Chapter 1

What Neuromarketing Is and Isn't

In This Chapter

- Getting a definition of neuromarketing
- Making sense of the science behind neuromarketing
- Seeing how neuromarketing is being used today
- Understanding the basics of neuromarketing measurement
- Succeeding with neuromarketing research

Neuromarketing is a new field that is rapidly emerging in the world of consumer research. For some observers, it's the "Holy Grail" of research technologies that will finally unlock the mysteries of consumer choice and behavior in the human brain. For others, it's the root of all evil that will finally give marketers and advertisers ultimate control over our minds and pocketbooks.

So, which is it: Holy Grail or root of all evil?

As with most exaggerations, the truth lies somewhere in the middle. Neuromarketing does bring some quite powerful insights and techniques into consumer research, and in this book we discuss those contributions in detail. But neuromarketing is not a technique for turning people into "zombie consumers," and we also discuss in detail why that's the case.

Neuromarketing is controversial, in many cases because it isn't well understood. It's also evolving and growing very rapidly, so it's a moving target. At this stage in its development, there isn't much consensus regarding what neuromarketing is, what it does, where it's going, or what we should do about it. So, it makes sense to start with some clear definitions.

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Defining Neuromarketing



Because we want this book to be a reference for all aspects of neuromarketing, our definition of the field is quite broad. We define *neuromarketing* as any marketing or market research activity that uses the methods and techniques of brain science or is informed by the findings or insights of brain science. (For more on brain science, see the next section.)

Ultimately, neuromarketing is about solving exactly the same problems that all types of market research aim to solve: how a company should best spend its advertising and marketing budget to communicate its value to its customers, while generating revenues and profits for its shareholders. If neuromarketing is worth its salt, it has to help marketers solve these problems better than other types of research.

In this regard, there is nothing mysterious about neuromarketing. It's just another type of market research, subject to the same constraints of time, money, and usefulness as any other type of research that is performed every day.

Neuromarketing versus marketing

Some people believe that neuromarketing is a field devoted to influencing people to buy things — often things they don't really need — and that it's, therefore, a bad and dangerous thing to do.



Part of the blame for this misconception lies with the term itself. *Neuromarketing* sounds suspiciously like a different (and nefarious) type of marketing, but it's not. Here's the distinction you need to keep in mind:

- **Marketing** is a field devoted to influencing people to like things, and ultimately to buy things, including things they may not need. Marketers are aware that people have brains. Marketing, therefore, is now and always has been devoted to influencing brains.
- **Neuromarketing** is a new way to measure *whether* and *how* marketing is working. Neuromarketers believe it's a better way to measure marketing because it's based on a more realistic understanding of how consumers' brains operate (we discuss the evidence for this claim in Chapter 2).

So, if you believe that influencing brains is a bad thing, then, in our opinion, your complaint is with marketing, not with neuromarketing.

What neuromarketing is good for

Taking this broad view of neuromarketing, there are three major ways that it can help us better understand marketing and consumer behavior:

- It can tell us what's going on in people's brains while they're experiencing a marketing *stimulus* (any marketing material presented in a controlled research test).
- It can tell us how brains react to marketing stimuli presented in different *situational contexts* (for example, alone or next to competing products, at different price points, in a store versus online, and so on).
- It can tell us how brains translate those reactions into *consumer decisions and behaviors* (such as buying a product or switching loyalty to a new brand).

Brain science and the foundations of neuromarketing

In this book, we use the term *brain science* to refer to all the scientific fields that underlie neuromarketing. We do this because we want to emphasize that the one obvious scientific source for neuromarketing — neuroscience — is not the only brain science that underlies neuromarketing. In fact, neuromarketing is built on top of at least three basic science fields, which, taken together, we refer to as the *brain sciences,* or simply *brain science:*

- **Neuroscience:** The study of the human nervous system, including the brain, its anatomy, functions, and the peripheral nervous system it controls. Neuroscience is most relevant to understanding the brain states and physiological reactions that accompany exposure to brands, products, and marketing materials.
- **Behavioral economics:** The study of how people make economic decisions in the real world. Behavioral economics is most relevant to understanding situational influences on consumer choice and behavior.
- **Social psychology:** The study of how people think and act in the (real or imagined) presence of other people. In recent years, social psychology has focused on the impact of nonconscious processes on human actions. It's most relevant to understanding how conscious and nonconscious brain processes work together in consumer choice and behavior.



Terminology: Brain or mind? Nonconscious, unconscious, or subconscious?

Brain* versus *mind: The word *brain* tends to be used when people talk about anatomical structures or circuitry in the brain. The term *mind* tends to be used to refer to the subjective cognitive states a brain creates. For example, the *prefrontal cortex* is an anatomical part of the brain, but *attention* is a cognitive "state of mind" produced by activity in the brain. Generally, we use these terms interchangeably. We consider "nonconscious processes in the brain" to be equivalent to "the nonconscious mind."

Unconscious, subconscious, preconscious,* and *nonconscious: There is a lot of intellectual baggage associated with all the terms that can be used to refer to the "not-conscious" processes in the brain. *Unconscious* has some bad connotations, in terms of both the Freudian unconscious and the association with anesthetized states. *Subconscious,* in turn, carries a "secondary" or "subsidiary" connotation, as if it's something below and, therefore, less than the conscious. A similar term is *preconscious,* which often would be perfectly appropriate, but it implies that *conscious* always follows *preconscious,* and this isn't always true. Given all these issues, we use the more neutral term *nonconscious* in this book. Using this term has the benefit of referring neutrally to "everything other than conscious"; plus, it's the term that's becoming the standard in the academic literature.



Other important disciplines, such as neuroeconomics and cognitive psychology, underlie neuromarketing, too, but we don't cover those fields in detail in this book. Also, each of the fields listed here is regularly spawning new subfields or merged fields, such as consumer neuroscience, consumer psychology, social neuroscience, and decision neuroscience, to name a few.

The point is that these are exciting times in the brain sciences, and neuromarketing is the beneficiary of all these fields.

Understanding the New Scientific Foundations of Neuromarketing

Neuromarketing is a distinctive approach to market research because it's based on new knowledge and findings from the brain sciences. This rich and rapidly growing body of knowledge provides many new perspectives on understanding consumer behavior. We call this new view of the consumer

the *intuitive consumer model,* as opposed to the *rational consumer model* that underlies most traditional market research. (We discuss these two models in detail in Chapter 2.) In this section, we offer an overview of some of the key findings that underlie the intuitive consumer model and neuromarketing.

Brain science tells us that the typical consumer is not a slow and careful deliberator when it comes to buying preferences and decisions, but instead is a *cognitive miser,* equipped with a brain that is adapted by evolution to conserve energy and produce fast and efficient consumer decisions and actions, not deep and logical assessments of marketing messages and purchase opportunities. Our consumer brains are attracted to both the new and the familiar, and they prefer the simple to the complex. These propensities are built into the circuitry of the brain, and they most often impact us below the level of conscious awareness.

This new picture of the human brain changes our understanding of how people see and interpret the world around them. This understanding has many implications for market research, which we introduce in Chapter 2 and cover in detail in Chapter 5. The most important of these implications is that human beings actually have very little awareness of why they do the things they do. This means that when people are asked by researchers about what they like or what they'll buy in the future, their answers are often guesses about what they think or will do. These guesses have been shown to be no more reliable and accurate than the guesses people make every day about what *other* people are thinking or going to do. People aren't lying or trying to deceive researchers when they make these guesses; they're literally unaware of the real causes and reasons for their actions.

This finding sets the fundamental challenge for market research. It's also the reason that neuromarketing has emerged in market research, because neuromarketing techniques hold the promise of measuring consumer responses that occur below the level of conscious awareness.

Many additional insights flow from this new science-based picture of the intuitive consumer. We focus on three more aspects of this picture in Part II: how emotions impact consumer decisions and behavior, how nonconscious goals drive decisions and actions, and how consumers really make decisions.

Modern brain science has made great strides in understanding the role of emotions in consumer behavior. Emotions operate at both conscious and nonconscious levels. They deeply impact our perceptions, beliefs, and attitudes, even when we aren't aware of them. They heavily influence what we notice (by directing attention), as well as what we remember (by triggering memory). We cover this topic thoroughly in Chapter 6.

The way in which our brains direct us toward any kind of decision and action, including consumer decisions and actions, is through the activation, pursuit, and attainment of goals. This is the basis of the motivational system that drives us, a system that has evolved over millions of years.

What we've learned from brain science, mostly in the last decade, is that goals can operate nonconsciously, as well as consciously. Contrary to our conscious experience, we're constantly activating and pursuing goals that we may have no idea exist. This finding has huge implications for marketing and consumer behavior — for both marketers and consumers. We consider these implications in Chapter 7.

Our understanding of human decision making has been revolutionized in the last 40 years. We used to see decision making as a conscious, deliberative process that could be reconstructed simply by asking a person to recount how he or she came to a particular decision. Today we know that people use different systems in the brain to make different kinds of decisions and that many decisions occur automatically, below the threshold of conscious awareness.

Consumer decisions are also highly influenced by *situational factors,* such as how a product is presented in a store or what other products it sits next to. These situational effects have been studied extensively in the new field of behavioral economics. A large body of research shows that these effects also often occur without conscious awareness of their impact.

With so many nonconscious influences on consumer decision making being uncovered, we need to take a new look at the power of traditional persuasion in marketing and advertising. We find that persuasion is probably less important in successful marketing and advertising than it was previously believed to be. Chapter 9 looks at consumer decision making in detail.

Neuromarketing is built on these insights and many others derived from brain science. It borrows the tools and technologies developed in the brain sciences and applies them to the world of marketing and consumer behavior. The underlying science will continue to progress, and neuromarketing will continue to benefit from this vibrant scientific foundation.

Exploring Where Marketers Are Using Neuromarketing Today

Neuromarketing is being used today by marketers in many research areas. In Part III, we tell you how it's being used, what results are being achieved, and how it's likely to be used in the future, in six key marketing areas:

- **Brand:** Understanding brands and branding is an area in which neuromarketing is a natural fit. Brands are essentially ideas in the mind, and they draw their strength by making connections with other ideas in the mind. A strong brand is one that triggers deep associations with related ideas that keep that brand at "top of mind" for consumers. In Chapter 9, we show how strong connections in long-term memory make leading brands so hard to displace. We also show how neuromarketing techniques can be used to measure brand effects that consumers may not even know exist.
- **Product:** Product innovation and package design are two research areas in which neuromarketing is making significant inroads. Because people have a hard time predicting what they'll like or do in the future, neuromarketing provides alternative ways to observe when a new idea is resonating positively with consumers and when it's generating a gigantic "Huh?" We cover these and other uses of neuromarketing in product and package research in Chapter 10.
- **Advertising:** Advertising research is an active area for neuromarketing. How advertising works and what makes one ad more successful than another have always been a bit of a mystery. Neuromarketing offers new tools and techniques that illuminate, if not completely solve, this mystery. In particular, brain science leads us to the intriguing idea that ads may work best when they aren't paid attention to, and that the repetition of positive emotional connections, rather than persuasive messaging, may be more effective at reinforcing brands and boosting sales. We discuss these and other ideas about ads and the brain in Chapter 11.
- **Shopping:** Shopping and in-store marketing are research areas where neuromarketing has much to offer. Shoppers expend surprisingly little conscious thought in the shopping experience. They pick up a huge number of visual and other sensory cues as they navigate their shopping journey, but they usually aren't aware of most of them. Situational factors are highly influential in determining shopping outcomes, often at the expense of shoppers' conscious intentions. How neuromarketing can be used to test shopper reactions in both real and simulated shopping environments is covered in Chapter 12.
- **Online:** Closely related to in-store shopping experience is online shopping experience. But there are important differences. In the online world, advertising and buying can exist right next to each other, with no need for consumers to delay gratification until they make their next trip down to the mall. As a result, the activation, pursuit, and attainment (or frustration) of consumer goals is much more immediate and dynamic in online shopping. For more details on the implications of this unique situation and how the human brain has adapted to online experience, see Chapter 13.

- **Entertainment:** The final marketing area we explore in Part III is entertainment. Although people are better able to identify when they're being entertained than when they're being persuaded, they have very little conscious access to why they find one TV program, movie, or video game more entertaining than another. Brain science provides some useful insights into what makes a story interesting and how interest is represented in the brain. This opens up the possibility of neuromarketing testing of entertainment programming. We look at this research in Chapter 14.

Explaining How Neuromarketing Measures Consumer Responses

In Part IV, we shift our focus from sources and applications of neuromarketing to the basics of neuromarketing testing — how neuromarketing measurement techniques differ from traditional market research and from each other — and how they've been adapted from the tools and technologies of brain science.

First, we emphasize that although neuromarketers criticize some assumptions underlying traditional market research, there remains an important place for these approaches among modern research methodologies. In Chapter 15, we review the three "workhorses" of market research — interviews, focus groups, and surveys — and discuss when they make sense, and when they present risks and limitations.

Looking at the new neuromarketing research tools and techniques, we see in Chapter 16 that they fall into two general categories: approaches that measure *responses of the body* to marketing, and approaches that measure *responses of the brain.* Each approach captures a different kind of signal, and each comes with a different set of pros and cons as a measurement technology. In Chapters 16 through 18, we review these methods in detail.

The most important *physiological* or *biometric* measures (based on body signals) used in neuromarketing include the following:

- **Facial expressions:** The human face registers a wide variety of emotional states. Facial expressions can be read at two levels: observable changes in expressions (for example, smiles or frowns) and unobservable micro-muscle changes (for example, contractions of muscles associated with positive and negative emotional reactions). Facial expression measures have been found to be robust indicators of positive or negative emotional responses (called emotional *valence*).

- **Eye tracking:** The measurement of eye movements and pupil dilation while viewing an object or scene. Eye tracking has many uses in neuromarketing, both as an independent tool and as a supplement to other measures. The speed and direction of changes in gaze patterns provide valuable indicators of attention, interest, and attraction.
- **Electrodermal activity:** A measure of perspiration on the skin, usually measured at the fingertips. The signal increases with increased emotional *arousal* (stimulation or excitation of the nervous system). A limitation of this measure is that it cannot distinguish between positive and negative emotional valence.
- **Respiration and heart rate:** These measures focus on the beating speed of the heart and how deep and fast a person is breathing. Heart rate has been found to slow down momentarily when attention increases. Fast and deep breathing is associated with excitement, while shallow breathing can indicate concentration, tense anticipation, or panic and fear.
- **Response time:** One way that nonconscious brain processes reveal themselves in behavior is by facilitating or interfering with the speed of response to word comparisons or visual choices. Response-time measures provide a simple and accessible way to test the strength of association between different concepts. They've been used successfully by neuromarketers in brand, product, and package testing.

Neurological or *neurometric* measures (based on brain signals) tend to be both more complex and more accurate than body measures. Sometimes the extra effort and cost associated with these technologies is worth it; other times not. It depends on the research question being asked. Three brain signal techniques are commonly talked about in discussions of neurological neuromarketing measures:

- **Functional magnetic resonance imaging (fMRI):** This technique is the favorite of academic researchers because it enables the precise imaging of activity anywhere in the brain. It does this by measuring blood flow. When parts of the brain become active, blood flows to them. Because blood contains iron, this flow can be traced by a massive magnet that surrounds the head of the person being studied. fMRI machines are very expensive but are available at most hospitals, universities, and independent imaging centers. They're indispensible for testing theories about how the brain works, but some neuromarketers consider fMRI — because of its cost, complexity, and artificial testing environment — to be overkill for market research testing.
- **Electroencephalography (EEG):** Probably the most popular neuromarketing technology because of its relatively low cost and manageable equipment requirements, EEG measures the strength at the scalp of very small electrical fields generated by brain activity. It's a well-established

technology that benefits from a massive academic literature. The biggest limitation of EEG is that it can't reliably measure changes in electrical activity deep in the brain.

- **Magnetoencephalography (MEG):** This technique measures minute changes in magnetic fields produced by the brain. It has many advantages but requires multi-million-dollar machinery that must be supercooled to near absolute zero to operate. It's used in academic studies but hasn't caught on as a practical method for commercial neuromarketing.

All these techniques are discussed in detail in Chapter 16. Their pros and cons for different types of research are covered in Chapter 18. Also in Chapter 18, we discuss how some leading companies are integrating different types of research — both neuromarketing and traditional — within a unified organizational structure to provide a single integrated, multidimensional view of consumer interests and behaviors.

Chapter 17 is devoted to the topic of neuromarketing on a budget. We describe three strategies that can be used to inexpensively gain neuromarketing insights for your business:

- **Response-time studies:** Timing synchronization software can be used to measure response times in thousandths of a second. Whether carried out online or in a computer lab, response-time studies can provide inexpensive insights into brand associations, product "pop out" in shopping contexts, and responses to both static and dynamic advertising.
- **Online services (eye tracking and facial expression analysis):** Online studies can now incorporate both eye tracking and facial expression recognition through the use of webcams or built-in computer cameras. Combined with clever experimental designs, *gamification* (putting game elements into online experiments), and *crowdsourcing* (using virtual betting to predict marketplace outcomes), these capabilities provide opportunities to test thousands of online study participants cheaply and quickly.
- **Behavioral experiments:** Behavioral economics provides insights and principles about how people make decisions in real-world situations. We show how you can set up and run behavioral experiments in your store or on your website, testing the results of different configurations relatively quickly and easily.

Succeeding with Neuromarketing Studies

Part V is devoted to practical and ethical issues relating to neuromarketing research. In Chapter 19, we identify five practical aspects of neuromarketing

studies that you need to understand if you want to get the most out of working with a neuromarketing vendor. Because neuromarketing is a new field, you'll want to be sure your vendor has a solid foundation in each of these areas:

- **Experimental design:** Is your experiment designed to efficiently test hypotheses and control for external factors that could confound or blur study results?
- **Measurement validity and reliability:** The extent to which a vendor's metrics have been tested to answer two key questions: Do they measure what the vendor says they measure, and are they generalizable to new samples and future situations?
- **Safeguards against *reverse inference:*** This term refers to a common type of logical inference in neuromarketing studies: "If brain signal A is active, then mental state B must be active." But even if mental state B is always accompanied by brain signal A, it does not follow *logically* that "every time brain signal A is active, mental state B must also be active." Brain signal A can be occurring for other reasons. Your vendor needs to be able to explain if and how it handles this inference challenge.
- **Statistical significance:** Proper statistical tests need to be applied to determine the probability that a result is not produced by chance. Given the complexity of many neuromarketing designs, the proper tests are not always easy to identify.
- **Normative data (comparative benchmarks):** Can your vendor provide data that correlates its measures with behavioral measures of marketing success? For example, advertising research companies usually provide normative data comparing scores on their metrics to product sales or other performance measures in the weeks after tested ads are shown. What normative data does your neuromarketing vendor have to show the predictive value of its measures?

We also propose that you review a simple but critical "pre-flight checklist" before committing to any neuromarketing study. The checklist consists of five questions:

- Are you testing the right hypothesis?
- Do you have the right experimental design?
- Are you testing the right materials?
- Are you sampling from the right population?
- Do you know how you'll use your results?

With the information covered in this book, we believe you'll be fully equipped to answer each of these questions and conduct a valid, reliable, and insightful neuromarketing study. We provide more details about each question in Chapter 20.

Two lessons remain in learning how to succeed with neuromarketing studies: how to pick the right partner to help you conduct neuromarketing research, and how to make sure any neuromarketing studies you do meet the highest ethical standards.

In Chapter 21, we look at how to pick the best neuromarketing partner for your needs. As the field matures, we're seeing the emergence of two types of partners you can consider:

- **Neuromarketing vendors:** These are firms that perform neuromarketing studies for you, using their methodologies of choice. Each vendor brings its own expertise and experience to your study, and vendors tend to work in relative isolation from each other.
- **Neuromarketing consultants:** These are a different breed of service providers that are beginning to appear on the neuromarketing scene. Neuromarketing consultants don't perform studies themselves; instead, they provide advice and counsel to companies and firms that want to conduct neuromarketing studies or a larger research program but want a partner to help them do many of the things covered in this book: Pick the right vendor(s), ask the right questions, oversee the project, and provide independent interpretation of the results. Neuromarketing consultants sometimes act as general contractors, assembling the research team, providing oversight of the project, and helping integrate the results into your business decision making.

Details about these two types of partners and the pros and cons of using each are discussed in detail in Chapter 21.

For some potential users of neuromarketing, the most important issues surrounding its adoption are ethical, not methodological or organizational. Due to the controversies that have followed neuromarketing over the years, many marketers want to know if neuromarketing has the same ethical foundations and standards that other market research disciplines have.

In Chapter 22, we outline a set of ethical safeguards and principles that we believe every neuromarketing vendor should adopt to ensure that every study is safe, accurately portrayed, and trustworthy. Many of these safeguards and principles have been introduced by others, including distinguished neuro-ethicists. We summarize them under three key principles:

- Protecting the rights of research participants, including confidentiality, full disclosure, and safety, in line with human subjects guidelines of the U.S. Health and Human Services Department and other regulatory agencies around the world
- Representing research and results fairly and accurately in all media and marketing communications
- Providing evidence for the validity and reliability of all neurometric and biometric measures to potential buyers of neuromarketing services

In addition, we discuss the emergence of industry standards for neuromarketing from research organizations such as ESOMAR (`www.esomar.org`) and the Advertising Research Foundation (ARF; `www.thearf.org`). We look in detail at the neuro-standards initiative for advertising research launched by the ARF and sponsored by some of the most respected advertisers in the world.

Finally, we revisit some important legal, social, and policy questions relating to neuromarketing. We argue, based on the evidence we've assembled in this book, that neuromarketing is a legitimate form of market research that will continue to increase in popularity and provide value to the marketing community. It isn't brainwashing or a conspiracy to make people over-buy or over-consume. It needs to be conducted ethically under the same standards as any other research methodology. We're optimistic about the future of neuromarketing and believe it can be a source of good for society. We close Part V by discussing three areas where neuromarketing can have a positive impact on public policy: in public service advertising, in public policy design and implementation, and in education.

Neuromarketing is a new way to think about marketing. It has emerged over the last decade because the brain sciences — especially the fields of neuroscience, behavioral economics, and social psychology — have provided us with a new and challenging picture of how human beings think, decide, and act in the real world. It was just a matter of time before this picture would be applied to consumer behavior. As we show in the next chapter, what it tells us is that much of what we thought was true about consumer thinking and behavior is actually wrong.