Medical Xpress

Using neuroeconomics to study psychiatry

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Neuroeconomics experts and guest editors of the *Biological Psychiatry* special issue Carla Sharp, John Monterosso, and P. Read Montague in an introductory paper define neuroeconomics as "an interdisciplinary field that brings together psychology, economics, neuroscience, and computational science to investigate how people make decisions."

Neuroeconomics is a relatively new field that traditionally has studied the decision-making process of healthy individuals. It does so by using neuroimaging techniques in conjunction with behavioral economic experiments. For example, an experiment may involve a gambling task where individuals must repeatedly choose between two options, one considered risky and one safe. The corresponding brain activity occurring during each choice is recorded and analyzed, allowing researchers to study and understand the underlying processes of those decisions.

In healthy individuals, investigators study optimal decision-making strategies. However, in psychiatric populations, studying alterations in decision-making can provide insights into the neurobiology underlying "real world" functional impairments. Dr. Sharp commented that "neuroeconomics provides an interdisciplinary platform for researchers to study reward-related decision-making as it relates to psychiatric disorder across multiple levels of explanation." Thus, in this introductory paper to the special issue, the authors detail the reasons why neuroeconomics is a useful approach to study psychiatric behavior.

Abnormal decision-making has been identified in many psychiatric

disorders, including substance abuse and addiction disorders, depression, anxiety, and attention-deficit/hyperactivity disorder. Individuals with these disorders tend to respond differently to rewards and losses, which includes how much value they place on immediate versus delayed rewards, and even how choices are altered based on the potential size of the reward. Neuroeconomics can be used to study these differential patterns of decision-making, which theoretically, could later be used to develop improved treatments.

Neuroeconomics may also advance psychiatry in a larger way by promoting the development of a new classification system based on linking pathology in brain systems to behavioral disturbances. This is a lofty and important goal for psychiatry, highlighted by the National Institute of Mental Health Strategic Plan that identifies the need for "new ways of classifying mental disorders based on dimensions of observable behavior and neurobiological measures". This would move the field beyond the categorical classification system that has been used for decades to diagnose and study psychiatric disorders.

"Neuroeconomics is one of the hottest areas in cognitive neuroscience. We are extremely pleased to have leaders in this field discuss its important implications for psychiatry," said John Krystal, Editor of Biological Psychiatry.

For now, the authors note that the "application of neuroeconomics to psychopathology has only just begun," but the papers in this special issue detail how and why this field can and should move forward.

More information: "Neuroeconomics: A Bridge for Translational Research" by Carla Sharp, John Monterosso, and P. Read Montague (doi: 10.1016/j.biopsych.2012.02.029). The article appears in *Biological Psychiatry*, Volume 72, Issue 2 (July 15, 2012)

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