Neuro Marketing : An Overview

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The word "neuromarketing" was coined by Ale Smidts in 2002. Companies such as Google, CBS, and Frito-Lay amongst others have used neuromarketing research services to measure consumer thoughts on their advertisements or products. The neuromarketing concept was developed by psychologists at Harvard University in 1990. The technology is based on a model whereby the major thinking part of human activity (over 90%), including emotion, takes place in the subconscious area that is below the levels of controlled awareness. For this reason, the perception technologists of the market are very tempted to learn the techniques of effective manipulation of the subconscious brain activity. The main reason is to inspire the desired reaction in person’s perception as deeply as possible. Neuromarketing is the process of researching the brain patterns of consumers to reveal their responses to particular advertisements and products before developing new advertising campaigns and branding techniques. The present paper is library research to comprehend concept of Neuromarketing from the marketers point of view and also this paper is an attempt to widen the scope of neuromarketing beyond commercial brand and consumer behaviour applications, to include a wider conceptualisation of marketing science. Drawing from general neuroscience and neuroeconomics, neuromarketing as a field of study is defined, and some future research directions are suggested.

INTRODUCTION

Does this situation sound familiar? You're shopping for something online and you've found it on several online merchants' sites. The cheapest two options are from companies you've never heard of Amazon.com is selling your desired good for a few bucks more. Something tells you to bite the bullet, pay the premium and order from Amazon.com. Chances are, that "something" is a subconscious area of our brain making decisions without your conscious knowledge. It's also a cornerstone of Neuromarketing.

According to Renvoise and Patrick (2007) neuromarketing is an emerging science that measures the physical effects of marketing on different parts of the brain. Each section of the brain is used for something different - motor skills, rational thought, feelings - everything has its own purpose. Neuroscientists use high tech equipment to understand the relationships between exposing consumers to marketing stimuli and the resulting changes in blood flow and chemicals to the different parts of the brain. Clearly understanding these effects are in the best interest of any company hoping to be effective with neuromarketing.

Neuromarketing isn’t about implanting ideas in people’s brains, or forcing them to buy what they don’t want to buy; it’s about uncovering what’s already inside our heads our Buyology.
Lindstrom, Martin (2008-10-14).

Neuromarketing, in a simplified way, studies how a person's brain responds to advertising messages. It is the study of the brain’s responses to advertising, the brands encountered in our daily lives, and all the associated messages and images that are strewn throughout the cultural landscape of everyday life.

From the Marketing Tools Woodpress blog

Neuromarketing is the process of researching the brain patterns of consumers to reveal their responses to particular advertisements and products before developing new advertising campaigns and branding techniques.

From the Collins English Dictionary
Neuromarketing Basics for Marketing Strategy

- The purpose of marketing is to influence decisions that result in a sale.
- Decision-making is overwhelmingly influenced by the old brain.
- Therefore, marketers can improve their success by aligning their strategies with the decision-making function of the old brain.

Neuromarketing And Our Three Brains

A human being possess three brains, each with a different specialized function:

1. New Brain: this brain thinks and processes rational data.
2. Middle Brain: this brain feels and processes emotions and gut feelings.
3. Old Brain: this brain decides.

The old brain takes into account the input from the other two brains, but is the actual trigger of decisions. "Researchers have demonstrated that human beings make decisions in an emotional manner and then justify them rationally. Furthermore, the final decision is actually triggered by the old brain, a brain that doesn't even understand words."

According to Renvoise and Patrick, there are 6 and only 6 stimuli that speak to the old brain. "Incorporating these 6 stimuli will give you fast access to the old brain and will immediately improve your ability to sell, market, and communicate."

The 6 stimuli that unlock the decision-making process:

1. **Self-centeredness**: the old brain is "the center of ME and has no patience with or empathy for anything that does not immediately concern its own well-being and survival." Therefore, focus entirely on your target (and not on yourself) and liberally use the "you and your" words.
2. **Contrast**: the old brain seeks clear contrast in order to make instant decisions and avoid confusion that results in delayed decisions. "...the old brain is wired to pay attention to disruptions or changes" such as before/after, risky/safe, with/without, and fast/slow. Therefore, to get the old brain's attention, create contrast and avoid things like neutral statements that dull contrast.
3. **Tangible Input**: the old brain prefers and scans for tangible input to avoid the extra time and energy involved in thinking. For example, easily grasped words like "more money" are to be preferred to "Maximizing ROI."
4. **The Beginning and the End**: the old brain tries to conserve energy (from thinking) by eliminating unnecessary content. "If the old brain can easily anchor a situation with a strong beginning point and a strong end point, it will not seek to use energy to retain content in the middle because it may not be necessary or vital to what the situation requires." The implication to presentations and all forms of communication is obvious and substantial: place the most important content in the beginning (focused on the "you"), repeat it at the end, and repeat it as often as necessary during the course of the communication to regain interest.
5. **Visual Stimuli**: the old brain prefers visual stimuli which are processed faster than words and concepts.
6. **Emotion**: Finally, "the old brain is only triggered by emotion." This means that "we remember events better when we have experienced them with strong emotions." Marketers who
HISTORY

Neuro-marketing perception are linked to the idea of mind control, and the roots of this are placed very far back in our history. Mind control is where an individual or group of individuals can be controlled without their awareness. It is perception below the individual's/group's threshold. It is also the idea that people can be made to do things they would not ordinarily do. (Cane)

There are two basic ways in which neuro-marketing subliminal messages can be sent to the unconscious visual and auditory. Since at least the 5th century B.C., the early Greeks created the science of rhetoric as a way of influencing people. By infusing pieces of mind-persuading data into sentences people can be manipulated by the language they use. If they see or hear certain bits of information (i.e. words, fragments, or sentences) placed strategically, a person can be persuaded one way or another (without perhaps knowing). Based on experimental findings in social psychology and the way in which we process information, the effectiveness of neuro-marketing perception has been continually examined throughout history. Subliminal messaging and mind control persists to be under scrutiny, as to whether it is capable of doing what it intends to do on the targeted person.

There is reason to believe that neuro-marketing is effective based on findings in historical contexts. An example of auditory subliminal messaging dates back to the 1920s when the BBC began broadcasting on radio for the first time. The people of the era thought the radio was so sinister, they considered it to be the voice of the devil. The BBC wanted to change this attitude, so they placed certain phrases using backward masking in their jingles. This may be an example of neuro-subliminal messaging used to persuade an entire nation to responding other than how they necessarily wanted to. A radio jingle was aired, which sounded completely innocent, but when played backwards it reveals a different (true) purpose. The words "This is not a noose, no really its not." Can clearly be heard. The BBC believed the subconscious could pick up backward messages in ordinary speech. (Cane) The BBC is obviously still around today, so did this jingle serve its deeper purpose?

Public concern about neuro-marketing manipulation can be seen in 1957 when a marketing researcher looked into statistical data. James Vicary claimed to find dramatic increases in the sales of
Coca-Cola and popcorn when he flashed the phrases "Drink Coca-Cola" and "Eat popcorn" for 1/2000 of a second during a movie. The statistics showed an increase in popcorn sales by 58%, with an increase in Coca-Cola sales by 18%. (Cane) This is perhaps the shocking information that led to an enormous response from the public. Individuals as well as legislators imagined possible effects of subliminal perception on the future-a world where everyone was subliminally manipulated to do what perhaps the government wanted them to do. (Elliston) In reality though, research on neuro-marketing effects has shown little overall effects in controlled conditions. There is no evidence based in real-world settings done by top researchers on influencing behavior. Also, in 1962, Vicary stated that the study was a fabrication and the evidence now suggests it was. He never released a detailed description of his study and there was never any independent evidence to support what he claimed.

Murphy and Zajonc (1993) have demonstrated that subliminal priming can be used to influence peoples’ affective reactions to an unfamiliar object. In a series of experiments, Murphy and Zajonc found that participants liked Chinese ideographs that were preceded by a subliminally presented smiling face better than the same ideographs preceded by a subliminally presented scowling face. Using a similar paradigm, Krosnick, Betz, Jussim, and Lynn (1992) have even shown that the subliminal presentation of positive and negative images can classically condition peoples’ impressions of others.

Previous research has also demonstrated that subliminal priming can even affect behavior (Dijksterhuis & Bargh, 2001). For example, Bargh, Chen, and Burrows (1996) found that participants who were subliminally primed with an African-American face responded with more hostility to a bothersome request made by the experimenter than participants subliminally primed with a Caucasian face. Through out history, it has been looked to political and governmental institutions to examine whether mind control and subliminal perception has been used amongst the general public. The CIA, for example, is one branch of government thought to use this technique in order to gain its authority over large bodies of people. If it is actually effective is up to public opinion of belief and personal reported experience.

The U.S. Federal Communications Commission (FCC) received complaints of a television station using subliminal messages in 1974. This was the first new case since the original in the 1950's. The FCC responded by issuing a public notice, which stated their official position- "We believe that the use of neuro-marketing perception is inconsistent with the obligations of a [broadcast] licensee, and therefore we take this occasion to make clear that broadcasts employing such techniques are contrary to the public interest. Whether effective or not, such broadcasts clearly are intended to be deceptive." The United States government has supposedly tried to take steps to protect individuals from unwanted influences relayed by subliminal messages. It has produced regulations to prohibit neuro-marketing to advertise consumer products. Such products include malt beverages and distilled spirits. (anonymous)

In the 1970s, controlled studies were conducted by the British psychologist Anthony Marcel. The experiments were based on previous findings indicating that a decision regarding a stimulus is "primed" when the stimulus follows a related stimulus. An experiment using an observer asked to classify a letter string as either a word (juice, lawyer) or a non-word (eciuj, reywal) was used. A letter string such as the word lawyer will be classified as a word faster when it follows a semantically related word (judge) than when it follows a non-related word (juice). Marcel found words that primed subsequent conditions made it difficult, if not impossible for the observers to distinguish when the words were present from when the words were absent. There have been many other experiments and studies done since Marcel's time to confirm his findings, but they have used other stimuli as well (such as pictures, faces, and spoken words). These other stimuli do prime or facilitate the following decisions when they are presented in an atmosphere that makes it hard to distinguish one stimulus from another stimulus. The belief is that the substantial information is perceived even when observers have little or no awareness of perceiving as shown by their difficulty in discriminating one stimulus from another stimulus. (anonymous)
In recent years, the term neuro-marketing subliminal perception has been made more general to describe any situation in which unnoticed stimuli are perceived. Neuro-marketing can be seen in advertisements if one look hard enough. Does this mean we are really influenced by subliminal messages? Do we buy certain cars because the rhetoric used enhances our desire to? Do we buy products because the ad in a magazine persuades us underneath our threshold of perception? Do we drink certain brands of soda because of product placement in movies that we perhaps do not notice? Do we recycle because the cast members in primetime television do, but we do not consciously see this while tuning in?

Despite this dubious beginning, does subliminal persuasion actually work? Many people seem to think so. Millions of people buy subliminal self-help tapes to help them lose weight, improve their self-esteem, or increase their assertiveness (Natale, 1988). Yet empirical studies suggest that these tapes are not effective. Greenwald, Spangenberg, Pratkanis, and Eskenazi (1991) tested the effectiveness of commercially available subliminal self-help tapes that claimed to increase either self-esteem or memory. After a month of use they found that neither of the tapes produced their claimed effects. More generally, Pratkanis and Aronson (1992) examined over 150 articles from the mass media and over 200 academic papers on subliminal processes. They found no clear evidence that subliminal messages influence attitudes or behavior.

Over the years, neuroscience propagated into several branches and one of them was cognitive neuroscience which basically looks into the capabilities of human being, such as attention, awareness, cognitive control, cognitive genetics, decision making, emotion, language, memory, motivation, action, perception, sexual behavior and social neuroscience. Some cognitive scientists published several keynote papers attempting to apply the neuroscientific research techniques such as fMRI to understand the neural correlates of buying instincts and buying decisions of the people, so as to help the companies spend lesser amount of time and money on promoting their brands and products (Babu and Vidyasagar, 2012).

Use of these techniques changed the way of traditional marketing research. Appendix 1 shows an advancement of neuromarketing over the traditional methods of marketing research—studying focused groups, research through questionnaires, simulated choice methods and marketing tests. Commenting on neuromarketing Marc Narine of BitFin said, “This system arose out of a quest to better understand the factors behind consumer thinking and behavior. The system combines multi-neuroscientific disciplines along with good old traditional marketing in a bid to better communicate a company’s message to its customer, in a form that reduces ‘chaos’ in the consumer’s mind, resulting in improved marketing performance.”

<table>
<thead>
<tr>
<th>Author</th>
<th>Field</th>
<th>Question</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erk et al. (2002)</td>
<td>Decisions between different products (automobile), fMRI</td>
<td>Is it possible to find neural correlates to evaluate the attractiveness of a product?</td>
<td>Products which symbolize wealth and status lead to a higher activity in areas which are responsible for rewards.</td>
</tr>
<tr>
<td>Deppe et al. (2005a)</td>
<td>Choice between different brands, fMRI</td>
<td>Which neural correlates forms the basis of brand choice?</td>
<td>In a decision-making process, favorite brands reduce analytic processing and lead to increasing attractiveness in fields associated with rewards.</td>
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<tr>
<td>Deppe et al. (2005b)</td>
<td>Influence of brands on credibility judgments, fMRI</td>
<td>Which neural correlates forms the basis of brand information as a frame in decision processes connected?</td>
<td>In situations of doubtful credibility, brand information has an important influence on the decision-making process which results in higher attractiveness in fields which include rewards in decision making.</td>
</tr>
<tr>
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<tr>
<td>McClure et al. (2004)</td>
<td>Choice between different brand products and their flavor perception, fMRI</td>
<td>How does brand information influence the flavor perception of sensorily similar products?</td>
<td>Depending on the brand information given to the test person, different areas are activated by the consumption of a soft drink. If the consumer believes the drink to be his favorite brand, areas of rewards are activated.</td>
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<tr>
<td>Klu-Charev et al. (2005)</td>
<td>Advertising effect of celebrities, fMRI</td>
<td>How does the so-called 'Expertise Hook' influence recollection?</td>
<td>The presumed expertise of celebrities leads to an increased activation in memory structure and a significant positive influence on purchase intention.</td>
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<tr>
<td>Plassmann et al. (2006a)</td>
<td>Choice between different service brands, fMRI</td>
<td>How do information asymmetries influence the neural 'favorite brand-effect'?</td>
<td>The favorite brand-effect of an anterior study (Deppe et al., 2005a) could be replicated for decisions under uncertainty. In particular, with uncertain decisions, the favorite brand leads to activation of areas responsible for the integration of rewards into decision making.</td>
</tr>
<tr>
<td>Plassmann et al. (2006b)</td>
<td>Choice between different store brands by loyal and disloyal customers, fMRI</td>
<td>What is the neural mechanism behind brand loyalty?</td>
<td>Loyal retail store customers show significant neural activations in brain areas involved in rewards processing when their preferred store brand is for choice as compared to disloyal customers.</td>
</tr>
<tr>
<td>Schaefer et al. (2006)</td>
<td>Choice between different car brands, fMRI</td>
<td>The aim of this study was to examine the neural correlates of culturally-based brands.</td>
<td>Results showed activation of single region in the medial prefrontal cortex related to the logos of the culturally familiar brands. The authors interpreted the results as self-relevant processing induced by the imagined use of cars with familiar brands and suggest that the prefrontal cortex plays a crucial role for processing culturally-based brands.</td>
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</table>
With the technological developments in neuroscientific equipment such as specialized Magnetic Resonance Imaging (MRI) scans in the backdrop, various fMRI facilitated-neuroscience research organizations such as NeuroFocus, BrightHouse Institute for Thought Sciences (BrightHouse), etc., were established—however, not for medical purpose, but to serve the corporate clients.

**Neuromarketing Initiative by Campbell**

Through review of literature it was found that as the sales of Campbell soup started declining since 2008, Campbell resorted to its decade old decision of changing the face of its label (earlier, Campbell changed its label in 1999 to overcome the decreasing sales). However, the company wanted to use the cutting edge technology to design its label. Finally, Campbell decided to use neuromarketing technique to expose the factors that prompt consumers to decide on buying a soup, so that the decision on a new label design could be made. For this purpose, Campbell hired the services of three neuromarketing firms, i.e.,Innerscope Research Inc., Merchant Mechanics and Olson Zaltman Associates. Their aim was to use biometric data derived from brain imaging to study neurological and physiological responses to know consumers’ preferences and the impact of advertisements on their buying decisions. Therefore, to measure microscopic physiological changes in consumers (when they faced store shelves), the researchers used the parameters such as skin moisture, heart rate, breathing rate, posture and other biometrics.

In this regard, Campbell’s vice president of global consumer and customer insights, Robert Woodard, says, “The traditional interview had limited usefulness because people's words did not fully capture their unconscious responses ... Campbell needed approaches that would help it understand the neurological and bodily responses to an ad rather than how people thought they had reacted...” (David, 2010).

Innerscope Research interviewed 40 customers at two different places on behalf of Campbell, i.e., at their homes and later at grocery stores. During these interviews, the customers opined that the can’s label portraying soup did not look warm and the big spoon holding a sample of soup could not provoke any emotional response from them. Thus, Campbell spent two years studying the small changes that take place in human body in response to pictures of bowls of soup to logo design. These results formed the basis for guiding the company to redesign its labels. Combining the biometric data with deep surveys about Campbell’s Soup as a brand and the consumers’ experience of eating soup, it was found that the customers were more emotionally engaged with the soup. However, to connect deeply with the emotional quotient of the consumers, Campbell, after thorough neuromarketing research, had decided to roll out a new label and packaging.

The chief characters of the new design had certain changes. Instead of a large logo, Campbell decided to use a smaller one and placed it at the bottom of container-label to attract more consumers. In order
to help customers in distinguishing and selecting their choice of soup. It decided to use different color-
shaded packaging for different lines of soups. To attract more consumers by touching their emotional psyche. It portrayed the image of ‘steamy’ soup on the label to appear warm and removed the image of big spoon holding a sample of soup. The bowl was also given a 3D look and curvatures were used in demarcating three sections on the label—Classic Favorites, product line of soup, and the logo. Through these changes, the condensed soup brand launched packing with the new label in February 2010 and expected to see an increase in sales by 2% over the next two years from 2010 onwards. However, the experts question the working of neuromarketing techniques in the real market conditions. At the same time, some of the consumer rights NGOs question the ethical nature of such marketing techniques (Babu and Vidyasagar, 2012).

Carl Marci, Innerscope founder, says his tools cannot pinpoint what emotions a person feels.

But if all the biological metrics move simultaneously in the same direction, the subject is likely to be emotionally engaging with something (Roger, 2010).” Read Montague, Director of the Human Neuroimaging Lab at Baylor College of Medicine, opines, “Brain imaging is not more accurate than other techniques. You will never get rid of psychology and behavioral studies—that is your ultimate end (Edwin, 2004).

Neuromarketing Turns to India Middle Class

For consumer goods companies, the technique is an alternative to verbal feedback from would-be consumers, which is not always reliable. The idea is to scan people’s reactions, then design products, packaging and advertising to stimulate particular parts of the brain. And the leading practitioners sees India’s bulging middle class as a prime target. Though neuromarketing’s critics dismiss it as a fad, yet neurofocus, the global market leader in neurological testing, has seen 100 percent year-on-year growth over the last three years. It employs leading neuroscientists, works with major food, car, electronics and cosmetics companies, and has offices in London, Tokyo, Tel Aviv, Seoul, Bagota, New York and Dallas. The idea of selling products through multiple celebrity endorsements is misplaced, and he says there is huge opportunities for neuromarketing in India. It is a culture that is highly emotional and companies need to be able to talk to people in a language that they truly understand. If one looks at the India’s ancient scriptures and philosophies one can see that it is a culture obsessed with the brain (Anantha, 2011).

For thousands of years the country has looked into the human condition, how people should live their lives, how they should think and react in any given situation. How does the mind and body connect? If I don’t do this here, where will I do it? Companies might not share such mysticism, but they know understanding India’s middle class is crucial. In a report from earlier this year, analysts at Deutsche Bank said: India’s middle class consumption is roughly equivalent to Ireland’s total private consumption and is forecast to triple as a share of India’s total consumption over the next 15 years.

For corporations, the middle class in India thus presents significant business opportunities. The sales growth of consumer goods such as televisions and mobile phones to the middle class has already been established, but a new range of products such as financial services is increasingly being geared towards this group as well. Meanwhile, penny-pinching customers might soon have to control their subconscious, if they’re to avoid overspending on saris, spices and the rest.

With the increasing application of new technology, a number of companies also approached the research organizations of various universities to conduct neuromarketing studies to improve their respective sales. Emory University’s neuromarketing research center, BrightHouse Institute for Thought Sciences (BrightHouse) was one of the earliest neuroscience research organizations that
scanned the brains of consumers to aid corporate clients. BrightHouse alone had a vast number of top corporate clients such as Coca-Cola, Home Depot and Procter & Gamble.

Thus, the neural activity (associated with memory, emotions and emotional information processing in the brain) recorded under fMRI exposed that neuromarketing could overcome consumers’ self-reporting bias and could remove their inability to articulate differences between conscious and unconscious thoughts. Thus, Montague brought out a notion that the brand and its image could more affect the customers’ choices than the product. This insight encouraged various neuromarketing research organizations to use neuroimaging to identify decision-making triggers among shoppers to help companies directly click buying-buttons in the customers’ brains to increase their sales.

Conclusion

Neuromarketing promises delivering complete information about the working of consumer mind—beyond what the consumer expresses. Its genius lies in extracting those unexpressed needs which are personal and hidden. By revealing these hidden thoughts running behind the mind, neuromarketing poses a threat to consumer privacy.

The above discussion, however, does not suggest that supraliminal and subliminal primes will always produce the same effects. If a supraliminal prime allows people to understand its influence and allows them to control this influence, whereas a subliminal prime does neither, then supraliminal and subliminal primes should lead to different results. For example, if people perceive a supraliminal prime to be part of a persuasive maneuver and have the ability to resist this persuasion, then supraliminal primes might create reactance and eliminate the effect of the persuasive appeal, whereas subliminal primes might still enhance the effect of the persuasive appeal.
Through the review of literature it was found that if marketers can read consumers’ mind accurately
and completely, there are possibilities that business can use this information to discriminate service to
consumers based on their profitability. They can use this information to influence their buying
behavior too. But certain others feel that the results found using a small sample cannot be used to
generalize to a large population as it is the cost-intensive exercise, some experts say that the
neuromarketing study to be done using fMRI costs around $3,000 per subject to scan an individual
brain and then interpret the results neuro-scientifically. The more the number of subjects, the more
precise the results are, but the costlier also it will become. So, they feel neuromarketing has not
reached the point where marketers can act against the best interest of the consumers.

**Future Scope**

Recent years have seen advances in neuroimaging to such an extent that neuroscientists are able to
directly study the frequency, location, and timing of neuronal activity to an unprecedented degree.
However, marketing science has remained largely unaware of such advances and their huge potential.
In fact, the application of neuroimaging to market research—what has come to be called "neuromarketing"—has caused considerable controversy within neuroscience circles in recent
times. Though some consultants such as Martin Lindstorm had a positive perception of
neuromarketing. He states, “But I do not believe neuromarketing is the insidious instrument of corrupt
governments or crooked advertisers. I believe it is simply a tool, like a hammer. Yes—in the wrong
hands a hammer can be used to bludgeon someone over the head, but that is not its purpose, and it does
not mean that hammers should be banned, or seized, or embargoed. The same is true for
neuromarketing.” Martin Lindstorm further adds, “It is simply an instrument used to help us decode
what we as consumers are already thinking about when we are confronted with a product or a brand—and
and sometimes even to help us uncover the underhanded methods marketers use to seduce and betray
us without our even knowing it. It is not my intention to help companies use brain-scanning to control
consumers’ minds, or to turn us into robots. Sometime, in the distant future, there may be people who
use this tool in the wrong way. But my hope is the huge majority wield this same instrument for good:
to better understand ourselves—our wants, our drives, and our motivations—and use that knowledge
for benevolent and practical purposes.

Also, a study conducted in 1983 backs Campbell’s purpose, as the study reveals that labels are more
important than tastes (Woolfolk et al., 1983). Even Kuchler (2010) says that the problems in traditional
focus groups are that “the respondents can be swayed by those sitting next to them or by the presence
of researchers. Alternatively, they may be unable to articulate their responses accurately. As a result, a
rising number of marketers now prefer to analyze the response of people’s brainwaves to brands and
advertisements by using the latest developments in neuroscience”.

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### Appendix 1

#### Comparison of Selected Marketing Research Approaches

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<th>Focus Groups</th>
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<th>Simulated Choice Methods</th>
<th>Market Tests</th>
<th>Neuromarketing</th>
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<tbody>
<tr>
<td><strong>What is measured</strong></td>
<td>Importance weighting for various product attributes</td>
<td>Choices among products</td>
<td>Decision to buy and choice among products</td>
<td>The brain activity to a particular sensory stimuli visual, audio or tactile, etc.</td>
</tr>
<tr>
<td><strong>Type of response process</strong></td>
<td>Speculative, except when used to assess prototypes</td>
<td>A hypothetical choice, so the same process as the actual purchase—but without monetary consequences</td>
<td>An actual choice, with customers’ own money, and therefore fully consequential</td>
<td>Neural responses to representations of the product that may lead to future consumption</td>
</tr>
<tr>
<td><strong>Typical use in new-product development processes</strong></td>
<td>Design phase, when determining customer trade-offs is important</td>
<td>Design phase, when determining customer trade-offs is important; may also be used as a forecasting tool</td>
<td>End of process, to forecast sales and measure the response to other elements of marketing, such as price</td>
<td>Can be used in refining the product attributes before releasing them for the market</td>
</tr>
<tr>
<td><strong>Cost and competitive risk</strong></td>
<td>Low cost; risk comes only from misuse of data by the seller</td>
<td>Moderate cost and some risk of alerting competitors</td>
<td>High cost and high risk of alerting competitors, plus the risk of the product being reverse engineered before launch</td>
<td>In a university research setting scanning costs average about $500 per hour. In a</td>
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Appendix 1 (Cont.)

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<thead>
<tr>
<th>Focus Groups</th>
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<tbody>
<tr>
<td>Technical skill required</td>
<td>Moderation skills for inside the group and ethnographic skills for observers and analysts</td>
<td>Questionnaire design and statistical analysis</td>
<td>Experiment design and statistical analysis (including choice modelling)</td>
<td>Running an instrumented market and forecasting (highly specialized)</td>
</tr>
</tbody>
</table>

Source: Dan and Gregory (2010)