University of Zurich[UZH]

Department of Economics – Neuroeconomics Seminar

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Tobias Egner
Duke University

Neurocognitive Mechanisms of Contextual Adjustments in Cognitive Control

When routine behavior runs into trouble, “cognitive control” processes are recruited to bring information processing in line with current demands. For instance, encountering an almost-accident on our commute will reinforce our attentional focus on the traffic and away from the radio. How does the brain accomplish this? In this talk, I will present behavioral, neuroimaging, and neuro-stimulation data that delineate the cognitive and neural mechanisms underlying our ability to adapt to changing task demands. Specifically, I will present a “control learning” perspective that views cognitive control as being guided by learning and memory mechanisms, exploiting statistical regularities in our environment to anticipate the need for control. Control learning not only adapts attentional sets to changing demands over time, but it can also directly associate appropriate top-down attentional sets with specific bottom-up cues. This type of learning holds the promise of combining the speed of automatic processing with the flexibility of controlled processing, and could form the basis of novel interventions in clinical conditions that involve impaired cognitive control.