

How game-theory logic underpins many of our seemingly odd and irrational decisions

April 21 2022, by Peter Dizikes



In new book, an MIT scholar examines how game-theory logic underpins many of our seemingly odd and irrational decisions. Credits: Christine Daniloff, MIT; stock and public domain images

Why do people wear Rolex watches or drive Bentleys, when less

expensive goods can perform better? Why does anyone fight the crowds at the Louvre to see the "Mona Lisa" for 30 seconds, when they could view it online for hours? Well, they may be engaging in "costly signaling," in which people display their wealth to seem desirable, even if it costs money to show they have money. And it's not only people who use costly signaling: Male peacocks grow longer tails to be more attractive to females, at the cost of being easier to catch by predators.

Meanwhile, other folks play it cool. You may not know that a co-worker went to an elite college, is wealthy, or has a famous family, despite being around them for months or years. What's behind that? This low-key style may also be a form of costly signaling, since it could make your co-worker seem more appealing, in the long run, to not show off.

"Counterintuitively, modesty is also a signal," says Erez Yoeli, a research scientist in the MIT Sloan School of Management and co-author of a new book explaining how [game theory](#) applies to everyday situations. "Things that at first seem irrational, once you dig a little and think about what is being signaled, and ask the right questions, become a lot less puzzling," he says.

Thus, people who do not bring up wealth-signaling attributes are signaling that they have a wealth of attributes, says Moshe Hoffman, Yoeli's co-author.

"They're basically saying, 'I'm willing to bury some information about me, and I'm confident I've got enough good attributes that somebody will uncover them,'" Hoffman says. "By not mentioning their credentials, they're signaling that they're not looking for a superficial interaction with somebody who is impressed with that one thing, and they don't need that thing to impress you."

Costly signaling is just one thing we do that seems irrational on the

surface but has a deeper logic behind it—a logic accounted for by the field of [game theory](#). Yoeli and Hoffman survey a wide range of these situations in "Hidden Games: The Surprising Power of Game Theory to Explain Irrational Human Behavior," published this month by Basic Books. Yoeli is also co-director of the Applied Cooperation Lab at MIT Sloan; Hoffman is a research scientist at the Max Planck Institute for Evolutionary Biology in Germany and a lecturer at Harvard University.

Cost and punishment

Yoeli and Hoffman have co-taught game theory at MIT Sloan, which helped shape their book. They want to demystify the subject, show its everyday applications, and give readers a chance to grasp some math along the way.

"Game theory is just a math toolkit for analyzing a situation where the right move for me depends on what's the right move for you, and where the right move is for you depends on what's the right move for me," Yoeli says. "All of the different models we use have that feature."

The usefulness of costly signaling, for instance, has been formalized in game-theory terms by two scholars (working separately), Michael Spence and Amnon Zahavi. In their models, the tradeoffs involved in costly signaling depend on individual circumstances. Because a long tail makes a male peacock easier to catch, growing one is only worth it for more physically fit peacocks, who can better evade predators. It is almost certainly a bad idea for an unfit male peacock.

Many game theory models show that through learning and evolution, such circumstances settle into a "Nash equilibrium," a much-banded-about phrase implying that individuals cannot improve their conditions by adopting different tactics; an unfit peacock will not suddenly thrive by growing a long tail.

In this vein, consider the problem of enforcing norms in society by issuing punishments, as opposed to appeasing wrongdoers.

"We all kind of know appeasement is a bad idea," Hoffman says. "Giving Hitler Czechoslovakia didn't work out well. But exactly why is it such a bad idea?"

Game theory can help formalize that answer through models showing that, while enacting punishments does incur costs on the punishers, this approach leads to lower costs by inhibiting repeated bad behavior. It does cost the U.S. something to impose economic sanctions on Russia for invading Ukraine; but not imposing any cost on Russia would encourage further invasions.

In game theory, such punishment-and-cost situations demonstrate an idea known as "subgame perfection," another version of the Nash equilibrium in which even wildly altered circumstances do not change the optimal decisions.

"You can punish, and punishing is costly, but if you do, then hopefully things will return to normal," Yoeli says. "The other choice is that you can not punish, but if you don't, then what the subgame perfection concept tells you is that cooperation is going to collapse, and you are going to be in an uncooperative environment thereafter. That second piece is not always obvious." Merely hoping people will behave themselves, in this case, is not a plan.

From complexity to categories

Ranging widely, "Hidden Games" even explores why our [societal norms](#) take the form they do. In one chapter, they examine game-theory work that describes how states take action based on signals from society and widespread norms. Those norms, however, often do not describe reality

very acutely.

"The norms we rely upon are very blunt, and the question is why would that be," Yoeli says. "It's such an odd thing, instead of norms being more sensitive to continuous variation."

For instance, the authors note in the book, the Jim Crow South defined people as being Black based on the infamous "one-drop rule," so that if a person had any Black heritage, they were simply defined as Black—even though many people were, and are, a mixture of ethnic heritages. Why do societies use such "artificial boundaries," as Yoeli and Hoffman term them? One answer to keep in mind, the authors observe, is that norms can be used for malevolent purposes, such as enforcing social caste systems.

"It comes down to coordination," Yoeli says. "The norms that have a huge influence in defining our rights have a coordination element with other people in society. And that coordination issue leads us to have very discrete categorical definitions of who is deserving of rights." Some people, he adds, might not "see or understand that without thinking of the game theory element."

Other scholars have praised the book as a compelling synthesis of academic thinking written for a general audience. Kevin Murphy, a professor of economics at the University of Chicago's Booth School of Business, has called "Hidden Games" a "fascinating book," in which Hoffman and Yoeli, as he has put it, "show time and again that many types of human behavior which seem inconsistent with consciously rational behavior can be understood once we realize that those same forces are operating below the surface."

For their part, Yoeli and Hoffman emphasize that game theory is more than particular models and examples.

"Any one of these game theory models is cool and illuminating, but I think the thing that is really cool is seeing all of them together and realizing this is an approach to uncovering answers about people's quirky preferences," Yoeli says. "If things seem inexplicable, there is this way of thinking about them that makes sense. That's one thing we hope readers get from this book."

More information: Book: "Hidden Games: The Surprising Power of Game Theory to Explain Irrational Human Behavior"

www.basicbooks.com/titles/erez..._games/9781541619463/

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