reach of more researchers. "You gain a lot of understanding of what happens," said Virginia Salem, who manages customer relations for ASL. "It gives you another measure of what people say and allows you to ask additional follow-up questions that you're not able to do in a traditional focus group."

The office-products chain Staples used eye tracking to test the extent to which customers interacted with in-store signage. The retailer first recruited customers planning a visit who would be willing to wear eye-tracking glasses. After a pre-interview at the store in order to learn details about the shopper's plan (her shopping list, the amount of money she intended to spend, how much time she anticipated the visit to take), the shopper was asked to return to her car and then start her shopping trip as she normally would, but with glasses on. Employees were told to treat the subjects as they would any customer.

EYE TRACKING
Glasses feature two cameras, one focused on the eye and the other on what the subject is seeing; data are logged in a display-transmit unit the subject also wears

Tom McCann, director-retail usability research at Staples, said he was surprised by what the study revealed. "It was very clear that the way customers interact with signs was very different in different points in the store," he said. Through the research, Staples was able to identify the type of content on signs customers found compelling. For example, it was able to confirm the common perception in the retail industry that signs with dollar signs or percentage signs draw attention. Another lesson learned: simplicity rules, seeing as a sign will get only a fleeting moment of the customer's attention. Staples is using the findings to modify its in-store signage, and will likely conduct further eye-tracking research by the end of 2011.

FUNCTIONAL MAGNETIC RESONANCE IMAGING

Functional Magnetic Resonance Imaging (fMRI) uses the same large magnets used for diagnostics in hospitals, to examine areas of the brain that become activated by thoughts, feelings and memories. The fMRI technique measures changes in blood flow related to neural activity in the brain, typically for visual and olfactory stimuli.

In the landmark study "Neural Predictors of Purchases," published in the journal Neuron in January 2007, researchers using fMRI documented evidence that distinct neural circuits related to anticipatory affect "precedes and supports consumers' purchasing decisions." In other words, a researcher can make an educated prediction that a consumer is about to buy something by observing activation in different parts of her brain. Another notable fMRI study, conducted by Read Montague, author of "Your Brain Is (Almost) Perfect: How We Make Decisions," put the Pepsi challenge to the test and found that when subjects didn't know what they were drinking, roughly half preferred Pepsi. But when told which samples were Coke, only one-quarter of respondents preferred Pepsi—meaning that the subjects' perceptions of the Coke brand made it taste better.

The idea of studying the brain directly can be quite compelling. But critics point to fMRI's high cost and say the usefulness of fMRI is limited since the subject must lie immobile in a tube and cannot interact with the environment, products, and so on. It is also difficult to study novel stimuli via fMRI, detractors say, since the response will diminish significantly after the first look at something.

ELECTROENCEPHALOGRAPHIC (EEG) TESTING

Electroencephalographic (EEG) Testing is one of a group of neuromarketing approaches that uses brain imaging, scanning or other technology for measuring brain activity to measure a subject's subconscious responses to specific stimuli at 2,000 times per second.

NeuroFocus, a neuromarketing firm recently acquired by The Nielsen Co., uses a dense-array EEG analysis to measure attention, emotion and memory. "Those are the critical building blocks to shoppers' DNA," said A. K. Pradeep, CEO of NeuroFocus. "Something has to command attention and be emotionally compelling to be worth remembering." Combined, Pradeep said, those readings reveal the overall effectiveness of what the test subject was looking at. That measure, in turn, can be used to determine purchase intent, novelty and awareness.

NeuroFocus often combines these measurements with eye tracking and galvanic skin response. For example, for packaging, the testing would reveal which elements generate excitement and which do not. Testing the package next to its competitors indicates which evoke higher responses in regard to novelty and effectiveness.

To date, NeuroFocus studies have required that the test subject wear a cap covered with openings. Researchers squeezed gel into the holes to conduct the signal and attached 64 to 128 sensors on top to record activity. But the company recently announced it can now provide the same level of readings with Mynd, a dry, wireless headset allowing for use in-store.

"We get insights that are not usually available because people are very poor at introspection into feelings," said Pradeep. "There are certain areas [in which] it is impossible for anyone to articulate how they feel." Next, NeuroFocus will be using EEG technology to delve into "mirror neuron activation"—better known as monkey