

Department of Psychology

Departmental Colloquium

THE NEUROBIOLOGY OF CHOICE

Paul Glimcher

New York University

Over the course of the last 300 years, three principle groups of scholars have attempted to understand how we make choices. Operating exclusively at the level of observable behavior, economists have developed clear mathematical models that place constraints on the representations of value decision-makers of various types could, in principle, employ. Psychologists, working at the level of mental states, have developed algorithmic models of the choice process. Working at a more mechanistic level, neurobiologists have described the information processing features of the primate brain and traced the flow of information through that circuitry as decisions are made. Within the last 10 years those three traditions have begun to converge, and overlapping constraints from each field have been used to identify many of the core feature of the mechanism of choice. Data from both monkeys and humans now indicates that frontal and basal ganglia circuits learn and store the values of an animals past actions, a process that seems to be critically dependent on the neurotransmitter dopamine. These stored values influence choice through a fronto-parietal network that takes as an input the values of the options before a chooser and generates as an output a motor plan. A more detailed outline of this system and some of the key experimental data serve to identify it will be presented.

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STUART 104

