**Your Friends Have More Friends Than You—and That’s a Good Thing for Marketers and Public Health Officials**

*In a new study, Professor Vineet Kumar and his co-authors two ways to seed interventions in social networks based on the “ friendship paradox.”*

**Written by Rebecca Beyer**

If you’ve ever been bothered by the feeling that your friends have more robust social lives than you do, you’re not alone. Lots of people feel that way, and, mostly, they—and you—are right. For decades, social scientists have recognized what’s known as the friendship paradox, which says that on average, the friends of any given individual have more friends than the individual does.

But, even if the phenomenon isn’t good for your self-esteem, it turns out it is very good for maximizing the effectiveness of limited vaccine supply or raising awareness about a new product or informing people about misinformation.

New research by Yale SOM’s [Vineet Kumar](https://som.yale.edu/faculty-research/faculty-directory/vineet-kumar) explores the underlying mathematical principles that make the friendship paradox true and offers up two ways—including a novel approach—to take advantage of the principle to help seed interventions in online and real-world social networks that could benefit public health, political, or marketing campaigns.

Using Kumar’s approach is more effective than other methods of seeding networking interventions “if we’re trying to stop an infection from becoming an epidemic, or, in the case of a marketing campaign, to do the opposite,” he says.

Kumar, an associate professor of marketing, focuses his work on digital technologies and artificial intelligence. His previous research has examined vaccine hesitancy and freemium business models, among other topics. He also has studied the friendship paradox before. In a working paper, “[Can Friends Seed More Buzz and Adoption?](https://som.yale.edu/sites/default/files/2022-01/Friendship_Paradox_Empirical_FastTrack.pdf)”, he explored whether using the friendship paradox could improve upon a previous effort to use social leaders to spread the word about microfinance through villages in rural India (in short, it could).

Kumar’s latest paper explores the principle of inversity, which measures whether two points (or people) who are connected in a social network are similar in their degree of connectedness or dissimilar. Based on that measurement, Kumar and his co-authors— Scott Feld of Purdue University, who wrote an influential paper on the friendship paradox in 1991, and David Krackhardt of Carnegie Mellon University—examine two methods for seeding interventions.

One method, the ego-based strategy, involves asking a random person in the network to provide the name or information of one of their friends, who would be the target of the intervention—that is, selected to receive a vaccination or given information to be shared widely. That method has been used in the past but its effectiveness has not been extensively studied.

The other method, the alter-based strategy, is apparently new. “We are the first to propose it as far as we can see,” Kumar says.

In the alter-based strategy, a random person in the network would be asked to provide contact information for multiple friends, based on some fixed percentage rate; for instance, if the rate is 50%, the target would flip a coin to determine whether they would provide the contact information of a particular friend. Those selected friends would then be used to seed the intervention.

Both strategies, ego-based and alter-based, perform better than existing methods, including choosing someone at random to seed an intervention or relying on leaders within a network to do so. For instance, in the case of a hypothetical epidemic, only about 25% of a network would need to be immunized to prevent an epidemic using either of the two strategies. Using a random intervention, about 50% of the network would need to be immunized.

A major advantage of the methods analyzed in Kumar’s paper is that they are privacy sensitive. Many other interventions require much more knowledge about a network’s structure and the people within it to improve upon the random seed intervention strategy.

“I don’t know about you, but I wouldn’t necessarily feel comfortable sharing all my friends’ information with a company or researcher,” Kumar says. “But if they ask me for one friend, I might.”

Kumar points out that there are other factors to consider when planning how to seed an intervention, including, in the case of public health campaigns, equity-based factors. But the friendship paradox is a very relevant consideration, he adds.

“The idea applies very broadly to any network,” he explains. “The people that are more popular”—and therefore more effective in seeding interventions—"are more likely to be reached using the friendship paradox.”

The findings have implications for a variety of fields, including marketing, public health, and even politics. If someone want to see how far misinformation about an issue or candidate has spread in a given network, for instance, they could use the alter- or ego-based friendship paradox strategies to do so.

“The thing that I’m really happy about is that these are simple interventions that can easily be deployed,” Kumar says.