University of Zurich[UZH]

Department of Economics – Neuroeconomics Seminar

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Efficient Coding and Risky Choice (joint with Lawrence Jin)

We experimentally test a theory of risky choice in which the perception of a lottery payoff is noisy due to information processing constraints in the brain. We model perception using the principle of efficient coding, which implies that perception is most accurate for those payoffs that occur most frequently. Across two pre-registered laboratory experiments, we manipulate the distribution from which payoffs in the choice set are drawn. In our first experiment, we find that risk taking is more sensitive to payoffs that are presented more frequently. In a follow-up task, we incentivize subjects to classify which of two symbolic numbers is larger. Subjects exhibit higher accuracy and faster response times for numbers they have observed more frequently. In our second experiment, we manipulate the payoff distribution so that efficient coding induces the decision maker's perceived value function to switch from concave to convex. We find that demand for risk is significantly higher when efficient coding induces a convex value function. Together, our experimental results suggest that risk taking depends systematically on the payoff distribution to which the decision maker's perceptual system has recently adapted. More broadly, we provide novel evidence of the importance of imprecise and efficient coding in economic decision-making.