

In Search of the Buy Button

Melanie Wells, 09.01.03

What makes some products irresistible? Neuroscientists are racing to find the answer to that question – and to pass it along to consumer marketers.

It could be a scene from a new age salon. Eight young women squirm under electrode-studded caps in a dark, small room in Greenwich, England. "Relax," intones Nicholas Coomans, a market researcher. "Imagine you are sitting on your own sofa for 20 minutes of TV." Coomans turns off the light and slips into an adjacent room so he can watch as the subjects take in a taped sitcom and six commercials. Coomans and his colleague, cognitive neuroscientist João Neves, aren't watching for facial expressions, body language or verbal feedback. They're interested only in their subjects' brains, which are abuzz with electrical activity, recorded as rows of squiggly lines crawling across the screen of a Dell laptop. The electroencephalograph picks up cognitive functions in 12 different regions of the brain, showing memory recall and the level of attention paid to visual and aural stimuli.

Are the subjects really focusing on pitches for Kit Kat candy, Smirnoff vodka and the Volkswagen Passat? Are they forming emotional attachments to these products? Unlike the people answering questionnaires or participating in focus groups, brain waves don't lie. An activity spike in the left prefrontal cortex--an "approach" response to the image of a Kit Kat chocolate bar--would suggest the subject is attracted to the brand image or message. When the right prefrontal cortex gets jumpy, it indicates, in this experiment, instinctive revulsion to an obnoxious, tongue-wagging character who pops up in a commercial for Carling beer.

When researchers zero in on electrical activity in yet another area, they can tell which parts of commercial messages, if any, are encoded in the experimental subjects' long-term memories. "People who are more likely to purchase a product show significantly higher memory encoding than those who are less likely," explains Richard Silberstein, a neuroscientist with the Brain Sciences Institute at the Swinburne University of Technology in Melbourne, Australia. He developed the headgear used in Greenwich.

Using machines that detect brain tumors and strokes to determine whether pink satin underthings will outsell black ones or if people really like pickles on their hamburgers--could this yield practical results? Some big marketers are sufficiently intrigued to put research money into the idea. Among the companies looking into whether brain signals can supplement or replace traditional tests of consumer response to commercials are General Motors, Ford of Europe, and Camelot, the U.K.'s national lottery operator.

Advertising, for the moment, remains more art than science. Brand marketers have tried appealing to people's emotions as well as to their sense of reason. They've tried guilt, anxiety, envy, fear, humor and suspense. There's no guarantee that they'll hit the mark by decoding synaptic firings and measuring fluctuations in blood flow.

But they can try. Neuroscientists say that by peering inside your head they can tell whether you identify more strongly with J.K. Rowling's Harry Potter, say, than with J.R.R. Tolkien's Frodo. A beverage company can choose one new juice or soda over another based on which flavor trips the brain's reward circuitry. It's conceivable that movies and TV programs will be vetted before their release by brain-imaging companies. A "fascinating" possibility, says William Raduchel, until recently the chief technology officer at AOL Time Warner, who explored using MRI technology for that purpose last fall. "It's a little like mind reading," says Henrik Walter, a neurologist and psychiatrist with the University Clinic of Ulm, Germany, where he conducts brain-imaging work for DaimlerChrysler.

All this is moving toward an elusive goal: to find a "buy button" inside the skull and to test products, packaging and advertising for their ability to activate it. So far, researchers are figuring out which brain states facilitate product recognition and choice; they're related to primal urges like those for power, sex and sustenance. As for brand loyalty, it turns out that memory and emotion play a big role. "In the not-too-distant future, firms will be able to tell precisely if an advertising campaign or product redesign triggers the brain activity and neurochemical release associated with memory and action," predicts James Bailey, professor of organizational behavior at George Washington University.

Folks have been trying for decades to decode what motivates shoppers. Economist and social critic Thorstein Veblen took a crack at it in *The Theory of the Leisure Class*, the 1899 classic that wryly posited the theory of "conspicuous consumption," his phrase for keeping up with the Joneses. In the 1930s George Gallup began polling people and peddling his findings to companies desperate for information about buyers. Twenty years later big ad agencies were tapping psychologists such as Ernest Dichter, founder of the Institute for Motivational Research. Some of Dichter's preachings--among them: that marketers should offer absolution to consumers who indulge in guilty pleasures like smoking cigarettes or eating sweets--seem laughably simple today.

If the fanciful quest hasn't changed, the tools of the trade have. There's eye tracking to monitor what people look at on a page or screen and for how long. Measuring galvanic skin response-- changes in the electrical resistance, that is-- can gauge emotional involvement. "So much of what drives our behavior happens without our awareness, how can business learn what people don't know they know? This is where these tools fit in," says Gerald Zaltman, a professor emeritus at the Harvard Business School and author of *How Customers Think*.

No tool gets more use than the Zamboni-size functional magnetic resonance imaging machine, which takes neural eavesdropping to a new level. The \$2.5 million device uses a large magnet to induce radio signals from chemicals in the brain and thereby monitor blood flow. It differs from the MRI of medical tests in making moving images rather than still ones. Thinking during tasks shows up in color in cross-sectional images, recorded as the subject lies with his head inside the scanner.

There are downsides. One is that the coffinlike confines spook claustrophobes, possibly distorting their reactions to stimuli. The other is that brain imaging is expensive. The moving-image MRI rents for \$1,000 an hour at Emory University in Atlanta; a single experiment, which includes at least 12 subjects, can cost \$50,000.

But much is at stake: \$117 billion was spent last year on advertising in the U.S., not to mention \$6.8 billion on, among other things, focus groups, opinion polling and ad and market tracking (says *Inside Research* newsletter), or the untold sums invested in 22,000 new consumer packaged goods per year.

As companies continue to learn about how our brains work, they will try to stimulate areas involved in preferences, purchasing decisions, even aspirations. Using MRI and other technology, DaimlerChrysler's research center in Ulm is studying the brains of drivers as they interact with cars. Some of that work is to design navigational and warning devices for a safer vehicle. Some is driven by the pure marketing goal of seeing how drivers' brains respond to specific images of autos. Daimler knows, for example, that when people look at the front of a sports car, a part of the brain that responds to faces--in the back of the brain where the cerebrum touches the cerebellum--comes alive. This may happen because the headlights are eyelike. Could the Mini Cooper be such a success partly because its "face" reminds some people of a friendly cartoon character?

You don't need a Ph.D. to put the more mundane aspects of psychomarketing to work. Market Connections International, a small firm in Montclair, N.J., pitches "environment-conditioned marketing" to such clients as Colgate-Palmolive, Kraft Foods and Unilever Group. It distributes product samples to vacationers to create a mental association between the product and having fun. "If you introduce a product to people on vacation when they are in a good mood, and they see that

in a store later--bang!--that comes back to them the way the bell worked with Pavlov's dogs," says Bailey, the professor at George Washington.

Memory plays a critical role in product choice. In a recent shopping study conducted by the Open University in Milton Keynes, U.K. and the London Business School, scientists found that when shoppers are asked to make a choice among common and closely related items in a grocery store-like setting, the areas of the brain involved in memory light up like a July 4th nighttime sky. When buyers choose a brand they really care about, neural activity suggests that they are making an emotional choice based on past experience, says Steven P.R. Rose, a professor of biology and director of brain and behavior research at the university. The study was funded by a supermarket and three other companies Rose won't name.

Companies of all types, among them Kellogg and Procter & Gamble, are more interested than ever in probing emotions. The cereal maker recently hired cognitive psychologist Angela Fratianna Weltman to explore women's conflicting feelings about food. Result: Instead of pitching Special K simply as a low-fat breakfast food, Kellogg is featuring average women caught between polar passions for doughnuts and great-looking legs. P&G has looked into the question of whether consumers harbor secret feelings for, of all things, toilet paper (see *box, p. 70*). Loopy or no, the assumptions are born out of brain research. Neurologist Antonio Damasio, a professor at the University of Iowa College of Medicine, suggests in his book *Descartes' Error* that emotion is critical to effective thinking and decision making. That may explain why offers like 99-cent hamburgers and 0% financing on cars--which appeal strictly to cold common sense--sometimes backfire.

It's not just our own emotions that play a part. Gregory S. Berns, a psychiatrist at Emory, is using brain imaging to demonstrate the effects of peer pressure on individual perception, with the idea of explaining the development of fads, from investment trends to the popularity of Burberry plaids and belly button rings. "There is probably some reward or kick in conforming to a group," says Berns, who believes most buying decisions are driven by the subconscious.

Berns recently put 30 subjects into MRI machines, where he asked them to compare 54 pairs of abstract three-dimensional images and decide if they were alike or different. Throughout the 75-minute test participants were shown responses given by four other subjects, while the MRI machine snapped 1,000 brain images.

This reporter lay down as a guinea pig. While in the scanner she was shown responses of four other subjects to the pairs of objects before seeing them herself, then performed the mental rotation required to evaluate the images. Lemminglike, she usually went along with the majority view, even when it was wrong. Her brain scan shows why: a change in perceptual processing. By

measuring relative degrees of activation in the parietal lobe, an area involved in integrating visual images, and in the prefrontal cortex, where decision making takes place, Berns says, he could determine that the group changed what the reporter perceived.

This experiment is one of a series of studies in the growing field of neuroeconomics, which investigates how people calculate risks and rewards. It is being funded by James Richards, a wealthy Atlantan who says he wants to understand the role of investor emotions in the purchase and sale of securities. The research could ultimately show that the brains of repeatedly successful investors subconsciously detect patterns before others notice them.

Certain products elicit a similar physiological kick, tripping the noodle's reward circuitry. A DaimlerChrysler study in Ulm showed pictures of 66 different cars--22 sports cars, 22 sedans and 22 small cars--to a dozen men, with an average age of 31, as they lay in a scanner. Far more than the other models, sports cars excited areas of the brain associated with reward and reinforcement. Among the sports cars that generated the strongest brain responses: the Ferrari 360 Modena, the BMW Z8 and the upcoming Mercedes SLR.

It's not just that sports cars have a more pleasing shape, says Walter, the psychiatrist with the University Clinic of Ulm who was involved in the study. They trumpet the driver's wealth and social dominance. "A sports car is like a peacock's tail," says Walter, a Honda driver. "Why should a female peacock choose a mate with a very huge tail? Because if you are strong and successful as an animal, you can afford to invest energy in such a useless thing." In other words, as people have known since our Paleolithic forebears carved the first fertility goddesses, sex sells.

Soda has an interesting effect on our heads, too. A century after Coca-Cola took cocaine out of its flagship beverage, neuroscientists are learning that soft drinks still work like the illicit drug--as well as like fat, salt, sugar--on our brains. P. Read Montague, a neuroscientist at Baylor College of Medicine in Houston, has demonstrated that subjects' brains register a preference for Coke or Pepsi that correlates with the product they choose in blind taste tests. (His study is not funded by the cola giants.) The brain of "Subject P" on the monitor in the Human Neuroimaging Lab, for instance, shows he is a Pepsi lover. After he got 35 alternating, but unidentified, squirts of Pepsi and Coca-Cola through a pacifierlike device while he was in a scanner, blood flooded areas of his brain involved in reward and decision making, but primarily after doses of Pepsi. In the neural taste test of 40 subjects, Montague found that kind of response less powerful with Coke.

So why does Coke outsell Pepsi? It has to do with the power of branding. Researchers are starting to decode the neural signature for brand preference. Justine Meaux, a neuroscientist at the privately held BrightHouse Institute for

Thought Sciences in Atlanta, says the medial prefrontal cortex is active when people behold images of things to which they are extremely attached. In a recent BrightHouse Institute study, 30 subjects were put in MRI scanners and viewed images of products, people and activities--rock climbing, President Bush, BMWs and the *National Enquirer*, among them. "Preference has measurable correlates in the brain; you can see it," says Meaux, whose company charges on average \$250,000 for such a study.

If companies can calibrate changes in preferences over time, it may help them engineer more durable brand loyalty. "This stuff is objectively measurable, and there are differences we can use to help guide our decisions in how we market to people," Meaux says. "We can see how we can change our behavior so someone will want to align with us."

Orwellian? Don't worry about it, says Baylor's Montague: "Marketers are already in your underwear drawer." These worries have been around forever. In 1957 Vance Packard's sensationalist bestseller *The Hidden Persuaders* suggested that consumers might be susceptible to "subthreshold" stimulation, such as odors and sounds, that "are just out of the range of conscious awareness." In time the panic over subliminal advertising subsided. But now, sighs Harvard's Zaltman, "There are people who think we can insert ideas into people's thinking." Not so, he says. His brain research, which has attracted business from companies like Coca-Cola, Hallmark and Johnson & Johnson, is aimed at understanding consumer motivation.

Outside of places like North Korea, brainwashing doesn't hold much commercial appeal. But insights into decision making and emotions are ripe for exploitation. Take the prefrontal cortex, an area that plays a key role in levelheaded decision making and long-term goals. It takes years to develop and then starts to lose some of its swagger when we're in our late 50s. That means kids under 12 and older people are more susceptible to urges that come from the amygdala, the emotional hot button in our heads. It responds to threats, emotional communication and sexual imagery--some of the stuff we see or hear in ads and other marketing ploys. The cookies on the low shelf in the grocery store are aimed at the 5-year-old's amygdala; an investment scam is aimed at the amygdala of a retiree. "By understanding the development of the prefrontal cortex, companies can market things in different ways," says Jordan Grafman, chief of the Cognitive Neuroscience Section of the National Institute of Neurological Disorders & Stroke at the National Institutes of Health. "There may be certain combinations of pitches they can use to appeal to the amygdala and prefrontal cortex. Or, if they know the age range of people watching a TV show, they can change a commercial to target them in different ways."

The rational response to the injection of brain waves into Madison Avenue is that it will neither revolutionize marketing nor make us consumer slaves. It will, rather, yield incremental benefits. "The human brain is the most complicated thing in the

universe," says John Van Horn, a research associate professor in psychology and brain sciences at Dartmouth College. "It would be arrogant to say we could stick someone in a machine and understand everything."

(c) 2003 Forbes Inc. All Rights Reserved
For personal use only; may not be distributed.
To request a reprint e-mail reprints@forbes.com.