The agony of choice

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Abstract

Most of what we understand of the neural basis of perceptual and decision making is currently limited to binary choices based on a single source of evidence whose reliability is fixed over time. In contrast, real life decisions often involve multiples choices and multiple sources of evidence with unknown time varying reliability. I will present a pair of studies in which we have started to explore the neural basis of these realistic decisions. I will start by presenting a neural theory of optimal decision making for 3 or more choices which explains in particular why people agonize when choosing among equally good options. In the second half of the presentation, I'll present a model of Bayesian multisensory decision making based on the theory of probabilistic population codes. I'll show that this theory is consistent with the population response of parietal area LIP in monkeys trained to perform optimal multisensory integration.

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