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Text messaging helps smokers break the habit

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A pair of related studies on smoking cessation by researchers at the University of Oregon and other institutions have isolated the brain regions most active in controlling urges to smoke and demonstrated the effectiveness of text-messaging to measure and intervene in those urges.

Both projects used the same group of test subjects -- 27 heavy smokers recruited from the American Lung Association's Freedom From Smoking program in Los Angeles.

Elliot Berkman, professor of psychology at the UO, and colleagues Emily Falk at the University of Michigan and Matthew Lieberman at UCLA, used functional magnetic resonance imaging (fMRI) in the first study to map areas of the brain in which impulse control battles are fought. They described kicking an unwanted habit such as smoking as "a war that consists of a series of momentary self-control skirmishes."

Their paper -- published online this month in *Psychological Science*, a journal of the Association of Psychological Science -- indicates that individuals' abilities to inhibit their responses to cravings can be predicted through fMRI testing. That means it may be possible to tailor smoking cessation programs to individuals' response-inhibition capacities.

"We are really excited about this result because it means that the brain activation we see in the scanner is predictive of real-world outcomes across a much longer time span that we thought," Berkman said. "The

tasks that we use in the laboratory are simplified models of these real-world processes -- but they seem to be valid models."

The second study -- also by Berkman, Falk and Lieberman, along with Janna Dickenson of UCLA and posted online in advance of publication in the journal Health Psychology -- tested short message service (SMS) text messaging "as a user-friendly and low-cost option for ecologically measuring real-time health behaviors." Research participants were prompted by eight text messages per day for three weeks to document their ongoing cravings, mood and cigarette use.

The research showed that text messaging is at least as effective as more expensive and harder-to-use handheld data collection devices in the "brief interval assessment" of people in smoking cessation programs. The palmtop devices typically used for what smoking cessation researchers call "ecological momentary assessment" can cost more than $300 each, while 86 percent of U.S. residents already have cell phones and 91 percent of those are SMS-enabled.

"Text messaging may be an ideal delivery mechanism for tailored interventions because it is low-cost, most people already possess the existing hardware and the messages can be delivered near-instantaneously into real world situations," said the study, which is scheduled to appear this week in Health Psychology, the journal of the American Psychological Association.

The study also confirmed earlier findings that monitoring smoking cessation participants at regular intervals -- whether by text messaging or through the use of other hand-held devices -- helps to eliminate "memory biases" that are common when cravings and outcomes are reported only on a daily basis. Its findings corroborate those of other studies that have indicated the importance of rapid, real-time measurement of smoking urges and resistance to them.

Text message monitoring of the Los Angeles smoking cessation participants was also a key element in the study by Berkman and his colleagues of the three brain regions that are most involved in response inhibition -- the right inferior frontal gyrus, the pre-supplementary motor area and the basal ganglia.

In that study, the smokers initially were asked to perform a simple self-control task as an fMRI machine scanned their brains' activity. They were next given lung and urine tests to determine the physical extent of their tobacco addictions, and were asked about their cravings and smoking patterns. Then they began the smoking cessation program, and were asked to respond to text message prompts eight times per day for three weeks.

The study concluded that those participants who had shown the most activity in the key regions of their brains during testing were also the most likely to resist their cravings to smoke -- which was documented in their text message responses.

"A big question that motivates my research is: How can we effectively use neuroimaging to learn something about long-term goals like smoking session?" Berkman said. "Using fMRI together with daily text messaging seems to be an excellent way to address that question."

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