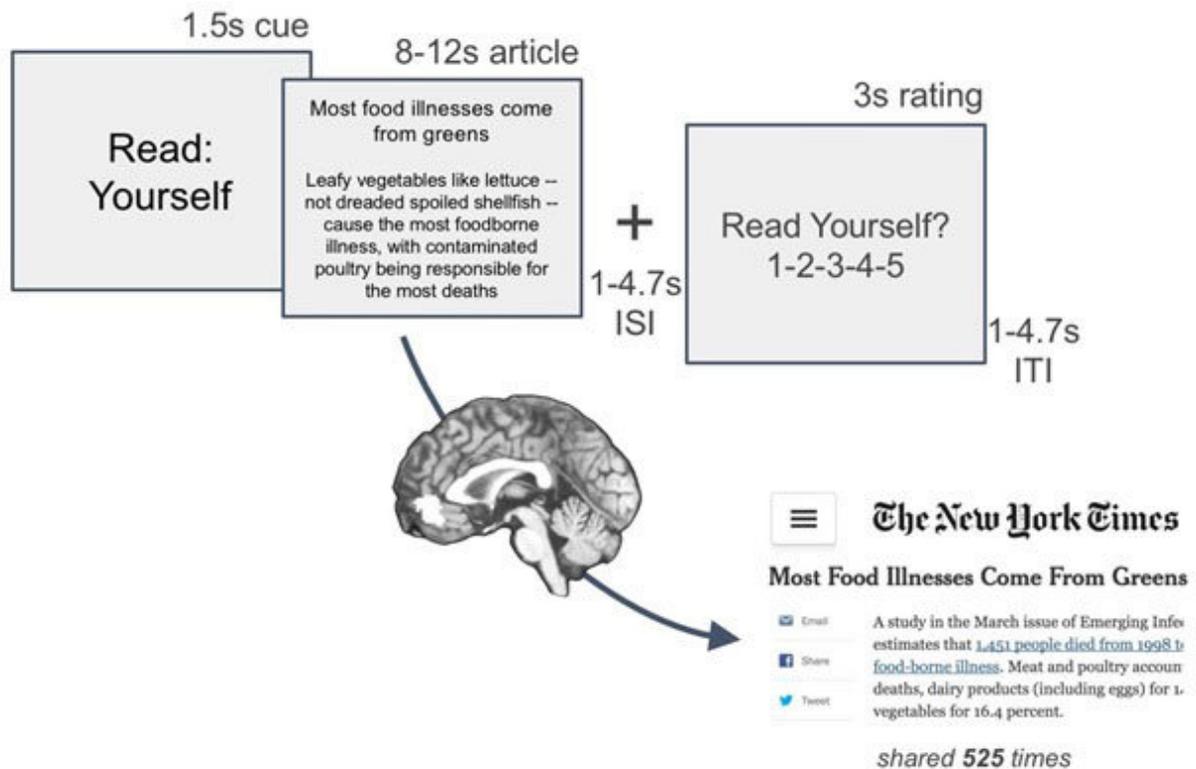


Researchers uncover ways to better predict viral information

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New York Times article viewing task and prediction of population information sharing. Brain activity was measured as people read and listened to headlines and abstracts of New York Times articles focusing on health and fitness. Population-level counts of the number of times each article was shared online within the first 30 days after publication (via email or social media) were collected from the New York Times website. Multilevel models used brain responses from the viewing task to predict counts of population article sharing. Credit: Image provided to the U.S. Army courtesy UPENN

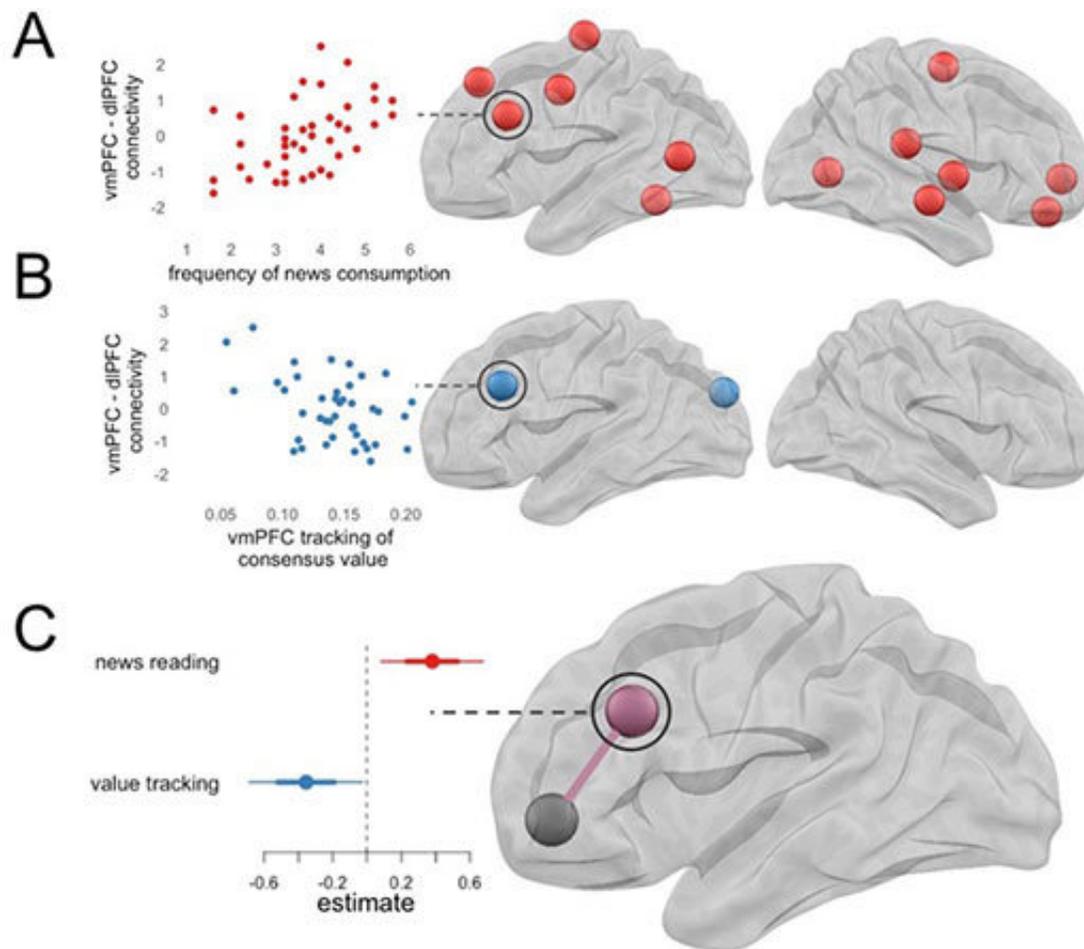
Many kinds of communication are critical to the success of Army missions: messages that promote a healthy lifestyle to Soldiers and their families, flyers distributed to support peacekeeping missions, recruiting skilled personnel to serve our nation. Knowing in advance what messages are more likely to be successful would give our troops a major advantage.

Neuroscientists at the University of Pennsylvania and the U.S. Army Research Laboratory have forecasted what content will get passed along repeatedly. In an article published in August 2018 in the journal *Cerebral Cortex*, researchers analyzed the brain responses of 40 people as they read real New York Times health article headlines and abstracts. They found that those who don't regularly read the [news](#) were best able to predict the popularity of those articles among real readers.

The researchers looked specifically at the brain's ventromedial prefrontal cortex (vmPFC), which supports judgments about how valuable something is. High levels of activity in that part of the brain not only reflected how much that individual wanted to read the story, but also tracked with how popular the article was on the New York Times website.

"The problem with the brains of the frequent news readers is that they showed a high value signal to all of the articles—in other words, they responded positively to all the New York Times stories," said study lead author Dr. Bruce Doré, a postdoctoral fellow in the Communication Neuroscience Lab of the University of Pennsylvania's Annenberg School for Communication. "It was the infrequent news readers whose brains were differentiating between the heavily-shared articles and the less popular ones. Their brains were able to diagnose which articles would go viral."

By definition, the researchers said, going viral means that a piece of content has escaped the confines of its normal niche audience.



Less frequent news reading was associated with lower connectivity of vmPFC with several brain regions, including several regions associated with executive function tasks. B) Higher vmPFC value tracking was associated with lower connectivity between x. C) The overlap of these analyses indicated that connectivity between vmPFC and dlPFC was associated with both news reading frequency and vmPFC tracking of consensus value. (Regions visualized reflect those for which 95% credibility intervals under a LASSO prior excluded zero). Credit: UPENN

Dr. Jean Vettel, an Army Research Laboratory neuroscientist, said the value of this research is in finding ways to predict what types of information will be widely shared with a population. She said instead of targeting frequent users of a media platform, this research points to the value of non-expert evaluations.

"A longstanding component of many successful Army missions has relied on successful communication," Vettel said. "For example, peacekeeping missions over the past few decades have often utilized card advertisements to share opportunities for fresh water, food, new jobs. The continued adoption of online social media as an influential medium for sharing news and information suggests its inherent value for future Army missions."

The Army is also interested in how to better communicate initiatives within the geographically distributed units, and this research also suggests that Soldiers who would generally not engage with these information campaigns would be the ones to study if the aim was to reach the non-readers with messaging, she said.

The researchers recruited general study subjects and not only loyal New York Times readers. Frequent news readers who thought about sharing an article showed high levels of connection between vmPFC and a region of the brain that supports the ability to exert deliberate control over thoughts and feelings. This, the researchers say, could suggest that frequent readers were weighing the value of the news stories in light of their own personal goals or motivations.

"Frequent news readers may be bringing to mind idiosyncratic information that's more unique to them," Doré said. "Infrequent news readers, on the other hand, responded in a way that was more reflective of how people in general respond."

"The key insight is that if something is going to get shared widely, it has to appeal more broadly," said senior author Dr. Emily Falk, associate professor of Communication, Psychology, and Marketing at the University of Pennsylvania. "If you're trying to get a wide reach on an article or video or product, you shouldn't just be talking to your most committed readers or advocates."

More information: B P Doré et al, Brain Activity Tracks Population Information Sharing by Capturing Consensus Judgments of Value, *Cerebral Cortex* (2018). [DOI: 10.1093/cercor/bhy176](https://doi.org/10.1093/cercor/bhy176)

Provided by The Army Research Laboratory

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