Researchers apply lessons of animal herd behavior to reduce alcohol-related traffic deaths

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Maurizio Porfiri, an associate professor of mechanical engineering at the Polytechnic Institute of New York University (NYU-Poly), is best known for his work on biologically inspired robots that mimic the movement of schooling fish so convincingly that real fish are enticed to follow them.

Watching the collective behavior of animals made him wonder: Could his knowledge of herd behavior have any application in the world of human health? So when he approached James Macinko, associate professor of public health and health policy in NYU's Steinhardt School of Culture, Education and Human Development, to learn about the latest research in public health, the idea of collaborating on alcohol-related traffic fatalities readily arose.

With Diana Silver, NYU Steinhardt assistant professor of public health and health policy, they have launched the first national study ever to apply systems science—an interdisciplinary field that takes into account entire interwoven systems—to the issue. The National Institutes of Alcohol Abuse and Alcoholism (NIAAA), one of the institutes and centers that comprise the National Institutes of Health, is funding their study.

Macinko and Silver had been studying how individual states develop public policies on a range of health topics, such as drinking and driving,

and were exploring how different combinations of health laws and policies work in concert or at odds with one another. Their work asks how states' political and economic profiles affect the adoption and diffusion of policy, and the effect of state health policy variation on health over time. Seeking new ways to analyze their complex data, Macinko and Silver turned to Porfiri in the hope that his dynamical systems research could lead them to a major breakthrough.

"Gaining a detailed understanding of state policy-making around alcohol and traffic fatalities should be a priority", Macinko pointed out, "since traffic fatalities are a leading cause of death and strong public policies can be powerful tools for ensuring health and safety."

Porfiri hypothesized that perhaps just as the movement of one fish can determine the movement of other fish, one state could similarly affect the behavior of other states.

"In this project we want to discover which is more important: ideology or geography," Porfiri said. "Will one state pass a law similar to that in another state because they are geographically close to one another or because they share an ideology? How are effective public policies diffused from state to state, and how can we predict that?"

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