National Academy of Sciences

Journal Club
Highlighting recent, timely papers selected by Academy member labs

Well-connected members of tight-knit groups spread controversial ideas much more readily than “influencers”

Posted on July 30, 2021 (https://blog.pnas.org/2021/07/well-connected-members-of-tight-knit-groups-spread-controversial-ideas-much-more-readily-than-influencers/) by Amy McDermott (https://blog.pnas.org/author/amcdermott/)

(http://blog.pnas.org/wp-content/uploads/2021/07/network_blog_art_Cropped.jpg)

People at the periphery of social groups often sow the seeds of social change. This image – titled *Amicitia*, by artist Kirell Benzi – shows teenage social networks in 82 U.S. communities. Each network, represented by a different color, presents the pattern of friendship connections, as determined by student questionnaires, in a particular community. Image credit: Kirell Benzi

The people who spread new and controversial ideas—changes in diet, exercise routine, political leaning, or even attitudes about vaccination—may not be the Kim Kardashians and Paris Hiltons. According to a recent study (https://www.nature.com/articles/s41467-021-24704-6) in *Nature Communications*, those with the most actual influence are often on the periphery of the social network. Coauthor and computational sociologist Douglas Guilbeault says that what makes these people special is that they are embedded in a tight-knit group with many connections to other tight-knit groups, even if each individual has fewer contacts than the most popular or famous person in the network.

“Think of a blue-collar worker at a car factory, who, let’s say, starts to adopt a vegan diet and is surrounded by people who don’t eat that way,” says Guilbeault, at the University of California, Berkeley. Maybe the factory worker has one or two good friends who also decide to try veganism in the lunchroom. Their small group, though not famous or particularly aware of their influence, would likely spread positive attitudes about veganism through the workplace much more effectively than a famous person on YouTube. “If it comes from someone embedded in the network,” Guilbeault explains, “it can spread in a peer-to-peer fashion.”

The people known as “influencers” on social media today have, by definition, the most followers and the most recognition. One might expect them to spread ideas furthest and fastest based on traditional epidemiological models, in which a superspreader can pass a virus to their many contacts. But as coauthor Damon Centola has shown in prior research (https://science.sciencemag.org/content/329/5996/1194) , complicated ideas actually don’t spread like diseases; they don’t ride single ties from one person to another to another. The focus of this study, then: What spurs the spread of a complex idea?

In the last 50 years, sociologists developed a number of algorithms, largely based on epidemiology, to simulate the spread of an idea. But Guilbeault and Centola, a sociologist at the University of Pennsylvania in Philadelphia, wrote a new algorithm, assuming that complex ideas spread not from person to person along simple chains, but rather radiate out from small groups that provide the social support needed for sustaining the spread of complex ideas. They based their model on earlier findings that an idea won’t spread unless each person who encounters the idea passes some threshold number of neighbors who have also adopted the behavior. “What the authors point out is that there is a tacit assumption here that stuff travels through handshakes, through one individual encounter with one other individual,” says Arnout van de Rijt, a sociologist at Italy’s European University Institute. That makes sense when talking about COVID-19, he says. “But there is a whole world of things that don’t spread in such a simple way.”

To validate their model, Centola and Guilbeault used real-world data on how a microfinance program spread through 43 villages in India. That data maps all the social ties in the villages and tracks if and when each household adopted the program, as well as which households were best at getting others to adopt it. The authors then compared the performance of their newly crafted algorithm to conventional models—i.e., those that tend to assume ideas do spread like viruses—and found that the new measures were much better at predicting which households effectively spread the program.

The “real payoff” of this paper, says Hana Shepherd, a sociologist at Rutgers University in New Brunswick, New Jersey, who was not involved in the study, is that it shows that new ways to *measure* networks can better model and account for the spread of ideas and behavior. It’s a new way of thinking about network connections and how to measure and test them against real-world data, she says. Shepherd adds, however, that, as with all formalized simulations, this one only revealed when the model works, not when it falls short.

One clear next step is using the findings to actually seed real-world ideas, Guilbeault says. He’s now working with administrators at California Veterans Hospitals to spread the adoption of a new telehealth program. Some of the software developed for this study is publicly available, allowing other scientists and companies to identify the key people in any network who could most effectively start the spread of an idea or behavior. “The punchline,” Centola says, is that in large networks, researchers can now identify which of the individuals who belong to key small groups should be contacted in order to initiate a cascade of changing thinking, “generating essentially a tipping point in social norms.”

Other recent papers recommended by Journal Club panelists:

Historic and bioarchaeological evidence supports late onset of post-Columbian epidemics in Native California (https://www.pnas.org/content/pnas/118/28/e2024802118.full.pdf?casa_token=4HvKGYhMyvQAAAAA:Pknjqxrio2Zu_3-eVk_2zQZgfEl7UOow-QX2v_pN0QJmpFJihUgVng7go3MQzQZFsH-9t32zCAK6Ow)

Understanding the dynamics of fish politics: The role of diverse actor interactions in transformations towards co-management (https://doi.org/10.1016/j.envsci.2021.06.010)

Genome-wide gene expression tuning reveals diverse vulnerabilities of M. tuberculosis (https://www.sciencedirect.com/science/article/pii/S0092867421008242?via%3Dihub)

A Design Strategy for Intrinsically Stretchable High-Performance Polymer Semiconductors: Incorporating Conjugated Rigid Fused-Rings with Bulky Side Groups (https://pubs.acs.org/doi/10.1021/jacs.1c04984)

Global waves synchronize the brain’s functional systems with fluctuating arousal (https://advances.sciencemag.org/content/7/30/eabf2709)

Phylogenetic reconstruction of ancestral ecological networks through time for pierid butterflies and their host plants (https://onlinelibrary.wiley.com/doi/full/10.1111/ele.13842)

Categories: Journal Club (https://blog.pnas.org/category/journal-club/) | Social Sciences (https://blog.pnas.org/category/social-sciences/) and tagged complex contagion (https://blog.pnas.org/tag/complex-contagion/) | COVID-19 (https://blog.pnas.org/tag/covid-19/) | network science (https://blog.pnas.org/tag/network-science/) | simple contagion (https://blog.pnas.org/tag/simple-contagion/) | social network (https://blog.pnas.org/tag/social-network/) | sociology (https://blog.pnas.org/tag/sociology/) | vaccines (https://blog.pnas.org/tag/vaccines/)

One Response to *Well-connected members of tight-knit groups spread controversial ideas much more readily than “influencers”*

Shane McEvoy (https://www.flycastmedia.co.uk) *says:*

August 11, 2021 at 9:50 am (https://blog.pnas.org/2021/07/well-connected-members-of-tight-knit-groups-spread-controversial-ideas-much-more-readily-than-influencers/#comment-236162)

As individuals we are always looking for social proof on anything that is newly introduced so it’s not surprising that the group support idea works.

Reply (http://domain.com/2021/07/well-connected-members-of-tight-knit-groups-spread-controversial-ideas-much-more-readily-than-influencers/?replytocom=236162#respond)

Online ISSN 1091-6490