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Lessons From The Brain-Damaged Investor

Unusual Study Explores Links
Between Emotion and Results;
'Neuroeconomics' on Wall Street

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People with certain kinds of brain damage may make better investment decisions. That is the conclusion of a new study offering some compelling evidence that mixing emotion with investing can lead to bad outcomes.

By linking brain science to investment behavior, researchers concluded that people with an impaired ability to experience emotions could actually make better financial decisions than other people under certain circumstances. The research is part of a fast-growing interdisciplinary field called "neuroeconomics" that explores the role biology plays in economic decision making, by combining insights from cognitive neuroscience, psychology and economics. The study was published last month in the journal *Psychological Science*, and was conducted by a team of researchers from Carnegie Mellon University, the Stanford Graduate School of Business and the University of Iowa.

THE PRICE OF FEAR




A new study shows people with brain damage that impaired their ability to experience emotions such as fear outperformed other people in an investment game.

- The brain-damaged participants were more willing to take risks that yielded high payoffs.
- They were less likely to react emotionally to losses.
- They finished the game with 13% more money than other players.

The 15 brain-damaged participants that were the focus of the study had normal IQs, and the areas of their brains responsible for logic and cognitive reasoning were intact. But they had lesions in the region of the brain that controls emotions, which inhibited their ability to experience basic feelings such as fear or anxiety. The lesions were due to a range of causes, including stroke and disease, but they impaired the participants' emotional functioning in a similar manner.

The study suggests the participants' lack of emotional responsiveness actually gave them an advantage when they played a simple investment game. The emotionally

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impaired players were more willing to take gambles that had high payoffs because they lacked fear. Players with undamaged brain wiring, however, were more cautious and reactive during the game, and wound up with less money at the end.

Some neuroscientists believe good investors may be exceptionally skilled at suppressing emotional reactions. "It's possible that people who are high-risk takers or good investors may have what you call a functional psychopathy," says Antoine Bechara, an associate professor of neurology at the University of Iowa, and a co-author of the study. "They don't react emotionally to things. Good investors can learn to control their emotions in certain ways to become like those people."

The study demonstrates how neuroeconomics can offer insight into a question that has become a growing focus of economic inquiry: Why don't people always act in their own self-interest when they make economic decisions?

Though the field is still in its infancy, researchers hope neuroeconomics could someday have dozens of real world applications -- like explaining how brain chemistry influences market phenomena such as bubble manias and investor panics. Wall Street executives already are paying attention to the findings, since it offers insight into what motivates investors.

"This branch of inquiry and economic investigation is really fortifying and buttressing our understanding of investor behavior," says David Darst, chief investment strategist in the Individual Investor Group at Morgan Stanley. "It's beginning to inform our tactical decisions."

Using sophisticated brain-imaging technology such as magnetic resonance imaging, or MRI, tests and other tools, neuroeconomists peek inside people's brains to see which regions are activated when we engage in behaviors such as evaluating risks and rewards, making choices and cooperating with other people. Neuroeconomic researchers also tap into brain activity by measuring brain chemicals and exploring how damage to specific brain regions impacts economic decision making.

Neuroeconomics grew out of a related field called behavioral economics. Behavioral economists use insights from psychology and other social sciences to explore why humans don't always behave as predictably as standard economic models suggest they should.

In the late 1990s, when the links between psychology and neurobiology were firmly established, behavioral economists began turning to neuroscientists, in addition to psychologists, for help explaining human behavior. The idea was that if brain chemistry could explain phenomena such as depression or attention deficit disorder, it might also help explain more mundane psychological functions, such as how people reach financial decisions.

Behavioral economists, like Princeton's Daniel Kahneman, who won the Nobel Prize for Economics in 2002, began teaming up with neuroscientists, like Peter Shizgal at Concordia University in Montreal. In one study, the pair used gambling games and neuroimaging techniques to look what part of the brain is triggered when people anticipate winning money. They found that monetary rewards trigger the same brain activity as good tastes, pleasant music or addictive drugs.

The 41 participants in the new study included people with and without brain damage, including a control group of participants with brain damage that didn't affect their emotional processing. Players were given \$20 and asked to play a simple gambling game that involved 20 rounds of coin tosses. If they won a coin toss, they earned \$2.50. If they lost the toss, they had to give up a dollar. They could choose not to play in any given round, in which case they kept their dollar.

Logic indicates that the best strategy was to take the gamble in every round of the game, since the return on a win was much higher than the potential loss, and the risk in each round was 50-50. The players with emotion-related brain damage took a more logical strategy, investing in 84% of rounds, while the nonbrain-damaged players invested in just 58% of the rounds. Emotionally impaired participants outperformed the nonbrain-damaged participants, winding up with an average of \$25.70 versus \$22.80 at the end of the game.

The researchers believe fear had a lot to do with the poor performance of nonbrain-damaged participants. "If you just observe these people, they know the right thing to do is invest in every single round," says Baba Shiv, an associate professor of marketing at the Stanford business school and a co-author of the study. "But when they actually get into the game, they start reacting to the outcomes of the previous rounds."

Yet emotions may play a useful role in financial decision making. While the brain-damaged players did well in the specific game in the study, they didn't generally perform well when it came to making financial decisions in the real world. Three of four of the brain-damaged players had experienced personal bankruptcy. Their inability to experience fear led to risk-seeking behavior, and their lack of emotional judgment sometimes led them to get tangled up with people who took advantage of them. Their life experience suggests emotions can play an important role in protecting our interests, even if they sometimes interfere with rational decision making.

Humans developed this fear response as a survival mechanism to protect against predators. But in a world where predators aren't lurking around every corner, this fear system can be over-sensitive, reacting to dangers that don't actually exist and pushing us toward illogical choices.

"There was no such thing as stock in the Pleistocene era," says George Loewenstein, a professor of economics at Carnegie Mellon University, and a co-author of the study. "But human beings are pathologically risk averse. A lot of the mechanisms that drive our emotions aren't really that well adapted to modern life."

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