Risky Choice Descriptive Theory

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Prospect Theory

- A Descriptive Theory of Decision Making Under Uncertainty
- 3 parts
  - S-shaped value function
    - Reflection (S-shape)
    - Loss aversion (steeper for losses)
  - π function (decision weights)

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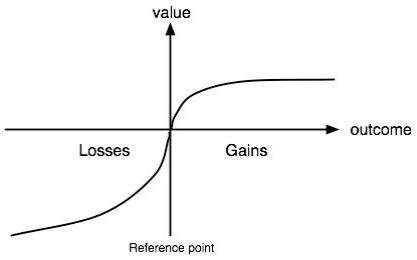
Prospect Theory Value Function



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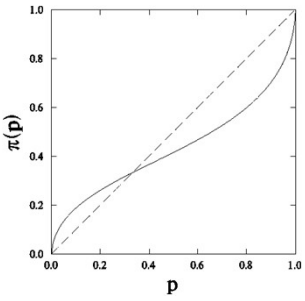
Pi Function



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Framing Effect

Imagine that the U.S. is preparing for outbreak of an unusual disease, which 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 program are as follows:

- Kahneman, D. & Tversky, A. (1984). Choices, values, and frames. American Psychologist, 39, 341-350.

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Gain Frame

If Program A is adopted, 200 people will be saved. (72%)

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. (28%)

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Loss Frame

If Program C is adopted, 400 people will die. (22%)

If Program D is adopted, there is a one-third probability that nobody will die and a two-thirds probability that 600 people will die. (78%)

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Framing Effect

- Risk averse for gains, risk seeking for losses
- Explained by the reflection of the S-shaped value function
  - Concave for gains
  - Convex for losses

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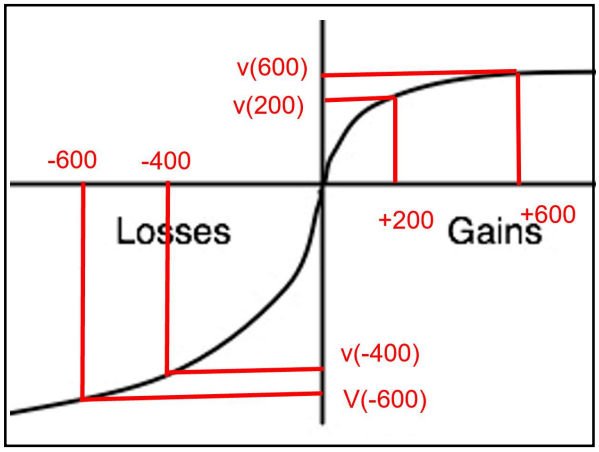

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Isolation Effect

Problem 5

In addition to whatever you own, you have been given 1000. You are now asked to choose between

A. (1000, .50) N=70 [16]
B. (500) [84]

Problem 6

In addition to whatever you own, you have been given 2000. You are now asked to choose between

A. (-1000, .50) N=68 [69]
B. (-500) [31]

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Endowment Effect (Kahneman et al)

- Subjects in Group 1 endowed with a coffee mug and asked whether they would like to keep their coffee mug or trade for a chocolate bar.
- Those in Group 3 were endowed with a chocolate bar and asked whether they would like to keep their chocolate bar or trade for a coffee mug.
- Those in Group 2 were endowed with nothing and asked to choose between a mug or a chocolate bar.

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Endowment Effect

Endowment	% choose mug
Chocolate	10%
Nothing	56%
Mug	89%

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Loss Aversion Explanation

- Thus all subjects were given a choice between a coffee mug and a chocolate bar.
- Subjects tended to stick with the item that had been endowed with.
- Losing the endowed object was weighed more heavily than gaining the new object.
- Explained by the fact that the value function is steeper for losses than for gains (loss aversion)

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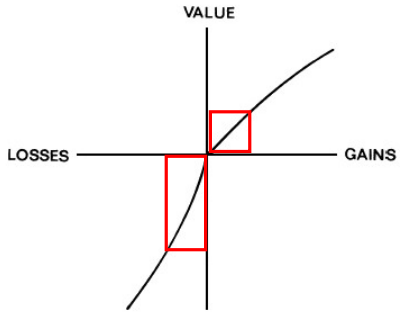
Prospect Theory



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Which explains what?

Prospect Theory
- S-shape of value function
- Loss aversion

Decision bias
- Framing effect
- Endowment effect

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Mental Accounting: Jacket & Calculator

a. You are buying a calculator for $15 and a jacket for $125. The clerk tell you that the calculator is on sale for $5 off at another branch of the store that is a 20 minute drive away. Do you go to the other store? (68% do)

b. You are buying a calculator for $15 and a jacket for $125. The clerk tell you that the jacket is on sale for $5 off at another branch of the store that is a 20 minute drive away. Do you go to the other store? (29% do)

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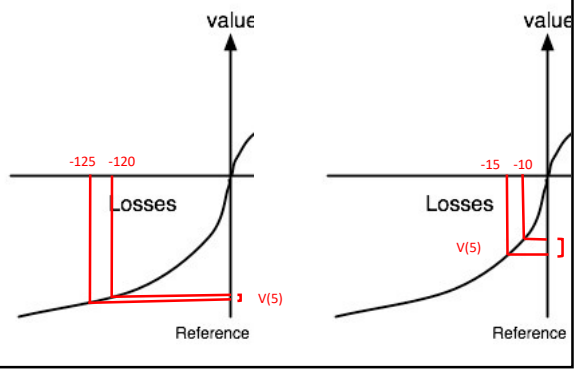
Mental Accounting



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Mental Accounting: Theater Ticket

a. You are going to the theater and have already bought a $10 ticket. When you arrive you realize that you have lost the ticket. Do you spend $10 for another ticket? (46% do)

b. You are going to the theater and plan to buy a $10 ticket when you get there. When you arrive you realize you have lost a $10 bill. Do you spend $10 for a ticket? (88% do)

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Sunk Cost Effect

- You and your friend each spent $12 on tickets to tonight's hockey game.
- It is now snowing, which will make driving a big hassle.
- You argue that it's not worth going.
- Your friend argues that he doesn't want to waste the $12 he spend on his ticket, so he wants to go.

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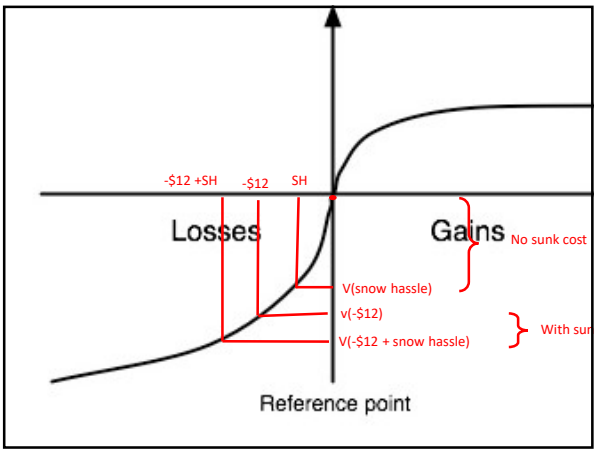

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What about the π function?

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Certainty Effect

1. Choice 1
- A: $30 with p=1.00 (74%)
- B: $45 with p=0.80 (26%)

2. Choice 2
- C: $30 with p=0.25 (42%)
- D: $45 with p=0.20 (58%)

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How PT explains the certainty effect

- Explained by the π function (decision weights)
  - Non-linear function of probability
- The ratio between π(1.00) and π(.80) is larger than the ratio between π(.25) and π(.20).
- Certainty is very appealing.

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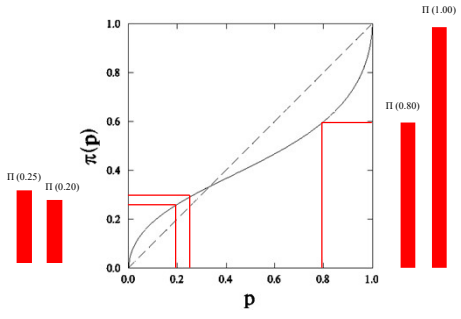
Pi Function explains the certainty effect



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The Allais Paradox

	Lottery A	Lottery B
Choice 1	10% chance of winning $500 M 89% chance of winning $100 M 1% chance of winning nothing	100% chance of winning $100 M
Choice 2	10% chance of winning $500 M 90% chance of winning nothing	11% chance of winning $100 M 89% chance of winning nothing

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Why isn't this normative?

	Ball numbers	1	2-11	12-100
Situation 1				
	Lottery A	$100 M	$100 M	$100 M
	Lottery B	$0	$500 M	$100 M
Situation 2				
	Lottery A	$100 M	$100 M	$0
	Lottery B	$0	$500 M	$0

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How PT explains the Allais Paradox

- Explained by the π function (decision weights)
  - Non-linear function of probability
- Normatively, these two differences should be treated the same
  - 10% and 11%
  - 99% and 100%
- The function is steeper at the ends and flatter in the middle.

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Summary

- Reflection of the S-shaped value function
  - Gain/loss framing
  - Mental accounting
  - Sunk cost effect
- Loss Aversion
  - Endowment effect
- π Function
  - Certainty effect
  - Allais Paradox

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