

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**

Dealing with Unfair Deals

“The Ultimate Game”

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

Differences in Human Brain Activity

Unfair Offer

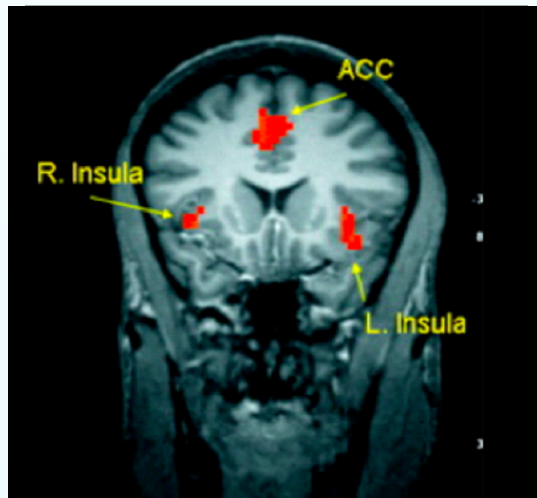
**Bilateral anterior
insula + anterior
cingulate cortex**

Fair Offer

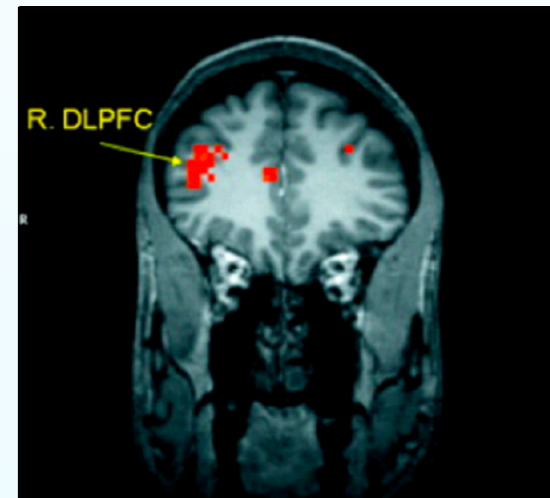
**Dorsolateral
prefrontal cortex**

Differences in Human Brain Activity

Unfair Offer



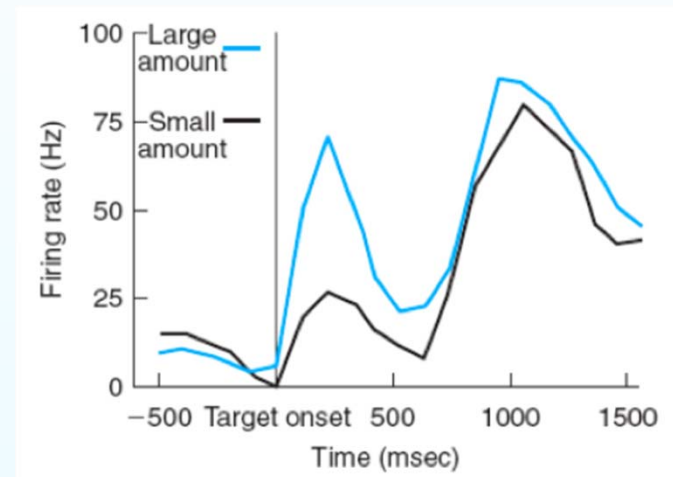
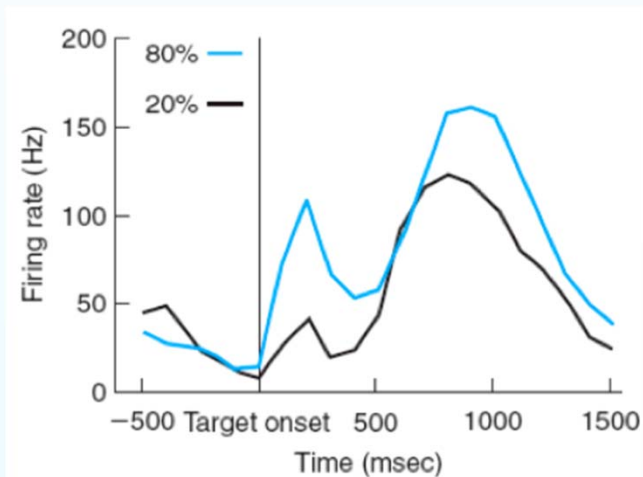
Fair Offer



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**