Watching others smoke makes smokers plan to light up

January 18 2011

Because of fMRI scanner time limitations, the researchers edited the movie into three 10-minute segments. The excerpts had the same number of smoking and non-smoking scenes, which lasted for equal amounts of time. The authors found that seeing this familiar action -- even when embedded in a Hollywood movie — evoked the same brain responses as planning to actually make that movement. Reprinted with permission: Wagner, et al. The *Journal of Neuroscience* 2011.

Seeing actors smoke in a movie activated the brain areas of smokers that are known to interpret and plan hand movements, as though they too were about to light a cigarette, according to a new study in the Jan. 19 issue of *The Journal of Neuroscience*.

Habitual smokers repeat the same hand motions, sometimes dozens of times a day. In this study, researchers led by senior investigator Todd Heatherton, PhD, and graduate student Dylan Wagner of Dartmouth College set out to determine whether the parts of the brain that control that routine gesture could be triggered by simply seeing someone else smoke.

The authors found that seeing this familiar action — even when embedded in a Hollywood movie — evoked the same brain responses as planning to actually make that movement. These results may provide additional insight for people trying to overcome nicotine addiction, a condition that leads to one in five U.S. deaths each year.

"Our findings support prior studies that show smokers who exit a movie that had images of smoking are more likely to crave a cigarette, compared with ones who watched a movie without them," Wagner said. "More work is needed to show whether brain activity in response to movie smoking predicts relapse for a smoker trying to quit."

During the study, 17 smokers and 17 non-smokers watched the first 30 minutes of the movie "Matchstick Men" while undergoing functional magnetic resonance imaging (fMRI). The researchers chose the movie because it prominently features smoking scenes but otherwise lacks alcohol use, violence, and sexual content.

The volunteers were unaware that the study was about smoking. When they viewed smoking scenes, smokers showed greater brain activity in a part of the parietal lobe called the intraparietal sulcus, as well as other areas involved in the perception and coordination of actions. In the smokers' brains specifically, the activity corresponded to the hand they use to smoke.

"Smokers trying to quit are frequently advised to avoid other smokers and remove smoking paraphernalia from their homes, but they might not think to avoid a movie with smoking content," Wagner said. The U.S. Centers for Disease Control and Prevention has warned that exposure to onscreen smoking in movies makes adolescents more likely to smoke. According to their 2010 report, tobacco use in films has decreased in recent years, but about half of popular movies still contained tobacco imagery in 2009, including 54 percent of those rated PG-13.

Scott Huettel, PhD, of Duke University, an expert in the neuroscience of decision-making who was unaffiliated with the study, said scientists have long known that visual cues often induce drug cravings. "This finding builds upon the growing body of evidence that addiction may be reinforced not just by drugs themselves, but by images and other experiences associated with those drugs," Huettel said.

Provided by Society for Neuroscience