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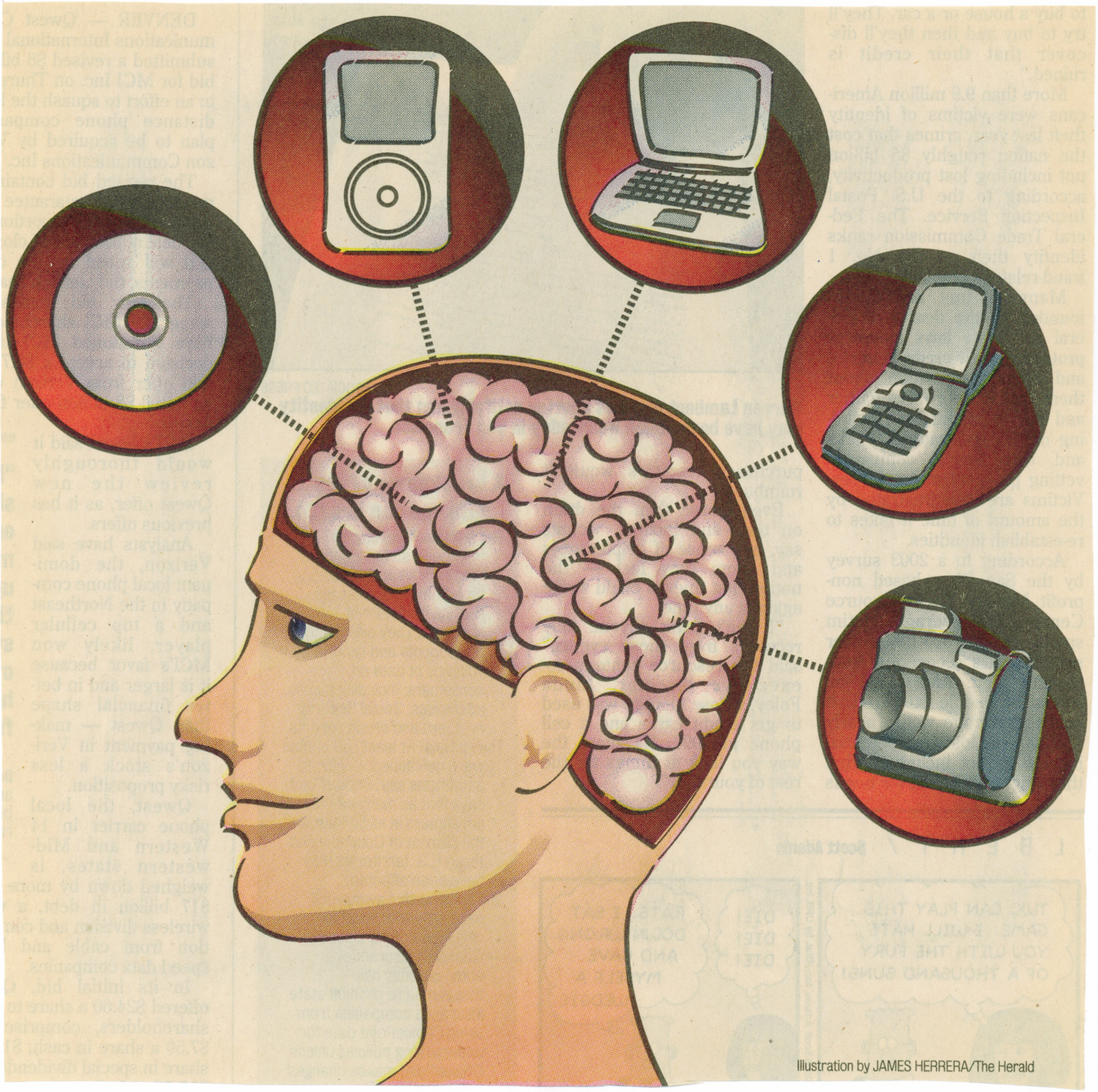

Illustration by JAMES HERRERA/The Herald

BRAINSTORMING

NEUROMARKETING SEEN AS WAY TO BOOST PRODUCT APPEAL

By ANDREAS von BUBNOFF
Herald Correspondent

On the Saturday night after Thanksgiving, Stanford University sophomore Bea Sanford lay inside a truck-sized cylinder in a dark, windowless room at the Lucas Center of Stanford University Medical School.

The cylinder scanned her brain while she played a video game, pressing a button at the right moments to win as much money as possible.

"We are trying to figure out what happens in somebody's brain if they see something they like," said Brian Knutson, a neuroscientist at Stanford supervising the experiment.

In this case, Knutson hoped the prospect of winning money would light up the so-called reward areas of Sanford's brain — the same areas that might become activated when a consumer sees a car or has a soft drink they like.

To study such areas, Knutson uses a new technique called functional magnetic resonance imaging (fMRI). fMRI uses the same method that hospitals use for brain scans to detect tumors, but the difference is that it doesn't look at the structure of the brain but rather the activity of certain brain areas by measuring its elevated oxygen levels. Higher oxygen levels are the body's response to active nerve cells, which need oxygen to keep functioning.

Just as with an MRI, fMRI patients are placed their back in a scanner that captures images of the brain. The machine is loud — so loud that patients must wear ear plugs — and sensitive. Any head movement can blur images, so researchers have patients bite on a piece of plastic fixed to the bed.

> The ultimate goal is to find the brain's "buy button" — the area that, when activated, predicts whether a person will like a product enough to buy it.

Knutson's experiment is part of an emerging research field called neuroeconomics, in which scientists use powerful brain imaging technology to see what happens in people's brains when they see something desirable. Over the past few years, the field has grown to at least a dozen groups worldwide. Stanford University opened its own neuroeconomics lab last summer.

Some companies have already moved on to the next step — "neuromarketing," or using brain imaging technology to improve the appeal of their products. The ultimate goal is to find the brain's "buy button" — the area that, when activated, predicts whether a person will like a product enough to buy it.

But scientists say neuromarketing is still far from reality, because the brain's "buy button" is still poorly understood.

Studies, worries arise

There have been only three solid scientific studies that show activation of a reward area when people look at or consume products, perhaps the closest thing to a "buy button" scientists have identified.

The studies also have found at least two different reward areas in the brain, an indication that the pleasure of consumption is more complicated than first thought.

And while a few companies have started to sell neuromarketing services, none of them have published their results for scientists to scrutinize.

"It's definitely not ready for prime time yet," Knutson said.

The field is raising ethical concerns, with some worrying the technology could be used to create marketing campaigns that might increase harmful behaviors such as overeating or smoking.

Ralph Nader's consumer advocacy group, Commercial Alert, sent a letter to the U.S. Senate Commerce Committee in July requesting an investigation of neuromarketing.

"An increase in marketing would cause an extra 22,000 early deaths (from tobacco) in the U.S., so it's a very

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serious public health problem," said Gary Rufkin, executive director of Consumer Alert.

Scientific studies published analyzed people as they consumed soft drinks or looked at cars. When the test subjects made a pleasurable choice, all showed activation in the same area of their brains, the medial prefrontal cortex.

A German group in 2002 showed that another area, the ventral striatum, was also activated when people looked at sports cars they liked.

Knutson's own studies, published in 2003, have shown that the ventral striatum is activated when people anticipate winning money. In his experiments, he looks at how this area responds while people play a video game that allows them to win small amounts of cash.

In his experiment, Knutson projects an image of the video game on a screen just above the eyes of the people as they lie in the scanner. After the scan, he compares each person's brain activation patterns with their responses to a questionnaire that asks how they felt during certain parts of the game.

Not everyone agrees that the ventral striatum really is a reward area. Some researchers believe it is simply an area activated when people become aroused or when they shift their attention.

"There are a whole bunch of theories about what this is doing," Knutson said.

It may take years to clarify such issues, Knutson said, and that's why it's too early for companies to apply the neuroeconomics research to sell their products.

Some companies won't wait

Three consulting companies already are using brain-scanning services to advise their corporate clients how to better sell their products: Atlanta-based Brighthouse, Neurosense in Oxford, England, and the Austrian company ShopConsult.

ShopConsult used brain scans to find that the limbic system, an area involved in emotion, and the visual cortex, an area that processes vision, respond more strongly when people see products next to emotionally charged pictures, such as smiling faces.

As a result, the company, whose clients are retail stores, advises stores to place emotionally appealing pictures next to their products, said Roland Jenny, ShopConsult's research director.

Jenny said he believes his company invented the term neuromarketing. In 2000, when ShopConsult started its neuromarketing activities, he got no result when he typed the word into the search engine Google. A Google search now yields 17,600 hits.

Many scientists are skeptical that the company's neuromarketing claims are true, because none of them have ever been published in a scientific journal. "I would say, 'Show me the data,' " Knutson said.

Still, Antonio Rangel, assistant professor of economics and director of the Stanford neuroeconomics lab, said there is not a single study that proves that neuromarketing works. Such a study would have to show not only that certain products activate the brain's reward areas, but also that this reliably leads to people buying more products, he said.

"I have not seen any studies as of today that will justify a company paying for that," Rangel said.