How anti-poverty programs go viral

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Anti-poverty researchers and policymakers often wrestle with a basic problem: How can they get people to participate in beneficial programs? Now a new empirical study co-authored by two MIT development economists shows how much more popular such programs can be when socially well-connected citizens are the first to know about them.

The economists developed a new measure of social influence that they call "diffusion centrality." Examining the spread of microfinance programs in rural India, the researchers found that participation in the programs increases by about 11 percentage points when well-connected local residents are the first to gain access to them.

"According to our model, when someone with high diffusion centrality receives a piece of information, it will spread faster through the social network," says Esther Duflo, the Abdul Latif Jameel Professor of Poverty Alleviation at MIT. "It could thus be a guide for an organization that tries to [place] a piece of information in a network."

The researchers specifically wanted to study how knowledge about a program spreads by word of mouth, MIT professor Abhijit Banerjee says, because "while there was a body of elegant theory on the relation between what the network looks like and the speed of transmission of information, there was little empirical work on the subject."

The paper, titled "The Diffusion of Microfinance," is published today in the journal *Science*. Banerjee, the Ford Foundation International Professor of Economics at MIT, is also a co-author of the paper. Along with Banerjee and Duflo, the other co-authors are Arun Chandrasekhar of Microsoft Research and Matthew Jackson, an economist at Stanford University.

Duflo and Banerjee are co-founders of the Abdul Latif Jameel Poverty Action Lab, or J-PAL, which is based at MIT and uses empirical field experiments to develop new strategies for poverty alleviation.

When 'leaders' don't have followers

The study is based on the operations of Bharatha Swamukti Samsthe (BSS), a microfinance institution based in Bangalore, in southwestern India. It uses information provided by BSS, as well as data from surveys the academic researchers conducted.

In 2006, the researchers conducted extensive surveys in 75 villages in the state of Karnataka (where Bangalore is also located) six months before BSS planned to begin offering microfinance programs in those villages.

The research team compiled extensive demographic, household and social-network data from the villagers to build a picture of the social connections in those places.

As it happened, BSS ended up running microfinance programs in 43 of those villages; the researchers then conducted follow-up surveys in those villages, ending in 2011. By using that data, Banerjee, Duflo and their co-authors could both map the empirical process of information diffusion and construct a model that could be applied in other settings.

Among other findings, the researchers discovered that participants in the microfinance programs are seven times more likely to pass along information about them to other households, compared to people who are informed about the programs but not participating. However, facts about the microfinance programs passed along by nonparticipants proved to be the main source of information for about one-third of the households that eventually did participate in the programs.

In all, they found, the 11-percentage point gain in participation occurs when the first people to learn about programs are in the 90th percentile of diffusion centrality, as opposed to the 10th percentile.

These findings could help organizations like BSS, or nonprofit anti-poverty groups, to evaluate the best ways of introducing programs in local settings. When BSS representatives introduce a program to a village, they generally start by holding meetings with local leaders—often teachers, business owners or heads of local savings groups (clubs intended to help people improve their finances). But the study shows that the social centrality of these types of people can vary.

"Some of them are indeed well-connected in the right way," Banerjee says. But as he also notes, "others are not, and those people do not do a particularly good job of informing others." And, as Duflo adds, "Our

research could conceivably help guide an organization to select more influential leaders to contact first."

A micro look at microfinance

Microfinance is the term for small-scale lending, popularized in the 1990s, that can help relatively poor people in developing countries gain access to credit they would not otherwise have. The concept has been the subject of extensive political debate; academic researchers are still exploring its effects across a range of economic and geographic settings.

"Microfinance is the type of product which is very interesting to study," Duflo says, "because in many cases it won't be well known, and hence there is a role for information diffusion." Moreover, she notes, "It is also the kind of product on which people could have strongly held … opinions." So, she says, understanding the relationship between social structure and adoption could be particularly important.

Other scholars believe the findings are valuable. Lori Beaman, an economist at Northwestern University, says the paper "significantly moves forward our understanding of how social networks influence people's decision-making," and suggests that the work could spur other on-the-ground research projects that study community networks in action.

"I think this work will lead to more innovative research on how social networks can be used more effectively in promoting poverty alleviation programs in poor countries," adds Beaman, who is an affiliate of J-PAL. "Other areas would include agricultural technology adoption … vaccinations for children, [and] the use of bed nets [to prevent malaria], to name just a few."

Microfinance is not the only area in which J-PAL researchers are

examining diffusion centrality. In one ongoing project in the same Indian villages, researchers are studying the diffusion of a lottery-based game to try to more easily identify the characteristics of well-connected people in these social networks.

"Future work could focus on finding ways to identify the most central people that are less demanding in terms of information than diffusion centrality," Duflo says.

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