

# Advertisers, neuroscientists trace source of emotions in brain

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First came direct marketing, then focus groups. Now, advertisers, with the help of neuroscientists, are closing in on the holy grail: mind reading. At least, that's what is suggested in a paper published today in the journal *Human Brain Mapping* authored by a group of professors in advertising and communication and neuroscience at the University of Florida.

The seven researchers used sophisticated brain-scanning technology to record how subjects' brains responded to television advertisements, while simultaneously collecting the subjects' reported impressions of the ads. By comparing the two resulting data sets, they say, they pinned down specific locations in the brain as the seat of many familiar emotions that ripple throughout it. The feat is another step toward gauging how people feel directly through functional magnetic resonance imaging, or fMRI, and other brain-scanning technology — without relying on what they claim to be feeling, the researchers say.

“We are getting to the heart of the matter by really showing this process in the brain, and how it works,” said Jon Morris, a professor of advertising and communications and lead author of the article. “We feel that this can be used to find out what people really feel about something, whether an advertisement or any other stimulus.”

Using MRI or fMRI — the former creates internal images of the brain, while the latter tracks blood flow within the brain — to test consumers' responses to advertisements or other stimuli is not new. But according to the study, much of the previous research has found that, for example,

responses to pleasant or unpleasant stimuli occurred throughout many regions of the brain, rather than in one specific location. As a result, the technique seemed of limited usefulness: Analysts could gauge only general response activity, not specific emotions.

“There was no real key happiness center, no key sad center, no key love center,” Morris said. “What you got was brain activity, in general.”

The UF team used an elaborate experimental system, currently under consideration for a patent, to try to narrow the search.

Because metallic or magnetic material can cause fMRI machines to malfunction, no television or sound equipment was allowed in the cylinder-like fMRI machines into which people are inserted. As a result, the researchers deployed a series of projections and mirrors to allow subjects to watch commercials. Sound reached them via tiny plastic pipes, similar to headphones once common on airplanes, rather than wires.

The 12 subjects also had hand-held devices that enabled them to report their feelings via a system called “Attitude Self Assessment Manikins” a version of the UF-developed Self-Assessment Manikin, or “SAM.” The “AdSAM” system lets viewers describe how they are feeling and the strength of those feelings by clicking on projections of people-like icons, a process that Morris characterized as more direct than translating feelings into words. Morris uses the AdSAM system in his work as a consultant to advertisers.

Researchers showed the subjects three television commercials advertising Coke, Evian and Gatorade, respectively, as well as an anti-fur commercial and an ad promoting teaching. To guard against preconditioned response, all the ads were at least 10 years old.

The researchers compared the activity in the subjects' brains as recorded by the fMRI machines to their reported responses on the AdSAM system. With several of the ads, they found the fMRI data and response converged on two of three measures — pleasure-displeasure and excitement-calm. Under the AdSAM system, these “bipolar dimensions” — as well as a third, dominance-submissiveness — form the foundation for more specific emotions.

Where the researchers compared the AdSAM data on pleasure-displeasure and excitement-calm to the fMRI data, they found simultaneous spikes in four different and highly localized areas of the brain. According to the article, the findings suggest “that human emotions are multidimensional, and that self-report techniques ... correspond to a specific task but different functional regions of the brain.”

Morris said the results are preliminary, but that follow-up studies could allow researchers to hone in on people's feelings with great specificity. That would be attractive to advertisers for obvious reasons, but psychologists might also find the techniques useful.

“Back in the 1950s, three psychologists found that all emotions could be measured in three dimensions,” Morris said. “Now we have learned that this may be more than a method for reporting emotion. It may actually reflect the way creatures on this planet function – possibly exposing a direct link to predicting behavior.”

Source: University of Florida

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