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Part I. The Brave New World of Neuromarketing

Chapter 1. What Neuromarketing Is and Isn’t


Defining Neuromarketing

9: Neuroscience is not the only brain science that underlies neuromarketing. For an expansive definition of neuromarketing similar to our own, see Plassmann, Hilke, Thomas Zoëga Ramsøy, and Milica Milosavljevic. "Branding the brain: A critical review and outlook." Journal of Consumer Psychology 22.1 (2012): 18, and Barden, Phil. Decoded: The Science Behind Why We
A rationale for naming social psychology, as opposed to cognitive psychology or psychology more generally, can be found in Bargh, John A., and Ezequiel Morsella. "The unconscious mind." *Perspectives on psychological science* 3.1 (2008): 73-79.

10: Brain or mind? Nonconscious, unconscious, or subconscious? There is a huge and fascinating literature on these topics that we were unable to address in N4D. On the question of consciousness, see Chalmers, David. *The Conscious Mind*. Oxford University Press, 1996. An interesting typology of different varieties of consciousness can be found in Dehaene, Stanislas, et al. "Conscious, preconscious, and subliminal processing: a testable taxonomy." *Trends in cognitive sciences* 10.5 (2006): 204-211.

**Understanding the New Scientific Foundations of Neuromarketing**

11: Cognitive miser. This term has a long history in psychology. It is derived from Herbert Simon’s concept of bounded rationality (see Simon, Herbert. *Models of Man*. Wiley, 1957), which was further developed by James March and others (see March, James. *A Primer on Decision Making: How Decisions Happen*. Free Press, 1994). This work, in turn, was a key foundation for Daniel Kahneman’s and Amos Tversky’s development of behavioral economics (see Kahneman, Daniel. "Maps of bounded rationality: Psychology for behavioral economics." *The American economic review* 93.5 (2003): 1449-1475). Kahneman’s work, described in Chapters 2, 8, and 24, is a central pillar underlying neuromarketing today.

The rest of this section is a high-level overview of Part II of N4D, Chapters 5-8.

**Exploring Where Marketers Are Using Neuromarketing Today**

12-14: This section of Chapter 1 is a high-level summary of Part III of N4D, Chapters 9-14.

**Explaining How Neuromarketing Measures Consumer Responses**

14-16: This section of Chapter 1 is a high-level summary of Part IV of N4D, Chapters 15-18.

**Succeeding with Neuromarketing Studies**

16-17: This section of Chapter 1 is a high-level summary of Part V of N4D, Chapters 19-22.

**Chapter 2. What We Know Now that We Didn’t Know Then**

21: This chapter is a summary and interpretation of all the material covered in Part II, The Essence of Neuromarketing: The Nonconscious Mind of the Consumer. Additional references and sources are included in the sections below for Chapters 5-8.

**How We Used to Think about Consumers**

22: Mr. Spock goes shopping. This list of attributes covers most of what is called the rational economic actor in economics. This model is well-described in our “For Dummies” sister volume: Amthor, Frank, *Behavioral Economics for Dummies*. Wiley, 2012.

24: **The bedrock of traditional market research techniques.** These 3 “workhorses” of market research are discussed in detail in Chapter 15.

25: **Traditional market researchers tend to see these problems as fixable.** See, for example, Trei, Lisa. “Social science researcher to overhaul survey methodology with $2 million grant.” *Stanford News Service*, September 27, 2006.

25: **People don’t actually know what they know.** The classic reference is Nisbett, Richard E., and Timothy D. Wilson. "Telling more than we can know: Verbal reports on mental processes." *Psychological review* 84.3 (1977): 231-259.

### How People Really See and Interpret the World

This section draws upon a vast literature on nonconscious and conscious brain processes, including decision making. We can only mention a small slice of references here.


28: **The process of forming concepts is quite complicated and far from obvious.** For an overview of this process, see Kahneman, Daniel. "Maps of bounded rationality: Psychology for behavioral economics." *The American economic review* 93.5 (2003): 1449-1475, especially the discussion of “natural assessments” on p. 1453. Ascribing meaning and value implies that evaluation and judgment are parts of this process, which means, in turn, that our brains are literally incapable of recognizing something without evaluating it. See Kahneman, Daniel. *Thinking, Fast and Slow*. Farrar, 2011, especially Chapter 4, “The Associative Machine.”

28: **Facilitation.** Probably we should have used the term we use elsewhere in the book, *associative activation*, in this paragraph. The two terms refer to the same process. See Eimer, Martin, and Friederike Schlaguehen. "Response facilitation and inhibition in subliminal priming." *Biological psychology* 64.1-2 (2003): 7-26. See also Winkielman, Piotr, and John T. Cacioppo. "Mind at ease puts a smile on the face: psychophysiological evidence that processing facilitation elicits positive affect." *Journal of personality and social psychology* 81.6 (2001): 989.


32: Confabulation. Discussed in Mlodinow, Subliminal, p. 190:

The term “confabulation” often signifies the replacement of a gap in one’s memory by a falsification that one believes to be true. But we also confabulate to fill in gaps in our knowledge about our feelings. We all have those tendencies. We ask ourselves or our friends questions like “Why do you drive that car?” or “Why do you like that guy?” or “Why did you laugh at that joke?” Research suggests that we think we know the answers to such questions, but really we often don’t. When asked to explain ourselves, we engage in a search for truth that may feel like a kind of introspection. But though we think we know what we are feeling, we often know neither the content nor the unconscious origins of that content. And so we come up with plausible explanations that are untrue or only partly accurate, and we believe them. Scientists who study such errors have noticed that they are not haphazard. They are regular and systematic. And they have their basis in a repository of social, emotional, and cultural information we all share.


Replacing the Rational Consumer Model with the Intuitive Consumer Model

35: It makes sense to consider retiring the rational consumer and replacing it with the much more realistic intuitive consumer model. Our “intuitive consumer” model is an

**Chapter 3. Putting Neuromarketing to Work**

Chapter 3 is a condensed summary of all the material covered in Part III, Neuromarketing in Action.

**Building Better Brands with Neuromarketing**

37-41: For citations and references, see Chapter 9.

**Designing Better Products and Packages with Neuromarketing**

41-45: For citations and references, see Chapter 10.

**Creating Effective Ads with Neuromarketing**

45-48: For citations and references, see Chapter 11.

**Understanding the Mind of the Shopper with Neuromarketing**

48-51: For citations and references, see Chapter 12.

**Appealing to Brains Online with Neuromarketing**

51-55: For citations and references, see Chapter 13.

**Producing Compelling Entertainment with Neuromarketing**

55-58: For citations and references, see Chapter 14.

**Chapter 4. Why Neuromarketing Matters**

**Potential Dangers of Neuromarketing**


61: What neuromarketing technologies can say with some precision is that, at a moment in time, a person is exhibiting certain physical states that tend to be associated with certain mental states. Just as a reminder, this statement needs to be bracketed by the caveats presented in the discussion of reverse inference in Chapter 19.

62: Privacy, on the other hand, is an important concern. This issue is discussed in detail in Chapter 22. See Murphy, Emily R., Judy Illes, and Peter B. Reiner. "Neuroethics of neuromarketing." Journal of Consumer Behaviour 7.4-5 (2008): 293-302.


63: As the novelist William Gibson has famously observed. Gibson’s great quote about the future being unevenly distributed is from "The Science in Science Fiction” on Talk of the Nation, NPR (30 November 1999, at time 11:55).

64: Critics are wrong when they view neuromarketing as a weapon that can be used only by marketers to erode consumers’ ability to control temptations. On the applicability of brain science research to the problem of temptation, see Jimura, Koji, Maria S. Chushak, and Todd S. Braver. "Impulsivity and Self-Control during Intertemporal Decision Making Linked to the Neural Dynamics of Reward Value Representation." The Journal of Neuroscience 33.1 (2013): 344-357; Baumeister, Roy F. and John Tierney, Willpower: Rediscovering the Greatest Human Strength. Penguin Books, 2012.

Potential Benefits of Neuromarketing
66: A brain science subfield called neurodesign. This topic is taken up in Chapter 10.


Learning to Live with Neuromarketing: The New Realities
68: Consumers aren’t helpless. This theme is taken up in several blog posts in our Intuitive Consumer Blog at http://intuitiveconsumer.com/blog. On built-in resistance to persuasion, see Knowles, Eric S., and Jay A. Linn, eds. Resistance and Persuasion. Psychology Press, 2004. On tactics for countering marketing deception, see Boush, David M., Marian Friestad, and Peter

**Part II. The Essence of Neuromarketing: The Nonconscious Mind of the Consumer**

**Chapter 5. The Intuitive Consumer: Nonconscious Processes Underlying Consumer Behavior**

*The Intuitive Consumer Is a Cognitive Miser*


75: Lazy control. See the discussion in Kahneman, *Thinking, Fast and Slow*, Chapter 3, “The Lazy Controller.”


76: The brain tends to approach novelty with caution. See Hung, Wei-Ken, and Lin-Lin Chen. "Effects of novelty and its dimensions on aesthetic preference in product design." *International Journal of Design* 6.2 (2012): 81-90. The unfamiliarity of novel stimuli is an automatic trigger of bottom-up attention, which is more sensitive to negative than positive...

From Kahneman, *Thinking, Fast and Slow*, p. 67:

> To survive in a frequently dangerous world, an organism should react cautiously to a novel stimulus, with withdrawal and fear. Survival prospects are poor for an animal that is not suspicious of novelty. However, it is also adaptive for the initial caution to fade if the stimulus is actually safe.


> Familiarity operates on many levels to increase certainty and reduce effort. To a certain extent, the positive feelings generated by viewing a familiar mark are independent of any larger associative network of stored factual information about the brand. In low involvement situations, consumers do not want to take the time to consult branches of memory for specific brand attributes; they want to know immediately whether they “like” the choice. (p. 33)

On familiarity and perceived truth, see Weaver, Kimberlee, et al. "Inferring the popularity of an opinion from its familiarity: a repetitive voice can sound like a chorus." *Journal of personality and social psychology* 92.5 (2007): 821. From Kahneman, *Thinking, Fast and Slow*, p. 62:

> A reliable way to make people believe in falsehoods is frequent repetition, because familiarity is not easily distinguished from truth.


78: **Processing fluency can have powerful effects on people’s judgments and decisions.** A concise and accessible introduction to processing fluency is Song, Hyunjin, and Norbert Schwarz. "If it’s easy to read, it’s easy to do, pretty, good, and true." *Psychologist* 23.2


The Nonconscious Anchors Us in the Moment


82: Priming and associative activation. See the excellent introduction in Kahneman, Daniel. Thinking, Fast and Slow. Farrar, 2011, Chapter 4, “The Associative Machine.” Also, An interesting study of associative activation (also called spreading activation) of political concepts is found in Erisen, Cengiz, Milton Lodge, and Charles S. Taber. "Affective contagion in effortful political thinking." Political Psychology (2013).

83: Research on priming has exploded over the last decade. Studies referenced in this list:


85: Two conditions need to be in place for motivational, goal-based priming to work. Custers, Ruud, and Henk Aarts. "Beyond priming effects: The role of positive affect and discrepancies in implicit processes of motivation and goal pursuit." European review of social psychology 16.1 (2005): 257-300.


... although goal primes are quite pervasive, there are situations in which goal primes do not exert an influence on behavior. ... social primes influence the likelihood of selecting a beer/wine voucher over a tea/coffee voucher, but only for people who regularly drink. Thus, goal primes can influence only permissible behaviors. ... thirst primes are effective for people who are thirsty, but not for people who are hydrated. Thus, internal physiological states seem to moderate whether a goal prime can exert an influence.

Rather than being defenseless, we find that consumers exhibit automatic responses that reflect their perceptions of the persuasion intent of different marketing tactics, even when these perceptions are not salient [consciously perceived].


So, What’s the Conscious Mind Good For, Anyway?
87: Research has documented that effects like priming and processing fluency tend to go away when people are made aware of them. See, e.g., Laran, Juliano, Chris Janiszewski, and Marcus Cunha Jr. "Context-Dependent Effects of Goal Primes." Journal of Consumer Research 35.4 (2008): 653-667, at .. 654:

... a goal prime can increase performance on a task, but only when there is no conscious monitoring of task performance. Conscious monitoring appears to activate and/or prioritize competing goals that can negate the influence of the goal prime.

87: Our view of ourselves and our motivations is like a jigsaw puzzle with most of the pieces missing. The full quote from Mlodinow, Subliminal, p. 29:

We all make personal, financial, and business decisions, confident that we have properly weighed all the important factors and acted accordingly— and that we know how we came to those decisions. But we are aware of only our conscious influences, and so have only partial information. As a result, our view of ourselves and our motivations, and of society, is like a jigsaw puzzle with most of the pieces missing. We fill in blanks and make guesses, but the truth about us is far more complex and subtle than that which can be understood as the straightforward calculation of conscious and rational minds.


The Three Master Variables of Neuromarketing Research
Each of these variables receives a more thorough treatment in Chapter 6, “The Central Role of Emotions in Consumer Response.” This section summarizes those discussions.

*Selective attention implies a selection among possible conscious events. When we make an attentional selection, we expect to become conscious of what we’ve chosen to experience.*


### Chapter 6. The Central Role of Emotions in Consumer Response


**Understanding Nonconscious Emotional "Markers"**

**94: Consumers short on time, bombarded by information, and faced with barely distinguishable product alternatives rely on easily accessible emotional reactions to make shopping decisions.** See Bradford, “Trademark dilution and emotion”, p. 28:

> Humans have limited cognitive resources and so allocate them judiciously. In this respect, people have been described as “cognitive misers” who will expend only the effort required to make a satisfactory, rather than optimal, decision. Because emotional responses arise automatically, consumers short on time, motivation, or information often rely on positive or negative “emotional” impulses as the least costly route to making a decision.


> Conscious emotion commands attention and stimulates analysis, learning, and adaptation, often occurring in the aftermath of behavior and its outcomes. It may occasionally have a direct effect on behavior (for good or ill), but directly driving behavior is not its main function.


Emotions and Attention

99: It isn’t possible to pay attention without being aware that you’re paying attention. See Kahneman, Thinking, Fast and Slow, pp. 23-24:

> The often-used phrase “pay attention” is apt: you dispose of a limited budget of attention that you can allocate to activities, and if you try to go beyond your budget, you will fail. It is the mark of effortful activities that they interfere with each other, which is why it is difficult or impossible to conduct several at once.


100: Research shows that our brains respond quite similarly to things that are truly familiar and things that are mistaken to be familiar. Winkielman, Piotr, et al. "The hedonic marking of processing fluency: Implications for evaluative judgment." The psychology of evaluation: Affective processes in cognition and emotion (2003): 189-217.


Emotions and Memory


103: Memories are like photos stored on a computer hard disk. Full quote from Mlodinow, Subliminal, pp. 66-67:

Our process of remembering can be said to be analogous to the way computers store images, except that our memories have the added complexity that the memory data we store changes over time ... . In computers, to save storage space, images are often highly “compressed,” meaning that only certain key attributes of the original image are kept; this technique can reduce the file size from megabytes to kilobytes. When the image is viewed, the computer predicts, from the limited information in the compressed file, what the original image looked like. If we view a small “thumbnail”-sized image made from a highly compressed data file, it usually looks very much like the original. But if we blow the image up, if we look closely at the details, we see many errors—blocks and bands of solid color where the software guessed wrong and the missing details were incorrectly filled in.

103: In psychology labs, scientists have successfully induced almost any kind of false memory in their unsuspecting experimental subjects. The “Bugs Bunny at Disneyland” study is reported in Braun, Kathryn A., Rhiannon Ellis, and Elizabeth F. Loftus. "Make my memory: How advertising can change our memories of the past." Psychology & Marketing 19.1 (2002): 1-23.

104: Human memory didn't evolve for perfect remembering; it evolved for acting and surviving in an uncertain world. See Mlodinow, Subliminal, p. 63:

Though human memory is subject to the distortion of memory reconstruction, if those subliminal distortions had proved seriously detrimental to our ancestors’ survival, our memory system, or perhaps our species, would not have survived. Though our memory system is far from perfect, it is, in most situations, exactly what evolution requires: it is good enough. In fact, in the big picture, human memory is wonderfully efficient and accurate — sufficient to have enabled our ancestors to generally recognize the creatures they should avoid and those they should hunt down, where the best trout streams are, and the safest way back to camp.

Chapter 7. New Understandings of Consumer Goals and Motivation

Looking at How Goals Drive Us

105: A goal is something you want to achieve plus some kind of plan you have for getting there. "Goals can be conceptualized as mental representations of desired end-states that include the means through which to attain those states." Bargh, John A., and Ezequiel Morsella. "Unconscious behavioral guidance systems." Then a miracle occurs: focusing on behavior in social psychological theory and research. Oxford University Press, New York (2009): 89-118.

106: The emergence of a new science of motivation over the last two decades. See Shah, James Y., and Wendy L. Gardner, eds. Handbook of motivation science. Guilford Press,
2008; Moskowitz, Gordon B., and Heidi Grant, eds. The psychology of goals. Guilford Press, 2009

106: These scientists and their colleagues have shown that goals can be activated, pursued, and even achieved, completely outside our conscious awareness. See Bargh, John A., et al. "The automated will: nonconscious activation and pursuit of behavioral goals." Journal of personality and social psychology 81.6 (2001): 1014.

106: The parts of the brain that get activated when we consciously monitor and control our pursuit of goals is different from the parts that actually run the goal pursuit “program” itself. See Bargh and Morsella, “Unconscious behavioral guidance systems”:

That a goal can operate independently of conscious awareness of its operation implies the existence of a dissociation between the executive control structures in the brain responsible for ‘running’ that goal’s ‘program’ and those that enable conscious awareness of the goal pursuit. Recent cognitive neuroscience research has confirmed that distinct anatomical structures support the operating goal program, on the one hand, and the knowledge of its operation (i.e., consciously-held intentions) on the other. As one review concluded, aspects of the processing of conscious intentions appear to be represented in the prefrontal and premotor cortex, but it is the parietal cortex that houses the representation used to guide action.


107: The most surprising finding from nonconscious goal research is that we pursue nonconscious goals with exactly the same set of accompanying behaviors that are observed in conscious goal pursuit. See Chartrand, Tanya L., and John A. Bargh. "Automatic activation of impression formation and memorization goals: Nonconscious goal priming reproduces effects of explicit task instructions." Journal of Personality and Social Psychology 71.3 (1996): 464.

Preferences and feelings are unconscious guides to appropriate behavior. A tight connection between immediate, unconscious evaluation and appropriate (approach versus avoidance) actional tendencies is found throughout the animal kingdom; even single-celled paramecia have them (Schneirla, 1959). These “guides” do not arise out of thin air, however. Our present preferences are derived from those that served adaptive ends in the past. Knowledge gained at a lower level of blind selection, the short-cuts and other “good tricks” (Dennett, 1995) that consistently worked over our long-term evolutionary past, are fed upwards as a starting point—appearing as a priori knowledge, the source of which we are unaware. Campbell (1974) called these “shortcut processes” because they save us from having to figure out, each of us individually from scratch, what are the good and helpful things and which are the dangerous.

109-110: Researchers have identified several types of primes that appear to be particularly good at triggering goal pursuit in natural settings. References for each of these examples can be found in Chartrand, Tanya L., Amy N. Dalton, and Ciara Michelle Cheng. "The antecedents and consequences of nonconscious goal pursuit." Handbook of motivation science (2007): 342-355.

Having Goals We’re Not Aware Of


115: Studies show that when you fail to achieve a goal you didn’t even know you were pursuing, you feel bad. Chartrand, Tanya L. "Mystery moods and perplexing performance: Consequences of succeeding and failing at a nonconscious goal." Manuscript submitted for publication (2001); Leander, N. P., S. G. Moore, and T. L. Chartrand. "Mystery moods: Their origins and consequences." The psychology of goals (2009): 480-504.

Consumer Motivation, Goal Seeking, and Goal Attainment

116: Approach and avoidance are the two directions of the motivational dimension of emotion. For an introduction to the vast literature on approach and avoidance in motivated action, see Harmon-Jones, Eddie, and Philip A. Gable. "Incorporating motivational intensity and direction into the study of emotions: Implications for brain mechanisms of emotion and


116: A recent shopping study by neuromarketing vendor Sands Research. This research has not been published in a peer-reviewed journal, but a detailed account has been presented by Steve Sands in several forums, including the 2012 NMSBA World Conference in Amsterdam, The Netherlands: [http://bit.ly/188k5Yo](http://bit.ly/188k5Yo). The study is also described here: [http://bit.ly/1adoQ0o](http://bit.ly/1adoQ0o).

116: This finding, which replicates similar results in academic research, illustrates how quickly and how strongly nonconscious forces can motivate a consumer toward a decision. Milosavljevic, Mili, Christof Koch, and Antonio Rangel. "Consumers can make decisions in as little as a third of a second." *Judgment and Decision Making* 6.6 (2011): 520-530


Chapter 8. Why We Buy the Things We Buy

How People Make Decisions

120: But much of the time, consumers don’t act rationally and logically. This is a key premise of the whole behavioral economics tradition. Among the earliest observers of the discrepancy between rational actor expectations and actual economic behavior was Herbert Simon, who introduced the idea of “satisficing” as an alternative to rational calculation. See Simon, Herbert A. "Theories of bounded rationality." *Decision and organization* 1 (1972): 161-176;


A defining property of intuitive thoughts is that they come to mind spontaneously, like percepts. The technical term for the ease with which mental contents come to mind is accessibility (E. Tory Higgins, 1996). To understand intuition, we must understand why some thoughts are accessible and others are not. (p. 1452)

Highly accessible features will influence decisions, while features of low accessibility will be largely ignored. (p. 1459)

121: Effortlessness and natural assessments. According to Kahneman, “natural assessments” are routinely evaluated as part of perception and comprehension (impression formation and meaning determination in the language of our simple model of cognition) and are therefore always accessible. Kahneman, Daniel, and Shane Frederick. "Representativeness revisited: Attribute substitution in intuitive judgment." Heuristics and biases: The psychology of intuitive judgment (2002): 49-81:

Some attributes are permanent candidates for the heuristic role because they are routinely evaluated as part of perception and comprehension, and therefore always accessible (Tversky and Kahneman, 1983). These natural assessments include physical properties such as size and distance, and more abstract properties such as similarity (e.g., Tversky and Kahneman, 1983), cognitive fluency in perception and memory (e.g., Jacoby and Dallas, 1991; Schwarz and Vaughn, Chapter 5 this volume; Tversky and Kahneman, 1973), causal propensity (Kahneman and Varey, 1990; Heider, 1944; Michotte, 1963), surprisingsness (Kahneman and Miller, 1986), affective valence (e.g., Bargh, 1997; Cacioppo, Priester, and Berntson, 1993; Kahneman, Ritov and Schkade, 1999; Slovic et al., this volume; Zajonc, 1980), and mood (Schwarz and Clore, 1983). Other attributes are accessible only if they have been recently evoked or primed (see, e.g, Bargh et al., 1986; Higgins and Brendl, 1995).


> System 1 does not keep track of alternatives that it rejects, or even of the fact that there were alternatives. Conscious doubt is not in the repertoire of System 1; it requires maintaining incompatible interpretations in mind at the same time, which demands mental effort. Uncertainty and doubt are the domain of System 2. (p. 80)

122: **An important quality of System 2 processes is that they’re single-threaded.** See Kahneman, Daniel. *Thinking, Fast and Slow* (p. 451):

> Attempting to perform several tasks at once may run into difficulties of several kinds. For example, it is physically impossible to say two different things at exactly the same time, and it may be easier to combine an auditory and a visual task than to combine two visual or two auditory tasks. ... With practice, people’s ability to multitask in specific ways may improve. However, the wide variety of very different tasks that interfere with each other supports the existence of a general resource of attention or effort that is necessary in many tasks.


> In the particular dual-process model we assume, system 1 quickly proposes intuitive answers to judgment problems as they arise, and system 2 monitors the quality of these proposals, which it may endorse, correct, or override. The judgments that are eventually expressed are called intuitive if they retain the hypothesized initial proposal with little modification. (pp. 267-268)

123: **Two types of implicit decisions are discussed in the academic literature on choices and behavior.** This dichotomy is based on the discussion in Chartrand, Tanya L. "The role of conscious awareness in consumer behavior." *Journal of Consumer Psychology* 15.3 (2005): 203-210. Chartrand uses this simple model to talk about different types of automaticity (nonconscious influences) in consumer decision making:

![Figure 1: Model of Automatic Processes.](image-url)
Essentially all consumer decisions involve lack of awareness of intervening automatic processes (B). Reflexive implicit decisions also involve lack of awareness of the outcome (C), which is unlikely when the outcome is a product purchase. Intuitive implicit decisions involve awareness of the outcome (C), but the consumer may be unaware of both the environmental features influencing their decision (A) as well as the intervening automatic processes (B).


125: In the traditional rational consumer model, emotions and intuition are often viewed as obstacles to making rational decisions. The historical roots of this approach are found in the “Irrational Weigher” view in advertising research, which argued that emotional advertising manipulated consumers into overvaluing branded goods. See Brown Jr, Ralph S. "Advertising and the Public Interest: Legal Protection of Trade Symbols." Yale LJ 57 (1947): 1165. Today, this view is enshrined in the beliefs of consumer advocacy groups who view advertising as using emotions to lead consumers astray. An example is Ralph Nader’s Consumer Alter group, http://bit.ly/Quie6.

Why Consumer Decisions Aren’t Rational


127-128: Examples of judgment heuristics:


- **Framing.** This effect is particularly relevant in the political realm. See Schaffner, Brian F., and Patrick J. Sellers, eds. Winning with words: the origins and impact of political framing. Routledge, 2009.


**The Limits of Persuasive Messaging in Consumer Decision Making**


132: Brain science research paints a picture of priming (not attention) as the primary mechanism by which advertising influences us. For a specific example, see Harris, Jennifer L., John A. Bargh, and Kelly D. Brownell. "Priming effects of television food advertising on eating behavior." *Health Psychology* 28.4 (2009): 404:

> Advertising for food and beverages communicates potentially powerful food consumption cues, including images of attractive models eating, snacking at nonmeal times, and positive emotions linked to food consumption .... We propose that the messages presented in TV food advertising similarly have the power to act as real-world primes and lead to corresponding eating behaviors. Given the types of foods and consumption benefits typically promoted in food advertising, what is primed is usually snacking on unhealthy foods and beverages ....

127: Here are some examples using the anchoring heuristic:


- **In pricing.** For a wide-ranging overview see Poundstone, William. *Priceless: The myth of fair value (and how to take advantage of it)*. Macmillan, 2010.

- **Warehouse stores.** Exposure to high priced items at the front of the store can be observed in visits to any Costco. The suggestion that this practice is meant to trigger an anchoring effect is made by Lehrer at [http://bit.ly/RDsNaP](http://bit.ly/RDsNaP).

134: Evidence from hundreds of nonconscious processing experiments supports the conclusion that System 2 override is necessary to counteract the effects of System 1 heuristics. This phenomenon is discussed in detail in Kahneman, Daniel, and Shane Frederick. "Representativeness revisited: Attribute substitution in intuitive judgment." *Heuristics and biases: The psychology of intuitive judgment* (2002): 49-81, especially in “Section 2: The Supervision of Intuitive Judgments:”

> although priming typically increases the weight of that variable on judgment (a system 1 effect), this does not occur if the prime is a sufficiently explicit reminder that brings the self-critical operations of system 2 into play. (p. 273)


Part III. Neuromarketing in Action

Chapter 9. Brands on the Brain

Brands Are About Connections


142: Brand equity is the value a company realizes from a product with a memorable brand name and positive, strong brand associations. See Aaker, David A. Managing brand equity. SimonandSchuster.com, 2009. In the indirect route to advertising effectiveness model described in Chapter 11, increasing brand equity is the primary aim of advertising. See

The collection of brand memories can be described as what marketing researchers have labelled 'brand equity' – the asset created by good marketing. This is to a large extent what consumers have in their heads about the brand (Aaker 1991, 1996; Keller 1993). Keller and Lehmann (2003, p. 28) define brand memories as 'everything that exists in the minds of customers with respect to a brand (e.g. thoughts, feelings, experiences, images, perceptions, beliefs, and attitudes). This mindset influences consumers’ purchasing decisions and, across a broad group of customers, it affects the market performance of the company. (p. 153)


**How Brands Impact Our Brains**


145: Changing their terminology just a bit. Ariely and Norton use the term “fit” rather than values for the fourth category. We thought *values* (what one is fitting to) was a little easier to understand.


Brain science research provides us with a number of guidelines that can be used to optimize the chances that a conditioned learning process is occurring. These examples are based on Steidl, Peter. *Neurobranding*. CreateSpace, 2012.

**Why Leading Brands Are So Hard to Displace**


For leading brands, a top goal is to encourage habitual buying and avoid doing anything that may disrupt established buying habits that favor the leading brand. The four bulleted strategies are derived from Steidl, Peter. *Neurobranding*. CreateSpace, 2012.


An example is provided in the dog food category. The “We’re for Dogs” campaign is analyzed in Steidl, *Neurobranding*, pp. 71-73:

At a time when brands were primarily competing at the product level by offering additional vitamins or minerals, larger chunks, or flavors and textures that dogs prefer, and so forth, Pedigree launched the ‘We’re for Dogs’ campaign, a very simple proposition packaged up in a beautiful and often touching campaign.

Later extensions brought us a program that aimed at getting homeless dogs adopted, refreshing the positioning and giving it new credibility. In this case, Pedigree lifted the brand from competing at the product level to competing at the level of ‘love and belonging,’ as shown in Maslow’s pyramid. (p. 74)

**Using Neuromarketing to Test Brands**

Most brand-equity measures depend in large part on accounting metrics such as market share, relative price, and lifetime customer value. See Keller, Kevin Lane, M. G. Parameswaran, and Isaac Jacob. *Strategic brand management: Building, measuring, and managing brand equity*. Pearson Education India, 2011.


Neuroscientists have found that relative activation of certain brain-wave frequencies in the left and right frontal areas of the brain are reliable indicators of approach and avoidance motivation. Harmon-Jones, Eddie, and Philip A. Gable. "Incorporating motivational intensity and direction into the study of emotions: Implications for

**Chapter 10. Creating Products and Packages That Please Consumers’ Brains**

*How New Products Get Noticed*


In deference to this tradeoff, many product designers subscribe to the MAYA Principle – Most Advanced Yet Acceptable – to identify aesthetically optimal design alternatives. The principle is attributed to Raymond Loewy, American industrial designer.

158: **Figure 10-1: the spectrum from novelty to familiarity.** This graphic represents relationships hypothesized by the authors, not presented or tested in any specific research study.


160: **Marketers use the term learned codes to describe these associations.** Steidl, Peter. *Neurobranding*. CreateSpace, 2012, pp. 94-96.

161: **Research has shown that consumers even prefer to have meaningless categories (such as A, B, and C) than no categories at all.** Mogilner, Cassie, Tamar Rudnick, and Sheena S. Iyengar. "The mere categorization effect: How the presence of categories increases choosers' perceptions of assortment variety and outcome satisfaction." *Journal of Consumer Research* 35.2 (2008): 202-215.

161: **Research suggests that consumers’ implicit reactions to the category in which a product resides can impact their emotional response to the product itself.** Coupey,


161: The connections that get accessed automatically by our nonconscious brains are not governed by logical if-then rules; they emerge from unexamined associations and attributions that we might find laughable if we evaluated them consciously. These attributions are thus often misattributions. See, for example, Coulter, Keith S., and Patricia A. Norberg. "The effects of physical distance between regular and sale prices on numerical difference perceptions." *Journal of Consumer Psychology* 19.2 (2009): 144-157. As summarized in Kahneman, *Thinking, Fast and Slow*, p. 80:

System 1 is not prone to doubt. It suppresses ambiguity and spontaneously constructs stories that are as coherent as possible. Unless the message is immediately negated, the associations that it evokes will spread as if the message were true. System 2 is capable of doubt, because it can maintain incompatible possibilities at the same time.


**Neurodesign of Everyday Things**


165: Researchers at Harvard Medical School showed that humans have an innate preference for curved objects compared to pointy objects. Bar, Moshe, and Maital Neta. "Humans prefer curved visual objects." *Psychological science* 17.8 (2006): 645-648.

165-166: A series of studies led by **Rolf Reber, Norbert Schwartz, and Piotr Winkielman.** Reber, Rolf, Norbert Schwarz, and Piotr Winkielman. "Processing fluency and aesthetic pleasure: is beauty in the perceiver’s processing experience?." *Personality and social


166: Repeated exposure and the mere exposure effect. See Reber, Schwarz, and Winkielman, “Processing fluency and aesthetic pleasure”, p. 9:

Previously seen stimuli differ from novel stimuli with regard to at least three fluency-related parameters. First, familiar stimuli are processed faster than novel stimuli .... Second, familiar stimuli elicit less attentional orienting than novel stimuli .... Third, familiar stimuli have more organized processing dynamics than novel stimuli .... Based on such findings, several researchers suggested that perceptual fluency is central to the mere exposure effect and provided evidence consistent with this account ....


Neuromarketing and New Product Innovation

169: More than 80 percent of new products fail. Failure rates vary dramatically from product category to category, but overall, failure rates remain unacceptably high. For early efforts to check the statistics, see Crawford, C. Merle. "Marketing research and the new product failure


**Using Neuromarketing to Test Product and Package Designs**


174: Researchers have found, for example, that people will scan a package much differently when asked “How attractive is this package?” than when asked “How likely would you be to buy this product?” Observed in eye-tracking results in client research conducted at Lucid Systems, Inc., a neuromarketing research firm, in 2008-2009.


**Chapter 11. Advertising Effectiveness**

**Two Views of How Advertising Works**

176: **Direct vs. indirect routes to advertising effectiveness.** The indirect route model (also called the two-stage view of advertising) is examined from a neuroscience perspective in Plassmann, Hilke, et al. "What can advertisers learn from neuroscience?." *International Journal of Advertising: The Quarterly Review of Marketing Communications* (2007).

177: **Numerous studies have shown that the direct path can work, and does work, in a wide variety of circumstances.** Vakratsas, Demetrios, and Tim Ambler. "How advertising works: what do we really know?." *The Journal of Marketing* (1999): 26-43. Based on an extensive literature review, Vakratsas and Ambler conclude that “cognition” (aka rational, informational) variables are more important for “high involvement” goods, that is, goods a consumer is motivated to pay attention to.

177: **People pay little attention to most TV advertising.** This finding is discussed in detail in Heath, Robert. *Seducing the subconscious: The psychology of emotional influence in advertising.* Wiley. com, 2012:

> As early as the 1980s it had been shown that between 20% and 40% of us were leaving the room when an ad breaks came on (Soley 1984) and by the 1990s two-thirds were doing some other activity when watching television (Clancey 1994). By 1994, half of us actively disliked TV advertising (Mittal 1994), and nowadays almost everyone fast-forwards through the ads in previously recorded material (Goetzel 2006). We may love watching TV programs, and even love watching TV programs about ads, but we much prefer chatting to the family, making tea, checking our e-mails, and petting the dog to watching the real thing. (p. 40)


177: **Some issues with the direct-route model:**


Driving the Direct Route to Advertising Effectiveness


182: Our default response to any ad that grabs our attention is just as likely to be negative as positive. According to Friestad and Wright's influential persuasion knowledge model, consumers maintain a mental schema regarding marketers’ persuasion attempts. When consumers are confronted with what they believe to be a marketing attempt, they process the information differently than if they did not recognize the attempt as persuasive: they scrutinize it more carefully, argue with the message, and effectively change the meaning of the message. Friestad, Marian, and Peter Wright. "The persuasion knowledge model: How people cope with persuasion attempts." Journal of consumer research (1994): 1-31; McCarty, John A. "Product placement: The nature of the practice and potential avenues of inquiry." The psychology of entertainment media: Blurring the lines between entertainment and persuasion (2004): 45-61; Lowrey, Tina M., L. J. Shrum, and John A. McCarty. "The future of television advertising." Marketing communication: New approaches, technologies, and styles (2005): 113-132.


At the moment, advertising research focuses mostly on what can be directly verified. Awareness and recall can be verified by asking the respondent to confirm what they have learned. But, on another level, it is patently the case that people also learn and are influenced by things they forget, possibly in toto to a greater extent than things they remember. So research has to stop focusing on what people remember and start focusing on how they behave. Increased preference for or favourability towards brands is, after all, what advertising’s true objective is, not recall. (p. 52)

183: A large body of studies, by both academics and practitioners, has found very little relationship between ad recall and sales or market share. Relevant research is reviewed in Heath and Feldwick, "Fifty years using the wrong model of advertising." For an alternative view, see Mehta, Abhilasha, and Scott C. Purvis. "Reconsidering recall and emotion in advertising." Journal of Advertising Research 46.1 (2006): 49.

Taking the Indirect Route to Advertising Effectiveness


Using Neuromarketing to Test Advertising

187: Eye tracking: fixations per second (fps) has been found to be sensitive to cognitive load. See Kahneman, Thinking, Fast and Slow, Chapter 2, “Attention and Effort”; Rayner, Keith. "Eye movements in reading and information processing: 20 years of research." Psychological bulletin 124.3 (1998): 372.


188: Three techniques are commonly used by neuromarketers to measure emotional responses to advertising. These techniques are discussed in more detail in Chapters 16 and 17.
Chapter 12. The Shopping Brain and In-Store Marketing

Understanding the Mind of the Shopper

191: The human brain is, in many ways, optimized by evolution to be good at navigating through space to acquire objects in its environment. Kruger, Daniel, and Dreyson Byker. "Evolved foraging psychology underlies sex differences in shopping experiences and behaviors." *Journal of Social, Evolutionary, and Cultural Psychology* 3.4 (2009): 315-327. From the abstract:

> Compared to men, women relied more on object oriented navigation strategies and scored higher on skills and behaviors associated with gathering, the degree to which shopping is seen as recreational, the degree to which shopping is a social activity, and the tendency to see new locations as opportunities for shopping. Men scored higher on skills and behaviors thought to be associated with hunting. Most effect sizes were moderate or strong. These results suggest that shopping experiences and behaviors are influenced by sexually divergent adaptations for gathering and hunting.


192-193: Shopping and the five senses:


- **Touch:** The weight, texture, and hardness of touched objects can impact our later judgment, see Ackerman, Joshua M., Christopher C. Nocera, and John A. Bargh. "Incidental haptic sensations influence social judgments and decisions." *Science* 328.5986 (2010): 1712-1715.


195: Neuromarketing opens up the possibility of brain-based segmentation, which might be called neurographic. The term neurographic segmentation is a neologism coined by the authors to describe segmentation based on neural propensities.


**Addendum.** Another trait distinction that could have significant effects on shopping and consumer behavior is rational vs. intuitive thinking styles. See Witteman, Cilia, et al. "Assessing rational and intuitive thinking styles." *European Journal of Psychological Assessment* 25.1 (2009): 39-47.

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Making Stores More Brain-Friendly

197: Finding, choosing, paying. This model was created by the authors.

198: Shopping researchers provide a number of ways to track consumers moving through a store. A shopper tracking system using cell phones, called Footpath, is available from a company called Path Intelligence and is described in a Wired.com article from November 28, 2011: http://bit.ly/11SnJ71. See also Clifford, Stephanie. “Attention, Shoppers: Store is Tracking Your Cell,” New York Times, July 14, 2013, online at http://nyti.ms/16DewOo.


199-200: Some strategies to simplify choice in a shopping situation:

- **Minimize choice:** Iyengar, Sheena S., and Mark R. Lepper. "When choice is demotivating: Can one desire too much of a good thing?." Journal of personality and social psychology 79.6 (2000): 995.


Using Neuromarketing to Test Shopping Environments

Neuromarketing for Dummies®

References and Notes for Readers


Chapter 13. When Consumers’ Brains Go Online

Going Online: Something New for the Old Brain


There are a number of ways in which hypermedia environments may increase a user's cognitive load.

- Firstly, ... users may need to decide whether or not to follow a link whenever it is encountered in a text.
- Secondly, the mere presence of links, indicated as they are by a variety of visual cues (e.g. a change in font), may impose visual processing demands that are simply not seen in conventional, non-linked textual resources.
- Thirdly, individual nodes in a hypermedia environment, such as the World Wide Web, typically feature a variety of textual and non-textual elements. More often than not, individual pages on the Web are composed of a confusing mish-mash of multi-media components, many of which are semantically unrelated to the main content of the page. Page animations, adverts, sidebars, inline videos, pop-up boxes, image rollovers, complex menu navigation systems and all manner of decorative gee-gaws present the user with a plethora of opportunities for distraction that simply do not exist in the context of a conventional printed book.
- Finally, if the user does decide to follow a link, they are presented with the additional task of integrating information between the source and destination node. In the case where the content of the destination node is semantically-unrelated to the content of the source node, the reader experiences a disruption in narrative continuity that, in all likelihood, increases demands on working memory.
The passive nature of TV viewing was first described and measured by Herbert Krugman in the 1960s and 70s, see Krugman, Herbert E. "Brain wave measures of media involvement." *Journal of Advertising Research* 11.1 (1971): 3-9. More recently, the argument that TV is a passive, low involvement medium has been taken up by Robert Heath, see Heath, Robert, David Brandt, and Agnes Nairn. "Brand relationships: Strengthened by emotion, weakened by attention." *Journal of Advertising Research*, 46.4 (2006): 410.

**Understanding How Online Marketing Is Different**


206: **Search ads remain the most popular form of online advertising.** See eMarketer, “US Digital Ad Spending to Top $37 Billion in 2012 as Market Consolidates,” September 20, 2012, online at http://bit.ly/Qzdegt: “Search continues to be the leading digital ad spending format, although its share will begin to drop this year as the shares of rich media, sponsorships and video increase.”

207: **Guidelines for increasing the persuasive power of landing pages have been developed by web designers.** See Middendorf, Wouter. “Designing Perceptual Persuasion,” Johnny Holland blog, February 22, 2012, http://bit.ly/wzE2go. Maurits Kaptein has proposed targeting online consumers by identifying their preferred persuasion models (e.g., scarcity, reciprocity, authority, etc., based on Cialdini’s six principles of persuasion), and then presenting them with ads using that approach. See Kaptein, Maurits, “Persuasion Profiling: Attending to Individual Differences,” Johnny Holland blog, January 9, 2012, http://bit.ly/zOuHYy; Kaptein,

**Building the Perfect Website**


208: Some companies now provide software that can identify the salient elements of a web page. A recent example is Eye2D2 (http://www.eye2d2.com/). For the science underlying this approach, see Milosavljevic, Milica, and Moran Cerf. "First attention then intention." *International Journal of Advertising* 27.3 (2008): 381-398.


Satisfying (Almost) All Our Needs Online


215: Excessive choice can have several implications for consumer decision making:

How to Use Neuromarketing to Test Online Experiences and Marketing Effectiveness


Chapter 14. Entertainment Effectiveness

Why Our Brains Like Stories


221: Activating our memories of actual experiences as they're reflected in the story helps transport us into this imaginary world. Green, Melanie C., Jennifer Garst, and


222: *A good story carefully lays out an alternating sequence of tension and resolution.* This is a fundamental principle of film editing. See Pearlman, Karen. *Cutting rhythms: Shaping the film edit.* Taylor & Francis US, 2009, especially Chapter 4, “Tension, release, and synchronization.”


**Neuromarketing Goes to the Movies**


226: *There are a number of ways a trailer can activate nonconscious goals.* This list is generated by the authors based on an application of priming and nonconscious goal activation principles (Chapters 5 and 7) to the kinds of associations likely to be triggered by movie trailers.


**Product Placement in Movies, TV Shows, and Beyond**


228: A product placement is more likely to achieve this conversion if three features are present. See Law, Sharmistha, and Kathryn A. Braun-LaTour. "Product placements: How to measure their impact." The psychology of entertainment media: Blurring the lines between entertainment and persuasion (2004): 63-78.


**The Future of Entertainment: Immersive Games and Simulations**

230: 2008, the year worldwide video-game sales first surpassed movie sales. This milestone was reported widely in the media, see http://bit.ly/16innUg and http://bit.ly/1adenQ9.


**Using Neuromarketing to Test Entertainment**


**Part IV. Measuring Consumer Response with Neuromarketing**

**Chapter 15. Traditional Approaches: Why Not Just Ask People?**


**Understanding Why Asking Questions Is Risky Business**


- **Agreeableness bias.** Also called agreement bias or yea-saying bias, this is often seen as a subtype of desirability bias. See Mirowsky, John, and Catherine E. Ross. "Eliminating


- **Misinformation bias.** This is a variant of nonresponse bias, it occurs when people deliberately give false answers to surveys for the purpose of misleading pollsters. It is relatively unexplored in political polling research, most evidence is anecdotal.


- **Emotion (and preference) access bias.** Covered in detail by Kahneman, Thinking, Fast and Slow. The key principle is that accessibility usually biases beliefs about accuracy. Like emotional assessments, preferences are largely constructed at the moment of evaluation, as discussed in Chapter 8. See Lichtenstein, Sarah, and Paul Slovic, eds. The construction of preference. Cambridge University Press, 2006.


Introducing the Three Workhorses of Market Research

241: Interviews, focus groups, and surveys still make up about 90 percent of the research that's performed in the market research industry today. For the distribution of market research methodologies, an excellent source is the GreenBook Research Industry Trends (GRIT) survey, available at http://bit.ly/1cW50xK.


244: Risks and limitations of focus groups. For a general overview, see Morgan, David L. Focus groups as qualitative research. Vol. 16. Sage, 1997. See also Graves, Consumer.ology, esp. Chapter 7, "Understanding the Crowd: Focusing on focus groups."

- Motivated participation. This is a variation of the no opinion or knowledge exposure bias, with the added complication that the focus group participant may feel motivated to express some opinion (any opinion) because that is what is expected in the context provided.
- False leads. This is essentially a mistake of interpretation, not a flaw in the focus group itself. It is a function of taking motivated participation responses and treating them as representative of responses that would occur in a consumer’s “natural habitat.” It occurs when researchers (or observers) forget the generalizability limitations of qualitative research and falsely infer generalizability from accessibility or representativeness, a common System 1 error. From Graves, Consumer.ology, p. 157:
the [focus group] context, whereby a number of consumers are placed together in a room to talk about something, bears little relationship to the environment in which a consumer's response would normally occur. The artificial focus of discussing a consumer issue for a long period is a recipe for distortion and it's all too easy for that focus to miss the point entirely, either because the consumer response isn't determined at this level of mental processing, or simply because the abstract nature of the discussion means that something that seems irrelevant is glossed over.

245: People sincerely believe they’re answering truthfully and accurately, but they are, in fact, providing rationalizations and guesses. Kahneman calls this the tendency to nonconsciously replace a difficult questions with a simpler question. See Kahneman, Daniel, and Shane Frederick. "Representativeness revisited: Attribute substitution in intuitive judgment." Heuristics and biases: The psychology of intuitive judgment (2002): 49-81:

Early research on the representativeness and availability heuristics was guided by a simple and general hypothesis: when confronted with a difficult question people often answer an easier one instead, usually without being aware of the substitution.


Other Ways to Ask Consumers Questions


Mixing and Matching Traditional and Neuromarketing Approaches


Chapter 16. Neuromarketing Measures: Listening to Signals from The Body and The Brain


Understanding Where Neuromarketing Signals Originate


252: Figure 16-2. Neuromarketing measures from the body and the brain. Created by the authors to illustrate the organization of this chapter and Chapter 17.

Capturing Signals from the Body


254: Using images of expressions to guide self-reporting. A good example of this technique is found in Wood, Orlando. "Using faces; measuring emotional engagement for early stage creative." European Society for Opinion and Marketing Research (2007).


258: **Response time studies.** References for the three main types of response time measures are covered in Chapter 17.

**Capturing Signals from the Brain**


262: **Positron emission tomography (PET).** PET studies, due to their cost and invasive nature, are extremely rare in market research. See Kenning, Peter, Hilke Plassmann, and Dieter Ahlert. "Applications of functional magnetic resonance imaging for market research." *Qualitative Market Research: An International Journal* 10.2 (2007): 135-152.


**Putting Technologies in Their Proper Place**


**Chapter 17. Neuromarketing on a Budget: Inexpensive Ways to Learn From Your Customers**

**Running Response-Time Studies**


References and Notes for Readers


272: Example IAT studies:


Leveraging Online Services to Tap Into the Wisdom of Crowds

275: **Online eye tracking.** There are not many academic articles yet on online (webcam-based) eye tracking. For one example, see Ferhat, Onur. "Eye-Tracking with Webcam-Based Setups: Implementation of a Real-Time System and an Analysis of Factors Affecting Performance." One interesting discussion of current limitations vs. lab-based eye tracking can be found at http://bit.ly/15kk1HK (be sure to read the comments).


**Gamification.** We are not aware of any peer-reviewed studies that incorporate gamification into online or lab-based neuromarketing experimentation. The focus of gamification in market research to date has largely been on adding game-like elements to online surveys and choice studies. See Puleston, Jon. "Online Research–Game On!: A look at how gaming techniques can transform your online research." Shifting the Boundaries of Research(2011): 20;


**Conducting Do-It-Yourself Behavioral Experiments**


280: Examples of behavioral experiments:


- **Testing choice overload.** Referenced jam choice study is Iyengar, Sheena S., and Mark R. Lepper. "When choice is demotivating: Can one desire too much of a good thing?." *Journal of personality and social psychology* 79.6 (2000): 995.

- **Testing the effect of scent in the air.** Brainjuicer experiment is described in a webinar presentation at http://bit.ly/1e19Cl7.


- **Testing product bundling.** Referenced experiment in found in Barden, Phil. *Decoded: The Science Behind why We Buy*. John Wiley & Sons, 2013, p. 120, original source,

281: **Testing behavioral economics principles.** Experiments testing these principles are included in references to Chapter 8, “Judgment heuristics: the way we’re wired,” above. Page reference in N4D is p. 127.

**Balancing Costs and Benefits in Neuromarketing Studies**

No references for this section.

**Chapter 18. Picking the Right Approach for Your Research Needs**

**Summarizing What You Can Measure with Neuromarketing**

286: **Neuromarketing variables.** Good overall summaries for each variable are:

Matching Neuromarketing Approaches to Research Questions

290-292: For references for each of the approaches and methodologies listed, see:

- Behavioral response-time studies. See references for Chapter 17.
- Eye tracking. See references for Chapter 17.
- Behavioral experiments. See references for Chapter 17.
- Biometrics. See references for Chapter 16.
- Electroencephalography (EEG). See references for Chapter 16.
- Functional magnetic resonance imaging: See references for Chapter 16.

Integrating Neuromarketing and Traditional Research Approaches

294: Figure 18-1: The consumer cycle: marketing, shopping, consuming. This conceptual model was developed by the authors and is © 2013 Intuitive Consumer Insights LLC. All rights reserved.

296: Leading companies are just beginning to think about their research efforts in this holistic way. These efforts are generally not publicized due to confidentiality requirements. One example that has appeared in the press is the Disney research facility in Austin, TX. See Barnes, Brooks. “Lab Watches Web Surfers to See Which Ads Work,” New York Times, July 26, 2009, available online at http://nyti.ms/1a1UGAv.

Part V. Living with Neuromarketing: Practical and Ethical Considerations

Chapter 19. Five Things You Need to Know about Neuromarketing Studies and Measures

Experimental Design: Identifying How Good Experiments Work

300-303: Experimental design. The primary source for this section is the excellent text by Cobb, George W. Introduction to Design and Analysis of Experiments, Springer-Verlag (1998). See also Kirk, Roger E. Experimental design. John Wiley & Sons, Inc., 1982; Quinn, G. Gerald Peter, and Michael J. Keough. Experimental design and data analysis for biologists. Cambridge University Press, 2002; Sytsma, Sid, “The basics of experimental design [a quick and non-technical guide], online at http://bit.ly/14UdC3n. Reviewing the most often cited studies in a given methodological area (fMRI, EEG, EMG, etc.) is often a good way to identify experimental design best practices.

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302-303: Error due to chance vs. error due to bias. See the discussion in Cobb, Introduction to Design and Analysis of Experiments, Chapter 1, “Three sources of variability: One we want and two we don’t,” pp. 4-6, and “Chance error and bias compared,” pp. 11-13.


Measurement Theory: Understanding Validity and Reliability


305: Measuring reliability. The terms external validity are predictive validity are often used as synonyms for reliability. For tradeoffs between internal and external validity in different types of studies, see Roe, Brian E., and David R. Just. "Internal and external validity in economics research: Tradeoffs between experiments, field experiments, natural experiments, and field data." American Journal of Agricultural Economics 91.5 (2009): 1266-1271.

305: Figure 19-2: Validity, reliability, and generalizability. The “target” metaphor for the interaction of these concepts is commonly used. We adapted this figure from the Wikipedia article
305-306: The Holy Grail of measurement theory is **generalizability**. Using the “target” metaphor, we use the term **generalizability** to describe the result when a metric is both valid and reliable. Generalizability has also been defined as **dependability**. The classic study is Cronbach, Lee Joseph. *The dependability of behavioral measurements: Theory of generalizability for scores and profiles*. John Wiley & Sons, 1972. See also Webb, Noreen M. *Generalizability theory: A primer*. Sage, 1991; Austin, Jon R., Judy A. Siguaw, and Anna S. Mattila. "A re-examination of the generalizability of the Aaker brand personality measurement framework." *Journal of Strategic Marketing* 11.2 (2003): 77-92.

**Reverse Inference: Connecting Brain Measures to States of Mind**


**Statistical Significance: Knowing When to Believe the Results**

310-313: The statistics discussed in this section, with the exception of Bayesian statistics, are rudimentary and covered in appropriate detail in any introductory Statistics text or college course. Our discussion here is meant only to point out some basic examples of common-sense statistics that, surprisingly, some neuromarketing vendors still ignore.


**313: Bayesian inference and decision making (sidebar).** This is one of the most common illustrations of Bayesian inference. This specific example is taken from Poldrack, Russell A. "Can cognitive processes be inferred from neuroimaging data?." *Trends in cognitive sciences* 10.2 (2006): 59-63.

**313: Bayes rule.** We did not include the formula for Bayes Rule in the sidebar example, but it is both intuitive and mathematically simple. See the Wikipedia article, "Bayes theorem," online at [http://bit.ly/18p5WEU](http://bit.ly/18p5WEU).

**Normative Data: Linking Findings to the Real World**

**314: Normalized (or standardized) data.** Also called *standard scores*. The most common form of standardization is the *z*-score, computed for each observation in a sample as the raw score minus the mean of the total sample, divided by the standard deviation of the sample. A simpler form of standardization is the *percentile ranking*, which ranks a score relative to all other scores collected across multiple experiments or measurements. Normalized scores have nothing to say about *construct validity*, the extent to which a metric accurately reflects a theoretical construct of interest.


**314: Normative database.** For an example of a normative database used to validate a research vendor’s metrics (not a neuromarketing vendor, unfortunately), see Blair, Margaret H., and Allan R. Kuse. "Better practices in advertising can change a cost of doing business to wise investments

Chapter 20. A Pre-Flight Checklist for Successful Neuromarketing Studies

What Are Your Business Objectives for This Study?

317: Here’s an ironic scenario that happens too often in neuromarketing. Strictly hypothetical, of course.

319: Here are some questions to help identify strong business objectives for your neuromarketing study. These questions are derived from the collective experience of the authors and the fellow neuromarketers with whom we share war stories.

What Hypothesis Are You Testing and What’s the Best Test to Use?

319-320: The absence of a hypothesis is probably the number-one cause of client dissatisfaction with neuromarketing research. Based on the authors’ experience.

320-321: Package design example. Strictly hypothetical.

321: Defining the right test to evaluate a particular hypothesis can drill down into very detailed issues quite quickly. These questions are based on the material in earlier sections of this book.

- **Aspects of the consumer experience.** From the six application areas in Part III.
- **Mental processes.** From the list in Chapter 18.
- **Attributes of the material being tested.** From the cognitive processes discussed in Part II.

Are You Testing the Right Materials?

322: Comparing visual stimuli at different resolutions introduces serious potential distortions into a neuromarketing test. This is one of the key findings of processing fluency research. Degrading the resolution of images and written text, even at consciously undetectable levels, can produce significant processing fluency effects. See Sansom-Daly, Ursula M., and Joseph P. Forgas. "Do blurred faces magnify priming effects? The interactive effects of perceptual fluency and priming on impression formation." *Social Cognition* 28.5 (2010): 630-640; Winkielman, Piotr, et al. "Affective and Cognitive Consequences of Visual Fluency: When Seeing is Easy on the Mind." *Visual Persuasion* (2000).

322: Balancing what varies between the stimuli being compared against what is controlled or held constant. This is an application of the second *rule of thumb* for designing good experiments (Chapter 19, p. 304), applied to the selection of stimuli for comparison.
323: One of the most common mistakes in neuromarketing studies is to fail to properly align hypotheses with testing materials. Authors' personal observation.

323: Maximizing the inferential power of a test. This hierarchy of inferential power is based on principles of good experimental design and the authors’ experience with neuromarketing study designs.

Are You Sampling from the Right Population?

324: In an experiment, you have to identify your relevant subgroups before you run the study; you can’t construct a new subgroup comparison after the data have been collected. This is a fundamental feature of experimental design, see Cobb, George W. Introduction to Design and Analysis of Experiments. Textbooks in Mathematical Sciences (1998).

324: Here are some subgroup comparisons that can yield interesting and relevant insights in neuromarketing studies:


How Will Your Results Change Your Business Actions?

325: In his book The Power of Intuition. Klein, Gary. The power of intuition: How to use your gut feelings to make better decisions at work. Random House Digital, Inc., 2007. In slight contrast to Klein's advice, we recommend envisioning different results for the hypothesis being tested, not overall failure of the project (the risk of which can be mitigated by following the advice in Chapters 20 and 21).

Don't Pay the Price of a Failure to Communicate

No references for this section, just good sound advice.

Chapter 21. Picking the Right Neuromarketing Partner

Knowing What You Need from a Neuromarketing Partner


Looking At Your Options

332: Strategic research partners vs. transaction service providers. A useful way to look at the business orientation of consulting firms in any field is presented in Maister, David H. Managing the professional service firm. Simon and Schuster, 2007. Maister identifies three basic types of consulting firms:

- **Procedural**: Firms specializing in work for which the solution or approach is well known. Execution is usually delegated to less experienced staff who use pre-established procedures to provide solutions. Also called “helping hands” consultants or (disparagingly) “order takers.” The key to selling this work is its efficiency. It has the greatest leveraging potential of the three models, and so has been the focus of most business growth and adoption by larger firms.

- **Brain**: Firms specializing in work that requires a lot of creativity, utilizing professional expertise (“smarts”) and innovative thinking to solve problems that are hard to specify and may not have been solved before. These firms are usually individual or boutique practices, but larger firms may harbor such practices within their larger set of services.

- **Grey hair**: Firms that also address unique and difficult-to-codify problems, but that emphasize their prior experience and knowledge about the subject matter, rather than raw creative power and innovative thinking.
Among neuromarketing vendors, the larger market research firms are likely to focus on procedural solutions that commoditize neuromarketing deliverables in a manner similar to how they provide traditional research deliverables. While they may claim to have more “strategic” consulting services, those services are often heavily dependent on their more transactional offerings. Scientist-led smaller firms tend to follow the “grey hair” model when they are based on a particular methodology, technology, or expertise associated with a single leader. Firms that follow the “brain” model are just beginning to appear. These firms are often led by a team of scientists with a range of specializations and areas of expertise. They often describe themselves as purveyors of innovative research and technology solutions and platforms that combine neuromarketing elements with other technologies and approaches.

334: After all, anyone with a Rolex and a fancy suit can call himself a consultant. This raises the issue of accreditation or certification, a topic the neuromarketing industry has yet to address, as we note in Chapter 22.

**Neuromarketing Orientations and Specializations**

335-336: Neuromarketing technology specializations. This categorization of neuromarketing vendors is based on the authors’ experience and observations in the industry.

336: Table 21-1. Comparing technology specialists on complexity, turnaround, and cost. These are high level generalizations. Always speak with individual vendors directly to determine where they stand on complexity, turnaround times, and cost.

337: Integrated solution specialists are developing the expertise and breadth of experience to help with this challenge. This is a typo we missed when editing the book. It should say “Integrated solution generalists” rather than “Integrated solution specialists.”

**Questions to Ask a Prospective Neuromarketing Partner**


**Chapter 22. Neuromarketing Ethics, Standards, and Public Policy Implications**

**Doing Neuromarketing Ethically**


345: **In the early days of neuromarketing, some vendors clearly overreached in making claims about what neuromarketing can do.** In some cases, the “early days” were quite recent; see Lindstrom, Martin. "You love your iPhone. Literally." *New York Times* (2011), available here: http://nyti.ms/17vj7WC, and responses by neuroscientists referenced in note to p. 262.


348: **No neuromarketing vendor has yet published a peer-reviewed validation of its metrics based on normative data.** To the best of our knowledge, this is still the case.

348: **Four examples of academic research that validate many of the core assumptions underlying neuromarketing:**


> As you can guess, I am not a proponent of black boxing, particularly not in neuromarketing where we should be able to converge on the same solutions. Quite the contrary. I simply do not understand the need for secrecy among neuromarketing companies. The science is already out there, so why make up new scales? It opens up the possibility of cheating, snake oil production and what is less. Think about the strategic blunders that may be made based on erroneous and unscientific hand waving.

**Moving the Industry toward “Neuro-Standards”**

350: **Early adopters stand in sharp contrast to mainstream buyers who tend to avoid new technologies until they’re proven and adopted by most of their peers.** This view of how new technology is adopted was first identified by Geoffre Moore. See in particular Moore, Geoffrey A. *Crossing the chasm: Marketing and selling disruptive products to mainstream customers*. HarperCollins, 2002 and Moore, Geoffrey A. *Inside the tornado: strategies for developing, leveraging, and surviving hypergrowth markets*. HarperCollins e-books, 2009.


351: **The experts identified several areas where they thought standards could be developed.** A draft of the final report (a final version was not produced) is available here: [http://bit.ly/18HfBph](http://bit.ly/18HfBph).

**Understanding Legal Issues Concerning Neuromarketing**


354: **The more interesting question that neuromarketing has raised in legal circles is whether messages and cues we receive through unconscious means constitute “speech” that should be protected under free speech laws.** See Wilson, R., Jeannie Gaines, and Ronald Paul Hill. "Neuromarketing and consumer free will." *Journal of Consumer Affairs* 42.3 (2008): 389-410; Blitz, Marc. “Neuromarketing, Subliminal Messages and Freedom of Speech” (and associated discussion), *Neuroethics and Law Blog*, May 14, 2009,

*We do not believe that Manchurian customers will be marching down department store aisles any time soon, if ever. Consumers aren’t disembodied brains milling about the Mall of America. They juggle their pocketbooks and contemplate other items they have recently bought. Purchasing is a social activity, and people are social creatures, gauging the foreseeable reaction from a spouse (“You bought what!?”) and often soliciting advice from family, friends, or experts before buying. …*

*In the end, a cacophony of influences impinge on us at once, some cancelling out others, some combining in novel ways, some emanating from within us, some from the external environment, and still others generated by advertisers. Our implicit unconscious processes and overt conscious capacities come together to guide us. (pp. 44-45)*

**Using Neuromarketing to Make Us Healthier and Wiser**


Part VI. The Part of Tens

Chapter 23. Ten Mistaken Beliefs about Neuromarketing

361-369: For extensive references on each of these topics, please refer to the chapters and sections in the main body of the book where they are introduced and discussed. Everything in this chapter is a summary of content presented earlier.

Chapter 24. Ten Scientific Pillars Underlying Neuromarketing

371-378: For extensive references on each of these topics, please refer to the chapters and sections in the main body of the book where they are introduced and discussed. Everything in this chapter is a summary of content presented earlier.