New research shows what it takes to make society change for the better

April 1 2022

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Many people try to make society change for the better. The real challenge is how to get good solutions to scale up for major change. New research suggests that social change may depend on the relationship

between beneficial behaviors and policies.

The research, conducted by the University of Maine, University of Maine at Augusta, University of Vermont and Universite Laval in Quebec, Canada, attempted to understand how society can accomplish major, transformative social change, particularly the kind of social change necessary to tackle the growing problem of climate change.

The researchers studied a behavior that benefits groups, but does not spread without policy support, such as a costly measure to mitigate the effects of climate change. They created a mathematical model using an innovative combination of epidemiological and evolutionary techniques, which simulates a society where agents live in groups and adopt the beneficial behavior of peers—behavior that, given the right conditions, can spread virally, but not if the institutional costs are too high.

The model considers factors like the prevalence of adopters and non-adopters in a group; the diffusion of behaviors, both within the group and globally; the strength of institutions supporting the behavior and facilitating its spread; and the cost of those institutions.

"Our model is unique because it combines behavioral change and policy change in a single system, and encourages us to think about social change in a richer way. Large-scale social change is not just policy or behavior, but the emergence of a new self-reinforcing system that combines both. This allows us to ask new questions, such as 'how would a new pattern of behavior and policy spread?'" says Timothy Waring, associate professor of social-ecological systems modeling at the University of Maine and co-author of the study.

The results showed that both behavioral change and policy change are required to achieve large-scale social change—and that they need to happen together. Though neither can get the job done on its own, policy

change is especially critical.

The researchers found that sometimes the beneficial behavior can spread too far. In some cases, the spread of behavior beyond groups with supporting policy can reduce its perceived success and slow the spread of the policy, thereby limiting beneficial social change overall.

The simulation suggests that projects that involve both bottom-up viral spread of behavior and top-down policy change may be the best type of solution for large sustainability issues like climate change because they serve as an example and can spread between groups to influence major change.

"For example, let's say a state wants to spread participation in a new organic composting law which would benefit towns," Waring says. "To make the system work, the collected waste must be purely organic material. But contributing pure organic waste takes effort for households, so the behavior does not take off on its own. This is a common problem for policy implementation. But if towns experiment with systems to help support and spread the behavior, the successful town programs can spread between towns along with household contributions, resulting in effective, large-scale change."

Laurent Hébert-Dufresne, lead author on the study and associate professor at the University of Vermont, says, "Our model can help figure out how to balance bottom-up and top-down effects so that new solutions can scale. For example, it can help determine when we should promote a behavior like composting all over the country to normalize it and when we should instead focus on a local well-funded pilot project to show the potential benefits of composting."

Waring said that in future research, the team aims to apply these types of models to all sorts of beneficial social change, particularly the challenge

of tackling climate change.

The study was published in the *Royal Society Open Science* on March 23, 2022.

More information: Laurent Hébert-Dufresne et al, Source-sink behavioural dynamics limit institutional evolution in a group-structured society, *Royal Society Open Science* (2022). DOI: 10.1098/rsos.211743

Provided by University of Maine