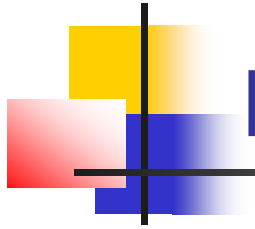
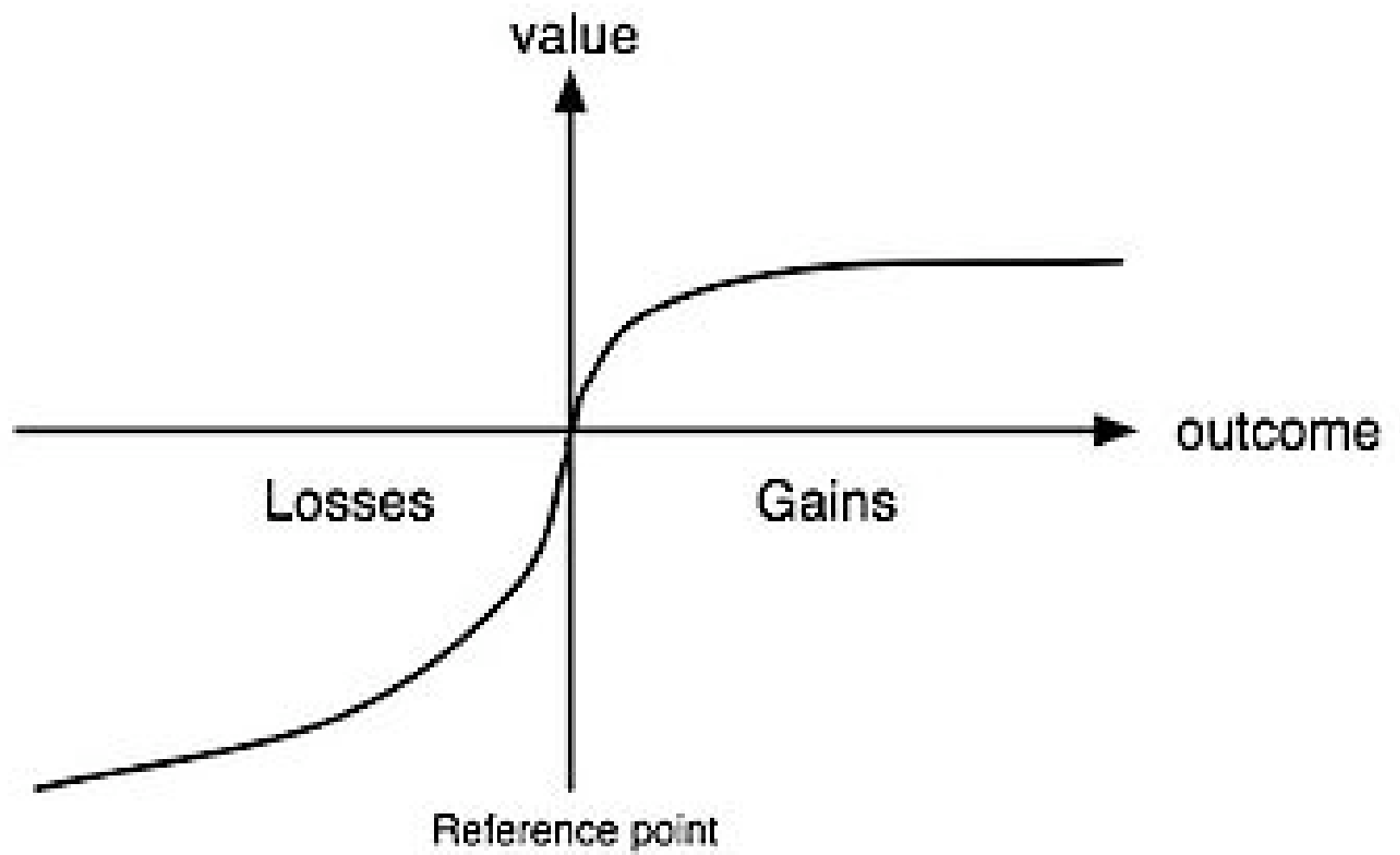


Decision Making and Problem Solving

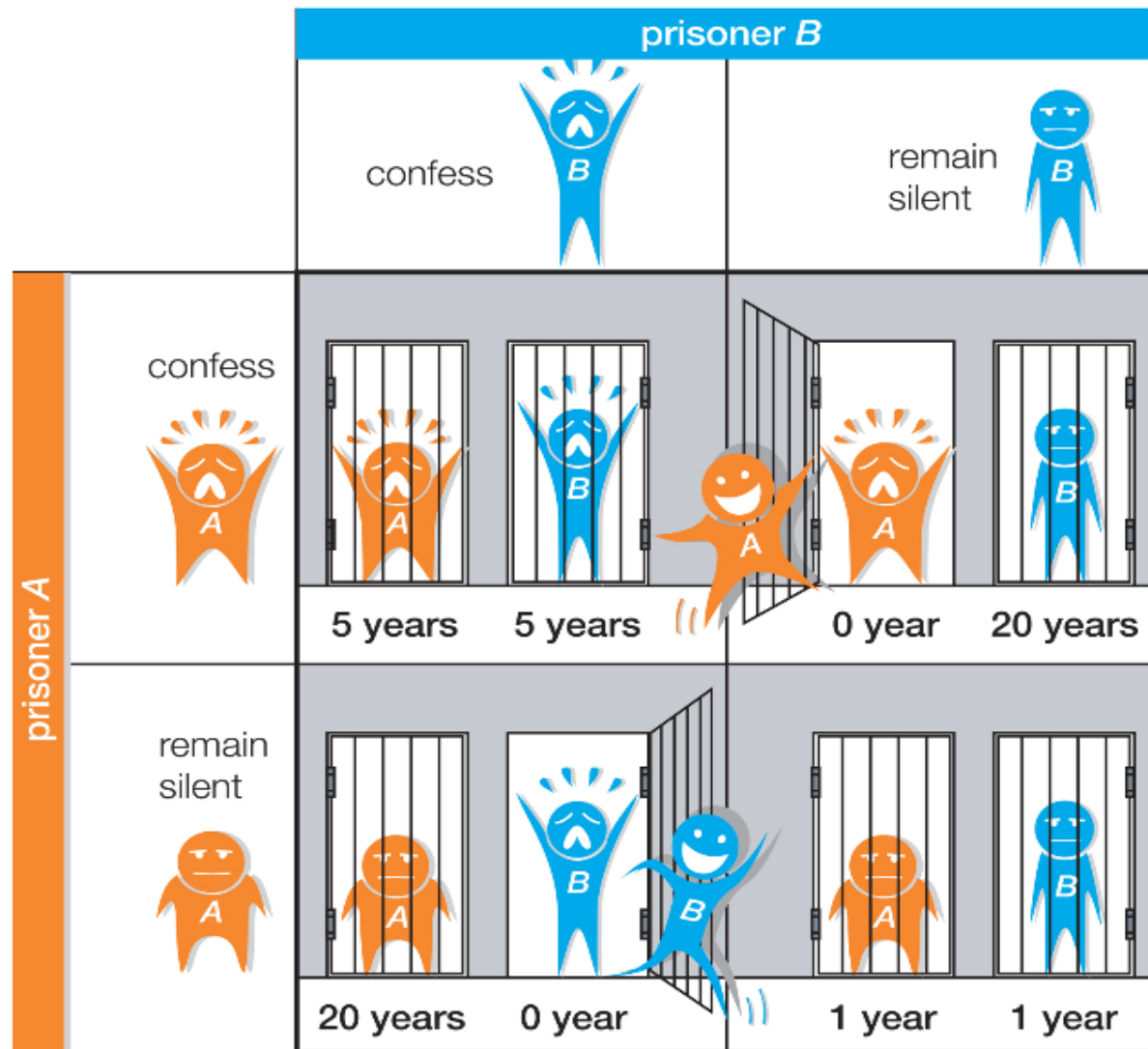


Decision Making

- **Prospect theory** (Kahneman & Tversky)
 - Gains and losses valued differently through the “framing effect”
 - Less willingness to gamble with profits than with possible losses
 - (a) Possible gain? Avoid risk
 - (b) Possible loss? Seek risk



Prisoner's dilemma



Asian Flu problem

Problem 1. Imagine that the US is preparing for the outbreak of an unusual Asian disease that is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

Program A: If Program A is adopted, 200 people will be saved.

Program B: If Program B is adopted, there is a one-third probability that 600 people will be saved and a two-thirds probability that no people will be saved.

Which program do you favor?

Asian Flu problem

Problem 2. Imagine that the US is preparing for the outbreak of an unusual Asian disease that is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

Program C: If Program C is adopted, 400 people will die.

Program D: If Program D is adopted, there is a one-third probability that no one will die and a two-thirds probability that 600 people will die.

Which program do you favor?



Prospect Theory

Choosing A over B in Problem 1 reveals risk aversion over gains

Choosing D over C in Problem 2 reveals risk seeking over losses

Note that the problems are algebraically equivalent.

Problem 1 and Problem 2 are objectively the same, they simply have different descriptions, or different framing.

However, we induce reverse choices by framing in terms of gains (Problem 1) and losses (Problem 2).

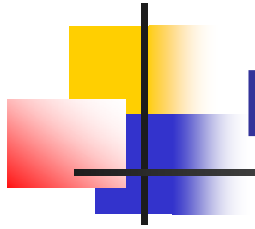


Prospect Theory

Doctors (participants) were asked whether it was best to treat lung cancer with radiation or surgery.

In one condition, doctors were told surgery carries a 90% immediate survival rate and a 34% survival rate at the end of 5 years. Doctors were then told all patients survive radiation procedures and 22% survive at the end of 5 years.

In another condition, doctors were told 10% of patients die during surgery and 66% die at the end of 5 years. Doctors were then told all participants survive radiation procedures but 78% die at the end of 5 years.



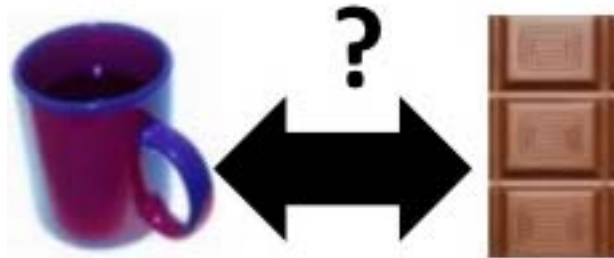
Decision Making

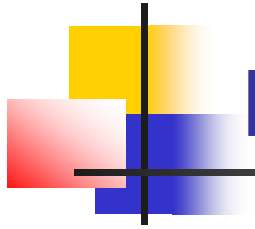
- **Prospect theory** (Kahneman & Tversky)
 - Won the 2002 Nobel Prize in Economics
 - Choice consists of two phases
 - (1) Editing (framing)
 - (2) Evaluation

Decision Making

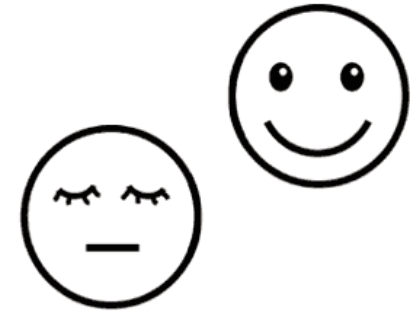
■ Endowment theory

- Higher value placed on what has been obtained
 - Chocolate bar 1st? Unwilling to trade for coffee mug
 - Coffee mug first? Unwilling to trade for chocolate bar



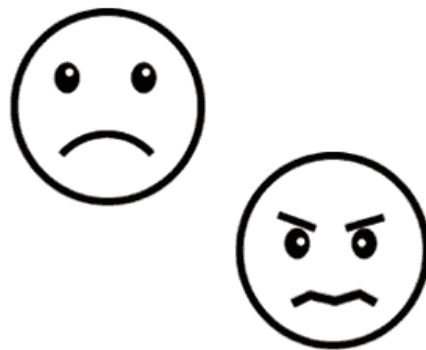


Decision Making



■ Mood Maintenance theory

- *Positive affect* mindset = motivated to take less risk
- *Negative affect* mindset = motivated to repair mood state (thus, higher risk)



Decision Making

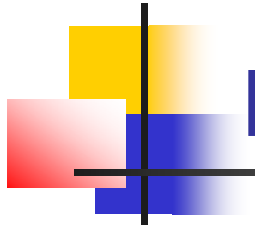
- **Illusion of choice**

- Altruism and operant conditioning
- “Hobson’s choice”





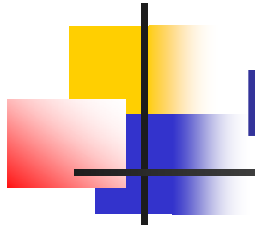




Decision Making

- **Illusion of control**

- Perception that uncontrollable events are somehow controllable
- Tendency to overestimate ability to control events and outcomes
- “**Planning fallacy**” – underestimate time involved in completing tasks, and making a choice



Decision Making

- **Negativity bias**

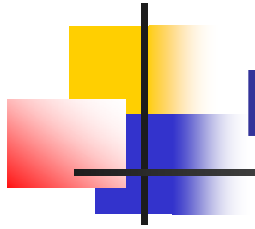
- Negative and positive stimuli are not equally salient
- Steeper negative gradient vs. positive gradient for information (which impacts future choice)
- Research: 5:1 'ideal' ratio of positive interactions vs. fighting in most close relationships



Decision Making

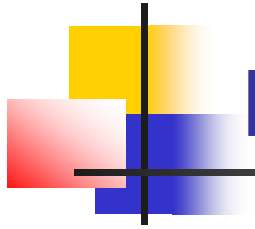
- **Positivity bias**

- General perspective or tendency to primarily recall or overestimate positive stimuli
- “Pollyanna principle”



Decision Making

- Obstacles and challenges
 - False necessity trap
 - It's “just part of the job”
 - Group norms (everybody's doing it)
 - Revenge!
 - False objectivity



Decision Making

- **Cognitive miser**

- Reliance on simple strategies to make decisions and evaluate stimuli
- Cognitive load can be a factor
- Draws heavily on heuristics and stereotypes