(www.cmo.com/features/articles/2016/6/21/neuromarketing-gets-smarter.html#gs.kpnp8k)

NEUROMARKETING

Mapping Consumer Minds

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Table of Contents

Table of Figures

Introduction

What if marketers could precisely pinpoint what consumers want? What if one word or one image could make the difference between a product's success or failure? For decades advertisers and marketers have been searching for the most effective ways to tap into the minds of consumers (Fullerton 212). Consumer motivation research in the 1940s and 1950s grew into consumer behavior research in the 1960s (Fullerton 219). At the dawn of the new millennium, neuroscientific discoveries birthed a field of study that would bring unique insight into consumer behavior research methods - *neuromarketing* (Morin).

An Emerging Field

Neuromarketing is "the application of neuroscientific methods to analyze and understand human behaviour in relation to markets and marketing exchanges" (Lee et al. 200). In other words, neuromarketers analyze consumers' physiological responses to advertising through brain imaging and biometrics. The resulting data provides insights into consumer opinion far beyond what is attainable through traditional consumer research methods (Lee et al. 200).

With biometrics, "researchers can measure aspects of peripheral physiology such as heart rate, respiration, skin conductance (hand sweating), pupillometry (pupil dilation), eye tracking (recording exactly what a consumer is looking at by tracking their eyes), and more" to measure consumer responses, particularly arousal (Stanton et al 800). However, biometrics only paints part of the consumer picture. To gain a better understanding of a consumer's engagement with and feelings toward an ad, researchers went straight to the source of consumer behavior – the brain (Morin 134).

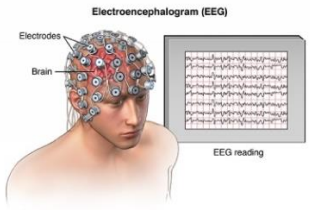

Fig. 1: EEG (myscienceschool.org/index.php?/archives/3208-What-is-Electroencephalography-EEG.html)

Electroencephalography (EEG) measures electrical activity in the brain through electrodes placed on the scalp (see fig. 1). Although inexpensive and often used in neuromarketing research, EEG cannot isolate activity in the subcortical areas of the brain, where much of consumer attitude and choice originate (Babiloni 699; Morin 133).

Fig. 2: MEG (https://www.ohba.ox.ac.uk/facilities/magnetoencephalography-meg)

MEG, magnetoencephalography (see fig. 2), like EEG, provides "excellent temporal resolution, but more importantly, a better spatial resolution than EEG." The MEG is best suited for measuring "activity in areas known or expected to produce activity given

specific tasks." However, like the EEG, it cannot pinpoint activity that involves "both higher cognitive functions (cortical) and emotional (subcortical)" (Morin 134).

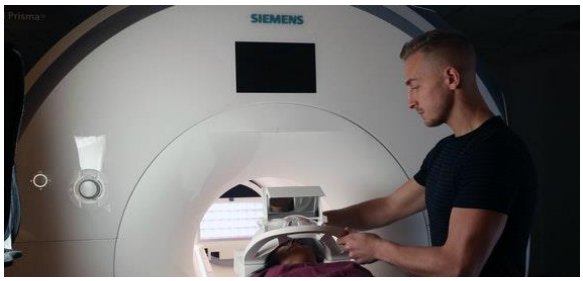

Fig. 3: fMRI (www.cardiff.ac.uk/cardiff-university-brain-research-imaging-centre/research/themes/functional-magnetic-resonance-imaging)

Many researchers favor the functional magnetic resonance imaging or fMRI (see fig. 3), which uses an MRI scanner to detect the change of the Blood Oxygen Level Dependent (BOLD) signal in the brain (Babiloni 699; Morin 131; Stipp 121). As the fMRI can isolate both the cortical and subcortical areas, it can accomplish what the EEG and MEG cannot – access to both the thinking and feeling areas of a consumer's brain in response to advertising. Although the fMRI has a distinct advantage over both MEG and EEG, it is not as proficient in temporal resolution for quick-moving visuals, such as television commercials. Morin suggests that in those conditions, researchers may seek to combine MEG and fMRI to optimize research data (Morin 134).

According to researcher Fabio Babiloni, 70 percent of all new products fail because of the "mismatch between the verbal report of consumers and their true internal feelings about the product" (698). However, neuromarketers strive to bring objective, reliable neuroscience data to the marketing mix. Martin Lindstrom, founder of Buyology, Inc (a neurological marketing company), found that a "region known as Brodmann Area 10, for example, is active when we think something is cool or hip; the right mesial prefrontal cortex is tied to the tendency to collect things; the *nucleus accumbens*, known as "the craving spot," plays a role in addiction and reward; and the *amygdale* handles responses to fear" (Tsai 19). This data could prove instrumental to a product's success in the market.

Research in Action

Serious neuromarketing research started in 2003 with Read Montague's study of Coca-Cola and Pepsi using fMRI (Morin 132). The study produced two significant discoveries. First, in blind taste tests, "activity in the ventral striatum (i.e., the reward-stimuli processing center) indicated affinity was evenly split between the two brands" (Tsai 20). However, when consumers knew the brand ahead of time, "75 percent said they preferred Coke" (Tsai 20) The fMRI showed considerable action in the "medial prefrontal cortex – associated with memory and higher thought processes" (Tsai 20). This data suggests a link between consumer's responses with brand associations and that, as Morin argues, "a strong brand such as Coca Cola

has the power to "own" a piece of our frontal cortex" (Morin 132) These results reinforce the importance of establishing positive brand associations and relationships with consumers.

In another study, a stereo-equipment manufacturer found that its customers hated the remote controls but could not articulate why. Neuroscientific research provided answers. According to Lindstrom, the study measured brain activity in the area associated with touch – the remote was too lightweight. Participants equated this with inferior quality. As a direct result of this research, the remote was made heavier, and customer opinion improved (Tsai 20).

Practical Applications

Billions are spent on advertising campaigns every year (Statista). An exponential amount of time and money is dedicated to product development, positioning, and advertising creative (Stanton et al. 802). Academic research in the field of neuromarketing can help companies and agencies make the best use of those dollars. For example, a study found that "the medial orbitofrontal cortex, an area associated with coding value, was more active when products were paired with celebrities" (Stanton et al. 802). This data, in conjunction with traditional behavior models, can aid marketers not only in ad creative but potentially in choosing a spokesperson.

Neuromarketing research applications stretch beyond just advertisements. A study by Fox et al. explores negative online consumer reviews and how neuromarketing methods can trace arousal, emotion, or even predict the spread of negative responses (2018). In a related study, Hsu and Cheng (2018) used fMRI to study word-of-mouth (WOM) during a product crisis. Both research endeavors could prove integral for companies and agencies alike in developing pre- or post-crisis strategies and managing WOM communications.

Neuromarketing research is often conducted after launching a campaign. However, advocates such as Babiloni (699) suggest that neuromarketing research should also be considered during product development. (See fig. 4). Understanding consumer interest and pinpointing product desire before the product is produced could enhance perceptions, increase sales, and generate positive associations.

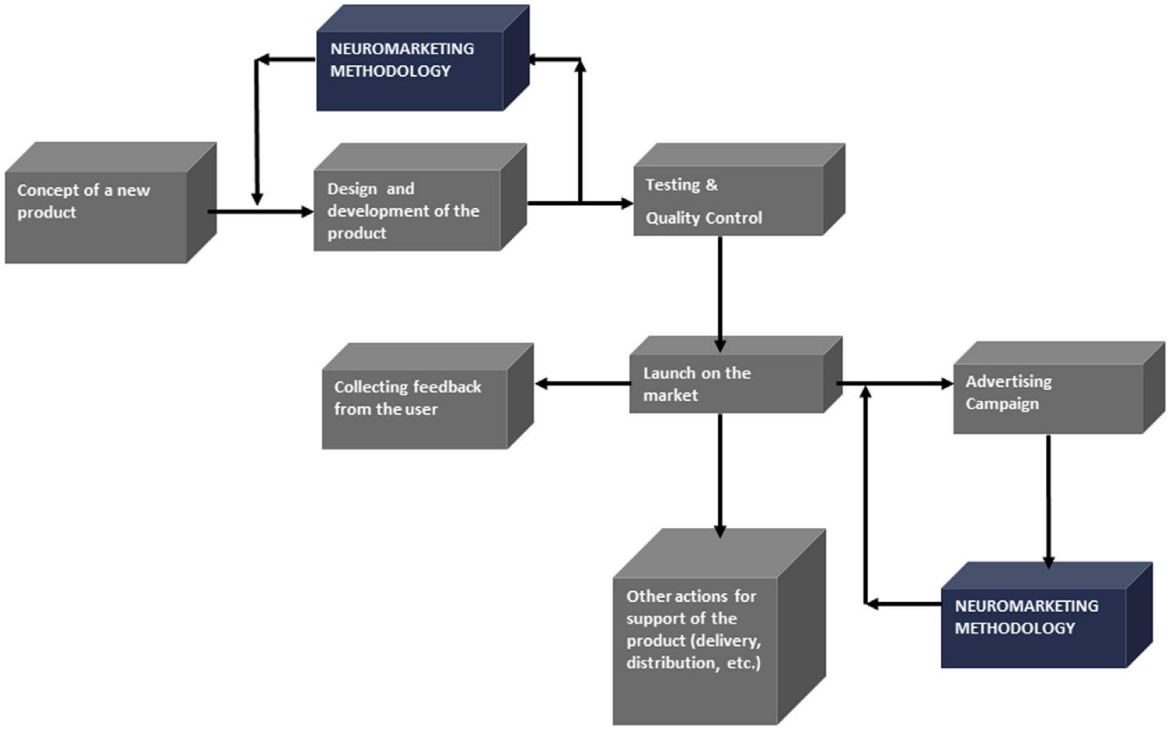

Fig. 4: Babiloni Product Development Cycle (700)

Although neuromarketers stress that continued research improves advertising effectiveness and segmentation strategies, there is no single path to understanding consumer behavior. Whether it be through traditional research or cutting-edge neuroscience technology, no individual approach can provide a complete picture of consumer intent (Ford). After evaluating neuromarketing techniques in two studies – Neuro 1 and Neuro 2 – the Advertising Research Foundation (ARF) concurs, suggesting that "adding neuroscience-based methods to a traditional test of commercial creative can identify advertising creative that leads to more sales" (Stipp 121).

Ethical Considerations

From the beginning, neuromarketing research has faced criticism and incited ethical debates. Montague's Coca-Cola/Pepsi study spurred almost immediate condemnation from the *Nature Neuroscience* journal and Commercial Alert (a consumer advocacy group) (Morin 132). Commercial Alert questioned the morality of neuromarketing studies, claiming that searching for a "buy button" in the human brain went against Belmont Report's guidelines regarding human testing (Stanton et al. 799). Many of the arguments against neuromarketing research (e.g., consumer choice manipulation or subliminal influence) are not

that different than for marketing and advertising in general (Stanton et al. 802). However, neuromarketing opponents do raise critical questions.

As researchers dip into the human brain, critics argue it falls dangerously close to private health information (Stanton et al. 805, 807). Participants may be unaware of how their information will be used by or sold to other companies. As neuromarketing companies are not regulated by an Institutional Review Board (IRB), the lack of peer review and oversight over methodology and ethical conduct could put consumer data at risk. Furthermore, industry clients may lack the scientific knowledge needed to evaluate the data they receive from neuromarketers. Neuromarketing agencies, then, could either overstate or understate methods and data to obtain clients (Stanton et al. 805, 807).

Further privacy concerns stem around the use of neuromarketing technology for business or retail use (Stanton et al. 808). Take, for example, if a salesperson installs eye-tracking technology in a store to monitor consumer interest, the salesperson could track a customer's eyes to a particular product and negotiate a higher sale price. Such action puts consumers at a serious disadvantage. Without knowledge of the installed technology nor the ability to fully control physiological reactions, consumers lack leverage to negotiate and could potentially pay higher costs than they would without such technology (Stanton et al. 808).

Babiloni advocates that "neuroimaging studies could return information also useful for tailoring successive advertising campaigns related to the particular product launched" (699). The effectiveness of that marketing insight is precisely what Lindell and Kidd fear (2013). In their study published in the *Mind, Brain, and Education* journal, 180 participants viewed full-color advertisements for two training programs. One was called "Right Brain" training and the other "Right Start" training. The advertisements were identical, except "Right Brain" had an MRI brain image in the ad and, "Right Start" did not.

Fig. 5: Brain-based Marketing (Morin 131)

Between all the respondents (evenly dispersed between parents, nonparents, and psychology students), the majority of all groups deemed ''Right Brain'' training "more interesting, educationally valuable, and scientifically strong" (Lindell and Kidd 38). As was indicated in additional studies, they conclude that using the "brain" in words and images infers sound scientific backing when there may be none. "Lay consumers," they argue, "are ill-equipped to evaluate the scientific claims made by ''brain-based'' products...this renders consumers acutely vulnerable to neuromarketing campaigns" (Lindell and Kidd 38).

On the other hand, proponents spotlight the benefits neuromarketing research can have for consumers. Although pinpointing consumer interest and desire can lead to higher costs, it also has the potential to produce higher-quality products or products more applicable to their needs or wants (Stanton et al. 809). Advocates also suggest neuromarketing research can aid in marketing and advertising for cause-related campaigns, public safety campaigns, and campaigns aimed at addictions from tobacco, drug, or compulsive shopping (Stanton et al. 809).

Conclusion

Companies, advertisers, marketers, and agencies must all continually adapt to changes in consumer behavior and evolving media and technology. To stay competitive and flourish through ever-changing markets, neuromarketing research offers vast potential for understanding the heart of their businesses – consumers. In conjunction with traditional consumer behavior research methods, neuromarketing can aid in developing better products and stronger creative, which can benefit companies and consumers alike. As the field of neuromarketing continues to advance, ethical debates will continue. Joint oversight efforts between academics, industry, and consumer groups might be crucial in the coming years. “Neuromarketing is here to stay,” says Christophe Morin, “And it will evolve, like humans – and brands – do” (135).

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