Decision Making

Rational Decision Making

Expected Utility = $\sum u(x_i)\, p(x_i)$
- **Utility of outcome $u(x)$**
- **Probability of occurrence $p(x)$**

Rational Decision Making

- **Evaluation of each alternative**
- **Choose action with highest expected utility**

Departures from Rationality

- **Risk-averse (vs. risk-seeking)**
- **Loss aversion**
- **Endowment effect**

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Dealing with Unfair Deals

"The Ultimate Game"
- **1st player: proposes how to divide a sum of money**
- **2nd player: accepts or rejects**

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Differences in Human Brain Activity

Unfair Offer	Fair Offer
Bilateral anterior insula + anterior cingulate cortex	**Dorsolateral prefrontal cortex**

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Differences in Human Brain Activity

Unfair Offer   **Fair Offer**
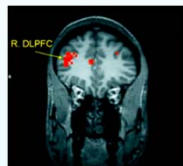
Neural Responding in Monkeys

- **Lateral inferior parietal neurons**
- **Probabilities of reward:**
  20% vs 80% visual field rewarded
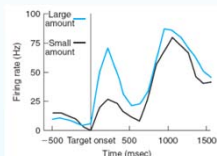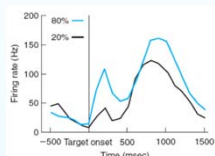- **Values of reward:**
  small vs large amount of juice

Neural Responding in Monkeys

Decision Making

- **Balance values and probability**
- **Don't follow expected utility**
- **Different parts of the brain**
- **Lateral inferior parietal cortex**