

The Iceberg Atop Your Shoulders: Neuromarketing in the global economy

By Dr. A. K. Pradeep

When I am asked why measuring the brain is so important to marketing success, I often answer with a single statistic: 95%.

That figure represents a solid and widely-accepted estimate of how much of our daily decision-making is performed at the subconscious level of our minds. As humans, we are under the constant misapprehension that we make all of our decisions consciously (and ideally with forethought and wisdom, of course!)

The truth is actually far different. The portion of our brain functions that involve conscious decision-making is only about 5%; the rest is done on a continuous basis by the 'iceberg' of our subconscious—that very large portion of our minds that lies submerged below our consciousness. It is critical to understand that we cannot access nor influence those subconscious processes—they are simply beyond our reach, given how our brains are structured and how they function.

As I explain in my book, *"The Buying Brain: Secrets for Selling to the Subconscious Mind"*, this is actually necessary for our existence—if we were consciously aware of the vast amount of data flowing into our brains every second through our five senses (approximately 11 million bits), and the comparatively tiny amount we can actually process consciously—about 40 bits a second—we would be so overwhelmed that we would be permanently frozen into inaction.

Why is this knowledge essential to marketers? Why is measuring the brain the most accurate, reliable, and actionable form of marketing research? For three primary reasons, as well as many others. (In a moment, I will explain three fundamental brain measurement metrics that are critical to understand and leverage for marketing success.) The three primary reasons are that the subconscious is where the core marketing objectives of **initial product interest**, **purchase intent**, and **brand loyalty** are formed.

The brain, as I like to describe it, is an incredibly complex series of neural networks. Specific regions and structures—many of which perform multiple functions—are interconnected to (if you will pardon the expression) a mind-boggling degree. Today, thanks to the amazing advances that have been made in neuroscience, we understand a great deal about how these networks operate, and we are able to capture and analyze the brain's responses to stimuli at the subconscious level.

What does that mean for marketing, and marketing research? To use the same phrase, a great deal. Now, we can measure—with extreme precision, because we capture brainwave activity at such enormous volumes, so fast—how much **attention** consumers are paying to a stimulus; to what degree they are **emotionally engaged** by it;



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At NeuroFocus, these are what we call our primary NeuroMetrics. They are vital to marketing and marketing research for a very basic reason. If a consumer does not **notice** much (or even anything) about a stimulus, they will not be emotionally engaged by it. If they are not **emotionally engaged** by it, they are not likely to **remember** it. And if they do not remember it, they are not likely to form an **intention to buy**.

In addition to an Overall Effectiveness score, which is developed

by combining these three primary NeuroMetrics, we derive three additional measures: **purchase intent, novelty, and awareness.** By way of explanation, novelty measures the degree to which a stimulus stands out—for example, how well a package design ‘pops out’ on a store shelf. Awareness is the degree to which messaging is understood.

The brain whispers; we listen

For marketers and market researchers, the goal has always been to gain the most deep, accurate, and reliable understanding of how consumers respond to stimuli. But conventional forms of market research such as surveys and focus groups have well-known structural flaws and shortcomings. There are basic neurological reasons why this is so.

Fundamentally, the way that the human brain is structured and how it functions means that, despite their best intentions, consumers are unable consistently to communicate accurately and reliably about how they truly feel or what they remember about a particular stimulus. So-called ‘articulated responses’—answers to questions gained through surveys and focus groups—are affected by a whole host of factors beyond consumers’ conscious control. These factors, such as language, education, ethnic and cultural backgrounds, and others can influence and distort articulated responses. A core neurological fact is that when someone is asked a question about something that they experienced, *in the course of formulating an answer the brain actually alters the original ‘data’ it recorded.* So it is very difficult to discern accurately and reliably how consumers responded to a stimulus by simply asking them about it.

A deep dive to the truth

In contrast, EEG-based measurement of responses at the subconscious level of the brain does provide highly accurate, reliable, and actionable data. These measurements are made at such an early stage of the brain’s reaction to a stimulus that they are not affected (influenced or distorted) by the ‘external’ factors I mentioned above.

The critical advantage for marketers and market researchers is that this data reveals precisely how the consumer responded, across the primary and derived NeuroMetrics

I described. Because we measure brainwave activity at 2,000 times a second, across the full brain, using high-density arrays of highly sensitive EEG sensors, and we correlate that massive amount of data with eye tracking and other biometric measurements, we arrive at an extremely detailed and precise picture of just how effective a stimulus is.

At NeuroFocus, we concentrate on studying subconscious responses to **brands, products, packaging, in-store marketing, and advertising.** Within each of those broad categories, we have dozens of neuromarketing products designed to capture even more detailed information. We can analyze the effect that specific attributes have on brand perception (brand ‘lift’). We measure

- **register** a stimulus through one or more of the five senses;
- form an initial **reaction** to that stimulus;
- and then formulate a **response** to that stimulus in the way of motor responses (speech and other muscle movements).

Full-brain EEG-based brainwave activity measurement is made at the second (**reaction**) phase of the Timeline. That stage occurs before the influences of culture, language, education, and other factors come into play. If you’re curious about how long the Cognitive Timeline is, in most instances the entire process is over in just one second or so. Our EEG measurements generally occur between 300-500 milliseconds—or one-third to one-half a second.

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the range of price points that consumers will find acceptable. We detect how music impacts advertising performance. We discover how effectively package designs lead to purchase intent. We isolate the specific aspects of a product’s consumption that create what we call Neurological Iconic Signatures—the ‘high points’ registered in the consumer’s subconscious as he or she actually uses or consumes a product. (These can be extremely valuable applied to everything from product design and formulation to packaging, advertising, and POS marketing). That is just a small sampling of the research studies we conduct for clients on a daily basis in our NeuroLabs around the world.

The global mind

Another question I am often asked is, “can neuromarketing learnings be applied across borders?” The answer is yes—and there are two basic reasons for that. The first is based on the neuroscientific fact I cited above. The EEG technology we use captures data very early in what is called the Cognitive Timeline, which is simply the amount of time it takes the brain to:

The second reason is equally fundamental to the human race. The fact is, **our brains are far more alike than they are different.** While some differences do exist—between young (childhood and teenage) and older (generally, over 60) brains, and between male and female brains, neurologically our brains are structured and function in a basically uniform fashion. This universality means that research findings from EEG-based neuromarketing studies hold true regardless of national origin or education or language, and the other factors that impact results from traditional market research methodologies.

This leads to the answer to another FAQ about neuromarketing: how we can use the sample sizes we do and still gain more precise, reliable, and actionable results than conventional research? The fact is, for the two foundational reasons I explained, EEG-based full-brain measurements require **one-tenth the sample size** required by conventional techniques. Consider that in the world’s leading neuroscience laboratories, landmark research studies into the brain and its functions commonly use sample sizes of a dozen or so subjects. The results are fully scientifically/

statistically valid—and the same holds true for neuromarketing studies.

The whole brain, and nothing but the whole brain (the body need not apply)

As neuromarketing continues its rapidly-accelerating rate of adoption by companies worldwide, and various claims are made by one so-called 'neuromarketing' company or another, it becomes increasingly critical for marketers to understand the underlying science.

There are two abiding truths to be learned:

- **there is no substitute for full-brain measurement**
- **the brain makes behavior**; the body is a lagging indicator

As I described, the brain is a highly complex series of neural networks. These networks connect various structures and regions of the brain. Many of these structures perform multiple functions.

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For this reason, **the critical thing for marketers to understand is that it is absolutely vital to measure across the full brain.** Unless you do measure the full brain's responses, you will miss very large amounts of the vital interactions that occur among these networks. Your data is going to be woefully incomplete, and you will not gather nearly enough brainwave activity to render the most accurate, reliable, and actionable results. You will have a far higher ratio of spurious 'noise' (muscle activity) to actual brainwave activity. In fact, depending on how few sensors are used and where they are placed, you may very well end up with largely muscle activity, and little to no actual brainwave activity at all as your database.

To put this into stark perspective, at NeuroFocus the amount of data that we routinely *discard* as this 'noise' (which represent normal artifacts such as eye blinks that are

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gathered by the EEG sensors during studies) is the same amount of data that one neuro-marketing company uses as its *entire data* set. The phrase 'garbage in, garbage out' applies well in this instance.

The second core point is that measuring directly at the brain is the only reliable means to ascertain how the subconscious is responding to a stimulus. There are companies that proffer various biometric measurements, such as heart and respiration rates, and the claim is that these somehow provide an accurate picture of how the brain is responding in real time.

The problem is, those biometric responses can take up to **five or more seconds** to fully materialize after the brain initially reacts to a stimulus. The actual response rate varies from biological system to biological system; as well as from individual to individual. One company claims to somehow systematically and reliably 'link' these varying biometric responses to the brain's responses.

The simple fact—and the 'caveat emptor' for marketers considering relying exclusively on biometric measurements—is that **there is no such neuroscientifically sound system.** It is not possible to establish a consistent temporal link across and between various biological systems' responses and the brain's. The brain makes behavior; therefore, for the most accurate and reliable results, you must measure directly at the brain (and remember: the **full brain!**)

How to use Neuromarketing

Armed with the fundamental knowledge outlined above, how can companies make the most effective use of EEG-based full brain neuromarketing research for marketplace success?

Obviously, one could write a book on the subject—which I did. But here I will touch upon some key learnings derived from the thousands of neuromarketing studies that we have conducted for clients around the world. These findings are ones which every business can apply almost immediately.

Faces are Fundamental: the brain simply loves faces. Following many millennia's worth of neurological development and refinement, we are built to search facial expressions for indications of intent. Are you friend or foe? Potential lover/mate? One of our core recommendations to clients is: find ways to focus on faces in your packaging, advertising, in-store displays, and other marketing materials. Your customer's brain will (subconsciously) thank you for it.

Curves are Critical: the brain dislikes sharp edges and straight lines. To the limited extent they exist in nature itself, they represent a threat to the subconscious mind. Such features can cut, maim, even kill—and they automatically invoke what is known as an 'avoidance response' deep in the brain. We are driven away from them, without even being aware of it.

How does this apply in the marketing realm? Next trip to the supermarket, take a look at the end cap—the arrangement of products at the head and foot of aisles. Note especially the sharp corners of the shelves. This is some of the most prime real estate in the retail realm—and it is fundamentally (if unintentionally) designed to drive consumers away. We always recommend to clients that they explore every way they can to create product displays and retail environments that feature curves. The consumer's brain will breathe a subconscious sigh of relief.

Images on the Left, Words on the Right: The brain is built to prefer this presentation. Apply it to everything from advertising to packaging to website designs and much more.

MNEA is Meaningful: The brain prefers four things in particular: motion, novelty, error, and ambiguity. We are built to notice things in **motion** (in mankind's earliest days, this enhanced our ability to recognize potential prey, and predators). Even in static circumstances (a print ad or POS display, for example), the representation of motion can help attract the brain's attention.

Similarly, we are built to notice and value

novelty. We seek out what is new in our environment, or we pay particular attention to things that stand out in our visual field. Marketers who find ways to make their package designs ‘pop out’ on the shelf; or who call attention to product features by applying color highlights in an ad; or similar devices that grab our attention will appeal to the subconscious.

Error seems like an odd thing to recommend for marketing purposes, but the brain loves solving simple puzzles; especially visually-based ones. By injecting a certain element of ‘error’ in some marketing materials, the brain’s attention and engagement can be gained. An example I use in “The Buying Brain: Secrets for Selling to the Subconscious Mind” is a print ad showing a small bird’s body with a small dog’s head attached. The brain does not recognize the existence of such a creature—so additional cognitive resources are immediately applied to try to ‘solve’ this visual puzzle. The result is, more time spent focusing on the ad.

The best expression and explanation of the **Ambiguity** factor can be found in one of the world’s most famous paintings. For centuries the Mona Lisa has captivated our imaginations. Generation after generation has pondered her face and sought to divine the answers to some very basic questions: what is she thinking? Is she smiling, or not? Why? The underlying reason for our fascination is the fact that the brain is intrigued by the less-obvious. We are drawn to try to understand the meaning behind her ambiguous expression. It is, in effect, a puzzle which the brain seeks to solve. So our neuromarketing counsel to clients is: dispense with the smiling models in your packaging and in your ads; a more ‘neutral’, ambiguous

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expression will capture the subconscious’ interest more.

These, and a whole host of other neurological learnings and best practices, underlie and underscore the value of neuromarketing in today’s competitively heightened, global marketplace. Knowing, with clarity and confidence, how the subconscious will respond to a new product introduction; a new ad campaign; a revamped logo or package design; the roll-out of in-store marketing materials, and similar big-ticket investments is one of the advantages of applying neuromarketing. The savings, in both time and money, are considerable. The competitive advantage of entering the marketplace certain that your brand, product, packaging, retail marketing, and advertising are going to receive the subconscious’ acceptance is obvious.

The future unfolding

Neuromarketing is rapidly coming into its own as the 21st century proceeds. Some exciting advances are being made as I write this. First, neuroscience itself is recording amazing new discoveries about the human brain. Very promising progress is occurring across many fields simultaneously. One which we at NeuroFocus are very interested in is BCI, or Brain Computer Interface. Knowledge of the brain’s circuitry is being combined with advanced computer science to devise means of marrying the two to help overcome paralysis and ‘locked-in’ syndrome.

In the commercial sector, we have recently unveiled the world’s first neuroscience-based 3D virtual reality in-store research methodology. N-Matrix 3D offers companies the capability of testing consumers’ subconscious responses to everything from package designs to product and aisle displays, store layout and signage, marketing materials and much more, all in a hyper-realistic environment designed to appeal to the brain as ‘authentic’, all without having to set foot in an actual store. This is an example where significant savings can be had, at the same time that the most accurate and reliable research results are obtained.

Another major breakthrough will be in wireless technology, which we are pioneering and will be announcing as this article goes to print. This ‘next generation’ of EEG-based full-brain neuromarketing research will provide



clients with the same superior scientific accuracy as the wired model does now, but will add even greater flexibility and will also make possible whole new applications, which we will also be announcing very shortly.

If I have conveyed that neuromarketing is a category on the move, I have succeeded. Companies and consumers stand to reap rewards through better understanding of how the brain responds, and what it loves.

About the author

Dr. Pradeep founded NeuroFocus in 2005. Now the company ranks as the world leader in the fast-growing neuromarketing research field, with numerous patents for its advanced technologies and a blue-chip client list representing Fortune 100 companies in dozens of categories.

The Advertising Research Foundation honored him with the 2009 Great Minds Award Grand Prize, which recognizes “an individual who brings excellence to advertising research in the category of research innovation.” He was also named “2010 Person of the Year” by the USA India Business Summit for his “impressive innovations and achievements in the field of neuromarketing.”

His new book *The Buying Brain: Secrets to Selling to the Subconscious Mind* was published in 2010.

Dr. Pradeep holds a Ph.D. in engineering from the University of California at Berkeley.