

*What role does consumer neuroscience play in the brand choice process
and how can it be used by companies to gain brand preference?*

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Abstract:

Every year, billions of dollars are spent on marketing and advertising efforts by companies striving to become the consumer's preferred brand. However, it is important that these efforts are built on detailed strategies as to not waste the company's budget and resources. The world of neuroscience is able to provide marketers with branding tactics based on the subconscious reactions of consumers' brains. This paper looks into the role that consumer neuroscience plays in the brand choice process and how companies can use this information to better target their desired audience. This research draws from academic articles and studies centered around cognitive functions and reactions. Many functions found to be involved in the brand choice process show that companies should create salient, attractive, memorable, and relatable branding decisions. The conclusions indicate the need for neuroscience-based strategies to complement traditional tactics.

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Part I: Introduction

Colgate, Crest, Sensodyne. Those are just a few of the toothpaste brands situated on the shelf in aisle 9 as consumers contemplate which one to choose. Their thought process may appear conscious as they ponder the costs and benefits of each choice and how they may affect their overall existence, but the majority of the brand choice process remains unobserved. Everything from the colors of the brand's logo to how their workday went is unnoticeably considered, yet creates a large impact on their final choice. Companies spend billions of dollars each year striving for their brand to gain preference in the minds of consumers, and for good reason, too. The brand serves as the first form of identity and impression in the consumer mind, taking about 90 seconds for an initial judgment to be formed. (Moir, 2007, p.407) Additionally, studies suggest that stronger brands experience 31% greater revenue growth. (Zvonek, 2018)

Using neuroscience to inform theory and strategy formation in the field of branding has skyrocketed in the past two decades. The introduction of new neuroscience-based technological uses, such as functional magnetic resonance imaging (fMRI) and electroencephalograms (EEG), has provided researchers and marketers alike the opportunity to gain deeper insights into how consumers decide which products are worthy of purchase. The brand choice process involves many different areas of the brain that inform the five phases of brand preference formation: identification, attention, predicted value, experienced value, and remembered value. A company is able to utilize these areas of the brain and increase their chance of achieving brand preference by assuring that their brand, messaging, and design choices are salient and attractive, relating to the goals of their desired audience, and easy to recall.

Part II: Historical Context and Background

A company's brand is made up of more than just a logo and a slogan, although those are integral aspects of it. Brands are made up of specific traits in a consumer's brain that effectively distinguish the company or product from others. In other words, as quoted by Tjaco H. Walvis, "[...] a brand is a network of associations with a (brand) name in the brain of a person."

Neuroscience, the scientific study of the nervous system and the brain, has been the subject of consumer behavior-related research, commonly referred to as neuromarketing, and has been used to inform brand and marketing strategies since around 2002. (Morin, 2011) Neuromarketing incorporates three neurophysiological methods in order to measure the effects of branding strategies. Electroencephalography, or EEG, measures the electrical activity over the brain's cortex by detecting large groups of active neurons. Functional magnetic resonance imaging, or fMRI, identifies and records activity in the brain based on blood oxygen levels during specific cognitive tasks. Magnetoencephalography, or MEG, involves the recording of brain activity through magnetic fields produced by the brain's natural electrical currents. During its introduction, neuromarketing had been questioned on the basis of unethical practices due to fear that it could not only record, but alter consumer behavior due to a ground-breaking study conducted by Read Montague. The study involved asking a group of consumers to taste two popular soda brands, Coca Cola and Pepsi, and showed that when the brand was identified, consumers preferred Coca Cola and their frontal lobe, involved in short-term memory and attention, became active. When brands were not identified, they preferred Pepsi and a structure in their limbic system, involved in emotion and instinct, became active. (Morin, 2011)

Marketing and branding research has long involved the use of traditional methods that strive to predict consumer behavior by relying on the subjects' abilities to accurately report their responsive emotions. This could involve interviews, surveys, focus groups, and more. However, these traditional methods pose large opportunities for error in data as subconscious processes, which have proved to be heavily involved in the consumer choice process, are not taken into consideration. Additionally, the ability of consumers to accurately report their emotional status can easily be misinterpreted and misidentified. (Morin, 2011) Studying the consumer's brain and its conscious and subconscious processes using neuroimaging techniques has offered researchers more dependable, authentic results, and marketers the ability to more accurately predict consumer behavior. The incorporation of this hard science has removed the "middle man" of brand research: The consumer's interpretation of their emotions.

Part III: Research and Analysis

Section A: The Phases of the Brand-Choice Process

While we may feel that we are aware of the process in which we decide to interact with certain products or brands, it appears that there are many subconscious aspects involved in this choice-making process and an abundance of activity between brain regions that help to follow through with it. These brain regions play major roles in the phases that occur when we, as consumers, create brand preferences.

Before these phases come into play, however, the consumer narrows their options down into the "consideration set." The consideration set is "the set of brands that are brought to mind and are scrutinized carefully at a particular choice occasion." (qtd. in Suh, 2009) For example,

while the toothpaste section of the grocery store includes a variety of options, the human brain cannot evaluate all options equally as it has limited information processing abilities. Therefore, the mind narrows down its potential choices. Once products have entered the consideration set, they undergo subconscious evaluation into the five main phases of brand-preference formation: identification, attention, predicted value, experienced value, and remembered value.

Identification

The consumer begins by identifying each brand by evaluating the associated information. While doing so, the consumer must also evaluate the internal and external conditions that will ultimately affect their final decision. For example, when evaluating what brand of toothpaste to consider for purchase, the consumer's decision may depend on their current preference for flavor (internal condition) and what their family member uses (external condition).

Identification takes place through visual evaluation, using the dorsal visual pathway and the ventral visual pathway of the brain, both connected to the primary visual cortex, V1, of the cerebral cortex. The dorsal visual pathway is involved in the "spatial deployment of attention," while the ventral visual pathway is involved in "object recognition". (Plassman et al. 2012) The visual cortex ranges from V1 to V5. V1 is responsible for gathering visual input from the lateral geniculate nucleus (LGN) and transferring it to V2 where size, color, shape, and space are evaluated. The inputs then continue to V3, responsible for inferring speed and direction of elements, and so on, up until they reach other areas of the brain to be analyzed.

The occipitotemporal region is also believed to be an important factor in the identification of brands, playing a role in the recognition of objects, processing of color, and

reading. Plassman et al. cite a 2010 MEG study conducted by M. Junghoefer and his team in which they discovered that female participants experienced stronger activity in the occipitotemporal region when viewing shoes, as compared to motorcycles. These results show that, when recognizing objects and stimuli, items deemed intrinsically significant to the consumer produce a different neural reaction than non-significant stimuli.

Attention

Once the consumer has identified all present brands, they must determine which incoming information will gain preference in their mind. This is where attention comes into play. Research has found three steps responsible for contributing to attention-gain in brand selection: Saliency (bottom-up) filters, top-down control, and visual selection. (qtd. in Plassman et al. 2012)

Saliency filters, otherwise referred to as bottom-up filters, are unconsciously driven by environmental cues and select the most principal and influential information that must be considered by attracting initial eye movements. This is achieved primarily based on low-level visual features, such as color, size, shape, and more. However, some high-level visual features also have the power to affect the selection process, such as text, faces, and the consumer's name. (Plassman et al. 2012) For instance, brightly colored text that stands out to the consumer is considered highly salient. Saliency is assessed in the hippocampus, through the entorhinal cortex, and interacts with the brain's memory network, placing stimuli deemed salient into long-term memory. The pulvinar nuclei, located in the thalamus, also plays a role in the evaluation of salience, by regulating perceptual saliency. The insula, responsible for regulating emotions,

awareness, and empathy, is sensitive to salient stimuli, and its core function is to mark this stimulus for “additional processing and [then] initiates appropriate control signals.” (Menon et al. 2010) Other areas of the brain have been found to be involved in the function of saliency filters, such as the anterior cingulate cortex, which regulates emotion, impulse-control, decision-making, and more, and the dorsolateral prefrontal cortex, which serves in the process of saliency map creation alongside the posterior parietal cortex. Saliency maps allow all types of feature information (e.g. shape, color, and orientation) in the visual field to be pooled together, and attention is given to the location with the highest amount of activity on the map. (Katsuki et al. 2013) For example, large packaging that includes color is more salient, and will produce more activity on a saliency map, than small black and white packaging. Therefore, the consumer will be more likely to shift their attention to the large colored packaging.

Top-down control allows consumers to direct their focus on stimuli they are particularly interested in viewing and suppress stimuli that do not relate to their interest. It is evaluated consciously and is dependent on internal states, external states, expectations, and goal-attainment. (Plassman et al. 2012) The dorsolateral prefrontal cortex is involved in the incorporation of expectations and helps to narrow the consumer’s focus onto relevant stimuli. For example, if the consumer is looking specifically for Crest toothpaste, they may be biased towards red and blue logos. Additionally, information that will help to fulfill set goals will gain attention over others. Along with regions involved in bottom-up attention, such as the ventral and dorsal pathways, the prefrontal cortex, and the posterior parietal cortex, two systems interact in order for top-down control to guide consumer behavior. A ganglia-centered system quickly

learns simple goal-directed behaviors while a prefrontal cortex-centered system gradually learns more complex, long-term goal-directed behaviors. (Buschman & Miller, 2014)

Visual selection then takes place after the incoming brand information has gone through the above processes and has been chosen to be attended to. Visual selection can be predicted by consumers' eye movements, as studies have found that products fixated on with gaze bias, the act of looking at particular products for longer periods of time, are eventually chosen.

(Plassmann et al. 2012)

Predicted Value

The predicted value of each brand with the potential to be chosen encompasses the “consumer’s belief about the experienced value of that brand at some time in the future.” (Plassmann et al. 2012) In other words, the predicted value represents the amount of pleasure that the consumer has anticipated when interacting with that particular brand. For example, an outdoor-enthusiast might associate greater predicted value with products from Patagonia than similar products from Walmart. The striatum, responsible for helping in decision-making and reward-related functions, has been found to be associated with encoding the predicted value of expected outcomes. (Goldstein et al. 2012) Studies have also found that the ventromedial prefrontal cortex and the dorsolateral prefrontal cortex encode behavioral preferences and expectations of future reward. (Gläscher et al. 2009; qtd. in Plassman et al. 2012)

The reward system of the brain is governed by the dopaminergic circuit, responsible for releasing dopamine into the brain. Key brain regions involved in this circuit include the ventral tegmental area, responsible for the initial release of dopamine, and the striatum, in charge of

forming evaluative expectations and social reward processing. (Shaw & Bagozzi, 2017) Other brain areas involved include the amygdala, ventral pallidum, insular cortex, and prefrontal cortex.

Reward can be distinctly separated into two components: wanting and liking. Wanting, based on motivation and prediction, promotes the “approach and consumption of rewards” and is controlled by the mesolimbic dopaminergic circuit. Dopamine, produced by the ventral tegmental area, spreads through the circuit to the nucleus accumbens, ventral pallidum, amygdala, anterior cingulate cortex, orbitofrontal cortex, and insular cortex. In comparison, liking, based on sensory pleasure responses in the brain, involves the interaction of the nucleus accumbens and the ventral pallidum in order to send information to the orbitofrontal cortex for cognitive processing. (Shaw & Bagozzi, 2017)

Experienced Value

Experienced value is the amount of pleasure a consumer derives from interacting with a particular brand. This encompasses the processing of rewards (as mentioned above) and the processing of emotions. Liking, as explained before, involves the evaluation of pleasure in the brain during a consumption experience through the use and distribution of dopamine. Emotional processing, also responsible for the use of naturally-produced dopamine, involves the production of responses such as happiness, sadness, fear, disgust, and more. The key areas of emotional processing are the medial prefrontal cortex, amygdala, thalamus, hypothalamus, insular cortex, orbitofrontal cortex, nucleus accumbens, and anterior cingulate cortex. (Shaw & Bagozzi, 2017) The amygdala has been known to process negative emotions, such as fear and sadness, while the

insular cortex processes the experience of risk, anger, and disgust. The orbitofrontal cortex also processes anger, as well as regret. The nucleus accumbens is a key region when it comes to dopamine distribution during motivational processes, and the anterior cingulate cortex has been associated with sadness. (qtd. in Shaw & Bagozzi, 2017)

Experienced value differs based on the valence and intensity of the experience. For instance, a consumer might associate greater experienced value with a winter coat that provided more warmth than other experienced coats. Studies conducted based on the valence, or hedonic tone, of a situation have shown that the orbitofrontal cortex, as well as the ventral striatum and the pregenual cingulate cortex, correlate with the processing of sensory pleasure. Brain regions involved in the processing of pain have remained largely unknown, but some studies have pointed to the lateral orbitofrontal cortex and the left dorsal anterior insula. (qtd. in Plassman et al. 2012) The intensity of a consumption experience has correlated with activity in many brain regions. Pain intensity has been found to produce activity in the insula and the anterior cingulate cortex, while the intensity of objects and flavor have produced activity in the dorsal and ventral striatum. (qtd. in Plassman et al. 2012)

Remembered Value

Remembered value allows for consumers to access memories of experienced value when interacting with certain brands and use it to influence their future brand-preference decisions. It “refers to how different brand associations are encoded, consolidated, and retrieved in the consumer’s memory.” (Plassmann et al. 2012) For example, if they bought Crest toothpaste, but found the mint to be too spicy, they will remember before they make a toothpaste purchase in the

future and it will ultimately impact their final decision. These memories, however, do not have to be just those experienced by the consumer. They can also be other's experiences that the consumer witnessed, whether that be through commercials or stories. Remembered value consists of two types of memory: explicit and implicit.

Explicit, or declarative, memories are experiences that a consumer can actively remember and consciously use to impact their brand-preference decision. For instance, remembering that the Crest toothpaste was too spicy during the previous time they used it. Explicit memories can either be semantic (memory of facts) or episodic (memory of experiences). (Shaw & Bagozzi, 2017) The temporal lobe, including the hippocampus and the parahippocampal gyrus (entorhinal cortex and perirhinal cortex), is used to form and encode episodic memories and store them for later use. The prefrontal cortex also plays a role in the processing of explicit memories. The left dorsolateral prefrontal cortex is activated when encoding memories, while the right dorsolateral prefrontal cortex is activated when retrieving them. Additionally, the striatum, located in the basal ganglia, has also been newly recognized as playing a role in memory retrieval (Scimeca & Badre, 2012), while fear-based, negative memories correlate with activation in the amygdala. (Shaw and Bagozzi, 2017)

Implicit, or procedural, memories involve the unconscious memory of skills and practices, such as tying your shoes or playing a musical instrument. The striatum has been discovered to support the development of a habit through two information processing pathways that work together to create a functional neural feedback loop. The main looping circuit is referred to as the cortex-basal ganglia-thalamus-cortex loop. (Parent, 2003) The cerebellum is also known to correct and fine-tune habit-enforcing movements. Additionally, new research is

showing that brain regions thought to be exclusive to explicit memory formation, like the prefrontal cortex, can play a role in implicit memory formation. H. Plassman et al. cited a 2007 study conducted by M. Pessiglione et al. that found that “subliminal high-value rewards increased the strength with which subjects deployed effort on a hand grip task relative to low-value rewards.”

In order for long-term memories to be formed, specific memories must be consolidated first. The amygdala has been found to “determine the strength and significance of memory traces,” (Shaw & Bagozzi, 2017) while the hippocampus acts as the main location for memory processing and consolidation. (qtd. in Shaw & Bagozzi, 2017) Due to the fact that the amygdala is so heavily involved in the memory-consolidation process, as well as emotional processing, it has been discovered that “emotionally arousing experiences are better remembered.” (qtd. in Shaw & Bagozzi, 2017) Emotionally arousing experiences include those that provoke strong feelings, such as rage, misery, or joy. A great example of this is when P&G released its ‘Thank You, Mom’ campaign advertisements for the 2016 Olympics, causing viewers to experience intense emotion and connection with the brand.

Section B: Important Aspects of Preference-Gaining Branding Strategies

As it can be seen, there are many different areas of the brain that are responsible for at least one function in the brand-choice process. These findings are highly useful in the world of marketing and branding, as they have offered researchers more dependable, authentic results, and marketers the ability to more accurately predict consumer behavior. However, preference-gain in the consumer’s mind is only controllable to a certain extent. While there is no guarantee that a

brand will be chosen by 100% of its viewers, a company is able to utilize these areas of the brain and increase their chance of achieving brand preference by assuring that their brand, messaging, and design choices are salient and attractive, relating to the goals of their desired audience, and easy to recall.

Saliency, Placement, and Attraction

Brands hoping to gain preference must first focus on gaining the attention of the consumer. This is when low-level visual feature choices, involved in bottom-up attention, become particularly important, such as the color, size, placement, and more. Some high-level features, like faces and the consumer's name, can also serve to increase the chances of preference-gain. Attention heavily relies on eye-movements. Researchers have found that consumers make an average of four eye movements within the first 2.5 seconds of viewing marketing stimuli. (qtd. in Shaw & Bagozzi, 2017) Salient stimuli attract these initial eye movements and increase the chance of being chosen. H. Plassmann et al. speak of a 2011 study conducted by Milosavjevic and his team that showed that when consumers are told to make food choices at high decision speeds, consumers preferred products with brighter-colored packaging, even when they may have preferred the taste of the opponent. Additionally, if a product can attract the initial eye movements of the consumer, it is more likely to achieve "gaze bias," resulting in an increased chance of being selected. Therefore, as brighter and more contrasting colors have been proven to gain subconscious preference, it is recommended that companies create product packaging with brighter colors that stand out from their competitors when on the shelf.

Additionally, placement of the product on the shelf or on a website can impact its ability to gain preference. Research has shown that, in terms of shelving, consumers tend to look toward the upper visual field and the right visual field. (qtd. in Plassmann et al. 2012) This holds true for websites, as well, as it has been found that consumers are almost 60% more likely to choose products placed in the center of the computer screen, as opposed to the same products placed in other locations. A 2009 study conducted by Milsosavjevic concluded that companies can even guide consumers to look at a specific area of the screen using low-level features, such as color. (qtd. in Plassmann et al. 2012) Evidently, brands should place products in these specific locations in order to increase their chance of being chosen.

Along with attractive design choices, the brand can also create an attractive product through price decisions and marketing actions, and reputation management. A 2008 study asked consumers to taste the same wine on multiple occasions, but were made to believe that each wine sample had different price points. The study concluded that price can effectively alter the perceived quality of products, creating a “placebo” effect. (Shaw & Bagozzi, 2017) Additionally, the order with which the price of the product is presented also plays a role in decision-making. A 2015 study different areas of the brain are activated when the price is shown before or after the product is viewed, inferring that it has an effect on how the consumer evaluates the product. (Shaw & Bagozzi, 2017) Reputation management can also impact preference-gain. Shaw and Bagozzi cite research that concludes that “high social status, through wealth and social dominance, are associated with the brain’s reward circuit.” H. Plassmann et al. (2012) cite an additional study that showed when people imagined driving cars with favorable reputations and social statuses, the pleasure centers of their brain became active. This shows that brands with

high social status seem to be subconsciously rewarding to consumers. Along with this, the reputation of the brand can actually alter the consumption experience. Research conducted by McClure et al. (2004) looked into consumer experiences when knowingly or blindly drinking Coke v.s. Pepsi. “The study showed that the experienced value signals depended on brand associations,” (Plassmann et al. 2012) and when knowingly drinking Coke, they witnessed changes in the memory and association centers of the brain.

Goals

Gaining preference also involves clear messaging to the company's target audience. In other words, consumers use their goals to filter, through top-down analysis, which stimuli they choose to give attention to. This could mean that certain colors stand out to them as their eyes are more likely to gravitate towards the colors of the logo of their preferred brand. This could also mean that certain words or images could more easily attract their attention. For example, if they are looking to shop for new clothes, their eyes may gravitate towards brand names including “clothes” or “fashion,” or logos with clothing items included in the design. When advertising, it has been shown that the informativeness of the ad largely depends on the goals consumers pursue while viewing them. (qtd. in Plassmann et al. 2012) Without a doubt, it can be said that goals affect consumption behavior. However, goals do not necessarily have to be conscious thoughts to have such an impact. “Research on nonconscious goal pursuit suggests that goals can be activated by situational cues and can influence behavior outside of awareness until the desired outcome has been attained.” (qtd. in Chartrand et al. 2008) For example, if an action is pursued every time a consumer is in a specific location, that location will always spark the formation of

that subconscious goal and the consumer will unknowingly pursue it. Chartrand et al. (2008) cite one study that concludes that the viewing of brands can spark the formation of subconscious goals, as well.

Memory and Recall

In order for brands to be chosen among the abundance of competitors, they must be associated with a positive long-term memory. Salient stimuli, as discussed above, is more likely to be placed in long term memory. (Walvis, 2007) Along with this, stimuli that is applicable and relevant in the lives of consumers is preferable, as this, too, has a direct correlation with whether or not it will be stored in long-term memory. Walvis cites a 2007 study conducted by Kuhl et al. involving the remembering of word pairs. The results showed that “the brain chooses to remember elements it thinks are most relevant to certain tasks and suppresses less relevant cues.” In order for an experience to become a long-term memory, it must be applicable enough to “turn off” the suppressors involved in top-down attention that filter and allocate attention to salient stimuli. (Walvis, 2007) The primary choice cues that individuals use to filter stimuli based on their needs and desires include “product category, sub-category, functional and symbolic attributes, use occasion, self and user image and combinations of these.” Due to this reason, brands must ensure that their products are being successfully targeted at their desired audience, or consumers will not find their product relevant. Brands and messaging must also be *distinctly* applicable. Studies have shown that brands with identical features compete more intensely against each other in the brand-choice process and, in turn, reduce both brands’ saliency. (Walvis, 2007) Therefore, it is not enough to simply be applicable and relevant in the tasks and

goals of consumers, but companies must create brands and messaging that stand out amongst their competitors.

Additionally, brands can be recalled easily by creating repetition of a specific, associated message. Long-term potentiation states that the repeated firing of synaptic connections in the brain causes the connection to strengthen over time. (Walvis, 2007) Therefore, in order for a brand to appear in the memory of consumers, companies must repeatedly promote their brand and their message in order to be remembered at the time of decision-making. Slogans, mottos, and jingles are particularly successful at doing this. However, the repeated message must be specific in order to increase recall ability. Walvis (2007) states, “the more identical the stimulus (brand’s message or the choice cue) is to the stimulus stored in memory, the more likely the memory can be activated and retrieved.” Therefore, it’s important that a brand’s message is consistent throughout all marketing platforms over time, so the same synaptic connection in the brain is strengthened every time.

Furthermore, whether or not the product or brand is associated with “expert power” influences their ability to be recalled. The results of a 2008 study cited by H. Plassmann et al. (2012) showed that products presented simultaneously with an “expert person” were easier to recall after a few days. Therefore, it can be concluded that celebrity endorsements and the inclusion of public figures in product promotions can help the recall of a brand at the time of consumer decision-making.

Finally, brands actually have the power to alter previous memories stored in the minds of consumers. “A study by Braun-Latour and Zaltman (2006) demonstrated that advertising can unconsciously alter consumers’ beliefs as reflected by a change in how they recalled their earlier

reporting of these beliefs following exposure to advertising,” while another 2011 study showed that “exposure to an imagery-evoking ad led to a false memory of prior product exposure, further causing alterations in product attitude.” (Plassmann et al. 2012) So, even if a consumer may have the memory of a prior experience with a brand, the future exposures to the brand will impact both the past and present brand associations.

Section C: Special Cases

These neuroscience findings are generalized for the average human, but that does not guarantee that these suggested strategies will hold true for all consumers. Occasionally, special cases occur that impact the effectiveness of these strategies, such as social contexts and brain abnormalities.

Whether or not the consumer is making a brand decision in a social context can impact the results of the strategies. In a 2015 study quoted by Pozharliev et al. (2017) that focused on the effects of social settings on subconscious attention allocation, they discovered “enhanced brain activation in occipital areas when participants viewed pictures of branded products together to when they viewed them alone,” suggesting that the presence of another individual can increase attention given to brand promotional materials. Additionally, a social context can affect the emotional process in which a consumer interprets marketing materials before, during, and after exposure to them. (Pozharliev et al. 2017) As consumers read the reactions of others around them, it can impact their own reactions and feelings towards the advertisement or product. Many different types of social interactions can impact the brand-choice process, therefore it is

important that companies understand and take into account how they communicate their message to their desired audience.

Furthermore, abnormalities of the brain can also impact the brand-choice process and the effectiveness of the above strategies. Similar to a previously mentioned 2004 study where researchers looked into consumer experiences when knowingly or blindly drinking Coke v.s. Pepsi, Koenigs and Tranel (2008) investigated how brain lesions, specifically damage to the ventromedial prefrontal cortex, could impact the consumer's preference for Coke or Pepsi. The study discovered that "brand associations in the open tasting did not influence the lesion patients, only the control patients," (Plassmann et al. 2012) meaning that lesioned patients did not change their decision when they were told what drink brand they were experiencing. Therefore, companies must also account for the biological differences between the cognition of consumers.

Part IV: Conclusion

In conclusion, when investigating the role that consumer neuroscience plays in the brand choice process, it is now known that this process involves many different areas of the brain, such as the prefrontal cortex, striatum, and the dorsal and ventral visual pathways. These brain areas play key roles in the five phases of brand preference formation: identification, attention, predicted value, experienced value, and remembered value. This information can then be utilized by companies looking to gain brand preference and increase their chance of achieving it by assuring that their brand, messaging, and design choices are salient and attractive, relating to the goals of their desired audience, and easy to recall.

A great exemplar of the above is the well-renowned footwear industry dominator, Nike. To attract initial attention, their advertisements make great use of contrasting sizes and colors. The ad often involves the highlighted shoe displayed with bright, vivid colors surrounded by unsaturated colors, while the ad's message is often big and bold. Their website can also be seen to use these effects, as the background is completely white and their shoe previews seem to be one of the only points of color. Nike's advertisements also make great use of faces, often those of celebrities and influencers, to attract the eyes, which also utilize 'expert power' and increase their ability to be recalled. Their reputation remains fairly positive and they have gained an extremely high social status, which works together with their prices to activate the reward system in consumers. Their messages often target the motivational goals of their desired audience, with a great example being their most popular slogan "Just do it." This slogan also helps to increase the recall of the brand due to its specificity, relation to consumer goals, and repetition throughout campaigns. Nike's dominance is not attributable to luck. The use of strategy centered around consumer behavior and thought processes has allowed this company to facilitate connections with their desired audience and their market value to surge.

Marketing and branding research has long involved the use of traditional methods that strive to predict consumer behavior by relying on the subjects' abilities to accurately report their responsive emotions. However, these traditional methods pose large opportunities for error in data. The incorporation of consumer neuroscience has offered researchers more dependable results and marketers the ability to more accurately predict consumer behavior. Companies and their promotional teams must factor in, or at least understand, both the subconscious and conscious processes involved in the brand choice process.

However, these findings should not be relied on alone. While they are backed by hard science, many questions still remain unanswered and there has not been a sufficient amount of research conducted in order for companies to confidently base the entirety of their marketing framework on consumer neuroscience. I recommend that professionals look for ways to incorporate these findings within their traditional framework. As an opportunity for future research, individuals should investigate which aspects could best complement specific areas of traditional marketing methods.

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