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More powerful persuasion

Today's brain-imaging research could make tomorrow's arguments even more convincing.

By Beth Azar
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Along with most every marketing firm and politician in the world, psychologists have long been interested in understanding the mechanisms behind a persuasive argument. Now, some psychologists are using imaging to examine what happens in the brain when someone hears or reads a message designed to spur them to action, whether that's to use more sunscreen, quit smoking or recycle.

Research by University of California, Los Angeles, social cognitive neuroscientist Matt Lieberman, PhD, and his graduate student Emily Falk has found several brain areas that appear to be key to persuasion. One is the dorsomedial prefrontal cortex, the area right behind the eyes and up a bit. Previous brain-imaging studies have linked this area to the ability to take the perspective of others, and Lieberman and Falk consistently see this area activated in people who are exposed to messages that aim to convince them of a particular point.

In their first published study on this topic using functional magnetic resonance imaging (fMRI), in the *Journal of Cognitive Neuroscience* (posted online Nov. 19, 2009), Lieberman and Falk found that the more persuasive participants thought a message was, the more this brain area activated. That makes sense since a convincing argument forces people to think about someone else's point of view, says Lieberman. "Our data are consistent with the notion that if you can get someone to step into your shoes psychologically, you might be halfway home in terms of persuading them to see the content of the message the way you want them to," he says.

Of course, that does not prove that perspective-taking is going on, but the results have been intriguing enough that Lieberman and Falk have begun to test this possibility with behavioral studies.

Meanwhile, two other brain areas may help researchers understand persuasion: The medial prefrontal cortex, directly behind the eyes, and the precuneus, which sits near the back of the head. Earlier research by Lieberman and others suggest that these regions underpin self-reflection. Lieberman became interested in these areas after University of Michigan psychologist Hannah Faye Chua, PhD, and her colleagues saw them activate when people read highly tailored, self-relevant anti-smoking messages (*Biological Psychiatry*, Vol. 65). One person, for example, read a message that said: "You told us that you struggle with wanting to smoke when in the car. Overhaul your thoughts about being in the car as well as the car, itself. To start, have your car professionally cleaned and detailed right before you quit. Keep your favorite flavor of lollipops in the glove box. Consider carpooling with a nonsmoker."

Behavioral work by Michigan's Vic Stretcher, PhD, and others found that such tailored messages work better than nonspecific messages to encourage people to quit smoking. Chua's brain-imaging data supported that idea. She first used fMRI to show that the tailored messages activated brain areas associated with self-reflection — the medial prefrontal cortex and precuneus. In a follow-up study, she and her colleagues examined whether activation in these areas predicted if smokers would be more likely to quit. Their results so far look promising.

Lieberman and Falk have gotten similar results from an as-yet-unpublished study of sunscreen use. They used fMRI to scan 20 study participants who were looking at slides on the value of daily sunscreen use and saw activation in the medial prefrontal cortex and precuneus. The stronger the activation in the medial prefrontal cortex, the more likely people were to use sunscreen two weeks after the study. Activity in this brain region was even better at predicting whether participants would use sunscreen than the participants' own reports in interviews conducted immediately after the imaging.

Lieberman isn't ready to use the brain-imaging findings to start crafting messages, but he is using the findings to guide his behavioral work to understand persuasion. "Ultimately, it's a reverse-engineering problem," he says. "fMRI can identify the neural sequalae of effective messages, and then we have to work backwards to determine the features of a message that tend to produce those activations."

Lieberman's findings jibe with well-known persuasion research by Arizona State University psychologist Robert Cialdini, PhD. He has found that people are more likely to comply with a request — to reuse their hotel towels or conserve energy, for example — if they think other people they can relate to are doing the same. For example, Cialdini saw a significant jump in towel reuse if he simply said, "The majority of guests who have stayed in this room have reused their towels."

Although Lieberman's interpretation of his findings seems to support some behavioral work, another mechanism could be at play, says Ohio State University social cognitive neuroscientist Wil Cunningham, PhD. There's a growing base of research showing that the areas Lieberman sees activated are involved in labeling messages as positive or negative. "My work suggests these brain regions are associated with liking and wanting," says Cunningham. "It seems to me more like neural correlates of a positive response."

Lieberman argues that while the medial prefrontal cortex is more active when people indicate that they like or value something, many studies find that the region activates during self-reflection, self-reference and self-relevance when there is no evaluation occurring.

Whether these brain areas underpin persuasion or merely indicate it, they may allow researchers to predict which messages have taken root, says Chua. And that could be a boon for researchers.

"Someday we may be able to set up neural focus groups," Lieberman says. "You could see from 15 or 20 brains how effective a public health message would be without having to look at a million people and evaluate their self-reports."

Beth Azar is a writer in Portland, Ore.