarketing and consumer behavior in Portugal

Neuromarketing is a rapidly growing field that seeks to understand the underlying neural processes involved in consumer behavior. By using a range of neuroscientific tools, such as brain imaging and physiological measurements, researchers can gain insights into how consumers process information, make decisions, and respond to marketing stimuli. Portugal is an emerging market with significant growth in recent years, a rapidly expanding consumer base, and a dynamic business environment.

According to the Office of the High Commissioner for Human Rights, Portugal has not adopted specific neuromarketing or behavioral targeting legislation. However, general principles and rules on advertising apply to all advertising practices, including neuromarketing (OHCHR - Portugal, 2014). The publicity code is one example of

legislation that "(...) applies to any form of advertising, regardless of the medium used for its diffusion." Moreover, "Advertising is governed (...) by the norms of civil or commercial law." (Art nr 1 and 2, n.d.). All advertisements and publicity should also respect and comply with the Electronic Commerce Regulation, competition law, and Consumer Protection Law.

At the European level, no specific legislation or regulation on neuromarketing exists. The European Commission also studied neuro-marketing innovations and made policy recommendations to overcome obstacles, as mentioned on their website (Probst et al., 2014). However, regulations like the GDPR, introduced in 2018, set the rules for processing personal data in the European Union (EU), including Portugal. It applies to all companies that process the personal data of individuals within the EU, regardless of where the company is located.

Some organizations as WHO or ITA, have regulations on advertising, including sectors like food or healthcare and medicines. Additionally, advertising must respect human dignity and not promote discrimination or harmful behavior. Additionally, some researchers claim that the main internal factor that conditions companies' level of adoption of neuromarketing is the lack of a "culture of innovation," according to (Crespo-Pereira et al., 2020).

According to (Mañas-Viniegra et al., 2021). in their study regarding the logos of brands, they intended to determine the cognitive process of young Portuguese and Spanish university students of traditional brand logos with the current ones that are simple, flat, and two-dimensional—looking at variables such as gender and nationality. The results showed that the geographic difference did not cause any difference. Only a suggestion that Spain might be more familiar with flat design than Portugal. The authors conclude that flat logo design is a trend among digital audiences.

The literature on neuromarketing in Portugal is scarce; it is also hard to find neuromarketing campaigns done in Portugal or statistics on companies that use neuromarketing. Big companies like Google, Facebook, IKEA, Twitter, Tik Tok and Visa (Strieder, 2022) have done campaigns with resources to neuromarketing techniques that had a global impact. However, due to sensitive commercial information and limited public access to the research done for these companies, the basic techniques and fields of application are restricted and often not openly available (Lee et al., 2007).

Neuromarketing is significantly impacted by regulations and standards related to publicity and advertising. Though there are no specific rules for this field, it is important

to consider legal requirements and ethical norms when creating marketing campaigns. The public's values and expectations must also be taken into account.

4 Consumer awareness

In marketing, the concept of awareness is often linked to the brands, and if the consumer remembers the brand, including it in their initial consideration set. Awareness also triggers reflection and can improve the effectiveness of information spreading and social interactions within communities (Reinhardt et al., 2012).

Consumer awareness can have a significant impact on the decision-making process of consumers. Awareness about a product or service can influence consumers' attitudes and perceptions towards it, which can ultimately affect their purchasing decisions (Lobachevska & Daub, 2021; Ramlath, 2023). For instance, in the case of green marketing, awareness about the environmental impact of products can influence consumers' decision-making process and lead them to choose environmentally friendly products (Ramlath, 2023). It is important to understand that simply raising awareness is not enough to change consumer behavior. Awareness can only contribute to a favorable consumer attitude if coupled with trust in a particular brand or company. (Ramlath, 2023).

As a consumer, one is exposed to an abundance of information on a daily basis, sourced from various channels and centered around different topics. It is plausible that certain stimuli may have gone unnoticed, but their exposure can still have a subconscious impact on one's preferences or retain a brand in their memory. To acquire a comprehensive understanding of the effects of neuromarketing insights on marketing campaigns, it is imperative to assess the level of awareness among customers.

According to the paper (Chartrand, 2005), effectively addressing nonconscious processes in consumer behavior requires identifying whether the consumer is unaware of their environment, the automatic process, the outcome, or a combination of these factors. Each stage requires different strategies for change. If it is the environment, the focus should be on avoiding or neutralizing triggers. If it is the automatic process itself, consumers must eliminate the association or replace it with a conscious and deliberate new or competing automatic behavior. Finally, if it is the outcome, consumers should recognize how automaticity affects their lives. This understanding can provide motivation

and creativity to facilitate change, especially if the consequences are severe or far-reaching.

Mimicry can be used to better understand consumer behavior by examining how nonconscious mimicry of other people's consumption behaviors can influence individuals' preferences for specific products. A referred study by (Chartrand, 2005) demonstrated that individuals who nonconsciously mimicked the consumption behavior of a confederate reported liking the product consumed by the confederate more than the alternative product. This effect was mediated by the nonconscious mimicry of the confederate's consumption pattern, and participants were not aware of the influence of mimicry on their preferences. The study suggests that consumers' attitudes and preferences can be partially determined by automatic mimicry processes, which consumers are unaware of and cannot control. Therefore, it may only sometimes be in consumers' best interests for their attitudes to be influenced by nonconscious mimicry. However, this effect could help develop marketing strategies that align with consumers' nonconscious mimicking tendencies to increase product preference and sales.

In another study, the researchers intended to see how consumer-related goals can become automatically activated and guide consumer behavior and whether consumer-related images, such as brand logos, can influence behavior via the automatic activation of a goal. The study conducted in 2005 by Fitzsimons et al. found that subliminally priming participants with either Apple or IBM brand logos influenced their actual behavior, with those primed with Apple logos performing more creatively on a standard creativity measure, as cited in (Chartrand, 2005). The study also investigated the underlying mechanism behind the effects and found that the priming effect became more substantial with a delay, indicating the manipulation of a goal to be creative. Participants in the study needed to be made aware of the triggering stimuli or the intervening goal activation, representing an instance of very little awareness of the stages in the process. If the outcome were negative, however, it is more likely that the consumer would notice it and attempt to identify the environmental trigger and what it is activating (Chartrand, 2005).

In conclusion, consumer awareness is a crucial factor in marketing strategies. Understanding nonconscious processes and the stages at which they occur is necessary to determine the appropriate strategies for change. Mimicry and subliminal priming can influence consumer behavior without awareness, which can help develop marketing

strategies. However, it is essential to ensure that consumers' attitudes and preferences are not manipulated in ways that may not be in their best interests. Ultimately, a better understanding of consumer awareness can lead to more effective marketing strategies and improved consumer well-being.

5 Demographic and psychographic factors

The identification of consumer groups with similar characteristics, needs, and preferences is facilitated by the application of demographic and psychographic factors. These factors are frequently employed in market segmentation and are of paramount importance to marketing strategies.

Demographic and psychographic factors can be employed to identify consumer groups with similar characteristics, needs, and preferences. These factors are frequently employed in market segmentation and are of paramount importance to marketing strategies. Empirical studies have demonstrated that demographic factors, such as gender, age, education, and income, can influence offline and online shopping behavior (Hou, 2020).

The utilization of demographic factors in market segmentation has long been established as an effective method for identifying groups of consumers with similar needs and preferences. It is also important to note that consumers with similar demographic characteristics can still be vastly different individuals. This is where psychographics comes into play, which provides data about people's attitudes, interests, and opinions (AIOs) to cluster consumers based on shared lifestyles and personality traits. A person's lifestyle encompasses not only how they allocate their income but also represents their identity within society and their non-identities. It is imperative that marketers comprehend the lifestyle of their target audience in order to devise effective marketing strategies that align with their values and preferences (Solomon, 2004).

In conclusion, the theme for this thesis was selected following a review of the literature on neuromarketing, which revealed that companies allocate a portion of their budget to neuromarketing. Nevertheless, further research is required to ascertain the consumer's opinion and the perceived effect of this campaign or the perceived impact of

the decision-making process. Despite the abundance of literature on neuromarketing and consumer behavior, it has proven challenging to identify articles or papers that consider the perceived impacts from the consumer's perspective, particularly in Portugal.

6 Methodology

A survey was deemed an appropriate method for gathering primary data, as it would allow for a more comprehensive and accurate response to the research question and objectives proposed for this study. The simplicity of this method, coupled with the general public's familiarity with it, made it an ideal choice. It was crucial to ensure that respondents could answer the questions privately, without the influence of peers or investigators, or any sense of inadequacy regarding their knowledge level.

6.1 Research design

The population under investigation is the Portuguese population. The sampling methodology employed in this study is the snowball technique, which was utilized to identify Portuguese individuals who met the study's criteria, regardless of their demographic characteristics (e.g., age, gender, or education) or geographic location. The sample, comprising 255 inquiries, is a convenient sample based on the availability or accessibility of participants.

The survey was accessible for a period of three months, from September 9 to December 6, 2023. The snowball sampling method was employed, as the survey was made available on social media platforms, including Facebook groups, Instagram, and WhatsApp groups. Additionally, the survey benefited from the collaboration of the senior university "Projetos de vida." However, it is possible that this approach introduced bias, as active social media users were more likely to respond. The study employed a participant referral method to create a "snowball effect" and reach a diverse range of individuals. In addition, social media was used to increase reach and response rate. This survey employs a cross-sectional design, which entails the collection of data from a sample of participants at a single point in time. In contrast to longitudinal studies, cross-sectional studies do not involve a temporal dimension. Instead, they primarily focus on data collected at or around the time of data collection (Kesmodel, 2018).

The survey is comprised of five sections. The survey comprises five sections: 1) Demographic data, 2) Neuromarketing, 3) Endorsement, 4) Product placement, 5) Ethics.

The results were analyzed using descriptive statistics, including statistical graphs, the median, and the mean. Probability distribution and correlation tests were also applied, including the Chi-square test and Spearman rank correlation.

The literature review serves as a conceptual basis for understanding the findings and discussion presented in the results. The utilization of secondary data, information collected from other authors, will serve to provide a foundation for a more comprehensive understanding of the primary data resulting from the survey responses.

The principal objective of this study is to address the following question: The objective of this study is to examine the impact of neuromarketing techniques on consumer behavior and decision-making in Portugal. A survey will be distributed on social media platforms such as Facebook, Instagram, WhatsApp, and email in order to collect primary data. The surveys will yield insights that will inform the proposed objectives:

1. To assess consumers awareness and understanding of neuromarketing techniques in the Portuguese market.
2. To examine the influence of neuromarketing techniques on consumers decision-making and purchasing behavior in the Portuguese market.
3. To explore the demographic factors that may impact of neuromarketing on consumer behavior in Portugal.
4. To compare the effectiveness of product placement and celebrity/influencer endorsements in influencing consumer behavior in the Portuguese market.
5. To identify any ethical concerns or negative perceptions consumers may have towards using neuromarketing in Portugal.

6.2 Data Collection

The survey was created by combining elements from other surveys that aligned with the research objective. Additionally, new questions were developed to complement the existing ones, resulting in a sample size of 255 inquiries. The sample was divided by age

and generation, with the following age groups: 16-25 (Generation Z), 26-39 (Generation Y), 40-57 (Generation X), and +58 (Baby Boomers).

The respondents were required to live in Portugal. The survey was distributed via a hyperlink shared on social media. The estimated duration of the survey was 10 minutes. It included an initial disclaimer explaining the purpose of the survey and the intended use of the data provided. No names or personal contact information was collected or stored.

The survey questions were primarily on a Likert scale from 1 to 5, with 1 representing the lowest level of agreement (e.g., "1 - strongly disagree" and "5 - strongly agree"). Other questions were structured as yes/no or "maybe/I don't know" options.

A preliminary test was conducted with six individuals to ensure the survey's functionality and navigation were optimal. Any identified typos were also corrected.

The survey was conducted using Google Forms, and the data was stored in the researcher's personal Google account.

7 Results

To better understand the relationship between generations and the questions across different sections of the survey, it was created a matrix with coded variables (Appendix II) with the coded variable it was possible to better perform Spearman and Chi-square tests using SPSS software to analyze the results and obtain better insights (Appendix III).

This analysis will follow the sections created in the survey: 1) Demographic data, 2) Neuromarketing, 2) Endorsement, 4) Product placement, and finally 5) Ethics.

Over a period of three months, 255 individuals completed the questionnaire. Of these, 84 (33%) were male, 169 (66%) were female, and 2 chose not to disclose their gender (1%).

The age range of participants was 16 to 83 years old, categorized as follows: 16-25 (Generation Z), 26-39 (Generation Y), 40-57 (Generation X), and 58+ (Baby Boomers). The age range with the highest representation was 16-25, accounting for 30% of the sample, followed by 26-39 (27%), 40-57 (21%), and finally 58+ (22%) - as shown in Figure 1. The mode age was 25 and the average was 39.4 years old.

In terms of education, over two-thirds of the respondents have completed either high school education or a bachelor's degree, representing 38% and 35%, respectively. 16% have a master's degree, while 5% have only completed primary education. The extremes

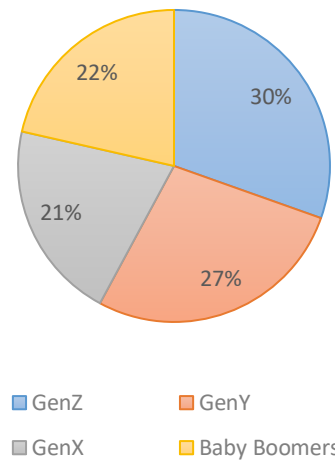


Figure 1 Circular graphic showing the distribution by generation in percentage. Font: (Goncalves, 2024)

of the scale, primary education, and a doctorate, are both represented by 3%.

The survey's second section inquired about respondents' familiarity with neuromarketing as a concept, its impact on consumers, participation in tests, and companies' use of neuromarketing.

The survey participants demonstrated limited familiarity with the term 'neuromarketing'. The results suggest a trend towards lower scores on the Likert scale, with most responses at level 3 (refer to Figure 2). Comparable outcomes were observed regarding the comprehension of concepts and techniques in neuromarketing. A majority of the surveyed individuals believed that neuromarketing has an impact on the consumer

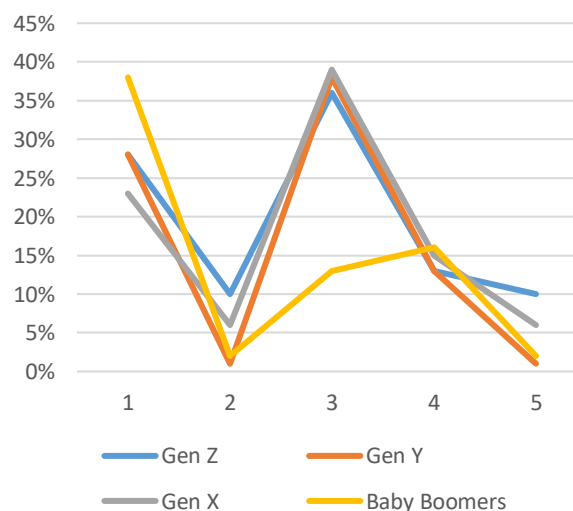


Figure 2 Line graphic representing the familiarity with the term "neuromarketing." Font: (Goncalves, 2024)

decision-making process, with the percentage of those who answered 'yes' ranging from 65% to 77% across all generations (to Figure 3). When asked about participating in a study to measure brain activity, all generations responded similarly on the Likert scale, with a slight inclination towards the upper levels. The results indicate that between 44% and 51% of respondents believe that companies should use insights from neuromarketing techniques to design their marketing campaigns. The average response for familiarity with the term 'neuromarketing' was 2.46, and for familiarity with the techniques, it was 2.22.

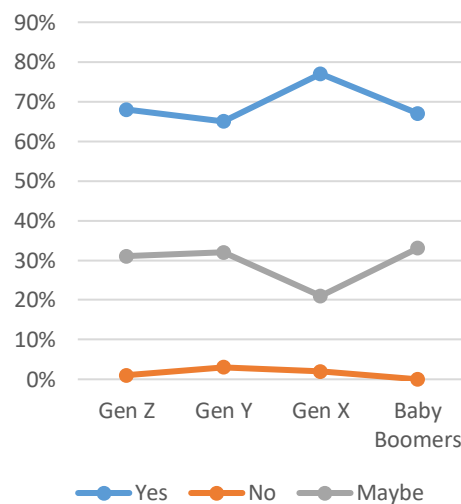


Figure 3 Line graphic representing the impact on consumer decision making process. Font: (Goncalves, 2024)

The statics test showed no correlation between the generations and the knowledge or awareness of neuromarketing, with p-values above the conventional alpha level of 0.05.

The survey's third section focuses on endorsements from influencers, celebrities, and YouTubers. The results show that social media is the primary source for Generation Z to learn about the opinions of these public figures, with 74% of them using social networks for this purpose. The percentage decreases as we move through the generations, with only 25% of baby boomers doing the same. The percentages for 'yes' and 'no' are almost reversed, with only 3% and 6%, respectively, responding 'maybe' (refer to Figure 4).

All generations are highly exposed to formats that include product recommendations from influencers, celebrities, or YouTubers. However, Gen Z shows a higher tendency, with 95% exposure, followed by slight decreases in the following generations. There is a significant difference in the transition to Baby Boomers, nonetheless 62% were still exposed. Despite the differences among generations, it is clear that all of them are highly exposed to videos, stories, or photos.

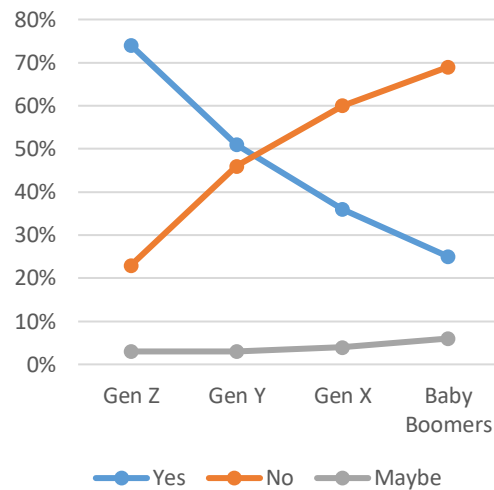


Figure 4 Line graphic representing "Consult social media for influencer/celebrity opinions." Font: (Goncalves, 2024)

This level of exposure may help to explain the high number of people who answered 'yes' when asked if they have ever been tempted to buy something because it was recommended by an influencer, celebrity, or YouTuber. Once again, Gen Z has the highest percentage of 'yes' answers, with 82% having been tempted to buy, 8% saying 'no,' and 10% saying 'maybe.' The percentages of 'maybe' and 'no' gradually increase, with slight changes in the 'maybes' and a significant increase in the 'no' percentage. According to a survey, only 25% of baby boomers expressed interest in purchasing recommended products, while 24% were uncertain and 51% did not show any interest. This data supports the trend shown in Figure 5. The survey also revealed that Gen Z is the generation most likely to seek guidance from celebrities/influencers when making purchasing decisions, with 60% responding positively and 26% responding negatively. The survey results indicate that Generation Y had a decrease in positive responses from 60% to 46% and an increase in negative responses to 41%. In contrast, only 13% of Generation X and baby boomers responded positively, with an overwhelming 69% responding negatively. The percentage of respondents who were uncertain remained relatively stable, ranging from 13% to 18%.

When asked about their level of confidence in influencers, including celebrities and YouTubers, the most common response was 'maybe,' except among Baby Boomers. Notably, the percentage of 'no' responses increased from 21% in Generation Z to 35% in Generation X, with an overwhelming majority of 67% among Baby Boomers. It is evident that none of the generations have blind trust, and there is a trend towards decreasing trust from older to younger generations. Trust tends to increase when brands partner with celebrities, influencers, or YouTubers, with similar proportions across generations Z, Y,

and X. However, baby boomers are less likely to trust these partnerships, with only 11% reporting an increase in trust.

The proportion of people reporting a decrease in trust is relatively low across all generations but is most notable among baby boomers at 13%.

Trust stability remains similar among Gen Z, Gen Y, and Gen X, oscillating between 54% and 56%. However, it is more prevalent among Baby Boomers, at 76%.

This indicates that although there is a general inclination towards trust stability in such partnerships, there are notable differences between the generations. Baby Boomers appear to be the most resistant to brand partnerships.

This section revealed p-values <0.05 indicating a dependence between generations and the endorsement technique.

The next section of the survey is about product placement. Most respondents reported recalling some form of product placement (58%) across all generations. The following questions ask respondents to rate their level of agreement with given statements on a Likert scale from 1 to 5, where 1 means completely disagree and 5 means completely agree. The majority of the statements yielded similar results across all four generations, as shown in Figure 6.

When asked whether TV series should use fictional brands instead of real ones, the results were almost identical. The majority of respondents indicated that they do not prefer fictional brands over real ones. Additionally, the responses of different generations were not as consistent when the phrase “don't mind branded products appearing in TV series” was used. While Gen Z and Gen Y have similar responses, with low percentages in level 1 (8% and 7%, respectively) and a gradual increase until level 5 with 37% and 29%, respectively, Gen X had 17% and 13%, respectively, at level 1 and 5 and high values for levels 2 and 3.

The following question in this section (question 17, see Appendix I) relates to situations that the respondent may have already encountered and can be answered with a simple 'yes' or 'no', as shown in Fig.5. For instance, 'Have you ever searched for a product in a store after seeing it on a TV series?' or 'Have you ever desired to try a product after seeing it on a TV series?' For all the experiences presented, the majority of the responses were 'no', with no discernible pattern of increase or decrease across generations.

In the product placement section, the tests indicate that the majority of the questions have a p-value greater than 0.05, suggesting that there is no significant relationship

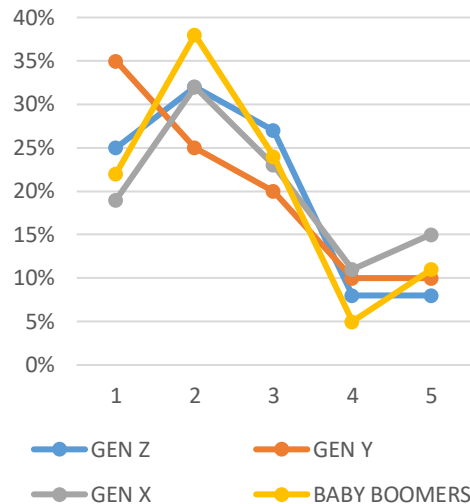


Figure 5 Line graphic representing the similarity across generations on product placement. Font: (Goncalves, 2024)

between the generation and the perceptions and opinions of this technique for the consumer.

The final section of the survey addressed ethical concerns related to neuromarketing. When asked whether neuromarketing techniques manipulate consumers, all generations tended to view them as manipulative. The percentages for values 1 and 2 were low, no more than 9% across all generations, with around 30% at level 3 of the Likert scale. In values 4 and 5, the percentages of Gen Z and Gen Y are higher in level 4 (42% and 39%) and lower in level 5 (24% and 20%), while generations X and Baby Boomers have higher percentages in level 5 (40% and 36%) than in level 4 (9% and 28%). Gen Z has a lower percentage on level 5 (9%) but higher percentages on levels 1 and 2 (7% and 9% respectively), making them the generation that least believes neuromarketing techniques are manipulative. Overall, generations tend to view neuromarketing techniques as manipulative.

When it comes to the ethical issues raised by neuromarketing, there is a high level of uncertainty. The most common response is 'maybe', with percentages ranging from 30% to 49%, regardless of generation. The remaining responses ('yes', 'no', 'I don't know') each account for approximately 20% of the total. This indicates a clear lack of knowledge and uncertainty, making it difficult to form a more definitive opinion. Respondents do not believe they are legally protected against neuromarketing techniques, which they perceive as manipulative. The percentage of people who answered 'yes' did not exceed 10% in any generation. Most answers were divided between 'no' and 'I don't know', revealing a lack of knowledge on the subject.

When asked whether the evolution of neuromarketing could threaten consumer autonomy and privacy, with percentages ranging from 41% to 47% the respondents said “maybe”. This was followed by an affirmative response with percentages ranging from 30% to 42%. Only 28% of Gen Z answered negatively, with the percentage decreasing as the generations advanced, and only 14% of baby boomers answered negatively. Although Gen Z is slightly more optimistic, uncertainty is common to all generations.

Generation does not significantly influence opinions regarding ethics according to the statistics test made for the questions in this section, all got p-values >0.05.

8 Result discussion

The results indicate that all generations had similar responses regarding their knowledge of the term and associated concepts and techniques. The respondents had comparable attitudes towards participating in studies. They also expressed their views on the influence of neuromarketing on the consumer purchasing process and their belief that companies should utilize neuromarketing in their marketing campaigns.

The analyses suggest that the impact of neuromarketing techniques on consumer behavior and decision-making (see Figure 6), as perceived or acknowledged by respondents, does not vary significantly across generations within this sample. This implies a consistent perception or awareness of neuromarketing across the generational spectrum.

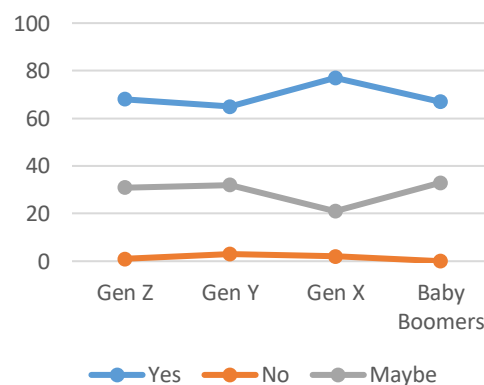


Figure 6 Line graphic with the influence of neuromarketing on consumer buying decisions, in percentage. Font: (Goncalves, 2024)

Although the specific content of the neuromarketing questions is not detailed, the lack of significant correlations or associations suggests either a broad consensus on neuromarketing techniques or a uniformly low level of awareness, regardless of generational differences.

Endorsement shows dependence with generations, in particular with Gen Z, which represents a key insight for the marketers in Portugal that want to target younger generations. They also tend to trust and use these platforms as references. This can be explained by Gen Z proximity to technology and social media like Instagram, TikTok, and YouTube. The practitioners can employ this technique with younger generations, particularly for awareness purposes.

However, when asked about product placement, the results among generations are closer, as this technique is commonly used in films and TV shows, making it more easily accessible to all age groups.

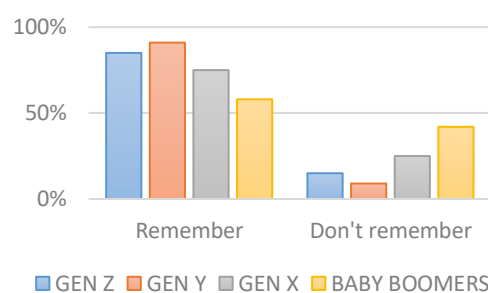


Figure 7 Bar graphic showing the distribution on the recollection of Product Placement by the inquiries, in percentage Font: (Goncalves, 2024).

Despite being influenced by neuromarketing, consumers are generally unaware of its existence and do not express ethical concerns regarding its use. It is believed that companies should continue to utilize these techniques.

Data indicates that product placement has an equal impact on all generations of consumers. Endorsements are more effective for younger generations. It is important to consider the platform or technology used for the technique, as it may have less exposure to older generations. This is particularly relevant in the Portuguese context, where demographics show an aging population.

Regarding ethical concerns, there is a perception that neuromarketing techniques may be manipulative and influence consumers. However, it is unclear if there are any ethical dilemmas or problems created by their use this can be due to a lack of knowledge and awareness of neuromarketing shown by the 2nd section of the survey as the respondents have some idea but not enough to understand the potential dangerous as the response with the most weight among all four generations was 'maybe.'

These survey results provide a baseline understanding of consumer perceptions of neuromarketing across generations and serve as a starting point for more in-depth research and strategy development in this area.

9 Ethical concerns

This study examines the impact of neuromarketing on consumer behavior while addressing ethical concerns related to the validity of the data collected, the rights of participants, and adherence to scientific principles.

Prior to participating in the survey, all participants received detailed information about the research objectives, their role in the study, and the intended use of the data. Participants were informed that their participation was voluntary and that they could stop the survey at any time.

To ensure anonymity and confidentiality, no personal identifiers were collected, and the data collected were stored securely. The information collected was used solely for research purposes and was not shared with third parties.

Researchers followed ethical principles to ensure the integrity of the research data. They collected, analyzed, and reported the data honestly and without fabrication, falsification, or inappropriate manipulation.

In conclusion, the study was conducted with sound ethical principles and respect for the participants and the scientific process.

10 Limitations

As is the case with much research and academic work, this study is not without limitations. Despite the constraints of limited resources and time, the study was designed to be as robust as possible. Nevertheless, the outcomes may be influenced by the sampling methodology and sample size. However, corrective measures have been implemented to mitigate any potential bias. Volunteer bias occurs when individuals who choose to participate in a study differ in some way from those who do not. This may be attributed to a greater interest or involvement in the topic, or to more pronounced opinions. This bias may affect the generalizability of the results, as the responses may not accurately reflect the attitudes, behaviors, or characteristics of the population. The snowball effect

can result in the formation of a more homogeneous group, as individuals tend to request that their social circle complete the survey.

Nevertheless, it is essential to acknowledge the constraints of this study, including the absence of more comprehensive statistical analysis and a more representative sample. It is recommended that future research adopt a more robust methodology, with a more detailed statistical analysis aimed at creating more accurate models.

Furthermore, the lack of awareness about neuromarketing may result in responses from individuals who lack an opinion. As neuromarketing is based on subconscious processes, individuals may lack the self-awareness to recognise and acknowledge the impact of marketing techniques on them.

CONCLUSION

In conclusion, this dissertation has achieved its objectives by uncovering significant insights through data collected from Portuguese consumers. The findings reveal a general lack of awareness about neuromarketing and its techniques among Portuguese consumers, spanning across all generations. This lack of understanding extends to the ethical implications of neuromarketing, which, although not well comprehended, are perceived as potentially manipulative.

The study shows that consumers acknowledge the impact of neuromarketing on their behavior and purchasing decisions, despite having limited knowledge. Notably, generational differences did not have a significant effect on perceptions or behaviors related to neuromarketing, except in the context of advocacy. The impact of certain techniques, such as product placement and celebrity endorsements, could not be precisely measured. However, consumers did recall exposure to these methods, indicating a tangible effect.

This research highlights the critical need for greater transparency and ethical consideration in the application of neuromarketing techniques. It also emphasizes the importance of educating the public about neuromarketing to foster informed consumer decisions. As this field continues to evolve, it offers fertile ground for further research. This has profound implications for marketers and policymakers who aim to navigate the dynamic landscape of consumer behavior in Portugal.

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APENDIX

APENDIX I

Survey

Secção 1 de 6

Como é que a aplicação de técnicas de neuromarketing afeta o comportamento e a tomada de decisão dos consumidores em Portugal?



B *I* U

Tese de Mestrado em Marketing e Negócios Internacionais

Este questionário insere-se numa investigação de mestrado em Marketing e Negócios Internacionais. Todas as informações recolhidas serão utilizadas exclusivamente para fins académicos e serão mantidas estritamente anónimas. O principal objetivo deste questionário é compreender o impacto do neuromarketing, nomeadamente nas estratégias de product placement e endorsement, no comportamento dos consumidores em Portugal.

Antecipadamente, estimamos que o tempo necessário para responder a todas as questões seja de aproximadamente 10 minutos.

Ao submeter este questionário, estará implicitamente a autorizar o tratamento dos dados fornecidos.

Agradecemos sinceramente pelo seu tempo e disponibilidade!

1. Sexo: *

- ☐ Feminino
- ☐ Masculino
- ☐ Prefiro não dizer

2. Idade *

Texto de resposta curta

3. Educação completa: *

- ☐ Ensino primário
- ☐ Ensino Básico
- ☐ Ensino Secundário
- ☐ Licenciatura
- ☐ Mestrado
- ☐ Doutoramento

Neuromarketing



O neuromarketing é uma área que estuda o mercado e o consumidor utilizando técnicas de imagiologia para retirar informações sobre o que se passa no cérebro quando o consumidor é exposto a um determinado estímulo.

Através dessas técnicas é possível retirar informação sobre gostos e preferências que nem a própria pessoa está consciente de ter pois acontecem no seu cérebro sem esta se aperceber, e/ou a sua vontade explícita.

Estas informações são depois utilizadas nas campanhas de produtos.

4. Quão familiarizado está com o termo neuromarketing? *

	1	2	3	4	5	
Nada familiarizado	☐	☐	☐	☐	☐	Muito familiarizado

5. Quão familiarizado está com os conceitos e técnicas utilizados no neuromarketing? *

	1	2	3	4	5	
Nada familiarizado	☐	☐	☐	☐	☐	Muito familiarizado

6. Acredita que o neuromarketing influencia as decisões de compra dos consumidores? *

- ☐ Sim
- ☐ Não
- ☐ Talvez



7. Sentir-se-ia confortável em participar num estudos de neuromarketing que envolvessem o monitoramento das suas reações cerebrais ou emocionais enquanto interage com anúncios ou produtos? *

	1	2	3	4	5	
Nada confortável	☐	☐	☐	☐	☐	Muito confortável

8. Pensa que as empresas devem usar neuromarketing, por exemplo, para desenvolver estratégias de marketing? *

- ☐ Não
- ☐ Sim
- ☐ Não sei

Influencer/celebrity endorsement



Influencer/celebrity endorsement é utilizada como técnica de marketing e acontece quando uma celebridade ou influencer faz publicidade sobre certa marca ou produto, sendo paga ou não para tal.

9. Já consultou as redes sociais para saber opinião de celebridades/influencers de um produto? *

- ☐ Sim
- ☐ Não
- ☐ Talvez

10. Já assistiu a algum video/story/foto que incluísse recomendações de produtos ou reviews? *

- ☐ Sim
- ☐ Não
- ☐ Talvez

11. Já se sentiu tentado a adquirir um produto ou serviço recomendado por uma celebridade/influencer/youtuber? *

- ☐ Sim
- ☐ Não
- ☐ Talvez

:::

12. A recomendação de uma celebridade já o ajudou a decidir na escolha de um produto ou serviço? *

- ☐ Sim
- ☐ Não
- ☐ Talvez

13. Confia nas opiniões dadas pelas celebridades/influencers/youtubers? *

- ☐ Sim
- ☐ Não
- ☐ Talvez

14. Quando as celebridades/ influencers/ youtubers assumem parcerias com marcas a sua confiança nas opiniões dadas: *

- ☐ Aumenta
- ☐ Diminui
- ☐ Mantem-se

Ações de *product placement* acontecem quando vê marcas em novelas/ séries/ filmes



Product placement é a incorporação propositada de conteúdo comercial em configurações não comerciais, quando produtos de marcas reais são utilizados como adereços em anúncios, series, filmes, videoclips, etc. (Exemplo, colocar uma determinada garrafa de refrigerante numa cena de um filme)

15. Indique, por favor a sua situação em relação às ações de *product placement* *

- ☐ Nunca vi qualquer ação de product placement
- ☐ Recordo-me de ver ações de product placement

16. Indique por favor o grau de concordância relativamente às seguintes afirmações sobre o product placement em séries televisivas



Grelha de escolha múltipla

Linhas

Colunas

- | | | | |
|--|---|---|---|
| 1. Detesto ver a identificação da marca em ... | X | ☐ 1 Discordo totalmente | X |
| 2. Não me importo que os produtores televi... | X | ☐ 2 | X |
| 3. É muito pouco ético influenciar a audiênc... | X | ☐ 3 | X |
| 4. Os fabricantes enganam a audiência ao ... | X | ☐ 4 | X |
| 5. O governo devia regular a utilização de pr... | X | ☐ 5 Concordo totalmente | X |
| 6. Prefiro ver marcas reais do que marcas f... | X | ☐ Adicionar coluna | |
| 7. As séries televisivas deveriam utilizar ma... | X | | |
| 8. A presença de produtos de marca em sér... | X | | |
| 9. Não me importo que produtos de marca ... | X | | |
| 10. A presença de produtos de marca em s... | X | | |
| 11. As séries televisivas deviam conter ape... | X | | |
| 12. Não me importo de ver produtos de mar... | X | | |
| 13. Considero que utilizar marcas reais equ... | X | | |
| 14. Quem vê televisão é influenciado de for... | X | | |
| 15. Compro frequentemente marcas que ve... | X | | |
| 16. Adicionar linha | | | |



Pedir uma resposta em cada linha



17. Já passou por alguma destas situações? *

	Sim	Não
Já procurei um produto numa loja...	☐	☐
Comecei a utilizar um produto de...	☐	☐
Parei de utilizar um produto depo...	☐	☐
Já quis experimentar um produto...	☐	☐

Secção 5 de 6

Ética no neuromarketing

As implicações éticas do neuromarketing podem ser objeto de debate. Por um lado, o neuromarketing pode fornecer informações valiosas sobre o comportamento e as preferências do consumidor que podem ajudar as empresas a melhorar seus produtos e serviços. No entanto, também há preocupações sobre o potencial do neuromarketing para manipular ou explorar os consumidores (Murphy et al., 2008; Wilson et al., 2008).

18. As técnicas de neuromarketing são manipulativas, isto é, acabam por manipular o que o consumidor quer comprar? *

	1	2	3	4	5	
Discordo completamente	☐	☐	☐	☐	☐	Concordo completamente

19. Para si, há alguma técnica de neuromarketing levanta problemas éticos? (storytelling, product placement, influencer endorsement) *

- ☐ Sim
- ☐ Talvez
- ☐ Não
- ☐ Não sei

20. Acha que o consumidor está protegido contra técnicas de neuromarketing por leis e/ou regulamentos? *

- ☐ Sim
- ☐ Não
- ☐ Não sei

Secção sem título



Descrição (opcional)

22. Se respondeu sim ou talvez à pergunta: Para si, a alguma técnica de neuromarketing levanta problemas éticos? (storytelling, *product placement*, *influencer endorsement*)

Quais são os problemas éticos que encontra?

Texto de resposta longa

APENDIX II

Matrix for SPSS

gender	1. Sexo:
age	2. Idade
generation	(added for analysis purposes)
edu	3. Educação completa:
nmkt01	4. Quão familiarizado está com o termo neuromarketing?
nmkt02	5. Quão familiarizado está com os conceitos e técnicas utilizados no neuromarketing?
nmkt03	6. Acredita que o neuromarketing influencia as decisões de compra dos consumidores?
nmkt04	7. Sentir-se-ia confortável em participar num estudos de neuromarketing que envolvessem o monitoramento das suas reações cerebrais ou emocionais enquanto interage com anúncios ou produtos?
nmkt05	8. Pensa que as empresas devem usar neuromarketing, por exemplo, para desenvolver estratégias de marketing?
endor01	9. Já consultou as redes sociais para saber opinião de celebridades/influencers de um produto?
endor02	10. Já assistiu a algum video/story/foto que incluísse recomendações de produtos ou reviews?
endor03	11. Já se sentiu tentado a adquirir um produto ou serviço recomendado por uma celebridade/influencer/youtuber?
endor04	12. A recomendação de uma celebridade já o ajudou a decidir na escolha de um produto ou serviço?
endor05	13. Confia nas opiniões dadas pelas celebridades/influencers/youtubers?
endor06	14. Quando as celebridades/ influencers/ youtubers assumem parcerias com marcas a sua confiança nas opiniões dadas:
pp01	15. Indique, por favor a sua situação em relação às ações de product placement
pp02	16. [Detesto ver a identificação da marca em séries televisivas se a sua presença tiver objetivos comerciais]
pp03	16. [Não me importo que os produtores televisivos recebam alguma compensação dos fabricantes por colocarem as marcas nas suas séries televisivas]
pp04	16. [É muito pouco ético influenciar a audiência televisiva ao utilizar produtos de marca nas séries televisivas.]
pp05	16. [Os fabricantes enganam a audiência ao disfarçar as marcas como adereços nas séries televisivas.]
pp06	16. [O governo devia regular a utilização de produtos de marca em séries televisivas.]
pp07	16. [Prefiro ver marcas reais do que marcas falsas/fictícias em séries televisivas.]
pp08	16. [As séries televisivas deveriam utilizar marcas fictícias em vez de marcas reais.]
pp09	16. [A presença de produtos de marca em séries televisivas torna os programas mais realistas.]
pp10	16. [Não me importo que produtos de marca apareçam em séries televisivas.]
pp11	16. [A presença de produtos de marca em séries televisivas devia ser totalmente banida.]
pp12	16. [As séries televisivas deviam conter apenas as marcas que são essenciais ao realismo do programa.]

pp13	16. [Não me importo de ver produtos de marca em séries televisivas desde que estes sejam mostrados de forma realista.]
pp14	16. [Considero que utilizar marcas reais equivale a fazer "publicidade disfarçada".]
pp15	16. [Quem vê televisão é influenciado de forma inconsciente pelas marcas que aparecem nas séries televisivas.]
pp16	16. [Compro frequentemente marcas que vejo personagens de televisão utilizar ou mostrar em séries televisivas.]
pp17	17. Já passou por alguma destas situações? [Já procurei um produto numa loja depois de o ver numa série televisiva.]
pp18	17. Já passou por alguma destas situações? [Comecei a utilizar um produto depois de o ver numa série televisiva.]
pp19	17. Já passou por alguma destas situações? [Parei de utilizar um produto depois de o ver numa série televisiva]
pp20	17. Já passou por alguma destas situações? [Já quis experimentar um produto depois de o ver numa série televisiva.]
ec01	18. As técnicas de neuromarketing são manipulativas, isto é, acabam por manipular o que o consumidor quer comprar?
ec02	19. Para si, há alguma técnica de neuromarketing levanta problemas éticos? (storytelling, product placement, influencer endorsement)
ec03	20. Acha que o consumidor está protegido contra técnicas de neuromarketing por leis e/ou regulamentos?
não incluída em SmartPLS	22. Se respondeu sim ou talvez à pergunta: Para si, há alguma técnica de neuromarketing levanta problemas éticos? (storytelling, product placement, influencer endorsement) Quais são os problemas éticos que encontra?
ec04	21. Considera que a evolução do neuromarketing poderá vir a ameaçar a autonomia e privacidade dos consumidores?

APENDIX III

Spearman's test and Chi-square test results

Neuromarketing section

		Correlações				
			generation	nmkt01	nmkt02	nmkt04
rô de Spearman	generation	Coefficiente de Correlação	1,000	-,114	-,074	-,005
		Sig. (2 extremidades)	.	,069	,241	,936
		N	255	255	255	255
	nmkt01	Coefficiente de Correlação	-,114	1,000	,871**	,285**
		Sig. (2 extremidades)	,069	.	<,001	<,001
		N	255	255	255	255
	nmkt02	Coefficiente de Correlação	-,074	,871**	1,000	,290**
		Sig. (2 extremidades)	,241	<,001	.	<,001
		N	255	255	255	255
	nmkt04	Coefficiente de Correlação	-,005	,285**	,290**	1,000
		Sig. (2 extremidades)	,936	<,001	<,001	.
		N	255	255	255	255

** . A correlação é significativa no nível 0,01 (2 extremidades).

Generation * nmkt03

Testes qui-quadrado

	Valor	df	Significância Assintótica (Bilateral)
Qui-quadrado de Pearson	9,248 ^a	6	,160
Razão de verossimilhança	9,387	6	,153
Associação Linear por Linear	,011	1	,916
N de Casos Válidos	255		

a. 0 células (0,0%) esperavam uma contagem menor que 5. A contagem mínima esperada é 10,81.

Generation * nmkt05

Testes qui-quadrado

	Valor	df	Significância Assintótica (Bilateral)
Qui-quadrado de Pearson	4,180 ^a	6	,652
Razão de verossimilhança	5,013	6	,542
Associação Linear por Linear	,106	1	,745
N de Casos Válidos	255		

a. 4 células (33,3%) esperavam uma contagem menor que 5. A contagem mínima esperada é ,83.

Endorsement section

generation * endor01

Testes qui-quadrado			
	Valor	df	Significância Assintótica (Bilateral)
Qui-quadrado de Pearson	36,291 ^a	6	<,001
Razão de verossimilhança	37,844	6	<,001
Associação Linear por Linear	30,358	1	<,001
N de Casos Válidos	255		

a. 4 células (33,3%) esperavam uma contagem menor que 5. A contagem mínima esperada é 1,87.

generation * endor02

Testes qui-quadrado			
	Valor	df	Significância Assintótica (Bilateral)
Qui-quadrado de Pearson	33,593 ^a	6	<,001
Razão de verossimilhança	33,617	6	<,001
Associação Linear por Linear	26,524	1	<,001
N de Casos Válidos	255		

a. 4 células (33,3%) esperavam uma contagem menor que 5. A contagem mínima esperada é 2,29.

generation * endor03

Testes qui-quadrado			
	Valor	df	Significância Assintótica (Bilateral)
Qui-quadrado de Pearson	48,049 ^a	6	<,001
Razão de verossimilhança	52,027	6	<,001
Associação Linear por Linear	30,529	1	<,001
N de Casos Válidos	255		

a. 0 células (0,0%) esperavam uma contagem menor que 5. A contagem mínima esperada é 8,31.

generation * endor04

Testes qui-quadrado			
	Valor	df	Significância Assintótica (Bilateral)
Qui-quadrado de Pearson	33,478 ^a	6	<,001
Razão de verossimilhança	36,491	6	<,001
Associação Linear por Linear	17,856	1	<,001
N de Casos Válidos	255		

a. 0 células (0,0%) esperavam uma contagem menor que 5. A contagem mínima esperada é 7,90.

generation * endor05

Testes qui-quadrado			
	Valor	df	Significância Assintótica (Bilateral)
Qui-quadrado de Pearson	38,315 ^a	6	<,001
Razão de verossimilhança	37,410	6	<,001
Associação Linear por Linear	8,794	1	,003
N de Casos Válidos	255		

a. 0 células (0,0%) esperavam uma contagem menor que 5. A contagem mínima esperada é 6,86.

generation * endor06

Testes qui-quadrado			
	Valor	df	Significância Assintótica (Bilateral)
Qui-quadrado de Pearson	9,391 ^a	6	,153
Razão de verossimilhança	9,877	6	,130
Associação Linear por Linear	6,614	1	,010
N de Casos Válidos	255		

a. 0 células (0,0%) esperavam uma contagem menor que 5. A contagem mínima esperada é 9,77.

Product placement section

		Correlações																						
rô de Spearman	generation	generation	pp02	pp03	pp04	pp06	pp07	pp08	pp09	pp10	pp11	pp12	pp13	pp14	pp15	pp16	pp05	pp01	pp17	pp18	pp19	pp20		
	generation	Coefficiente de Correlação	1,000	,055	-,309**	-,022	,065	-,122	-,005	-,271**	-,263**	,221**	-,016	-,261**	-,116	-,155*	-,118	,045	,236**	,025	,027	-,111	,161**	
		Sig. (2 extremidades)	.	,384	<,001	,727	,302	,051	,942	<,001	<,001	<,001	,804	<,001	,065	,013	,060	,479	<,001	,689	,673	,076	,010	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp02	generation	Coefficiente de Correlação	,055	1,000	,007	,559**	,362**	,124*	,292**	,027	,030	,409**	,322**	,123	,298**	,348**	,082	,484**	,017	-,018	-,055	-,040	,018	
		Sig. (2 extremidades)	,384	.	,905	<,001	<,001	,048	<,001	,672	,632	<,001	<,001	,051	<,001	<,001	,189	<,001	,791	,770	,378	,520	,776	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp03	generation	Coefficiente de Correlação	-,309**	,007	1,000	-,013	,011	,441**	-,069	,567**	,645**	-,340**	,208**	,620**	,224**	,292**	,115	-,090	-,154*	-,032	-,053	,052	-,195**	
		Sig. (2 extremidades)	<,001	,905	.	,836	,865	<,001	,272	<,001	<,001	<,001	<,001	<,001	<,001	<,001	,067	,151	,014	,614	,396	,409	,002	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp04	generation	Coefficiente de Correlação	-,022	,559**	-,013	1,000	,442**	,221**	,341**	,019	,021	,436**	,419**	,178**	,436**	,454**	,050	,610**	,090	,074	,072	-,014	,053	
		Sig. (2 extremidades)	,727	<,001	,836	.	<,001	<,001	<,001	,765	,742	<,001	<,001	,004	<,001	<,001	,429	<,001	,151	,237	,255	,821	,397	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp06	generation	Coefficiente de Correlação	,065	,362**	,011	,442**	1,000	,267**	,321**	,065	,003	,400**	,329**	,146*	,354*	,368**	,066	,537**	,017	-,013	-,043	-,131*	,046	
		Sig. (2 extremidades)	,302	<,001	,865	<,001	.	<,001	<,001	,301	,962	<,001	<,001	,020	<,001	<,001	,291	<,001	,792	,835	,493	,037	,463	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp07	generation	Coefficiente de Correlação	-,122	,124*	,441**	,221**	,267**	1,000	-,253**	,487**	,581**	-,035	,347**	,538**	,254**	,323**	,132*	,140*	-,073	-,032	-,028	,020	-,114	
		Sig. (2 extremidades)	,051	,048	<,001	<,001	<,001	.	<,001	<,001	<,001	,577	<,001	<,001	<,001	<,001	,035	,026	,243	,609	,660	,751	,069	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp08	generation	Coefficiente de Correlação	-,005	,292**	-,069	,341**	,321**	-,253**	1,000	-,075	-,164**	,408**	,212**	,009	,293**	,187**	-,031	,321**	,005	,086	,086	-,064	,111	
		Sig. (2 extremidades)	,942	<,001	,272	<,001	<,001	<,001	.	,233	,009	<,001	<,001	,887	<,001	,003	,628	<,001	,934	,173	,172	,307	,078	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp09	generation	Coefficiente de Correlação	-,271**	,027	,567**	,019	,065	,487**	-,075	1,000	,660**	-,241**	,312**	,595**	,316**	,324**	,211**	,010	-,176**	-,080	-,013	,098	-,226**	
		Sig. (2 extremidades)	<,001	,672	<,001	,765	,301	<,001	,233	.	<,001	<,001	<,001	<,001	<,001	<,001	<,001	,877	,005	,202	,840	,119	<,001	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp10	generation	Coefficiente de Correlação	-,263**	,030	,645**	,021	,003	,581**	-,164**	,660**	1,000	-,268**	,295**	,687**	,289**	,316**	,133*	-,063	-,208**	-,026	,004	,114	-,162**	
		Sig. (2 extremidades)	<,001	,632	<,001	,742	,962	<,001	,009	<,001	.	<,001	<,001	<,001	<,001	<,001	,033	,313	<,001	,681	,951	,069	,009	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp11	generation	Coefficiente de Correlação	,221**	,409**	-,340**	,436**	,400**	-,035	,408**	-,241**	-,268**	1,000	,280**	-,143*	,272**	,166**	,104	,451**	,206**	,044	-,002	-,153*	,128*	
		Sig. (2 extremidades)	<,001	<,001	<,001	<,001	<,001	,577	<,001	<,001	<,001	.	<,001	,022	<,001	,008	,099	<,001	<,001	,480	,977	,014	,041	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp12	generation	Coefficiente de Correlação	-,016	,322**	,208**	,419**	,329**	,347**	,212**	,312**	,295**	,280**	1,000	,462**	,538**	,332**	,070	,394**	-,021	,187**	,169**	-,033	,012	
		Sig. (2 extremidades)	,804	<,001	<,001	<,001	<,001	<,001	<,001	<,001	<,001	<,001	.	<,001	<,001	<,001	,268	<,001	,735	,003	,007	,600	,854	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp13	generation	Coefficiente de Correlação	-,261**	,123	,620**	,178**	,146*	,538**	,009	,595**	,687**	-,143*	,462**	1,000	,474**	,357**	,201**	,028	-,113	-,074	-,039	,005	-,242**	
		Sig. (2 extremidades)	<,001	,051	<,001	,004	,020	<,001	,887	<,001	<,001	,022	<,001	.	<,001	<,001	,001	,658	,073	,241	,530	,936	<,001	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp14	generation	Coefficiente de Correlação	-,116	,298**	,224**	,436**	,354**	,254**	,293**	,316**	,289**	,272**	,538**	,474**	1,000	,569**	,093	,373**	-,040	,113	,116	,049	-,045	
		Sig. (2 extremidades)	,065	<,001	<,001	<,001	<,001	<,001	<,001	<,001	<,001	<,001	<,001	<,001	.	<,001	,140	<,001	,526	,070	,065	,435	,479	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp15	generation	Coefficiente de Correlação	-,155*	,348**	,292**	,454**	,368**	,323**	,187**	,324**	,316**	,166**	,332**	,357**	,569**	1,000	,149*	,354**	-,124*	,017	,084	,165**	-,087	
		Sig. (2 extremidades)	,013	<,001	<,001	<,001	<,001	<,001	,003	<,001	<,001	,008	<,001	<,001	<,001	<,001	.	,017	<,001	,048	,786	,182	,008	,166
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp16	generation	Coefficiente de Correlação	-,118	,082	,115	,050	,066	,132*	-,031	,211**	,133*	,104	,070	,201**	,093	,149*	1,000	,101	,060	-,255**	-,267**	-,106	-,254**	
		Sig. (2 extremidades)	,060	,189	,067	,429	,291	,035	,628	<,001	,033	,099	,268	,001	,140	,017	.	,109	,339	<,001	<,001	,090	<,001	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp05	generation	Coefficiente de Correlação	,045	,484**	-,090	,610**	,537**	,140*	,321**	,010	-,063	,451**	,394**	,028	,373**	,354**	,101	1,000	,129*	,154*	,066	-,138*	,136*	
		Sig. (2 extremidades)	,479	<,001	,151	<,001	<,001	,026	<,001	,877	,313	<,001	<,001	,658	<,001	<,001	,109	.	,040	,014	,292	,028	,030	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp01	generation	Coefficiente de Correlação	,236**	,017	-,154*	,090	,017	-,073	,005	-,176**	-,208**	,206**	-,021	-,113	-,040	-,124*	,060	,129*	1,000	-,075	-,098	-,238**	,018	
		Sig. (2 extremidades)	<,001	,791	,014	,151	,792	,243	,934	,005	<,001	<,001	,735	,073	,526	,048	,339	,040	.	,234	,117	<,001	,771	
		N	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	
pp17	generation	Coefficiente de Correlação	,025	-,018	-,032	,074	-,013	-,032	,086	-,0														

Ethical section

generation * endor01

Testes qui-quadrado

	Valor	df	Significância Assintótica (Bilateral)
Qui-quadrado de Pearson	36,291 ^a	6	<,001
Razão de verossimilhança	37,844	6	<,001
Associação Linear por Linear	30,358	1	<,001
N de Casos Válidos	255		

a. 4 células (33,3%) esperavam uma contagem menor que 5. A contagem mínima esperada é 1,87.

generation * endor02

Testes qui-quadrado

	Valor	df	Significância Assintótica (Bilateral)
Qui-quadrado de Pearson	33,593 ^a	6	<,001
Razão de verossimilhança	33,617	6	<,001
Associação Linear por Linear	26,524	1	<,001
N de Casos Válidos	255		

a. 4 células (33,3%) esperavam uma contagem menor que 5. A contagem mínima esperada é 2,29.

generation * endor03

Testes qui-quadrado

	Valor	df	Significância Assintótica (Bilateral)
Qui-quadrado de Pearson	48,049 ^a	6	<,001
Razão de verossimilhança	52,027	6	<,001
Associação Linear por Linear	30,529	1	<,001
N de Casos Válidos	255		

a. 0 células (0,0%) esperavam uma contagem menor que 5. A contagem mínima esperada é 8,31.

generation * endor04

Testes qui-quadrado

	Valor	df	Significância Assintótica (Bilateral)
Qui-quadrado de Pearson	33,478 ^a	6	<,001
Razão de verossimilhança	36,491	6	<,001
Associação Linear por Linear	17,856	1	<,001
N de Casos Válidos	255		

a. 0 células (0,0%) esperavam uma contagem menor que 5. A contagem mínima esperada é 7,90.

generation * endor05

Testes qui-quadrado

	Valor	df	Significância Assintótica (Bilateral)
Qui-quadrado de Pearson	38,315 ^a	6	<,001
Razão de verossimilhança	37,410	6	<,001
Associação Linear por Linear	8,794	1	,003
N de Casos Válidos	255		

a. 0 células (0,0%) esperavam uma contagem menor que 5. A contagem mínima esperada é 6,86.

generation * endor06

Testes qui-quadrado

	Valor	df	Significância Assintótica (Bilateral)
Qui-quadrado de Pearson	9,391 ^a	6	,153
Razão de verossimilhança	9,877	6	,130
Associação Linear por Linear	6,614	1	,010
N de Casos Válidos	255		

a. 0 células (0,0%) esperavam uma contagem menor que 5. A contagem mínima esperada é 9,77.