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# The breadth - depth dilemma in decision making

A talk hosting

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In multialternative risky choice, we are often faced with the opportunity to allocate our limited capacity between several options. In such cases, we face a natural trade-off between breadth —spreading our capacity across many options— and depth —gaining more information about a smaller number of options. Despite its broad relevance to daily life, including in many naturalistic foraging situations, the optimal strategy in the breadth-depth trade-off has not been characterized. In this talk, I will formalize the breadth-depth dilemma through a finite-sample capacity model in three different scenarios: multi-armed bandits, multiple accumulators and large decision trees. Generally, it is observed that it is optimal to sample just few options out of many, thus favoring depth processing over shallow processing, perhaps providing a basis of why mental simulations and imagination are so common cognitive processes. Our results also provide a rich casuistic for metareasoning in multialternative decisions with bounded capacity using close-to-optimal heuristics.

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