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Betting on the Brain

In 2003, a group of economists invited Rodolfo Llinás, M.D., Ph.D., the Thomas and Suzanne Murphy Professor of Neuroscience, and chairman of the Department of Physiology and Neuroscience, to speak at a symposium about how humans perceive the concept of worth, and how good the brain is at predicting what will have value. By including properties of brain science into their equations, economists hope to improve their forecasting skills, which will play a critical role in resolving the current worldwide financial crisis. Dr. Llinás met with *News & Views* recently to share his insights.



You've written that "prediction is the ultimate function of the brain." When we walk, for example, we use our senses so that we don't step off a cliff. So, why did we walk right off this economic cliff?

The ability to predict has two components: how quickly you can see what is happening and how quickly you can react. This crisis is like traveling on a bus at great speed toward an abyss. The momentum is such that the only thing you can do is brace yourself or jump out of a window.

Why didn't we see this coming?

Long-term prediction is more complicated. Our brain is largely limited to one axis of probability. Chess is a beautiful example. Most players can imagine the consequences of a move or two, while the rare grand master might see a probability distribution maybe 10 or 15 moves ahead. As you look farther ahead, the number of possible outcomes grows exponentially. In complicated systems, we simply don't have big enough brains to predict that far into the future.

Can we build better brains, i.e., computers, to do that for us?

The underlying problem in this crisis is people. People are scared. That is an emotion. The only cure for fear is rationality. In this crisis, we can use our cognitive abilities to try to understand what is going on. One thing to keep in mind is that the U.S. is worth quintillions. We're talking about a thin layer of the economy that's in trouble. But our ability to modify emotional events by rationality is limited. For instance, we know that jumping out of a plane with a parachute is relatively safe. But our natural reaction is "What, you want me to jump?" We have a primeval fear of heights.

Can science help us out of this mess?

The problem is that economics is soft. It's all based on value, and value is a subjective property. In physics, in math, in medicine, there are things you can measure. The charge of an electron can be found. It's independent of our existence. But value is totally dependent on our existence. It's an intrinsic property of our brain. If somebody thinks my watch is beautiful, and would love to have my watch, suddenly its value begins to increase. What other people believe is almost as important or more important. We are a gregarious bunch of monkeys. We believe what everybody else believes. This is why present-day economics is not a hard science.

How do we act rationally amid such frightening prospects?

You can't rationalize if you don't know how to fix things. We're facing huge problems, and nobody knows what's going to happen because markets have a life of their own. The bus continues to move, and the abyss lies ahead. But being desperate and afraid solves nothing. Individually, you have to sit down and calculate exactly where you stand – not just economically. You should also ask yourself, "Am I happy or unhappy?" In our society, many people look at their bank account to find out how happy they are. Will people come to understand that life is about life, not about money? I don't know.

About the image:

"It's like a casino down there," says Dr. Rodolfo Llinás of the main floor of the New York Stock Exchange. "There are only three things you can do: bet, win, or lose." Two days before Dr. Llinás visited the exchange on October 15, 2008, the Dow had scored its biggest single-day percentage gain in 75 years, soaring 936 points. Two hours after he departed, the Dow plummeted 733 points, marking one of the worst days in its history. (photo by Bud Glick)

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