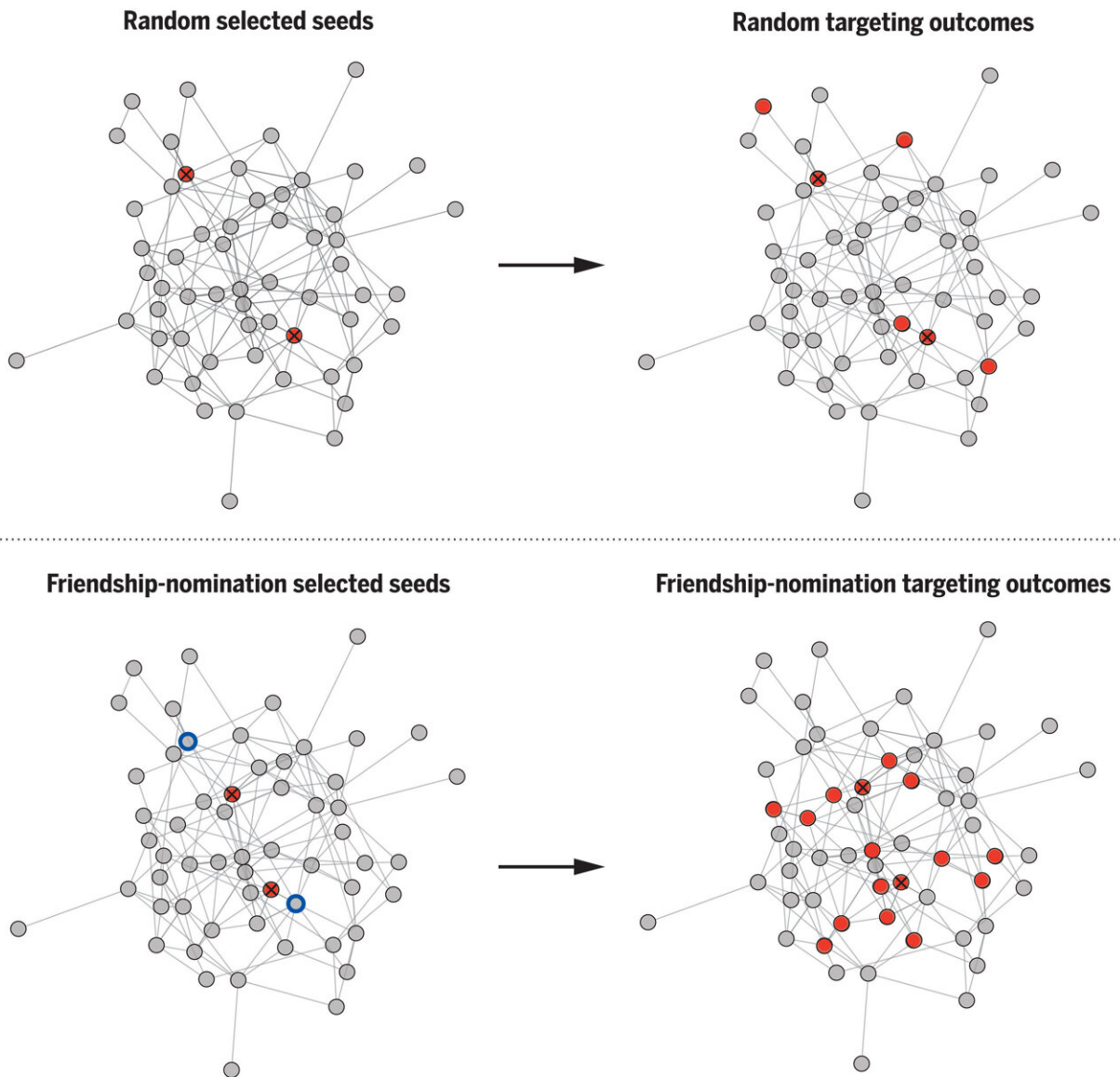


Targeting friends to induce social contagion can benefit the world, says new research

May 2 2024, by Mike Cummings



Using friendship-nomination targeting to enhance social contagion. (Top) Two

out of 58 people (red circles with an X) in a village network are randomly chosen to be seeds for an education intervention. At follow-up, they themselves have adopted the relevant practice and have influenced four other villagers to do so (plain red circles). (Bottom) For each of the same two random people (circles with blue perimeters), a random friend is chosen to be a seed instead (new red circles with an X). These people have a different location in the network. At follow-up, these seeds have influenced more people (14) to adopt the relevant practice. Credit: *Science* (2024). DOI: 10.1126/science.adi5147

A new study co-authored by Yale sociologist Nicholas A. Christakis demonstrates that tapping into the dynamics of friendship significantly improves the possibility that a community will adopt public health and other interventions aimed at improved human well-being.

The study, [published](#) in the journal *Science*, evaluated a strategy that exploits the so-called "friendship paradox" of human social networks. That theory suggests that on average, your friends have more friends than you do. As the theory goes, the individuals nominated as friends potentially wield more [social influence](#) than those who identify them.

For the study, the researchers utilized the friendship paradox in the delivery of a proven 22-month education package promoting maternal, child, and neonatal health in 176 isolated villages in Honduras.

Christakis and co-author Edoardo M. Airoidi of Temple University found that use of this "friendship targeting strategy," in which randomly chosen people nominated random friends to receive the educational intervention, was substantially more efficient than other methods of implementing the program. The researchers found that delivering the intervention to a smaller fraction of households in each village via the friendship targeting strategy led to the same level of behavioral adoption as would have been achieved by treating all the households.

"We found that targeting people's friends for an intervention induced significant social contagion, creating cascades of beneficial health practices to people who didn't receive the intervention," said Christakis, Sterling Professor of Social and Natural Science at Yale. "This means that, without changing the intervention, without increasing the number of people targeted, and without changing the setting, we can materially enhance the overall adoption of desirable practices in demanding situations."

For the study, which unfolded over five years, the researchers mapped face-to-face social networks among 24,702 individuals—encompassing 10,013 households in the 176 Honduran villages—discerning all relevant social ties among study participants.

Then, people were either selected randomly within each village to receive the intervention or they were randomly chosen to nominate their friends, who were subsequently picked at random. The researchers also varied the percentage of households within in each village that would receive the intervention, from as low as 5% to as high as 100% of the villagers.

The 22-month educational program covered a broad range of topics, including the importance of breastfeeding infants, the need to seek prenatal care, and the proper treatment of diarrhea in children. Over the course of the study, the researchers assessed 117 outcomes covering the intervention's effects on the relevant knowledge, attitudes, and practices of both the villagers who received the intervention and those who did not.

Their objective was not to evaluate the [public health](#) intervention—which was known to have positive benefits—but rather the effectiveness of the network targeting methods used to choose people to whom to deliver it.

The team found strong evidence that there were spillover effects from the friendship nomination method, meaning the people who received the intervention were spreading what they had learned within their social networks.

In 113 of the 117 program outcomes they assessed, the friendship nomination and random targeting methods achieved nearly the same level of adoption found in villages where all households received the intervention, but with a much smaller percentage of people targeted. Furthermore, friendship targeting was discernably more efficient than random targeting in 34 of the measured outcomes, with an average reduction of 7.4% in the targeted fraction of households that needed to be treated, according to the study.

The study found that outcomes relating to knowledge, as well as those that were intrinsically easier to adopt, spread more readily through friendship targeting.

"Spillover effects are notoriously hard to estimate with accuracy," said Airoidi, Millard E. Gladfelter Professor of Statistics, Operations, and Data Science at Temple University's Fox School of Business. "We had to develop novel statistical methods to design this complex and large-scale randomized field experiment in order to do that."

For many outcomes, using the friendship-nomination targeting method to reach 20% of households in a village affected outcomes the same as administering the intervention to every household, according to the study. In the future, the method can be deployed relatively easily and without the expense of mapping a village's social network.

"This means that for the same amount of money and resources, you could implement the [intervention](#) to 20% of households in five villages instead of all the households in the single village and get five times the

results," said Christakis, director of the Human Nature Lab at Yale.

"Friendship targeting can be used not only to facilitate the adoption of public health interventions, but also to promote agricultural innovation and economic development. Any kind of behavior change you wish to effectuate that involves social contagion can in principle be enhanced by using this technique."

The study is part of a large multi-year project in collaboration with the Ministry of Health in Honduras, the Inter-American Development Bank, and many other local agencies and funders. Many other reports and papers that describe the project's various aspects and findings, with a broad set of other scientists, will appear in the coming years.

More information: Edoardo M. Airoidi et al, Induction of social contagion for diverse outcomes in structured experiments in isolated villages, *Science* (2024). [DOI: 10.1126/science.adi5147](https://doi.org/10.1126/science.adi5147)

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