

## **An Exploratory Qualitative Study to Investigate the Neural Basis of Advertising, Promotion Processes, and Their Psychological Effects**

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### **Abstract**

Previous studies overlooked examining the role of sensory receptors regarding the effects of advertising and promotion and did not provide a detailed explanation of how these effects occur. This study focuses on these aspects, in addition to distinguishing between the appetitive and defensive systems of the human psyche in order to reveal the paradoxical effects of advertising and promotion in society. An exploratory qualitative research was conducted, utilizing in-depth structured interviews with 12 participants, including 12 open ended questions and supported by previous literature reviews. The functions of sensory receptors and brain regions must be empirically studied, regarding the neural mechanisms of advertising and promotional processes. This research also investigates the effect of advertising and promotional materials on the viewer's appetitive and defensive systems, in addition to the effect of repeated exposure to these materials on the brain areas responsible for memory and emotions.

### **Keywords**

Neural associations, human senses, sensory receptors, brain regions, appetitive system, defensive system.

### **Article history**

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## **1. Introduction**

Previous studies in the field of marketing in general, and advertising and promotion in particular, focused on human senses, as researchers considered providing logical explanation for how advertising and promotion materials impact audiences. Sensory marketing is a marketing method in which customers become affected by their senses (Krishna et al., 2016). It evaluates various kinds of perceptions, namely auditory, visual, gustatory, haptic and olfactory (Silaban et al., 2023). Moreover, sensory cues influence customers' perceptions of food and their responses within the restaurant (Silaban et al., 2023).

However, two elements, sensory receptors and affected brain regions remain unexamined between those cues and customer's final responses. Consequently, a distinct perspective has been provided in this study, confirming that a deeper element beyond senses exhibits the most important effect on audiences. While sense organs receive various kinds of information, senses represent the final result of the activity of various sensory receptors. These receptors process information and lead to the final responses of audiences. Thus, neglecting their role in studies regarding promotional and advertising content is considered a significant gap. Sensory receptors occur in the eyes, mouth, nose, and ears, as well as other; body organs; they enable the human body to effectively react to internal and external events (Marzvanyan & Alhawaj, 2019). Additionally, exploring the role of the neural association among various brain regions in transferring messages is crucial for creating the effects of advertising and promotional activities. This aspect had not been adequately addressed in previous advertising and promotion studies, despite earlier neurological research examining the interaction between hippocampus and other neocortical regions during the evocation of stimuli learned from a single exposure (Simons & Spiers, 2003).

Behavior is the outcome of large scale neurodynamical processes and continuous changes in the activation level of different brain areas (Duch, 2007). Despite this complexity, a significant gap exists in previous and recent studies regarding the significance of advertising and promotion in urging customers to purchase the product or service without identifying the factor that links these processes to customer behavior, or the neural mechanisms responsible for their success. Therefore, the subconscious brain represents a challenge for researchers in the marketing field (Sevic et al., 2022). Researchers believe that repetition is necessary for achieving optimal consumer responses (Schmidt & Eisend, 2015). However, diverse topics in this regard remain unexplored, such as the importance of incorporating various elements in advertising and promotional content, in order to enhance the efficiency of sensory receptors, which consequently contributes to activating the brain regions responsible for memory and feelings. In addition to studying the two reverse effects of the repetition process, which is one of the pivotal aspects in this research, repeated exposure to information through advertising and promotional content strengthens the neural associations in audiences' minds and facilitates the transfer of information among different brain regions. It has been proven that repetition enhances the relational associations between certain items; as long as the associated pairs are recalled, those

relational associations are maintained, predicting sustained hippocampal activation over time (e.g., Yang et al., 2016). Although the importance of repetition in advertising was explained in prior research, it has not been extensively explored in recent studies.

The effect of repetitive advertisements is a controversial issue and remains a topic of interest for researchers (Longman, 1997). Furthermore, there are no profound explanations regarding the positive and negative consequences resulting from viewing advertisements and promotional materials, based on the frequency of exposure, especially when presented in an exaggerated manner. It is essential to delineate how information is transferred from the brain regions responsible for processing sensory and visual information, to those responsible for memory and learning functions. Therefore, this research emphasizes this necessity due to the significant ambiguity in advertising and promotion studies concerning the true motives influencing customers' inclinations toward particular products and services.

Further research is required in the advertising field concerning the influence of advertisements on eliciting real donations, as substantial effort is necessary to recognize the fundamental role of emotions in predicting effective non-profit advertising campaigns (Martinez-Levy et al., 2022). It remains challenging to discern consumers' thoughts or unravel their real motives that lead to the purchase of products and services (Sevic et al., 2022). Among these motives is the ability of the advertised product or service to satisfy various psychological desires of customers; by triggering their appetitive or defensive system, depending on individual characteristics, convictions, and priorities in life, in addition to the nature of the advertising and promotional materials.

This analysis discusses a new aspect; the control of one system over another, based on the nature of the advertising or promotional content presented in society, which is explored in this research, as it has been overlooked in previous studies. Two motivational systems regulate human emotions, the appetitive and defense systems, responding to the environmental stimuli that either promote or threaten physical survival (Lang et al., 1997). This research addresses the lack of studies that explore the neural and psychological aspects of the conditional associations between the advertising content and the promoted products, services, or ideas. Moreover, it aims to achieve specific objectives, by addressing the following questions:

- Is the activity of sensory receptors within the viewers' bodies responsible for their ability to receive advertising and promotional messages and respond to them?
- Does the neural connection between different brain regions play a key role in the impact of advertising and promotional materials on viewers by facilitating the transfer of information from sensory areas to those related to memory and behavior?
- Does the repeated exposure to advertising and promotional materials activate viewers' memories of the advertised products or services and influence their inclination to purchase?

- Should well-known brands continue their promotional and advertising campaigns to maintain a strong neural association in the minds of viewers, especially with the constant emergence of contemporary brands?
- Have many advertising and promotional efforts activated the appetitive system of individuals at the expense of their defensive system?

Addressing the aforementioned questions aids in achieving the research objectives, which include:

- Exploring the relationship between the activation of viewers' sensory receptors through advertising and promotional content and their ability to process and positively respond to the promoted products or services.
- Investigating the role of various brain regions in the effects resulting from viewers' exposure to advertising and promotional campaigns, especially concerning the connectivity among these regions.
- Demonstrating the impact of repetition in advertising and promotion processes on strengthening neural associations of a product, service, or idea in viewers' minds.
- Exploring the significance of advertisements for well-known brands to maintain their positive positions in the minds of customers.

Analyzing the paradoxical effects of advertising and promotion processes on the appetitive and defensive systems of viewers.

## **2. Theoretical Background**

### **2.1. The Role of Sensory Receptors and Brain Regions in Advertising and Promotion**

Advertising and promotional studies have consistently highlighted the influence of viewers' senses and emotions on their purchasing decisions. However, the question remains: Are there missing elements that have not yet been investigated? The answer may be affirmative, particularly since sensory receptors, despite their importance in the effect of advertising and promotional materials on viewers, were not considered in previous studies. Although some research has illuminated the role of different brain regions, it has not provided detailed insights into how information flows from one region to another or the conditions that direct this flow.

The connection among different brain regions is considered one of the fundamental conditions required for processing sensory information. It was previously mentioned that any stimulus, such as odor is the result of activating one or many olfactory receptors (Korsching, 2004). Similarly, taste buds consist of a group of taste cells that create a pore through which stimuli can subsequently invade the brain (Marzvanyan & Alhawaj, 2019), while various stimuli activate sensory receptors in the form of sound waves, pressure, motion, and touch (Iheanacho & Vellipuram, 2019). Furthermore, tactile mechanoreceptors facilitate the sense of touch, which is crucial for human survival and development (Iheanacho & Vellipuram, 2019).

Previous neurological studies emphasized the connectivity between the hippocampus and other brain regions over time (Zhan et al., 2018). For instance, it has been noted that parietal areas engage in working memory and executive control (Ioannides & colleagues, 2000). The hippocampus is a significant factor in the formation process of neural associations (Du et al., 2019), while the nearby amygdala generates responses to sensory stimuli perceived by the individual and analyzed in another region in the brain (Kiernan, 2012). Identifying these brain regions and demonstrating the connection among them, which facilitate the processes of receiving and retrieving information until the desired impact is achieved remains a gap that needs to be bridged in future advertising and promotion studies.

## **2.2. The Effect of Repetition on the Unconscious Mind in Advertising and Promotion Processes**

Neuroscience has contributed to identifying the underlying factors of the effects of advertising and promotional processes on viewers, which direct their preference toward certain products and services. However, many of these factors remain unrecognized and require further exploration. Most of them influence the subconscious level of the public, often leading them to purchase unnecessary products or services or even adopt ideas that are not in their favor. This indicates a form of neural manipulation of viewers' minds, a concept that has been implicitly underscored in earlier studies, such as Lewin (1951), suggesting that people can be influenced by manipulating their predetermined goals.

Furthermore, recent neuroscientific studies have demonstrated that most mental processes involved decision-making occur without individuals' awareness (Sevic et al., 2022), which clarifies why many individuals cannot predict their future choices (Vecchiato et al., 2013). Consequently, neuromarketing techniques can assist researchers in perceiving the significance of subconsciously communicable content, as 95 percent of the perceptions occur implicitly (Scheier & Held, 2013).

Although the importance of repeated exposure of the viewer to advertising and promotional materials has been examined in numerous earlier studies, this subject has not received considerable attention from contemporary researchers, as indicated by recent findings. A study claimed that there is no significant effect when the repetition of messages was increased by 50% or 100% (Lodish et al., 1995). Thus, redundant exposures to the same advertisement can decrease its effectiveness (Calder & Sternthal, 1980). Conversely, McCullough and Ostrom (1974) found that increased repetition leads to greater preference for the advertised product (Mitchell & Olson, 1981).

Previous studies have not thoroughly investigated this issue, especially with regard to the brain regions largely activated by repeated messages, or the significance of using contents with various elements to stimulate sensory receptors, ensuring long-term retention of these messages rather than short-term and extending their effect for a long period of time. These aspects have been revealed throughout this study. Memory strength is affected by advertising and promotional scenes, depending on the degree of

viewers' sensitivity, in addition to the content and the number of elements used in the advertisement. As discussed earlier, repetition remains a significant element in the degree to which viewers are affected by advertising and promotional materials. A previous study showed that participants' attitudes toward certain characters became more positive the more frequently they appeared during the exposure phase (Haddock & Maio, 2008). Moreover, memory performance improves and is sustained over time through repetitive learning (Ebbinghaus, 1964).

There is also a gap in previous research regarding the investigation of the contradictory impact of repetition. This process indicates that the stage of memorizing messages may differ from the stage of retrieval, as the activation of the brain regions responsible for encoding information may decrease with each new repetition, while the opposite occurs during the retrieval of advertising messages, when seeing the advertised product in the store. Two phenomena were mentioned in previous studies during memory encoding and retrieval, namely repetition suppression and repetition enhancement respectively (Zhan et al., 2018). Repetition suppression in the hippocampus is emphasized in the case of a single stimulus (Manelis et al., 2013) or when stimulus associations are repeatedly presented (Zeithamova, et al., 2016).

Accordingly, it is evident that using several elements in advertisements leads to a substantial activation of the brain regions responsible for memory and emotions, as emphasized in this study. Furthermore, the decrease in neural activity resulting from the exposure to a stimulus multiple times indicates a state of adaptation (Grill-Spector & Malach, 2001). This suggests the presence of unresolved matters regarding the repetition of advertising and promotional messages that require further investigation.

### **2.3. The Significance of Advertising and Promotion for Both Established and Emerging Brands**

Questions may arise concerning the reason established brands continue to invest in advertising and promotion despite their long-standing popularity. Scientific explanations on this subject remain lacking, in both earlier and recent studies, indicating the need for intensive research. Advertising and promotional processes are crucial for established brands, ensuring that their neural associations are maintained with the same degree of strength in viewers' minds, especially with the continuous emergence of new brands in the market.

It is important to note that neural networks are not fixed, they are appearing and disappearing throughout our lives in a dynamic way, relying on our own experiences (Demarin & Morovic, 2014, p.209). The theory of Associationism was based upon complex interrelated concepts, leading to well-organized and structured mental processes (Bistricky, 2013). Repeated experiences result in associated ideas and behaviors to which individuals ultimately adapt (Markie, 2004). Therefore, the repetition of advertisements familiarizes the viewer with the product over prolonged periods of time, transforming it into the primary option to come to mind when considering the purchase of a specific product.

Furthermore, advertisements significantly participate in maintaining a positive brand image in consumers' minds over a long time, influencing their preferences and purchasing decisions. Several studies have confirmed that brand image can be developed and strengthened relying on various approaches, such as advertising (Raji et al., 2019) and promotion (Agmeka et al., 2019). This image refers to the brand associations formed in the memories of consumers (Keller & Swaminathan, 2020).

## **2.4. The Impact of Advertising and Promotion on Viewers' Psyche**

The defensive system consistently operates in situations involving threats, such as escape, withdrawal, and attack; conversely, the appetitive system is activated in situations related to survival, including nurturance and sustenance, relying on certain behaviors, such as ingestion and caregiving (Bradley et al., 2001). Similarly, pleasant images activate the appetitive system, causing the inhibition of defensive reflexes (Bradley et al., 2001). A person's choice in life consistently impacts one of these two psychological systems. In this context, previous literature reported that advertising expenditures play a significant role in affecting customers' choices (Basil et al., 2013). Raji et al. (2019) demonstrated that advertisement messages influence consumers' perceptions of brands through, driving their purchase intentions; thus, they represent one of the effective marketing strategies used to establish a brand image and enhance consumers' perceptions of product quality.

Certain promotional materials are not intended for profit, such as the ones directed at reducing driving risks by advising drivers to decrease their speed. This type of promotional material stimulates the human defensive system, which is responsible for survival and protecting individuals' lives from potential hazards. Conversely, materials that promote several types of food, some of which are unhealthy stimulate the appetitive system and increase susceptibility to different diseases, such as obesity, diabetes, and various cardiac diseases. Many marketing strategies have been employed to promote unhealthy food, which negatively influence preferences, food attitudes, and the intake of young people, and are considered powerful environmental determinants contributing to excess weight and poor dietary habits (Harris et al., 2021). Promotional materials amplify happiness resulting from engaging in certain behaviors, as individuals are generally inclined to what they believe to be a source of happiness. Thus, the concepts of avoidance and approach refer to directional actions toward pleasant and unpleasant situations (Lang & Bradley, 2013).

## **3. Research Methodology**

### **3.1. Research Method and Sample**

This exploratory qualitative study aims to investigate various phenomena in the field of advertising and promotion that have not been previously studied or have received limited attention. Exploratory research aims to highlight the emergence of a certain phenomenon and to reveal its characteristics, particularly with the presence of

limited knowledge concerning it (Polit & Beck, 2008). In qualitative research, participants' lived experiences can guide researchers into unexplored areas. This approach aims to enhance the comprehension of people's beliefs, situations, and experiences, in addition to developing theories that can describe these experiences (Holloway & Galvin, 2023). Qualitative approach emerged from social and behavioral sciences to understand the dynamic, holistic, and unique nature of individuals (Hogan et al., 2009). This research adopts a phenomenological approach, which relies on real experiences to gain insight into how individuals perceive them (Delve & Limpaecher, 2022). This approach is utilized to examine people's experiences, expand knowledge of their perspectives, and enhance researchers' comprehension of certain phenomena (Bliss, 2016).

For this study, six men and six women of different ages were selected, based on a convenience sampling approach. It is the most common technique in qualitative research, as participants are chosen according to their availability, regarding location, time, access, and willingness (Lopez & Whitehead, 2013). Twelve interviews were conducted in this research, to achieve data saturation, as the diversity of data collected from the twelve participants supported the objectives of the study. The researchers found that any additional interviews would not yield new insights regarding the issues under investigation.

Saturation is an essential element in qualitative studies; consequently, sample size should always be determined with respect to it (Fusch & Ness, 2015). The same number of interviews has gained consensus among researchers in previous studies, regarding its ability to achieve data saturation. Guest et al. (2006) concluded that twelve interviews can achieve data saturation, especially in qualitative studies that employ non-probability sampling techniques. Similarly, Ando et al. (2014) recommended considering twelve interviews as a sufficient sample size for thematic analysis in qualitative studies.

### **3.2. Interview Protocol, Data Coding, and Thematic Analysis**

Structured interviews, including open-ended questions, were conducted both in-person and online with individuals. The participants were informed of the basic issues discussed in the study and the details of their involvement, ensuring their willingness to participate in the interviews and awareness of their right to withdraw at any stage. They were encouraged to freely share experiences, taking sufficient time to recall or narrate them. The interviews began with the simplest questions, in order to urge participants to respond without anxiety, then progressed to those requiring more thorough consideration. These procedures were adopted as part of interview protocols that were mentioned in previous studies, such as those by Jacob and Furgerson (2012).

Open-ended questions were posed to the participants, allowing them to speak without restrictions and present detailed information concerning the issues under investigation. Interviews were conducted individually to prevent influence from the opinions of other participants and to protect each individual's privacy. Participants



were allowed to narrate their experiences without any interruption or interference. The predetermined questions were posed in the same order, and the interviews lasted between 20 and 45 minutes.

Data was thematically analyzed, with themes, codes, and subthemes extracted, using a combination of inductive and deductive coding approaches. Various concepts were investigated, including sensory receptors, brain regions, conditional associations, neural manipulation, repetition processes, suggestive messages, and appetitive and defensive systems. The data collected from participants was carefully and repeatedly reviewed before the coding process, through identifying data segments that could be represented by short phrases. Subsequently, themes were generated and named, and sub-themes were elaborated.

During the coding process, previous theories related to the study's issues were considered, as well as the implicit and explicit meanings within participants' narratives, especially since many of these meanings pertain to scientific concepts relevant to this research. In thematic analysis coding, the process involved a combination of previously established codes applied to the participants' responses, in addition to codes emerging directly from their statements. By integrating inductive and deductive coding approaches, the researchers were able to analyze the gathered data holistically, combining previous knowledge with the insights generated by this study.

## **4. Thematic Analysis Findings**

### **4.1 Activity of Sensory Receptors and Brain Regions Through Advertising and Promotion**

The first four questions assess the importance of including the functions of sensory receptors and brain regions in discussions concerning advertising and promotion processes. In the first question, the effect of visual scenes included in donation advertisements on viewer's involuntary responses was evaluated, especially when these scenes evoke emotional pain. Accordingly, four themes were extracted: negative stimuli, which represent the main influencers; sensory receptors, which transfer these stimuli in the form of messages to the different brain regions; which in turn represent the third theme and finally, the motivational system, which is affected by these stimuli.

The first theme encompasses two codes: images of poor people and images of sick people depicted in advertisements, in addition to two sub-themes: the effect of using images of poor people on donations and the effect of using images of sick people on donations.

The second theme includes two codes: photoreceptors and mechanoreceptors, as well as two subthemes: the effect of photoreceptors on receiving advertising or promotional messages visually and the effect of mechanoreceptors on receiving them auditorily.

The third theme consists of four codes: the parietal lobe, the occipital lobe, the temporal lobe, and the frontal lobe. Moreover, it comprises four sub-themes: the

parietal lobe's role in processing sensory stimuli, the occipital lobe's role in processing visual stimuli, the temporal lobe's role in storing advertising and promotional messages, and the frontal lobe's role in organizing and controlling viewers' responses.

The final theme includes two codes: the appetitive motivational system, and the defensive motivational system, with two sub-themes: the degree of activation of the appetitive system by advertising and promotional messages and the degree of activation of the defensive system by advertising and promotional messages.

According to the findings, using images of poor or sick individuals significantly impacts the sensory and visual receptors of viewers, especially when accompanied by sad music intended to activate the auditory receptors as well. Consequently, all female participants decided that donation advertisements depicting people in need effectively encouraged them to contribute.

*"Donation ads that contain scenes of people in need affect my feelings a lot and encourage me to donate and to invite others to donate,"* A12, female, housewife.

However, one woman admitted that these types of advertisements deter her from donating.

*"I do not prefer to donate to charitable organizations that exploit poor or sick people in their ads,"* A7, female, accountant.

Another woman emphasized the significance of the credibility of organizations that collect donations. Among six men, four confirmed that they are not influenced by donation ads that use people in need.

*"No, I do not like those kinds of ads; for me that is a kind of taking advantage of people in need,"* A10, male, accountant.

Two male participants confirmed that this type of advertising material motivates them to donate. Based on the results, women exhibit greater responsiveness toward these advertisements than men, which is relatively logical, since women are more sensitive than men regarding emotional pain. However, the majority of participants of both genders are affected by donation advertisements. Additionally, advertising, and promotional materials evoking psychological pain can activate individuals' defensive systems at the expense of their appetitive systems. This alteration leads to diminishing the concern regarding the cost associated with the donation process, while increasing the concern for alleviating the emotional pain resulting from the advertisement through contribution.

For the second question, themes, codes, and sub-themes are similar to those of the previous one, except for the first theme, which emphasizes positive stimuli rather than negative as presented in the previous example. It consists of two codes: the image and voice of a celebrity, along with two sub-themes: the role of a celebrity's image and the role of a celebrity's voice in motivating purchase decisions. This question examines the effect of promoting products through using celebrities. All female participants confirmed this influence, especially if those celebrities are highly trusted or impressive,

with the exception of one woman who mentioned that she is not affected by their promotion.

*“If I am a fan of the celebrity who promotes the product, of course I can be affected,”* A7, female, accountant.

*“I can buy the advertised product if the person who is promoting it is trustworthy; in this case, I can be convinced of its quality, especially when I know that he uses it,”* A1, female, engineer.

A man stated that he is not influenced by celebrities promoting products, but rather affected by his real needs. In contrast, the rest acknowledged the effect of celebrities on them, with their emphasis on the importance of the credibility of the promoter.

*“Frankly, using a celebrity in the ad makes me very enthusiastic to buy the advertised product,”* A6, male, IT manager.

From the results, it is indicated that the proportion of rejection is equal between males and females, and is significantly lower than the approval rate, suggesting that celebrities can affect a percentage of viewers. In this context, the impact of the celebrity’s image and voice activate the same sensory receptors and brain regions that were discussed in the previous question. Typically, positive stimuli activate the appetitive system while inhibiting the defensive system, as presented in this example, leading viewers to be influenced by celebrities to the extent that they adopt purchasing habits that are not often in their interest.

For question 3, four themes were identified. The themes, codes, and sub-themes of this question are quite similar to their counterparts in the previous questions, except for the first theme which represents positive stimuli. Although it shares similarities with the previous question, it has a different nature. It consists of two codes: food image and sound of eating, in addition to two sub-themes: the effect of food image on the appetitive system and the effect of eating sound on the appetitive system. Question 3 raises an important issue regarding the impact of live food shows and food advertisements on audiences. Two of female participants confirmed that they can be fully affected by these advertisements and shows, while two others noted that they are affected when feeling hungry.

*“This always happens to me, as soon as I see food scenes in ads or shows, I feel hungry and want to eat,”* A9, female, student.

*“Sometimes I become affected and sometimes I am in control, which is based on my emotional state at the time of the show or ad,”* A12, female, housewife.

Two of the male participants indicated that they are affected by food advertisements and shows, while the rest emphasized that they are not affected at all.

*“In fact, I am very affected by food scenes, and I often order food after watching them,”* A6, male, IT manager.

*“Food ads and shows do not affect me at all,”* A8, male, pharmacist.

*“If I am on a healthy diet due to suffering from a medical condition, I will not be affected by these scenes under any circumstance; I can be affected in case of not having a special health condition,”* A11, male, professor.

The majority of the participants of both genders oscillate between full and conditional approval of the point raised, only a few of them admit to being unaffected. This is evidence of the significant effect of food ads and shows on the appetitive system of viewers, influencing them to consume food without limits on type or quantity.

For question 4, four themes were derived. The themes, codes, and sub-themes are similar to the ones in previous questions, except for two themes. The first theme, which refers to negative stimuli, includes one code: a product texture, and one sub-theme: the effect of product texture on purchase decisions. The second theme involves sensory receptors, including two codes: mechanoreceptors and photoreceptors, with four sub-themes: the effect of mechanoreceptors on product purchase, the effect of mechanoreceptors on product avoidance, the effect of photoreceptors on product purchase, and the effect of photoreceptors on product avoidance.

Question 4 highlights the significance of physically examining the product through touch to determine its material and quality. Participants of both genders assured the relevance of sensing the texture of the product to determine its quality, except for one woman who noted that she might overlook the unsatisfactory

texture of the product, if she likes its style. This shows the importance of visual receptors and those responsible for the sense of touch.

*“I have often decided not to buy lots of products due to their bad texture, which indicates poor material or poor quality,”* A4, female, engineer.

#### **4.2. Neural Manipulation of Viewers’ Minds Through Advertising and Promotional Messages**

The fifth question investigates whether participants are aware of the way advertising and promotional materials affect them. Five themes were formulated. The first theme is neural manipulation, divided into three codes; strong, moderate, and weak, and incorporates one sub-theme, namely the neural manipulation of viewers’ minds by advertising and promotion. Regarding the second theme which is conditional neural association, it includes three codes: strong, moderate, and weak. It consists of two sub-themes: classical conditioning, and operant conditioning. The third theme, the level of persuasion, represents three codes: high, moderate, and low, in addition to a sub-theme that addresses the effect of advertising and promotional materials on convincing the viewer to make purchases. Regarding the fourth theme, the purchase decision, it comprises three codes: high probability, neutrality, and low probability, as well as one sub-theme that examines the effect of advertising and promotion on the purchase process. The fifth theme, related to the perception of advertising and promotion, is divided into three codes: highly effective, slightly effective, and ineffective, in addition to one sub-theme: variance in perceiving advertising and promotion processes among viewers.

According to the results, some viewers may not recognize the effect of neural manipulation on their minds. Four of the women fully confirm the influence of advertisements on their purchasing decisions, while one believes that their effect is limited. Concerning the advertising mechanisms, the responses from the four women range from increasing product awareness via advertisements to their style and implementation. All of these factors are involved in the neural manipulation process of viewers' minds, especially when the information conveyed through advertising includes suggestive messages evoking the feelings of comfort and happiness associated with buying and consuming the product.

*"Yes, ads affect my purchasing decisions a lot by making me feel the importance of the promoted products, which increases my desire to buy them,"* A4, female, engineer.

*"I do not buy the product until I need it, ads do not affect me a lot,"* A5, female, housewife.

For male participants, five of them acknowledged the impact of ads on their purchasing decisions.

*"Ads make me attracted to many products even the ones which I did not intend to buy before, I am a frequent buyer because of ads and promotions, especially the attractive ones displayed on social platforms and websites,"* A2, male, lawyer.

Only one participant believed that ads do not affect his purchasing decisions.

*"Ads do not affect my purchasing decisions at all,"* A8, male, pharmacist.

With regard to the opinions of male participants, attractive advertisements that suggest purchasing a specific product will lead to greater happiness are considered the cause behind the success of advertising and promotional processes. However, one participant believes that genuine desires, in addition to purchasing power, are more influential factors in the purchasing decisions. The majority of participants regardless of gender acknowledged the impact of advertisements on their choices of purchase. These results underscore the effect of neural manipulation on audiences' minds, prompting many to buy products that can sometimes be harmful or unnecessary.

### **4.3. Effectiveness of Repeating Advertising and Promotional Messages**

For question 6, one theme was extracted, as well as 7 codes and 6 sub-themes. The theme refers to the repetition of advertising and promotional messages, while the identified codes are: the temporal lobe, learning process, sensation strength, memory power, memory capacity, attention and awareness improvement, and buying intention. The impact of repeated advertising starts with the temporal lobe, specifically in the hippocampus, which is responsible for learning and memory functions, in addition to the amygdala, which processes sensation. Repetition process increases the viewer's attention and awareness of the product, leading to an intent to purchase.

Question 6 explores the participants' perspectives concerning the effect of repeated advertisements on their sensations and memory. Among the female participants, three admitted that repetition strengthens their memory of the product and its specifications; however, it does not impact their emotions. The rest indicated that repetition affects both their memory and emotions, subsequently motivating them to purchase.

*"Watching the ad several times helps me remember the product and its specifications; however, I am not affected by the repetition process unless I really need the advertised product,"* A4, female, engineer.

Four of the male participants emphasized the impact of repetition in increasing their memory strength; nonetheless two did not believe it affects their emotions, while one participant contended that it has a reverse effect, discouraging him from purchasing the advertised product.

*"The repetition of ads does not increase my desire to buy the product, but of course it makes me remember the product better,"* A8, male, pharmacist.

*"There is no effect of ads on me, but repeating the ad provokes me and makes me refuse to buy the product,"* A6, male, IT manager.

The majority of participants of both genders recognize the impact of repeated advertisements on their memory. Regarding the effect on sensations, their opinions vary between acceptance and rejection, while the latter acquiring the largest proportion. This observation can be rationalized, as the urge to purchase can be curbed by several factors, such as individual's values, convictions, and financial or health status. These factors may motivate viewers to control their sensations to prevent impulsive purchasing behaviors.

#### **4.4. Effect of Conditional Association on Customer Perception**

For question 7, four themes were determined: conditional neural association, associative memory, motivational systems, and brain regions. The first theme consists of two codes: classical conditioning, and operant conditioning. The second theme includes two codes: short-term associative memory and long-term associative memory. The third theme comprises two codes: the appetitive motivational system, and the defensive motivational system. The final theme incorporates two codes: the temporal lobe and the frontal lobe.

Regarding sub-themes, the first theme encompasses two sub-themes: the effect of positive stimuli on emotions and behaviors and the effect of negative stimuli on emotions and behaviors. The second theme comprises two sub-themes: the storage of messages in short-term memory and the storage of messages in long-term memory. The third theme includes two sub-themes: the effect of negative messages on the appetitive system and the effect of negative messages on the defensive system. The fourth theme features two sub-themes: the activation of the temporal lobe responsible

for learning and memory and the activation of the frontal lobe responsible for organizing and controlling responses.

For question 8, the first three themes, along with their codes and sub-themes, are similar to those in the previous question, except for the third theme which contains an additional code: the parietal lobe, and an additional sub-theme: the activation of parietal lobe responsible for processing sensory information. Furthermore, the fourth theme, olfactory communication, encompasses two codes: the olfactory receptors, and the olfactory sense, and two sub-themes: the effects of the olfactory messages on the olfactory receptors and their effects on the olfactory sense.

The aim of the seventh and eighth questions was to investigate the potential occurrence of conditional neural association between different stimuli through real-life examples. In regard to question 7, individuals may enjoy certain types of food, but the occurrence of a subsequent unpleasant experience can lead them to avoid these foods indefinitely. Participants were asked if they had encountered a similar situation. Accordingly, there may be a negative neural link between the food and the unpleasant situations, which stimulates the retrieval of these situations every time they consume it, negatively affecting their appetite. Among the female participants, four reported experiencing this situation.

*“Yes, I have gone through this situation several times; there are kinds of food that I have recently refused to eat for that reason,”* A5, female, housewife.

For male participants, three admitted that this had happened to them; one of them experienced this situation with a specific soft drink.

*“Yes, that happened with one of the soft drinks, which I have started to avoid after the occurrence of a disgusting event associated with it,”* A10, male, accountant.

Seven participants of both genders confirmed their refusal to eat specific types of food that were linked in their minds to disgusting situations, emphasizing the notion of associative learning conditioning. Similarly, question 8 supports the idea of the neural association occurring between different stimuli; using a different example, as the majority of participants of both genders affirmed the association between scents and various memories represented in people, places, or events.

*“Yes, there are aromatic scents that remind me of certain people and events,”* A5, female, housewife.

Both examples explain the occurrence of conditional neural associations between advertising or promotional materials and the advertised or promoted items.

#### **4.5. Effectiveness of Advertising and Promotion Through Multi-Sensory Experience**

For question 9, four themes were extracted: product features, multi-sensory experience, product experience, and purchase decision. The first theme incorporates two codes: appealing and unappealing, and one subtheme, the evaluation of product features. The second theme consists of three codes: sight, hearing, and taste, in addition to three sub-themes: customer reviews, word of mouth and product sample. The third

theme comprises three codes: visual sense, auditory sense, and taste sense, as well as one sub-theme, the effect of multisensory integration on product experience. The final theme includes three codes: high probability, neutrality, and low probability, accompanied by one sub-theme, which is the effect of multi-sensory processing on purchase decisions.

Question 9 examines the importance of creating advertisements that provoke several sensory receptors, enhancing their effect on viewers' senses. For the female participants, four preferred engaging in the four stages that activate their different receptors before purchasing the food product, as they prefer to see it themselves, hear others' opinions and taste a sample if possible. In contrast, two participants acknowledged that they do not care about others' opinions, due to the variance in taste among individuals.

*"I prefer seeing and tasting the food product before buying it, however, I do not care a lot about others' opinions,"* A9, female, student.

For male participants, two of them preferred to evaluate all three cases together, while two others stated that they tend to see the product themselves in addition to hearing others' point of views.

*"I prefer the three cases together,"* A8, male, pharmacist.

The remaining participants prefer seeing and tasting the product only. Among participants of both genders, the number of individuals is equal among those who opt to experience all three cases and those who select only two. However, the number of women who aim to identify the product through the three different techniques that engage several receptors exceeds that of men who support the same idea. This difference may be attributed to women's tendency toward anxiety, due to their sensitivity that drives them to seek a feeling of reassurance when purchasing products, especially those with a direct effect on health. Conversely, men generally exhibit lower levels of anxiety and more flexibility during the purchasing process.

#### **4.6. Importance of Advertising and Promotion for Famous Brands**

In question 10, two themes were extracted: neural association and brand. The first theme consists of two codes: classical conditioning and operant conditioning, and two sub-themes: strong neural association and weak neural association. While the second theme comprises seven codes: brand identity, brand awareness, brand perception, brand association, brand recognition, brand familiarity, brand recall and brand adoption, in addition to four sub-themes: strong brand image, weak brand image, vanishing brand, and emerging brand. It is essential to investigate the significance of advertising for well-known brands, despite their reputation among the public on a large scale. Among the female participants, four emphasized their adoption of the latest brands instead of the older ones, especially with regard to catering services.

*"Actually, I have adopted new brands and abandoned some old ones,"* A9, female, student.



However, two of the six participants confirmed their loyalty to the brands they prefer even if other attractive options of the same type become available.

*“No, I always stick to my favorite brands,”* A12, female, housewife.

All male participants confirmed their adoption of contemporary brands over the ones they used to purchase, particularly, if their quality was better, except for one participant who assured his commitment to the brands he used to purchase in the past.

*“I have switched from certain brands to other brands recently, due to their low quality in comparison with other new brands,”* A10, male, accountant.

Accordingly, the possibility of replacing an old brand with a new one is significantly high. Thus, any brand can vanish as soon as another brand of the same type emerges and captures customers’ attention.

#### **4.7. Effect of Promotion on Community Through Mass and Social Media**

In addressing question 11, two themes were determined: promotion and suggestibility. The promotion theme encompasses three codes: promotion of ideas, promotion of behaviors and promotion of lifestyles, each further divided into three sub-themes related to promotion through mass or social media. Whereas the suggestibility theme discusses one code, suggestive messages, and is categorized into three sub-themes: adoption of ideas, adoption of behaviors and adoption of lifestyles. This question investigates the extent to which mass media and social media affect audiences through the ideas, behaviors, and lifestyles they promote.

The majority of participants of both genders emphasized their influence by the ideas, behaviors and lifestyles promoted through the aforementioned platforms, especially if such content is healthy, convincing, and consistent with their own convictions.

*“I become affected if these ideas and behaviors are consistent with my own convictions and principles,”* A4, female, engineer

However, two men asserted that they maintain convictions that cannot be influenced by the opinions of others. In conclusion, promoting ideas, behaviors, and lifestyles through the previously mentioned media can significantly influence viewers, prompting them to adopt those elements.

*“Yes, I am affected by healthy behaviors promoted through mass media and social platforms,”* A3, male, professor.

#### **4.8. Effect of Advertising and Promotion on Viewers’ Appetitive and Defensive Systems**

With regard to question 12, both parts A and B yielded six themes. The first theme comprises two codes: home-prepared meals and restaurant meals, and four sub-themes: healthy meals, unhealthy meals, tasteful meals, and untasteful meals. The second

theme, food quality, presents two codes: high and low and two sub-themes: high-quality food, and low-quality food. Theme 3 consists of two codes: high and low, in addition to two sub-themes: high food safety standards and low food safety standards. Theme 4 includes two codes: large and small, along with two sub-themes: large variety of food and low variety of food. Theme 5 addresses two codes: high and low, and two sub-themes: high-quality service and low-quality service. Finally, theme 6 discusses two codes: inclination and disinclination, with four sub-themes: inclination toward home-prepared meals, inclination toward restaurant meals, disinclination toward home-prepared meals, and disinclination toward restaurant meals.

This question illustrates the ability of promotional materials in affecting individuals' appetitive systems, leading them to adopt behaviors contrary to their convictions. Part A of this question investigated the participants' opinions concerning the healthiest types of food, whether home-cooked or restaurant-prepared. All participants, regardless of gender, believed that home-prepared meals are safer and healthier compared to food prepared in restaurants, due to their knowledge of their ingredients and preparation methods.

*“Regarding food hygiene and safety, home-prepared meals are the best,”* A4, female, engineer.

However, in Part B, when participants were asked about their food preference, eight participants, including four females, indicated their tendency toward restaurant meals.

*“Frankly, I tend to prefer restaurant meals, perhaps for the sake of good taste and variety, or to avoid cooking,”* B1, female, engineer.

Participants' responses illustrate the significant impact of long-term promotion of food service on individuals' psyche, leading them to prefer it even if this preference contradicts with their convictions. Consequently, the appetitive system exhibits a dominant role in influencing the behaviors of many individuals due to advertising and promotional materials.

## 5. Discussion

Advertising is considered a communication channel between advertisers and consumers to meet their needs (Kotler, 2002). The significance of including the process of conditional neural association, known as associative learning, has previously been explained in some advertising and promotional studies; however, critical aspects remain unaddressed, such as the role of sensory receptors and the neural connection between various brain regions. These connections, facilitated by neurotransmitters, allow the transmission of advertising and promotional messages from processing areas to those responsible for recall and response. Despite recognizing the influence of tailored nutrition campaigns on reducing the consumption of unhealthy meals, there remains limited knowledge regarding the neural processes responsible for stimulating behavioral change through these tailored messages (Casado-Aranda et al., 2022). This

may explain the struggle encountered by some researchers in determining the relationship between advertising and brand image. For instance, Dewi and Hartono (2019) found that advertising has no effect on brand image. Similarly, another study indicated that sales promotions did not impact brand image (Langga et al., 2020).

The results of this exploratory study confirm the importance of empirically investigating the aforementioned aspects in future research, particularly the observed differences regarding the reception of advertising and promotional messages. These differences are influenced by the degree of sensitivity of receptors in individuals, especially when comparing responses between women and men, in addition to the variations in the degree of activation of brain regions, depending on the nature of messages and individuals' sensitivity toward them. It has previously been suggested that women may often possess more active sensory receptors than men. For instance, one study revealed that women typically exhibit higher olfactory sensitivity than men (Sorokowski et al., 2019). Thus, one of the primary goals of this research is to explore the significance of sensory receptors and human senses in the field of advertising and promotion. This significance is based on the role of sensory receptors in transferring impulses as nerve signals, while the nerve fibers terminate in the central nervous system, determining the way different stimuli are perceived and allowing the human body to effectively react to internal and external events (Marzvanyan & Alhawaj, 2019). A similar process occurs when viewers react to advertising and promotional messages. Researchers have previously overlooked this fundamental element, primarily concentrating on human senses. As noted, sensory advertisements provide customers with direct and indirect cues to attract their senses (Krishna et al., 2016). Human senses result from the operation of the sensory organs, which gather information that is neurologically processed and analyzed by the sensory receptors. This study also reveals the neural association among different brain regions and their role in the field of advertising and promotion. Prior neuroscience studies emphasized the role of neurotransmitters in facilitating communication between certain brain regions, such as the amygdala and cortical regions (Martin et al., 2009).

This research demonstrates the possible effect of the repetition process on memory and emotions with regard to advertising and promotional processes. However, the significance of employing multiple advertising elements simultaneously in strengthening memory and eliciting strong responses to the advertised or promoted products cannot be overlooked. Although it has been noted that increasing the number of elements can elevate customers' purchasing intentions, this process differs from the process of single-sense advertising (Elder & Krishna, 2010). The reasons for the significant impact of these multiple elements on customers' purchasing intentions have not been thoroughly explored. The principal factor is increasing the number of brain regions that are activated using these elements, resulting in an extended and more substantial influence on memory and emotions. The interaction between the hippocampus and other regions related to a specific stimulus increases through repetition in learning process, this aspect should be considered in empirical studies (Zhan et al., 2018).

The results of this study emphasized the significance of the advertising and promotional processes for well-known brands, as the majority of participants confirmed their discontinuation of certain brands as soon as contemporary alternatives had emerged. These results are particularly logical, considering the fact that associations in the brain change over time (Rose, 2020). This represents an actual threat to any brand that cannot maintain its prominent position in the mind of the viewer. Especially since human behavior can dramatically change when it becomes associated with pleasure or pain, and when the recent neuro-associations become more influential than the old ones and are able to replace them (Robbins, 1991). Finally, this research emphasizes the requirement for extensive empirical studies on the contradictory effects of advertising and promotional processes on people's lives, as preliminarily introduced in this study. Therefore, discussions in advertising and promotion should incorporate two fundamental systems of the human psyche: the appetitive and the defensive motivational systems. This approach identifies customers' behaviors toward the products, services, ideas, as either inclination or aversion. Consequently, actions result from individuals' inclination or disinclination toward various stimuli (Lang & Bradley, 2013).

## **6. Research Contribution**

This research illustrates the significance of studying the sensory receptors of viewers along with their senses, based on an exploratory approach. It also examines the different brain regions that actively respond to advertising or promotional content, suggesting the presence of neural associations between those regions and the variance in their activation degree, depending on several discussed factors. Furthermore, participants' responses assisted in exploring the role of repeated exposure to advertising and promotional content in attaining the predetermined goals of advertisers and promoters. The study also investigates the psychological influence of these materials on the human psyche, particularly on the appetitive and defensive systems, which direct individuals' acceptance or aversion to the advertised or promoted content. These effects are evidenced by literature reviews in neuroscience, in addition to the results of this study.

## **7. Conclusion**

Although advertising and promotion were primarily established for the benefit of business owners, in order to achieve high profits, these goals cannot be attained at the expense of customers, since balancing the interests of both parties is essential. Moreover, advertisers and promoters should avoid neural manipulation of viewers' minds and instead, satisfy their actual needs through high-quality products and services. Therefore, providing comprehensive insights into the neural motives of susceptibility to advertising and promotional materials and their psychological influences is crucial.

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