



In The Papers

## This Is Your Brain On Shopping

Elisabeth Eaves, 01.05.07, 3:00 PM ET

Attention, shoppers: A brave new retailing world may be just around the corner. Using brain-scanning equipment, a team of scientists has discovered that they can correctly predict whether subjects will decide to make a purchase. Their research is published in the paper "Neural Predictors of Purchases" in the January issue of *Neuron*.

The authors, who hail from Carnegie Mellon University, Stanford University and the MIT Sloan School of Management, work in the budding field of neuroeconomics, a discipline that combines neuroscience, economics and psychology to study human behavior and choice making.

To be sure, stores won't actually be able to brain scan shoppers anytime soon to discover which way they're leaning. The necessary technology, a functional magnetic resonance imaging (fMRI) machine, remains prohibitively expensive and requires subjects to lie down in a coffin-like tube. The research, nevertheless, has implications for understanding consumer behavior.

Corporations including General Motors and Ford have already tried using brain imaging in market research, complementing more traditional methods like surveys and focus groups. (See "[In Search Of The Buy Button](#).")

But previous studies have only gone so far in examining the brain's reaction to specific images, such as cars, candy and cash. (See "[This Is Your Brain On Money](#).") This is the first time researchers have used fMRI to examine what the brain does while making a purchasing decision.

The study's 26 participants were each given \$20 to spend, which they were allowed to keep if they purchased nothing. The researchers then showed the subjects a series of products and prices--one was a box of Godiva chocolates--while observing three parts of the brain: the nucleus accumbens, which is associated with the anticipation of pleasure; the medial prefrontal cortex, which is associated with balancing gains and losses; and the insula, a part of the brain that registers pain.

The scientists found that when subjects were presented with products they found desirable, the pleasure center was activated. When, subsequently, the subjects were shown the price--\$7 for the chocolates--one of two possible things happened: If the price was lower than what the subject was willing to pay, the decision-weighting medial prefrontal cortex showed greater activity, while the pain-registering insula showed less.

If, on the other hand, the price was higher than what the subject was willing to pay, then the pattern was reversed, with the medial prefrontal cortex showing less activity and the insula showing more.

Next, the subjects had to choose whether to buy or not. The authors discovered that the brain activation patterns predicted actual buying decisions, with high medial prefrontal cortex activation indicating they would buy, and high insula activation indicating they would not.

For Scott Rick, one of the study's authors and a Ph.D. candidate in behavioral decision research at Carnegie Mellon, the most remarkable thing about the study is that it challenges the orthodox economic view of consumer decision

making. Traditionally, economists have held that buyers are weighing the immediate pleasure of acquiring an item against the pleasures of other, delayed uses for the money.

The paper, though, supports the alternative view that consumers are weighing an immediate pleasure against an immediate pain. "Standard economics assumes people are immune to the influence of immediate emotions," Rick says. "That's why the relationship between insula activation and spending decisions is particularly interesting."

This helps us understand why payment methods that minimize instant buyer pain--like credit cards--appear to encourage overspending, a phenomenon once seen by many economists as a behavioral anomaly. "The abstract nature of credit coupled with deferred payment may 'anaesthetize' consumers against the pain of paying," the study's authors write.

The takeaway? Offer layaway, if you're a retailer. And if you're a consumer, beware of brain-scanning machines.

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