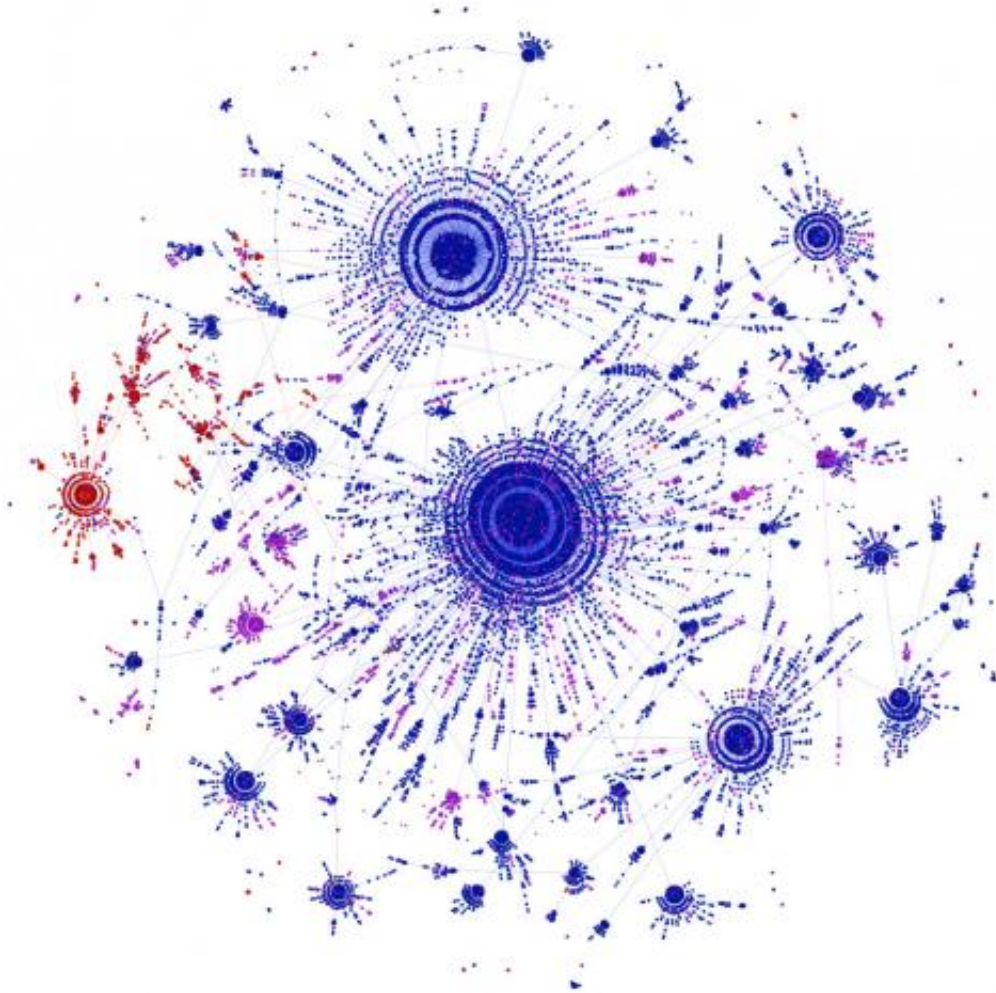


Facebook memes can evolve like genes

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A diagrams showing the spread of the "No one should" meme on Facebook. Each node represents a different version, and each edge connects a version to the most likely ancestor variant. Nodes are colored by timing prompt: rest of the day (blue), next 24 hours (red), or other (purple), showing that mutations in the timing prompt are preserved along the branches of the tree. Credit: Lada Adamic

(Phys.org) —What started as a politically liberal Facebook meme in support of health care reform morphed as it spread across the social network into hundreds of thousands of variations—some just a few words from the original, but others centered on taxes, beer, or Star Wars' villain Jabba the Hutt.

The twists on the original text over time in many ways mirrored the evolution of biological genes, researchers from the University of Michigan and Facebook have found.

The team examined 460 million shares of more than 1,000 text status-update memes—typically messages that ask to be shared if you agree with their sentiment. The researchers looked at updates from an 18-month period between 2009 and 2011. This was just after Facebook lifted its 160-character limit, but before it added the "share" button. So to share a meme, users had to copy and paste or retype it, opening the door for both errors and edits.

A "meme" is an idea or behavior that moves through a culture. Evolutionary biologist Richard Dawkins coined the term in 1976 to describe how information or style proliferates, for example, but in recent years it has more often referred to "viral" Internet content. Dawkins and others have long theorized that memes and genes evolve in similar ways and the new study examines the extent to which the analogy holds.

According to the study, Facebook acts as a large Petri dish in which memes can mutate and replicate over the substrate of the network of friendship ties.

One of the memes the team studied most closely got started as "No one should die because they cannot afford health care and no one should go broke because they get sick. If you agree please post this as your status for the rest of the day." Because the data was made anonymous, the

researchers don't know who came up with the update.

In this early form, the message was copied more than 470,000 times. A different version that began "thinks that," which would follow the person's name, was copied 60,000 times. And the third most common variation added, "We are only as strong as the weakest among us" in the middle. All resonated most with self-described liberals.

Overall, 89 percent of copies were exact and 11 percent included a mutation. Some were neutral. "The rest of the day" became "the next 24 hours," for instance. But others transformed to appeal to new audiences. "No one should die because the government is involved with health care..." and "No one should go broke because the government taxes and spends" were popular among self-identified conservatives.

"No one should be without a beer because they can't afford one," and "No one should be frozen in carbonite because they couldn't pay Jabba the Hut" were less politically polarized forms that also became widespread.

The researchers found that they could model the evolution of memes with what's called the Yule process, which typically describes how common different versions of genes are in a population.

"It surprised me that the model fit really well," said Lada Adamic, an associate professor in the U-M School of Information and the Department of Electrical Engineering and Computer Science, and a member of Facebook's data science team. "We can't claim that memes evolve exactly like genes, but there are a bunch of very convincing parallels."

One is in lateral gene transfer, which occurs when useful snippets of genetic information are passed, in essence, sideways among different

individual organisms, rather than passed "down" between generations. Bacteria can accomplish this through several mechanisms. Adamic and her colleagues saw it happen in the memes as well. People would lift phrases such as "95 percent of you won't repost this, but the 5 percent who [have a heart/care/are true friends] will..." from one meme and add them to another.

"Some of the variants would have the snippet and others wouldn't, and the ones that had it were more popular," Adamic said. "They were little boosters."

Another attribute common in gene and meme reproduction is that mutations tend to occur more often at the beginning or end of a sequence. And in both processes, shorter sequences of similar information tended to spread more broadly. Those are just a few of the similarities detailed in the study. The researchers say the work opens a window into how people interact and persuade one another.

"In many ways memes shape the culture and communities through which they move," said Eytan Adar, an assistant professor in the U-M School of Information and the Department of Electrical Engineering and Computer Science. "The thing we really wanted to understand was how the cultures shaped the memes. This work has implications for understanding how people communicate and influence each other, and let's us measure people's beliefs, desires, values, and even what entertains and amuses them."

More information: Facebook note about the findings:
on.fb.me/1dxa6Qd

Provided by University of Michigan

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