COVER STORY: SCIENCE AND MARKETING

The Brain Guy wants to get inside your head: Are you paying attention? Are you engaged? Are you remembering what you see?

Advertising's Holy Grail: The latest trend in marketing didn't come from a focus group. Instead, scientists are trying to unlock consumers' deepest desires by peering deep into the brain. What makes a person leap off their couch to buy? Advertising heavyweights - including powerhouse Nielsen - want to know. JENNIFER WELLS writes.

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Bob Knight could be talking about gamma oscillations.

Bob Knight in one of his EEG labs at the University of California at Berkeley.

Or he could be talking about the Gaussian distribution.

At the moment he is talking about focus groups.

Focus groups?

Focus groups.

"Focus groups to me are very dangerous," Dr. Knight says on the phone from his office at the University of California, Berkeley. The professor of neuroscience has spent 30 years embedded in brain research, with an emphasis on how the regions of the frontal lobe control the brain to enable human behaviour.

That is, cognitive behaviour - retention, memory - as well as social and emotional behaviour.

For the purposes of this discussion, Dr. Knight, a seemingly easy-going sort of scientist who is not averse to using the delightful phrase "okey dokey," wouldn't mind being known simply as The Brain Guy.

Four weeks ago, The Brain Guy's name popped into the news when it was announced that **Nielsen Co.,** still the world leader in "audience measurement," had made what it called a "strategic investment" in a theretofore unheard-of California company called **NeuroFocus,** where Dr. Knight additionally serves as chief science adviser and where Dr. A.K. Pradeep, who holds a PhD in engineering, serves as chief executive officer. Together they blend the science side and the business side of an enterprise that uses brainwave analysis to, they assert, unlock the Holy Trinity of advertising. As in:

Are you paying attention?

Are you emotionally engaged?

Have you retained the information that the advertiser is trying to implant in that brain of yours?

As a measure of how seriously Nielsen, a $4.2-billion (U.S.) company by revenue, is taking the alliance, it announced that CEO David Calhoun, a man Fortune magazine describes as "engaged in a full-on crusade to raise Nielsen's game," has joined the NeuroFocus board.

The "game" as we know it has irretrievably changed from the uncomplicated, albeit time-consuming, task of filling out a Nielsen survey in exchange for a crisp $5 bill.

It has certainly changed since the moment more than 130 years ago when John Wanamaker opened Wanamaker's department store, published what is believed to be the first copyrighted advertisement, offered consumers a money-back guarantee, and uttered his famous dictum that one-half of his advertising spend was surely effective, if he could only figure out which.

In those days, advertising was a monologue: They sold, we bought. Today, the advertising industry says it is in "conversation" with the consumer. But the truth of it is, in this anxious-making era of reinvention, the consumer is in complete control.

The elixir, surely, lies in being able to peer into the brain and retrieve desire. Or aversion. Or purchasing intent.

Or price point!

"We were approached by a major car company to help them determine ... what price people would be most likely to be comfortable paying," Dr. Knight says. "We can get an electrophysiological tuning curve that actually picks the sweet spot for the price."

If true, the rarefied work of Berkeley neuroscience could translate into concrete results in Detroit.

"What we are really trying to measure and understand better is what consumers are engaged by, right?" says Dr. Pradeep, who launches into a chatty, spirited exchange about what the scientists are up to at NeuroFocus. "It could be engagement with a product, engagement with a package, engagement with an experience, engagement with content ... a movie ... TV show."

Dr. Pradeep, who once upon a time designed satellites, knows that this "engagement" of which he speaks has historically proved elusive. The newish field of neuromarketing has for years advanced the theory that it could sidestep the messy subjectivity of human nature by analyzing brain response. "I could go armed with a survey and pencil and ask somebody, 'How do you feel about this?' But the moment they start to think about it their answers are going to be not very precise," Dr. Pradeep says. "The act of observation changes reality ... The act of observation changes feelings."

As for focus groups, on that subject Dr. Knight's animus is unvarnished. "They're a little bit like juries where it's eight to four for acquittal on the first vote. Then it's 12 to nothing for guilty four days later and it's usually because of social factors and group dominance and all those kinds of behaviours that emerge in a group situation."

"The simple fact is the brain makes behaviour," Dr. Knight continues. "If you can effectively measure the brain, which we think we can ... We can give you information that's not available by any other methodology. You just can't get it in conventional marketing."

Until recently, neuromarketing has focused on using functional magnetic resonance imaging, or fMRI, to detect brain response. Kate Sirkin, global research director for **Starcom MediaVest Group,** says she was fascinated with this brain wave research a decade ago and did several studies with large clients to test its efficacy. The results, she says, "validated the hypotheses we walked in with."

But the costs of the technology were twice that of conventional methods. Still, she adds, it's interesting to see Nielsen - "the safest company in the world that doesn't do anything remotely risky" - committing to brainwave research. (It's also interesting, in a frightening-for-advertisers-and-their-clients sort of way, that a joint study undertaken by Starcom and Microsoft Advertising Solutions last summer revealed that one third of 17- to 35-year-olds reported that they never pay attention to advertising. The top 100 advertisers in the U.S., meanwhile, spent more than $104-*billion* on the sell side in 2006, according to Advertising Age.)

And on the science side, Dr. Knight is aware that his own alliance with NeuroFocus could look, well, risky.

Dr. Knight is more than aware of the faddishness that has taken hold in trying to layer commercial applications onto neuroscience. "When they approached me," he says of NeuroFocus, "I said, look, there are a lot of flakes out there doing this neuromarketing stuff. I don't need to have my career go out as a flake."

"Boo."

"One thousand, two thousand, three thousand, four thousand, five thousand, six thousand."

"Bingo," Dr. Knight says. "There's the fMRI response to me saying 'boo' to you."

Dr. Knight explains: "When you heard 'boo' it reached your brain in 20 milliseconds, a 50th of a second." By the time the blood flow response comes on - which is what fMRI measures - the neural activity is long over.

"It's a tremendous anatomical locator," he continues. "But it's not well suited to study communication between areas of the brain."

To understand neuroscience technology up close, a tour of the Rotman research lab at the Baycrest Centre in Toronto helps. Dr. Randy McIntosh, senior scientist and associate director, explains that fMRI measures metabolic demands (blood flow) and thus is "really, really good at measuring spatial location. It can tell you exactly where things are happening down to a couple of millimetres." But the responses are slow. "They're on the order of a couple of seconds," he says. "You can see that although you know where it's happening it is much more difficult to know the timing of when things are happening."

The sheer size of the fMRI machine - three tonnes or so - presents an obvious barrier to broad-based commercial applications in the advertising and marketing arenas.

A different, and far from new, technology is the measure of electrical impulses via electrodes attached to the scalp. Dr. McIntosh holds up a red cap streaming with electrode wires. "Electrical impulses are very rapid, Dr. McIntosh says. "You can get down to the millisecond or submillisecond range."

The NeuroFocus methodology employs electroencephalograms, or EEGs, in conjunction with eye-tracking and conductive skin response. (The latter, Dr. Knight acknowledges, is a sluggish measure of your autonomic nervous system, commonly retrieved by simply taping a sensor to the index finger. "I don't want you to think we consider it very important, but it's another measure we incorporate.")

Don Stuss, who heads the Rotman Institute and who has known Dr. Knight for years, has paid a visit to the NeuroFocus lab in Berkeley. "People would come in, the electrodes would be put on, they'd go in, see something, get paid and off they went."

Dr. Stuss attests to his colleague's bona fides. "I've always been skeptical of the science until I realized Bob was doing it," he says of the neuromarketing trend. "He's a hard-core scientist." (Dr. Stuss's own area of research is memory, which leads to a fascinating segue about a patient who lost all of his memory for his personal life but not for factual information. True story.)

There's so much to be skeptical about. It has been a half century since psychologist Ernest Dichter examined the nexus of consumption and desire. As human motivations are frequently unconscious, he wrote, "direct questions are not only inadequate, but unscientific and therefore are to be rejected."

There's a robust history of attempts to tap science in the hopes of overcoming this rather large roadblock. We no longer hear much about pupilmetrics, sometimes called pupilometrics, in which, as The New York Times wrote two decades ago, pupil dilation was monitored "by filming people who were strapped into chairs and whose heads were anchored into wax moulds."

In an attempt to assuage disbelievers, the NeuroFocus team applied their

methodology to pretested advertising that had already been carried out. "We started showing companies that we could nail their ads physiologically and we'd get the same results as these giant marketing firms looking at thousands of people," Dr. Knight says.

"That made me very comfortable. I wouldn't have worked with them if they hadn't agreed to that."

Example: Dr. Pradeep cites a study for a large financial services company, which he will not name. "We were given six ads to analyze," he says. "I pulled out one ad and I said that this ad in our minds was the best possible ad. The chief marketing officer stopped me and said, 'Pradeep, I just want you to know that through all the conventional testing we've done, the ad you picked out was rated the most mediocre among the entire bunch."

Dr. Pradeep asks forgiveness of his language when he recounts that his response was, "Oh shit ... I wondered if my life had come to a halt."

After a dramatic pause, the CMO continued: "It's funny, however, that the ad resulted in the greatest number of calls to the call centre."

By September, Nielsen was doing due diligence of a sort as it entered into a study with ESPN, the sports network. "We were looking at the sponsorship within one of their pregame shows," says Frank Stagliano, executive vice-president and general manager at Nielsen Entertainment. "We were going to go out and do a program test, their show versus a competitive show, and look at things like recall, shifts in intent to purchase, and brand consideration. A blocking and tackling study that we do all the time."

Instead, Nielsen used it as a test study for NeuroFocus. "NeuroFocus was able to go through second by second, each of the nine or 10 different treatments, and evaluate the effectiveness of each one of these and look at what the best practices were."

Peter Leimbach, vice-president of multimedia sales research at ESPN, says the results equated to "insights we had never had before." Text placement, sponsorship logo dissolution, voice-overs.

"One of the elusive questions on the TV side," he says, "is are sponsorship executions effective? Could we do more? Are we alienating our viewers because of the sponsorship stuff?"

ESPN has taken the results, which were tested in the baseball season, and has incorporated them in the National Basketball Association pregame and halftime shows, and is about to retest the concept.

Of particular appeal, Mr. Leimbach says, is the small number of test subjects required - the ESPN test ran with 20 respondents. Dr. Knight says he can derive a population prediction with a minimum of 10 participants, but the groups tend to run to 20 "just to be sure ... This has driven the classic market research people completely crazy because they're used to 2,000 people ... If you need 2,000 people to find an effect, you've got a lousy effect."

(You can't, by the way, use these techniques to make strong inferences about an

individual's behaviour. Here comes the Gaussian distribution. "It's like a bell curve," Dr. Knight says. "Most of the people will be right in the middle - they'll have the same response to 'boo.' But some will have no response to 'boo' and some will have a huge response." Thus the need to assess group effects to infer population behaviour. "I've seen things coming out that say John loved Mary based on the brain response," Dr. Knight says. "Baloney. You can't say it. We do not make individual predictions.")

Applications extend out of advertising and into programming. "After somebody watches a 45-minute show we can ask them to do a 25-minute survey," Nielsen's Mr. Stagliano says of his company's conventional feedback methodologies.

Consider the onscreen relationship of a husband and wife. "Twenty minutes after they've seen that relationship, a lot of things come into play that are well beyond subconscious response. You think about your own relationship with people you love. You think about your mom and dad. So when I ask you what do you think about the relationship between the husband and wife, a lot of conscious response comes in."

In other words, the closer you get to "boo" the better. "The farther away you get from the event the more your thinking comes online and you alter what you've just observed," Dr. Knight says.

Here's where we hit a roadblock.

It is impossible to tease from Dr. Knight his precise methods of analysis by explaining the algorithms he has devised. "I don't want to get into IP protected stuff because I'll get killed," he says. "This is the first time I've talked to anybody about this."

Dr. Pradeep calls NeuroFocus's intellectual property its "magic sauce," but then, he *is* an engineer.

Nielsen is moving full-steam ahead, and is now in the process of setting up NeuroFocus sites at its Digital Labs at the MGM Grand in Las Vegas and at CityWalk in Los Angeles.

Dr. Knight has to bustle off to class. "Here's something that amused me," he says before ringing off.

"We did some analysis of a pilot for a big series by a big network that had put a ton of money into it," he recalls. "They asked us to look at it and we did. The bottom line is the brain just couldn't stand it. It was horrible."

Preventing the launch of dreadful programming? There has to be something good in that. For the consumer: Being relieved of the pain of watching one more bad movie. Benefits to industry? Boundless.