Monkeys Believe in Winning Streaks, Too

People have a well-documented propensity to see winning and losing streaks in situations that are random. Now researchers have found that monkeys appear to share that belief. The results of the study suggest that the tendency to see patterns that don't exist may be inherited, an evolutionary adaptation that may have provided human ancestors a selective advantage when foraging for food in the wild, according to lead author Tommy Blanchard, a doctoral candidate in brain and cognitive sciences.

The study, coauthored by Benjamin Hayden, assistant professor of brain and cognitive sciences at Rochester, and Andreas Wilke of Clarkson University, was published in the *Journal of Experimental Psychology: Animal Learning and Cognition*.

To determine if monkeys may believe in winning streaks, the researchers had to create a computerized game that would hold monkeys' attention for hours.

HOT HANDS: Like people, monkeys believe in winning and losing streaks in what are actually random series of events.

They devised a fast-paced task in which each monkey could choose right or left and receive a reward when it guessed correctly.

The researchers created three types of play—two with clear patterns in which the correct answer tended to repeat on one side or to alternate from side to side—and a third in which the lucky pick was random. Where clear patterns existed, the three rhesus monkeys in the study quickly guessed the correct sequence. But in the random scenarios, the monkeys continued to make choices as if they expected a "streak." Even when rewards were random, the monkeys favored one side.

Why do monkeys and humans share this belief in a run of luck even when faced with copious evidence that the results are random? The authors speculate that because the distribution of food in the wild is not random, evolution has primed human brains to look for patterns.

Understanding the "hot-hand" bias could inform treatment for gambling addiction and provide insights for investors, says Hayden. "If a belief in winning streaks is hardwired, then we may want to look for more rigorous retraining for individuals who cannot control their gambling. And investors should keep in mind that humans have an inherited bias to believe that if a stock goes up one day, it will continue to go up."

—Susan Hagen

DOCTOR'S ORDERS: Doctors often don't advise patients to take preventive aspirin.

Baby Aspirin? Despite Guidelines, Many Doctors Don't Recommend

A majority of middle-aged men and women eligible to take aspirin to prevent heart attack and stroke do not recall their doctors ever telling them to do so, according to a Rochester study of a national sample of more than 3,000 patients.

Published online by the *Journal of General Internal Medicine*, the finding illustrates a common disconnect between public health guidelines and what occurs in clinical practice. The Rochester study is consistent with other research showing that physicians often do not recommend aspirin as prevention therapy to the general population, despite established guidelines by the U.S. Preventive Services Task Force.

Several reasons might explain the reluctance, such as competing demands and limited time to properly assess a patient's eligibility for aspirin, according to lead author Kevin Fiscella, professor of family medicine. Uncertainty about the benefits of aspirin therapy versus potential harms such as bleeding in the digestive tract also hinder physicians' decisions, the study says.

None of the patients in the study had cardiovascular disease, but all qualified for aspirin therapy based on their 10-year risk score for factors such as diabetes, high blood pressure, obesity, smoking, and use of cholesterol-lowering medications. Of the sample, 87 percent of men and 16 percent of women were eligible to take aspirin as a preventive measure, but only 34 percent of the men and 42 percent of the women said they had been instructed to do so.

Coauthor John Bisognano, director of outpatient cardiology services at UR Medicine, said most physicians can agree on approaches to medical care in immediately life-threatening situations, but have less enthusiasm to quickly embrace preventive guidelines, particularly when they involve wide-ranging interventions for a large segment of the population.

—Leslie Orr

SARAH HEILBRONNER (MONKEY); ISTOCKPHOTO (PILLS)

Bend in Appalachian Mountain Chain Explained

The 1,500-mile Appalachian mountain chain runs along a nearly straight line from Alabama to Newfoundland, except for a curious bend in Pennsylvania and New York state.

Researchers from Rochester and the College of New Jersey now know what caused that bend—a dense, underground block of rigid, volcanic rock that forced the chain to shift eastward as it was forming millions of years ago.

The findings, by a research team including Cindy Ebinger, professor of earth and environmental sciences, have been published in the journal *Earth and Planetary Science Letters.*

When the North American and African continental plates collided more than 300 million years ago, the North American plate began folding and thrusting upward as it was pushed westward into the dense underground rock structure in what is now the northeastern United States.

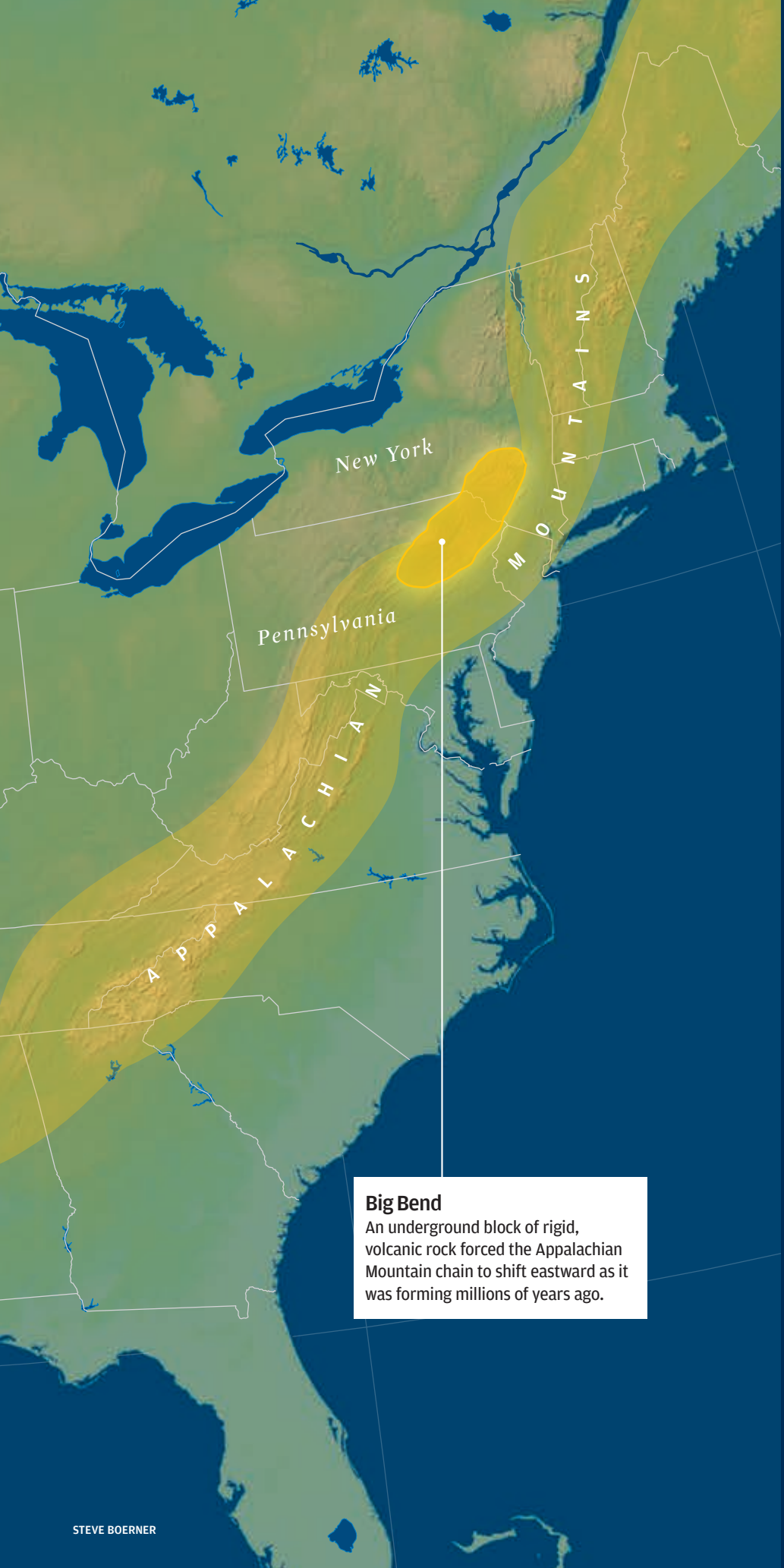
The dense rock created a barricade, forcing the Appalachian mountain range to spring up with its characteristic bend.

Ebinger calls the research a "foundation study" that will improve scientists' understanding of the earth's underlying structures. She says their findings could prove useful in the debate over the risks of hydraulic fracturing—popularly known as hydrofracking—in New York.

Hydrofracking is a technique to extract natural gas from deep in the earth. It involves drilling horizontally into shale formations, then injecting the rock with sand, water, and a cocktail of chemicals to free the trapped gas for removal.

The region just west of the Appalachian Basin—the Marcellus Shale formation—is rich in natural gas reserves and is being considered for development by drilling companies.

—Peter Iglinski



Big Bend
An underground block of rigid, volcanic rock forced the Appalachian Mountain chain to shift eastward as it was forming millions of years ago.

STEVE BOERNER