

# Introduction to Behavioral economics

## Lecture III - Decisions

Matej Lorko

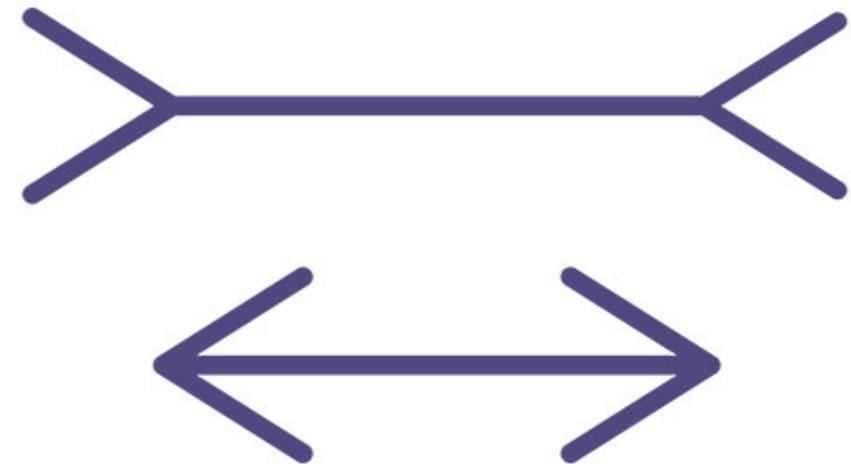
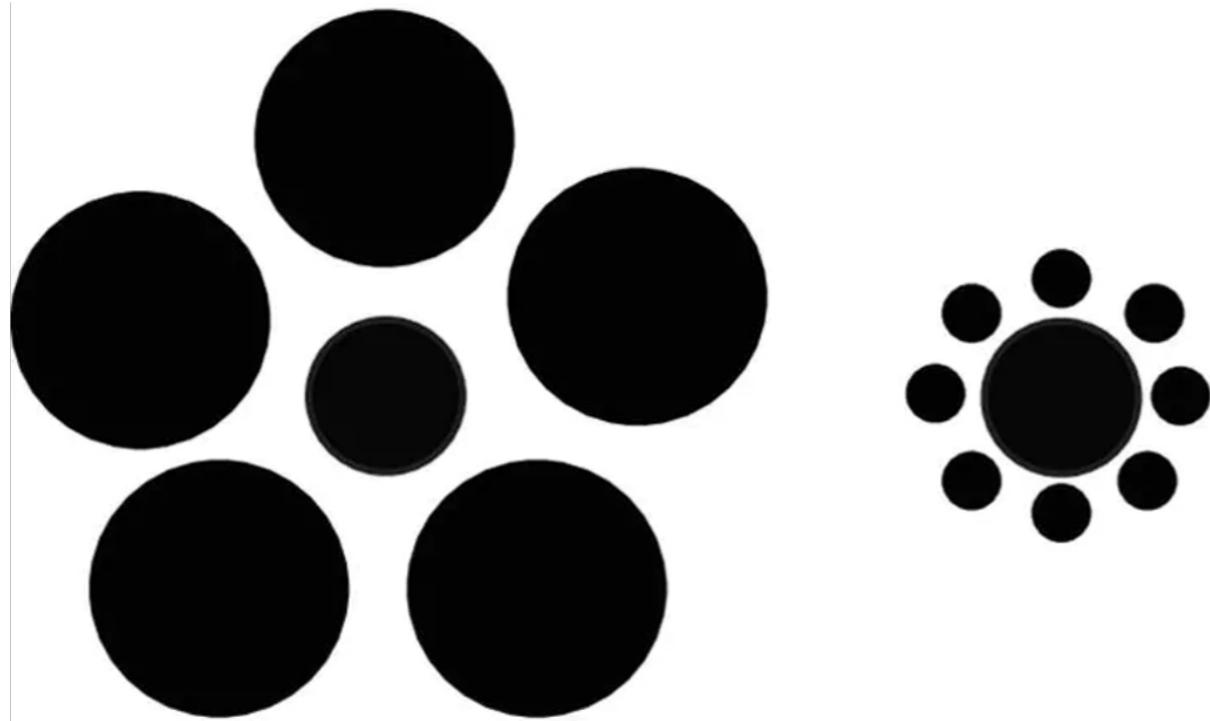
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References: Kahneman, D. (2011). *Thinking, fast and slow*.

# Everything is relative

## Context matters





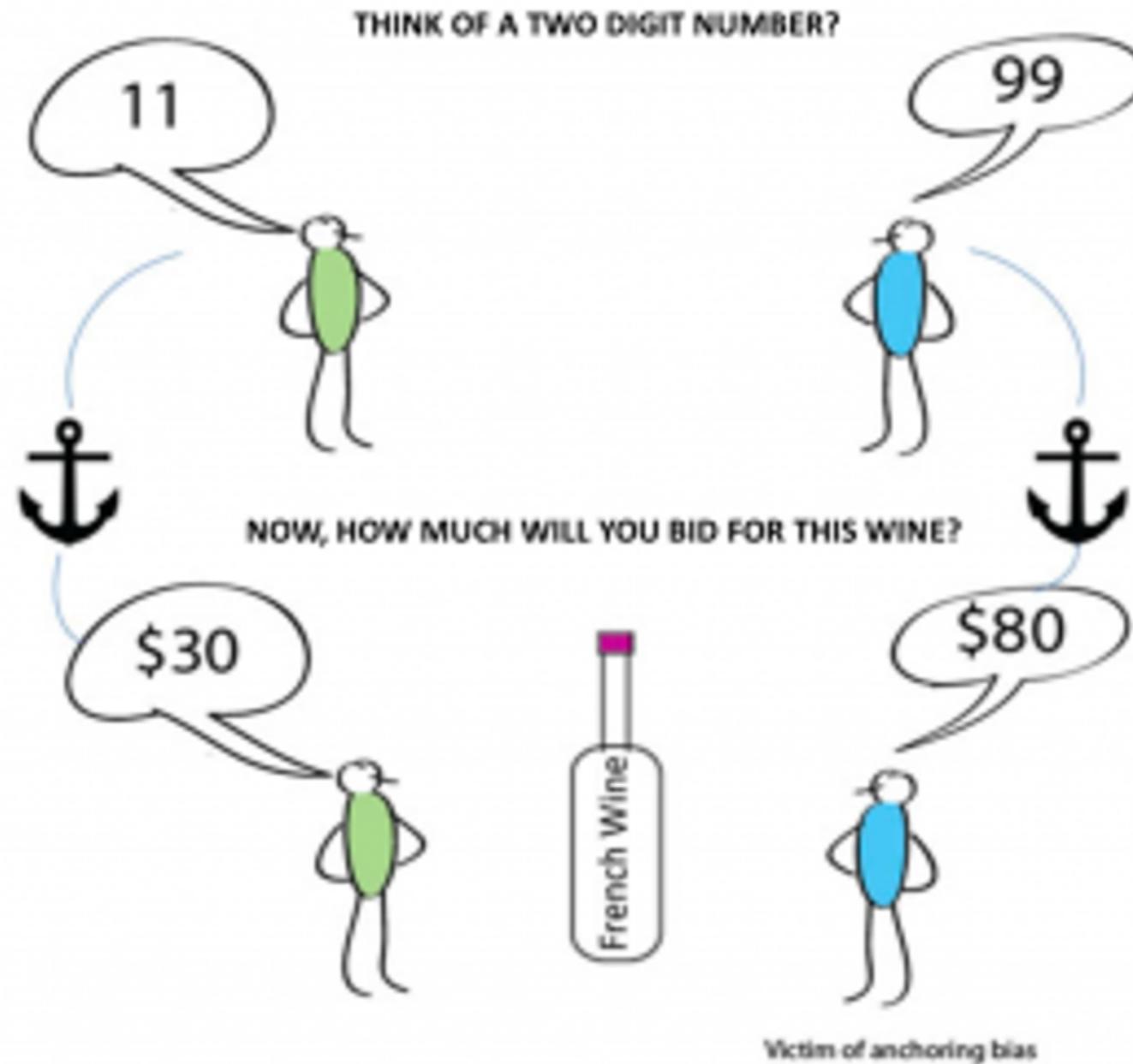


# Reference dependence

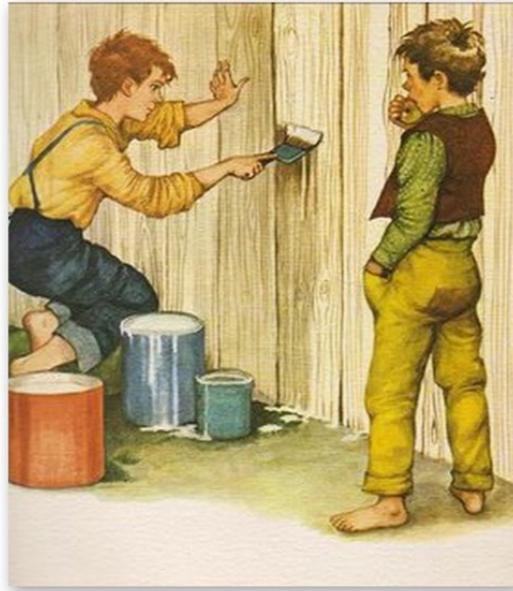


- Natural assessments of an object include size, distance, loudness, temperature, similarity and, whether it is good or bad....
- Importantly, a natural assessment will usually be a relative rather than absolute one.
- It is far more natural for us to say what is bigger, longer, louder, hotter and better, without knowing the exact volume, length, temperature, etc.
- To be able to judge relative magnitude we need some standard of comparison, and this is called the reference point or reference level.

# Anchors and values



# Anchors and values - Tom Sawyer Effect



# Separate vs. joint evaluation

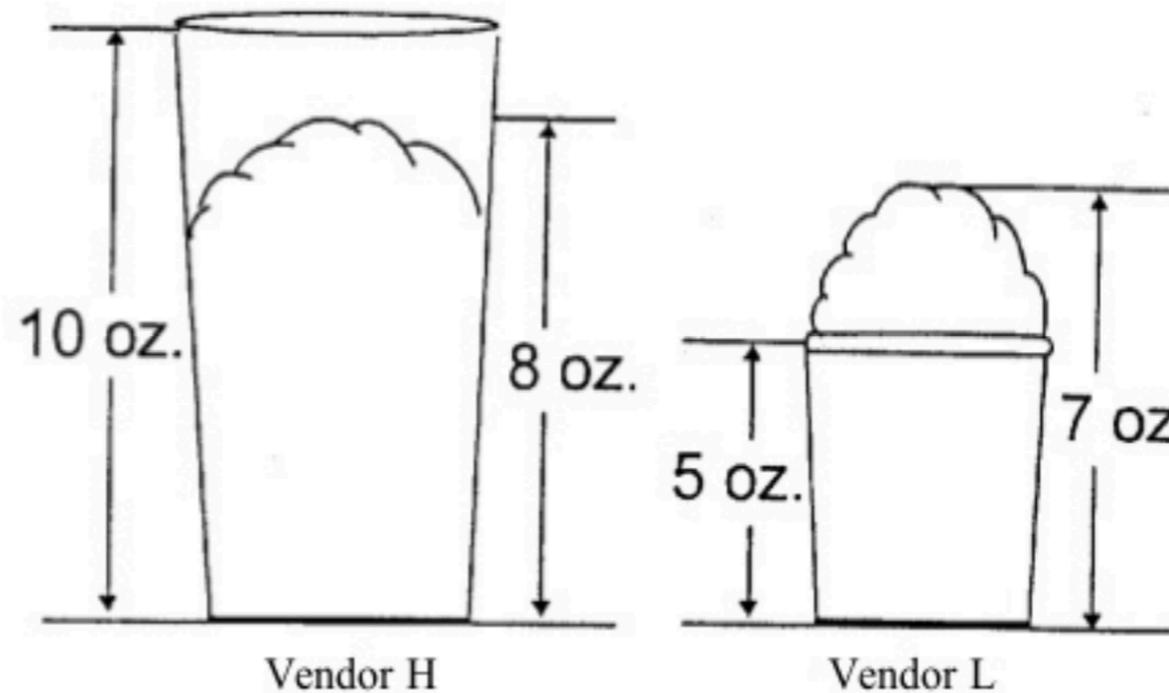
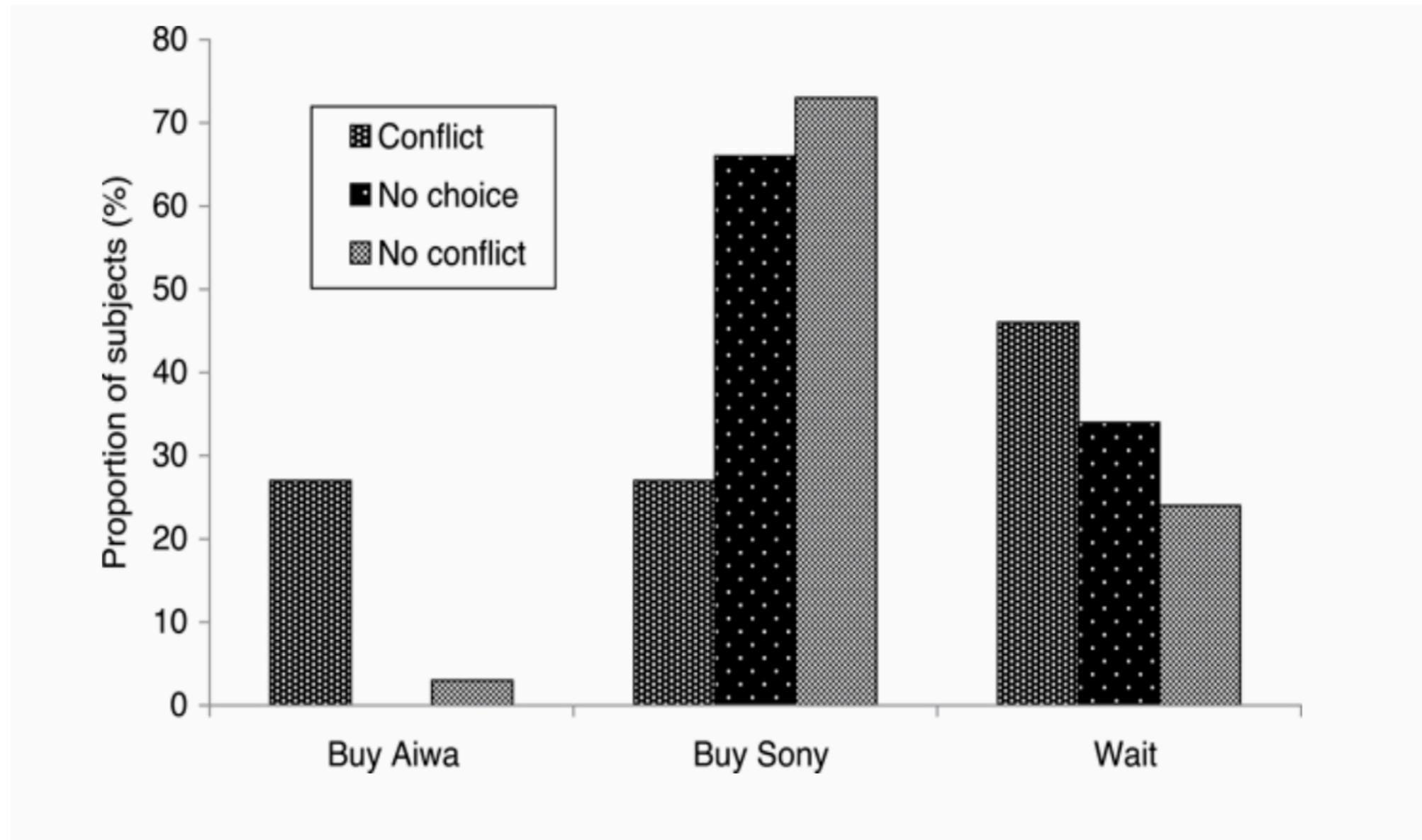


Exhibit 1. Drawings in Study 2

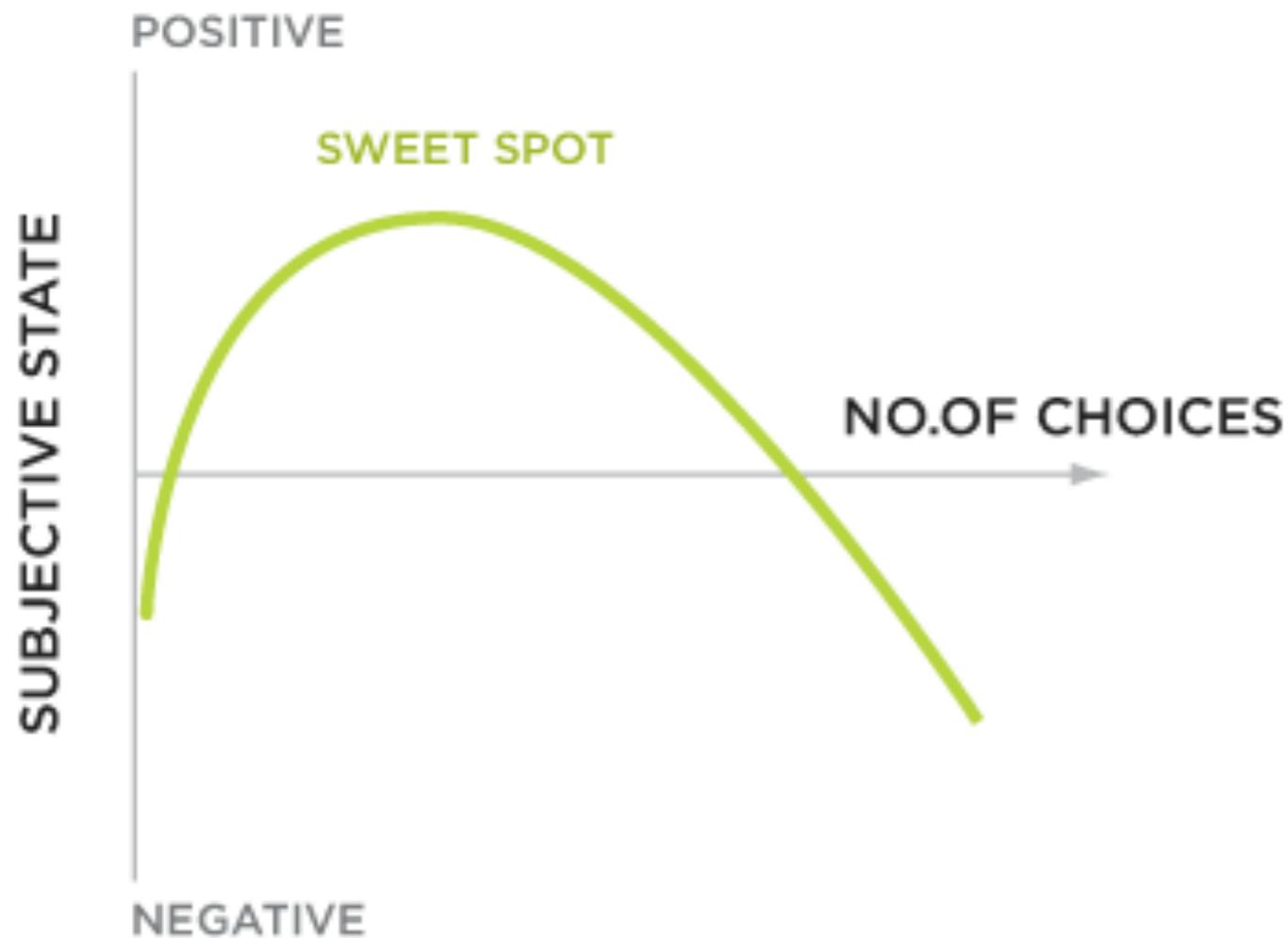
WTP prices for Vendor H's and Vendor L's Servings in Study 2

Evaluation Mode	Vendor H's	Vendor L's
Separate evaluation	\$1.66	\$2.26
Joint evaluation	\$1.85	\$1.56

# Choice vs. conflict



# Choice overload / paralysis



- The Paradox of Choice (Why More Is Less) - American psychologist Barry Schwartz argues that eliminating consumer choices can greatly reduce anxiety for shoppers. The book analyses the behavior of different types of people (in particular, maximisers and satisfiers) facing the rich choice. This book demonstrates to us how the dramatic explosion in choice—from the mundane to the profound challenges of balancing career, family, and individual needs—has paradoxically become a problem instead of a solution and how our obsession with choice encourages us to seek that which makes us feel worse.
- Autonomy and freedom of choice are critical to our well being, and choice is critical to freedom and autonomy. Nonetheless, though modern people have more choice than any group of people ever has before, and thus, presumably, more freedom and autonomy, we don't seem to be benefiting from it psychologically.

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# Decoy effect (asymmetric dominance effect)

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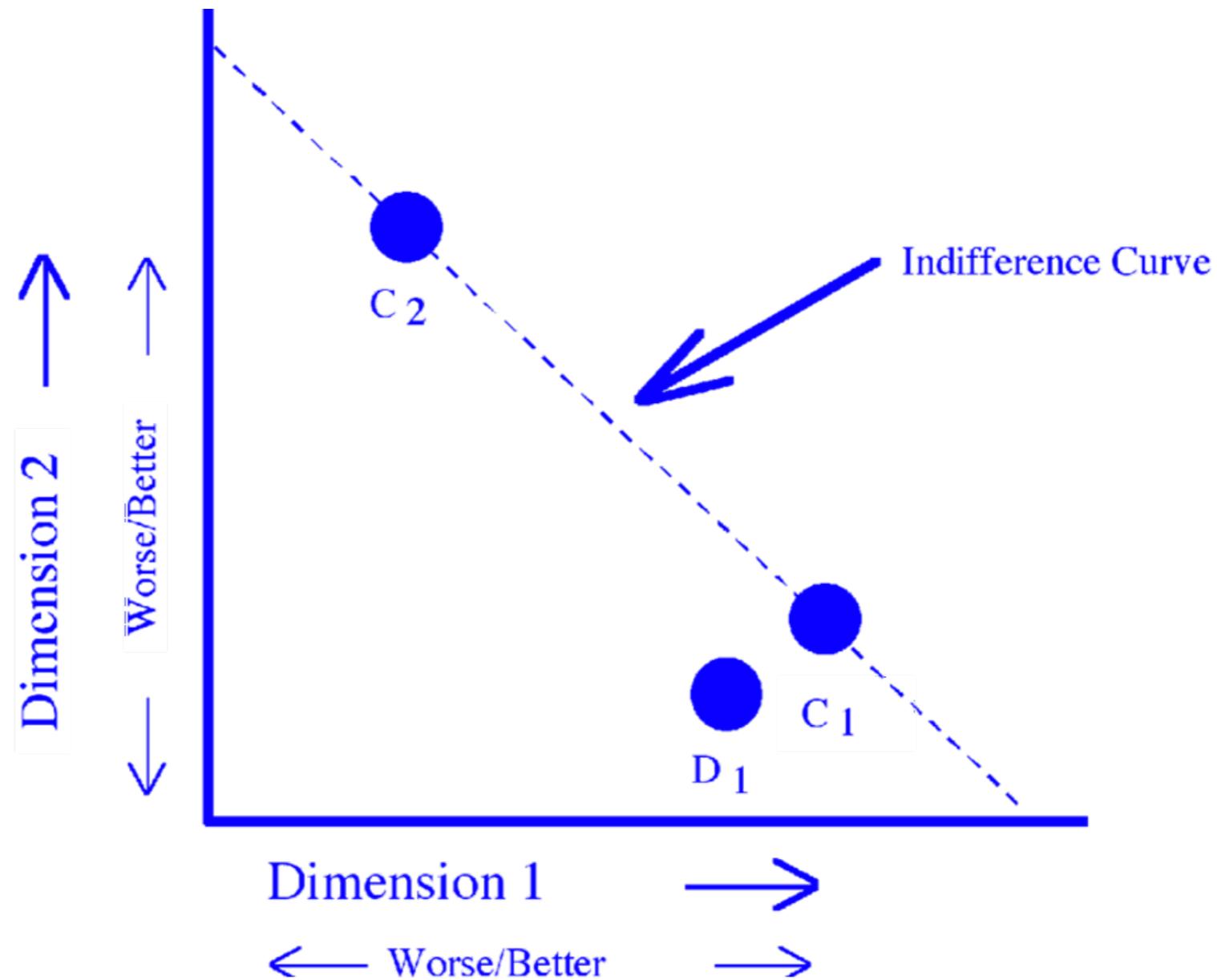
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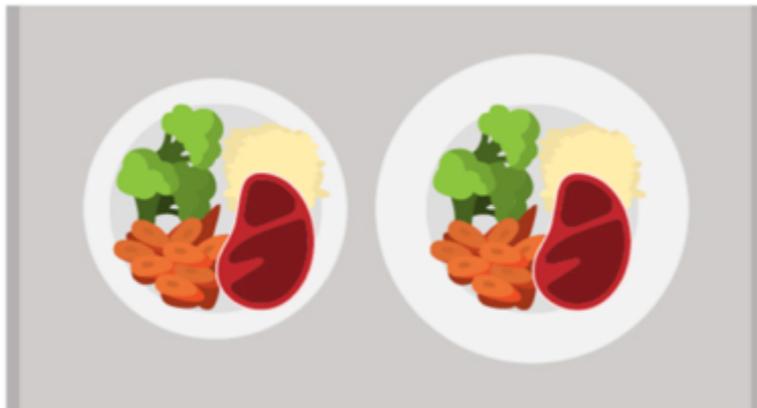
# Decoy effect (asymmetric dominance effect)



# Decoy effect vs. compromise effect

- In marketing, the decoy effect (or attraction effect or asymmetric dominance effect) is the phenomenon whereby consumers will tend to have a specific change in preference between two options when also presented with a third option that is asymmetrically dominated.
- An option is asymmetrically dominated when it is inferior in all respects to one option; but, in comparison to the other option, it is inferior in some respects and superior in others. In other words, in terms of specific attributes determining preferences, it is completely dominated by (i.e., inferior to) one option and only partially dominated by the other.
- When the asymmetrically dominated option is present, a higher percentage of consumers will prefer the dominating option than when the asymmetrically dominated option is absent. The asymmetrically dominated option is therefore a decoy serving to increase preference for the dominating option.
- On the other hand, the compromise effect dictates that a decision-maker chooses a middle option over an extreme one given a set of choice alternatives since choosing an intermediate option is easier to justify, less likely to be criticized, and is consistent with loss aversion.

# Framing of choices



# Framing and choices

- That context and framing influence perception and intuition, which influences reasoning, is one of the most important ideas in behavioral economics.
- Every time a person makes a choice, that choice has to be framed in a particular way, and how it is framed will likely affect perception, intuition, reasoning and the choice made. Decisions based on the framing effect are made by focusing on the way the information is presented instead of the information itself. Such decisions may be sub-optimal, as poor information or lesser options can be framed in a positive light. This may make them more attractive than options or information are objectively better, but cast in a less favourable light.
- While we might think that we are choosing from options, in fact we are usually choosing from descriptions of options. Thus, by framing options in a different way, we can influence decisions.
- Some types of framing:
  - Gain vs. Loss
  - Narrow vs. Broad
  - Omission vs. Commission
  - Opt-in vs. Opt-Out
  - Certainty vs. Pseudocertainty
  - Direct vs. Opportunity costs



**THINKING**  
HURTS

Decision number	Option A	Option B
1	2 points for sure	4 points with 40% probability 0 points with 60% probability
2	2 points for sure	4 points with 50% probability 0 points with 50% probability
3	2 points for sure	4 points with 60% probability 0 points with 40% probability
4	2 points for sure	4 points with 70% probability 0 points with 30% probability
5	2 points for sure	4 points with 80% probability 0 points with 20% probability

# **Decision-making under risk**

- Imagine, I offer you to play a game, which goes as follows. We will toss a coin. If it lands on heads, you win 100 euros. If it lands on tails, you win 200 euros. How much euros (maximum) would you offer me to play this game?

## Expected Value Hypothesis

$$EV = P(H) \times V(H) + P(T) \times V(T)$$

$$EV = 0.5 \times 100 + 0.5 \times 200$$

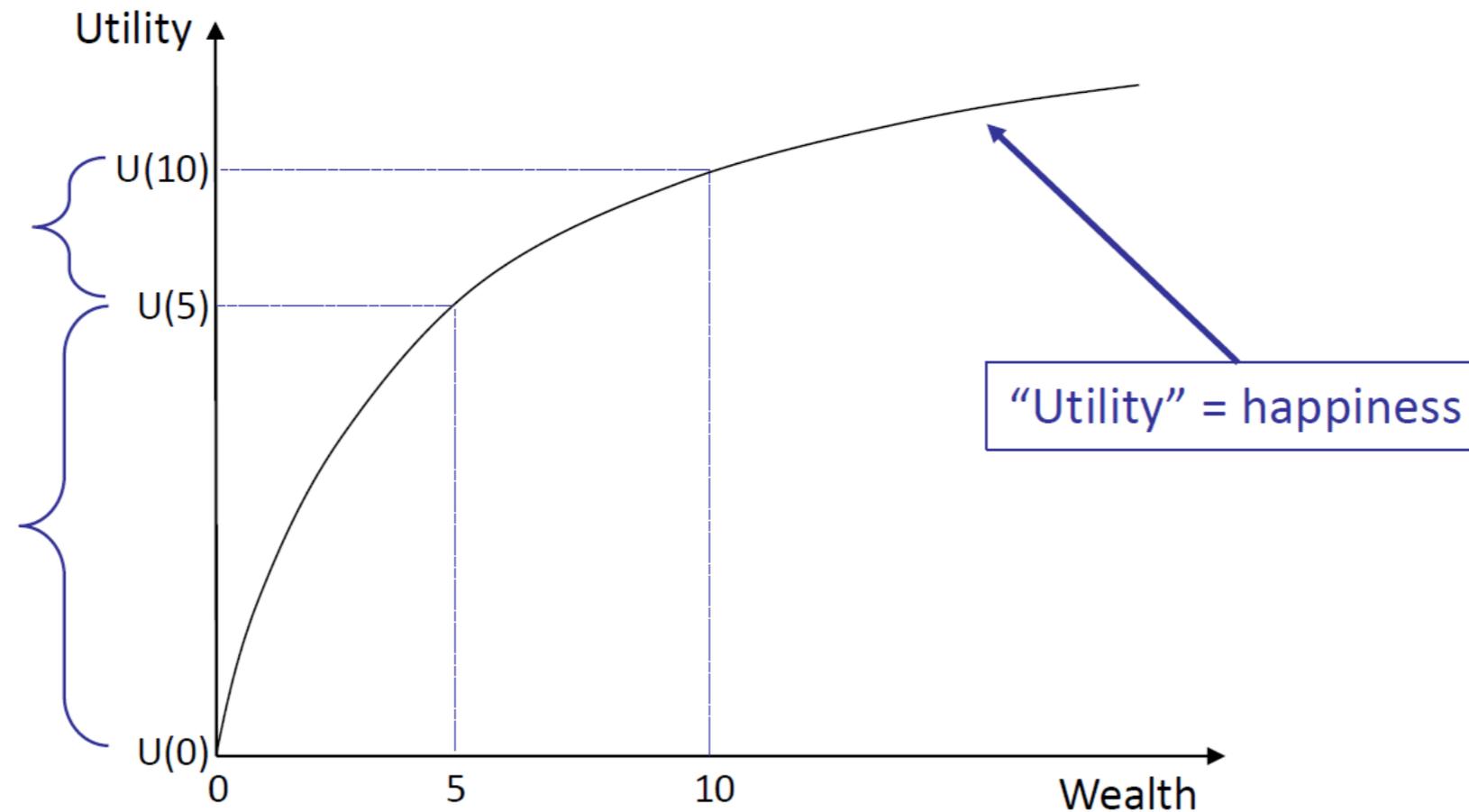
$$EV = 50 + 100$$

$$EV = 150$$

Would you pay 150 euros to play?

# Utility of Money

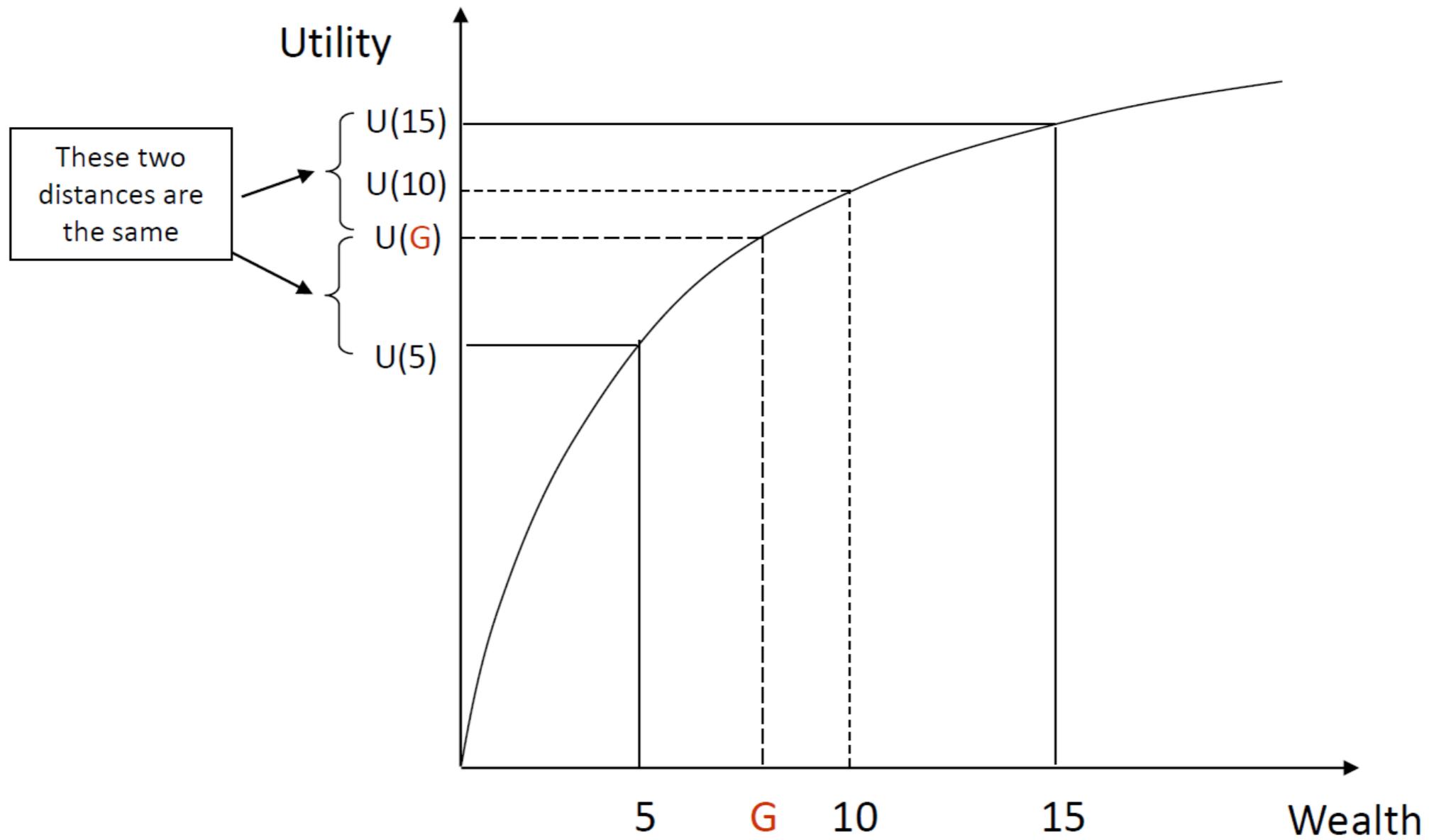
See the Lecture:  
Utility of Money



Implications of the graph:

- More money is undoubtedly better than less:  $U(10) > U(5)$ , *BUT*
- The incremental (marginal) value of an additional dollar gets smaller as our wealth increases:  $U(5) - U(0) > U(10) - U(5)$

# Risk Aversion



$U(G) = \frac{1}{2} U(5) + \frac{1}{2} U(15)$	$<$	$U(\frac{1}{2} \times 5 + \frac{1}{2} \times 15) = U(10)$
$\underbrace{\hspace{10em}}$		$\underbrace{\hspace{10em}}$
The probability-weighted sum of the utilities for each outcome...	...Is less than...	...the utility of the expected value of the outcomes

# The problem with the Expected Utility hypothesis

	Yesterday	Today
Your wealth	1 million	2 million
Your friend's wealth	3 million	2 million

- Do you feel the same as your friend?
- Here is where the psychology enters the picture!
- Prospect Theory – Kahneman & Tversky (1979), *Econometrica*!

# More on Risk Aversion

Please choose between Option A (\$50 for certain) and Option B (an equally weighted gamble of either \$100 or \$0). Which do you prefer?

*Option A*

\$50

For certain

*Option B: flip a coin*

\$0

If heads

\$100

If tails

Please choose between A & B

---

What happens if we increase the stakes a little?

*Option C*

\$500

For certain

*Option D: flip a coin*

\$0

If heads

\$1,000

If tails

Please choose between C & D

# Risk-Seeking Behavior

Now suppose that you have been kidnapped. Your (rather unusual) kidnapper tells you that you can choose between the following two options to obtain your freedom. (Assume that you have sufficient financial resources to make good on your agreement in either case):

## *Option A*

Pay the kidnapper \$500

## *Option B*

Toss a fair coin

- Pay \$0 if Heads
- Pay \$1,000 if Tails

# Loss Aversion

Here's a different type of game. In this situation, you aren't choosing between gambles with different levels of risk – you are choosing whether to play the game at all.

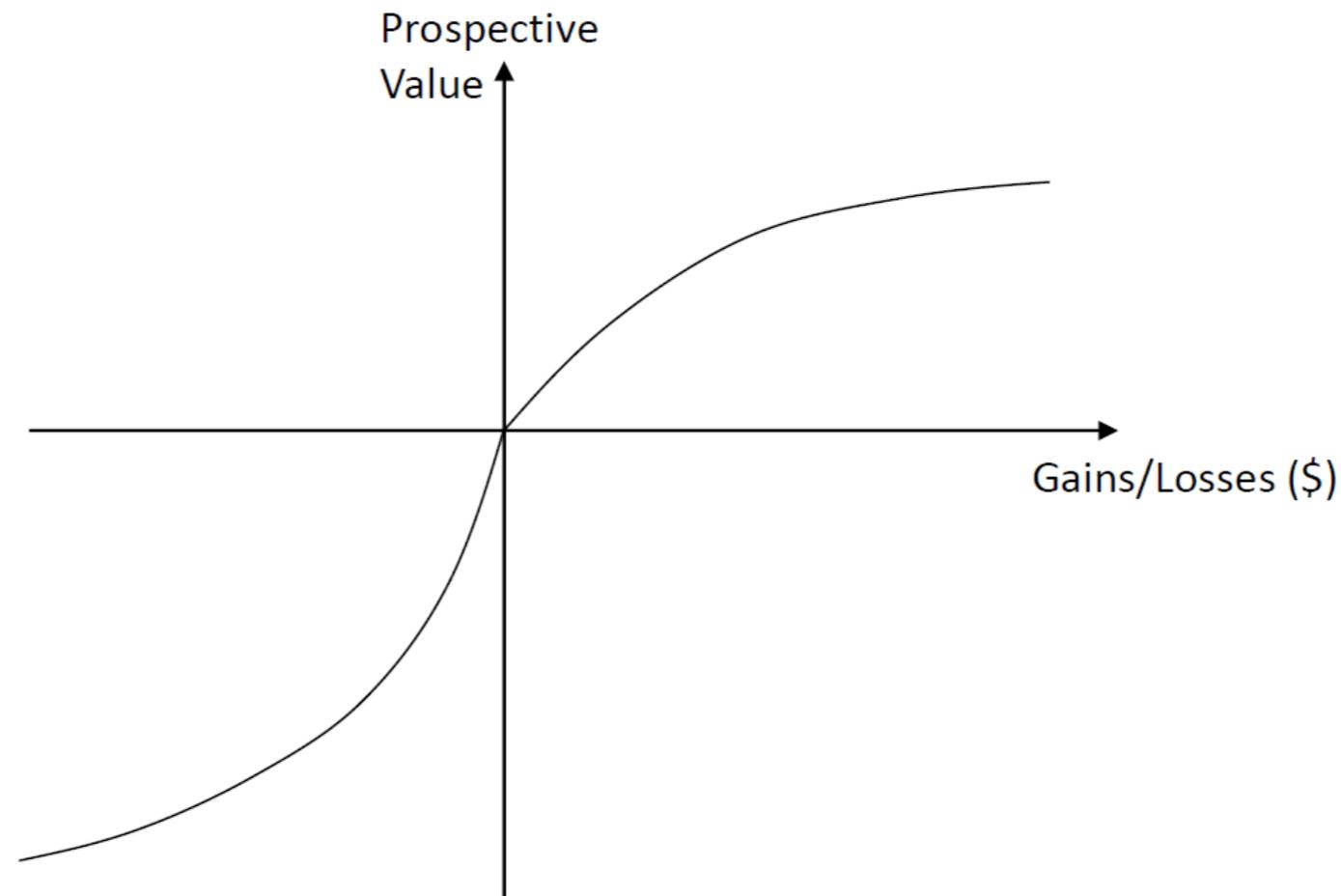
In this game, you toss a fair coin: if it lands Heads, you *win* \$2,000; but if it lands Tails, you *lose* \$1,000. Would you like to play this game? If you DO choose to play, you may play it only *once*.

Would you like to play this game?

WIN \$2,000	If heads
LOSE \$1,000	If tails

Do you want to play this game?

# Prospect Theory



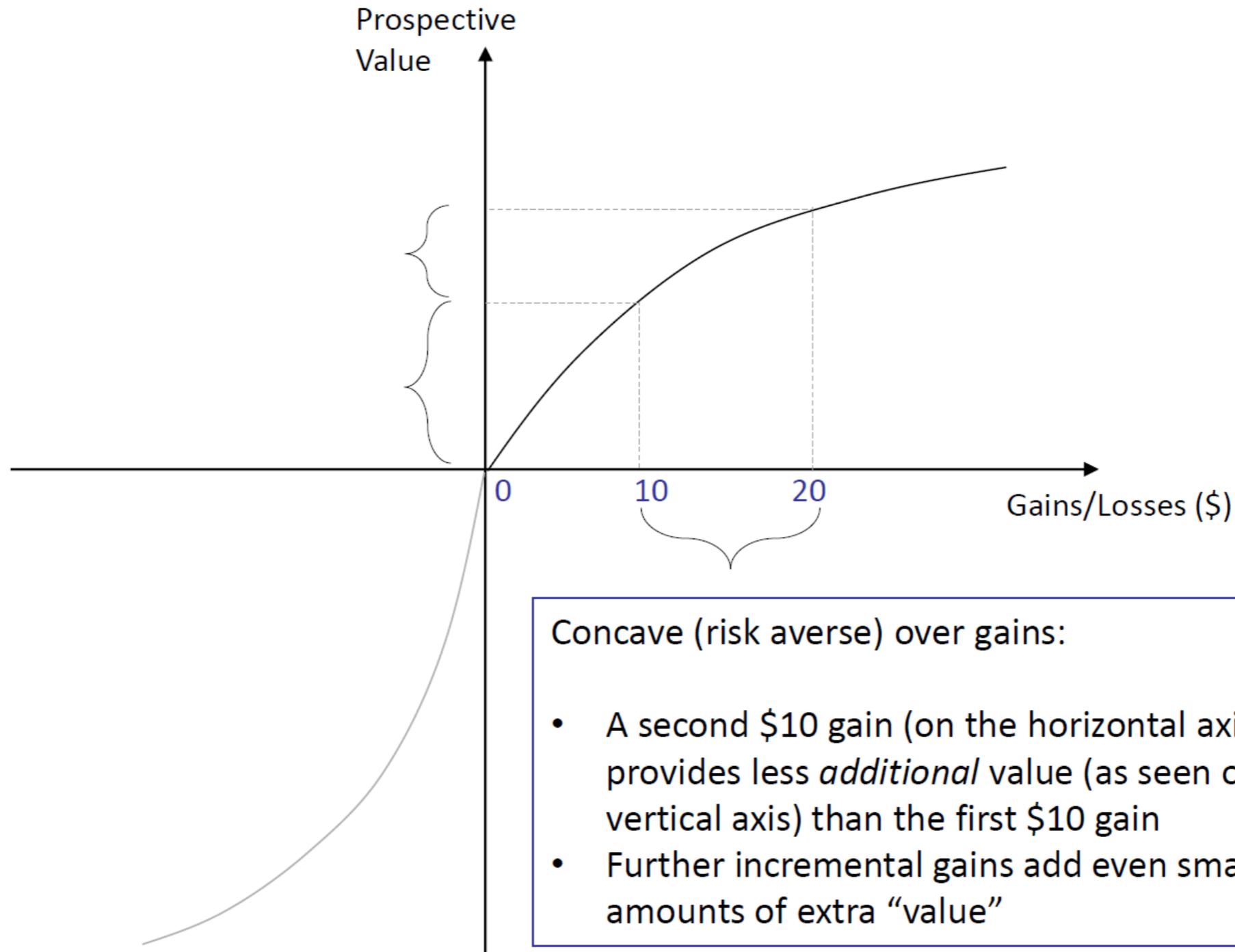
We will use the “Prospect Theory”\* utility function as a more realistic model of how we respond to gains and losses:

- risk aversion over gains (just like expected utility)
- risk *seeking* over losses (*unlike* expected utility)
- loss aversion (*unlike* expected utility)

\*Proposed by psychologists Daniel Kahnemann & Amos Tversky in the 1970s  
Provides insights on human behavior that are not reflected in expected utility theory

# Prospect Theory

## Risk Averse over Gains



Note: graph is not precisely to scale

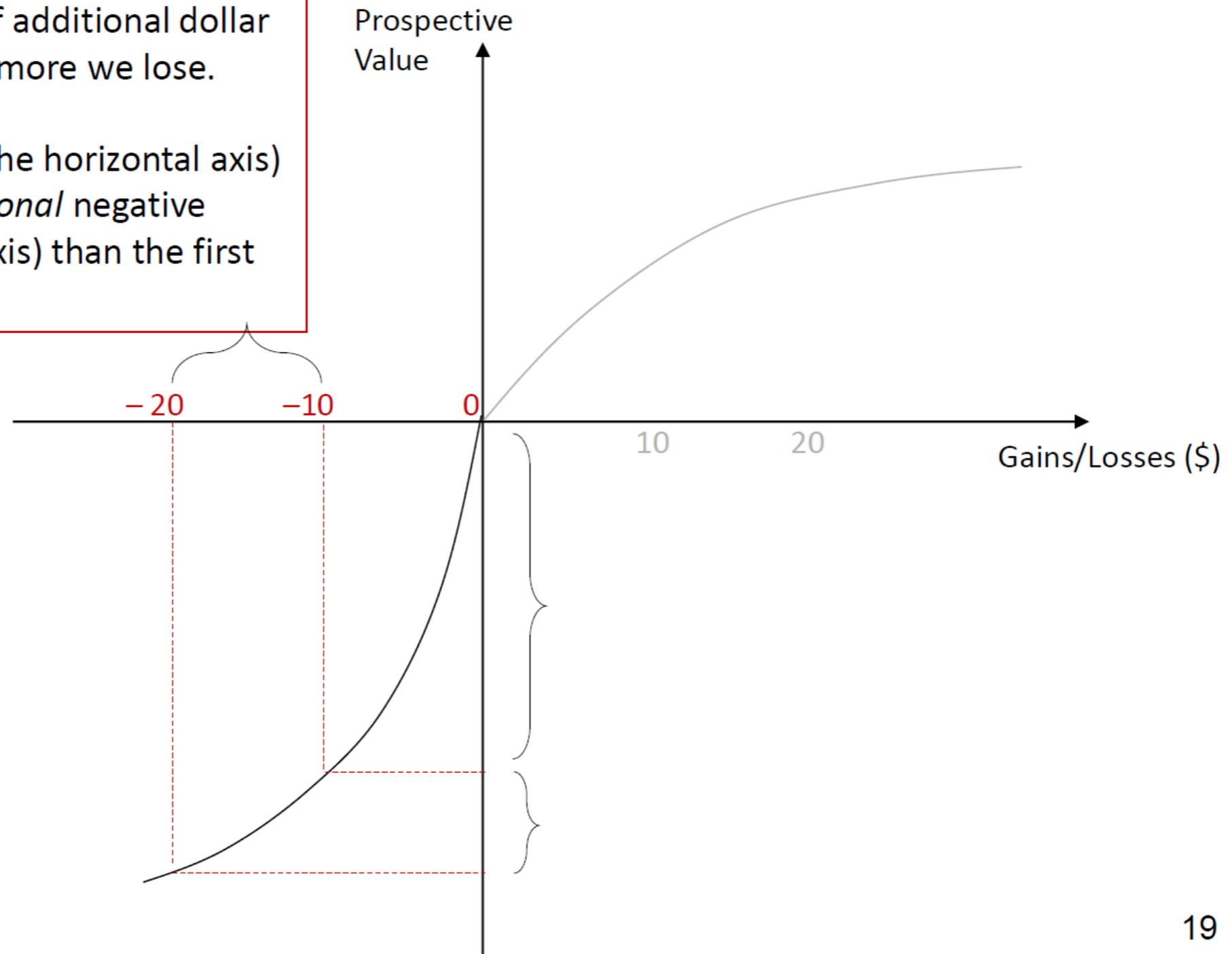
# Prospect Theory

## Risk Seeking over Losses

Convex (risk seeking) over losses:

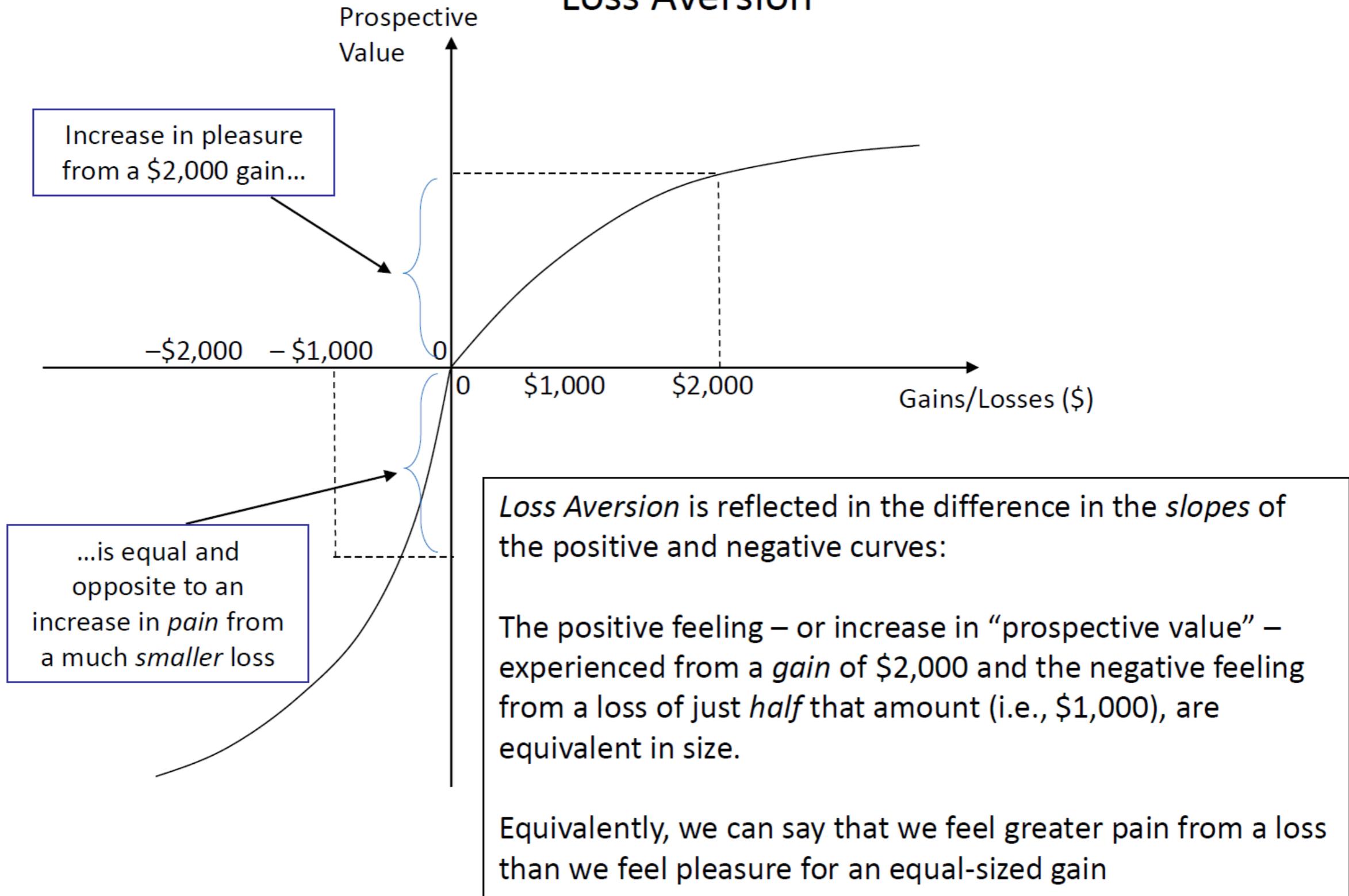
The *incremental* pain of additional dollar losses gets smaller the more we lose.

A second \$10 loss (on the horizontal axis) translates to less *additional* negative value (on the vertical axis) than the first \$10 loss.



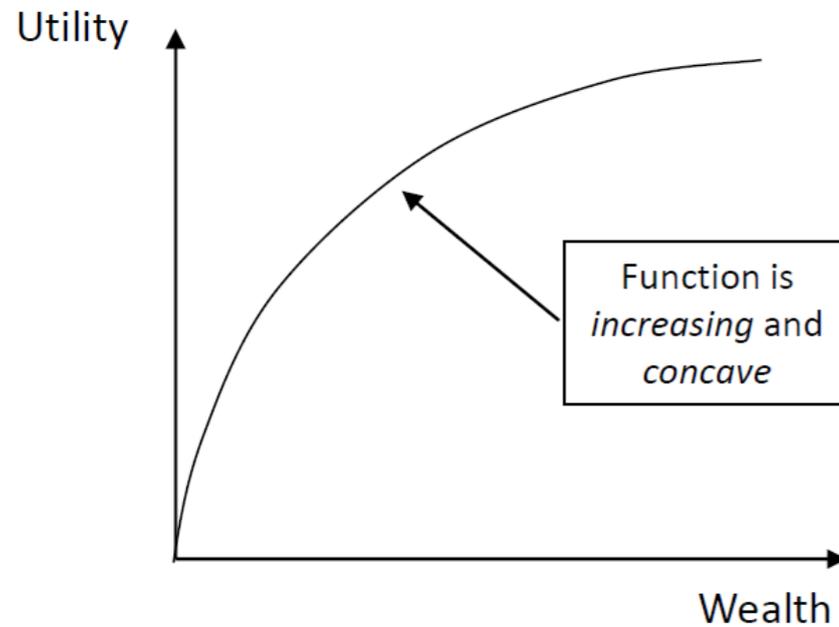
# Prospect Theory

## Loss Aversion



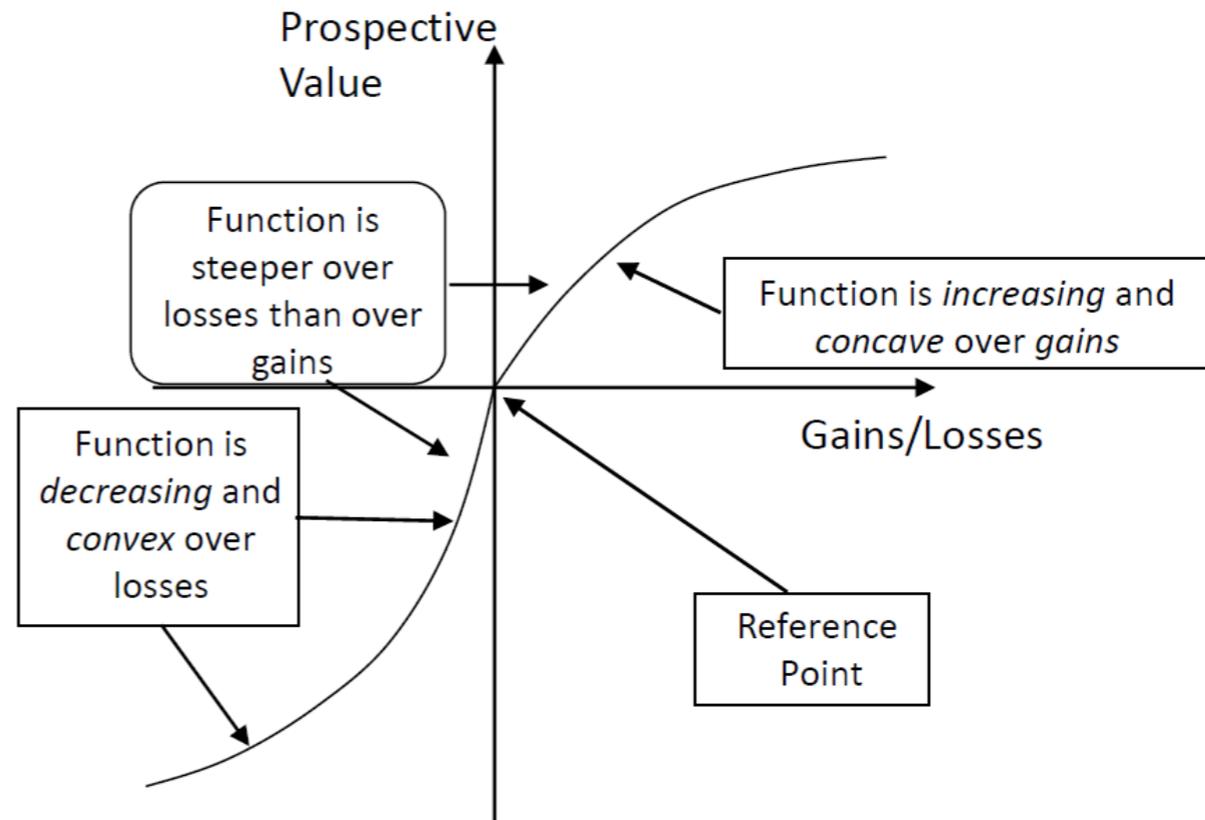
# Expected Utility (EU) versus Prospect Theory (PT)

## Expected Utility Theory



- Utility is measured as a function of absolute wealth
- Marginal (incremental) utility decreases as wealth increases (risk aversion)

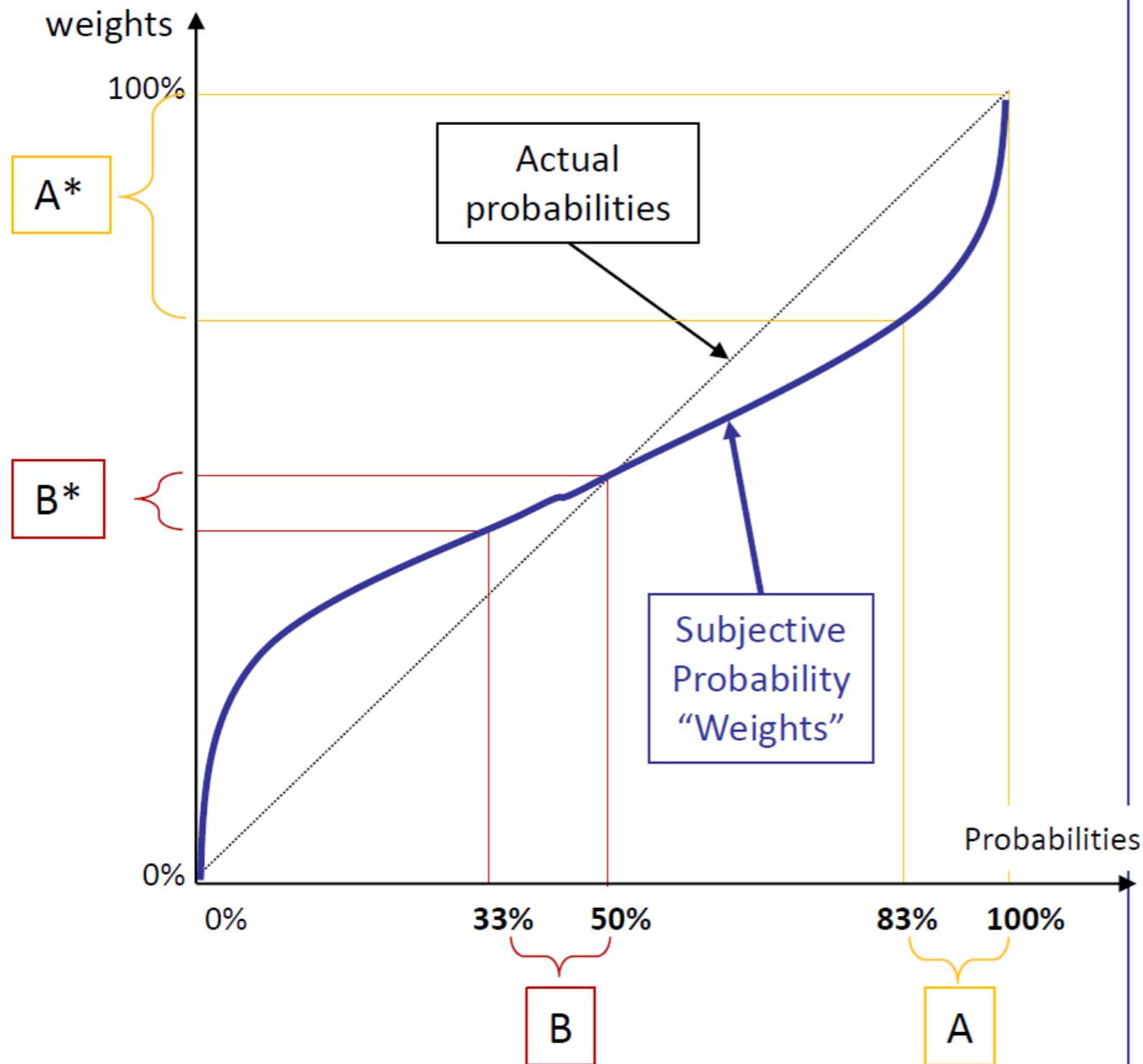
## Prospect Theory



- Value is measured over gains and losses relative to a reference point
- Marginal (incremental) value decreases over gains but increases over losses (risk aversion for gains, risk seeking for losses)
- Value function is steeper over losses than over gains (loss aversion)

See the Lecture:  
Expected Utility vs.  
Prospect Theory

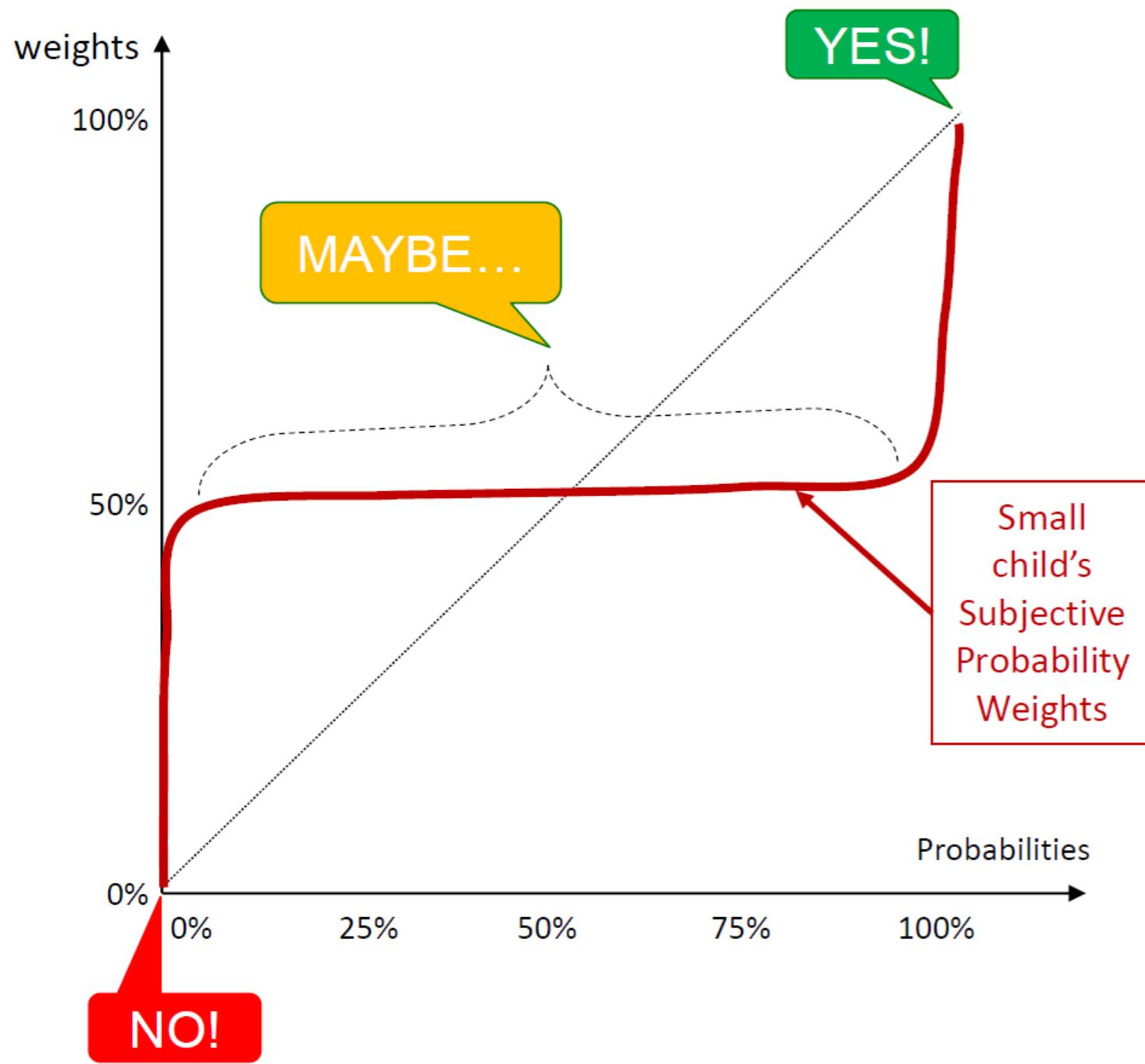
# Probability Weighting Function



On this graph, “true” probabilities are on the horizontal axis, while our “subjective weight” interpretation is reflected in the dark blue curve, with values on the vertical axis.

- Look at the *actual* change in probability from 100% to 83% (marked  $A$  on the horizontal). This probability decrease of  $1/6$  (17%) takes us from *certain* death to merely *probable* with the removal of one bullet from the fully loaded gun. Our *subjective* response ( $A^*$  on the vertical axis) to this change is noticeably larger than the objective probability change.
- Our emotional response to the change from certainty to probability is also significantly greater than our response to the change from 50% to 33% probability (distance  $B^*$  on the vertical), even though it has the same 17% reduction  $B$  in true probability terms.

# Subjective Probability & the Certainty Effect



Further examination of the graph helps us to see, more broadly, that we tend to be more sensitive to probability changes that take us from *certainty* to *probability*, than we are to probability changes in the middle of the range.

At the extreme, imagine the **small child's weighting function**: when asking for a treat (an icecream; an afternoon at the park) she understands the responses "yes" and "no", corresponding to 100% (certainly) and 0% (certainly not). All other probabilities are viewed generically as "maybe."

## Probability Weighting: Glossary of characteristics

See the Lecture:  
Probability  
Weighting

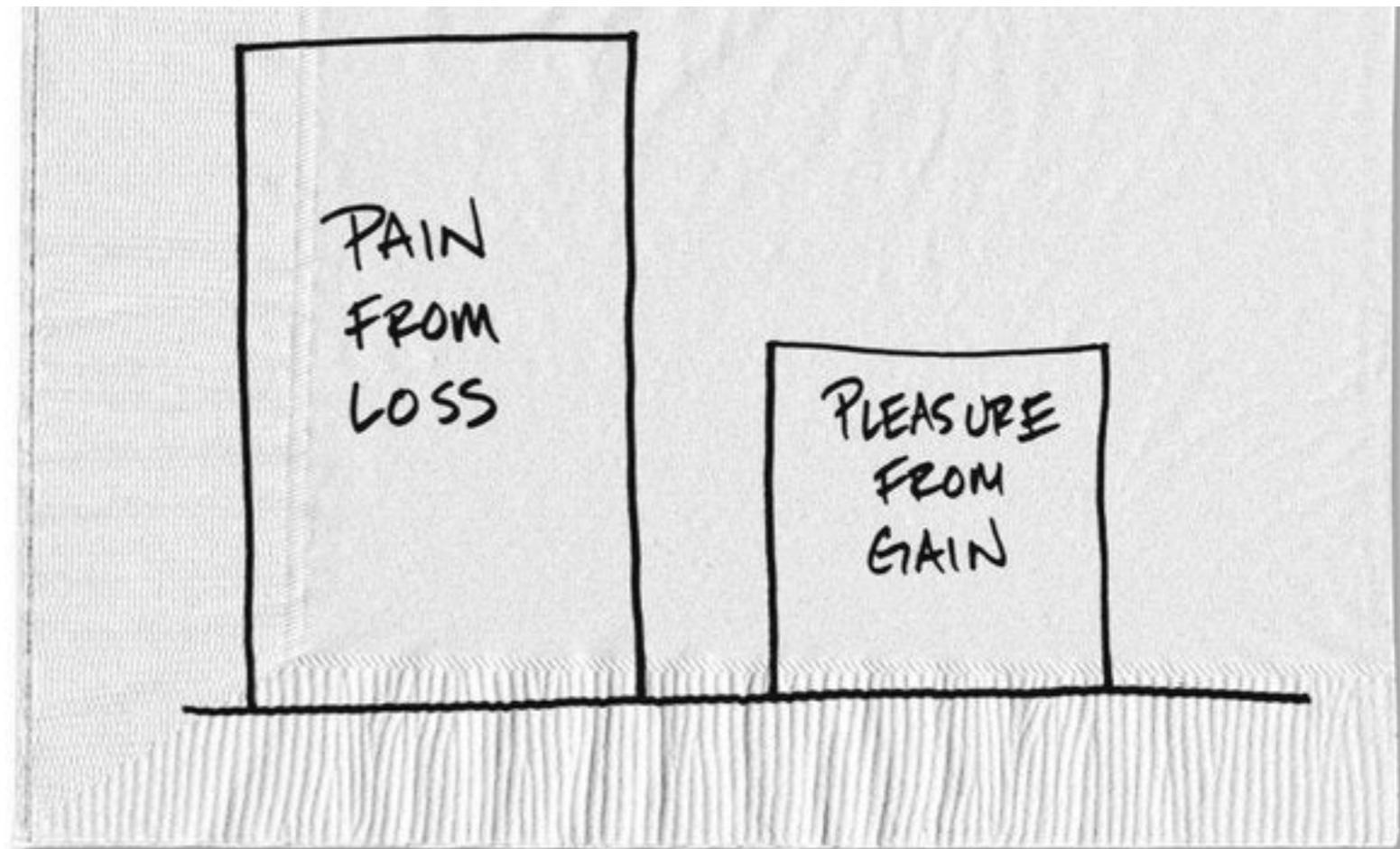
- We tend to *overweight* low probability events, especially events that are especially “front of mind” or “salient” to us at a particular time (think fear of flying following 9/11)
- We tend to *underweight* high probability events, especially those that are sufficiently common that they tend not to be reported in the media (think automobile accidents)
- We tend to be less sensitive to changes in probability in the middle of the range (e.g., 30% to 40%) than changes that move us from probability to certainty (10% to 0%, or 90% to 100%): the *Certainty Effect*

## Fourfold Patter for Risk Aversion or Risk Seeking

	Significant Gains	Significant Losses
High Probability	<p><b>Risk Averse</b> (under-weigh potential benefit)</p> <p>Fear of dissapointment Take unfavorable settlement Refuse preventative care Science Denialism?</p>	<p><b>Risk Seeking</b> (under-weigh potential harm)</p> <p>Desperate to recoup loss Reject favorable settlement Continue gambling Seek risky pseudoscience</p>
Low Probability	<p><b>Risk Seeking</b> (over-weigh potential benefit)</p> <p>Hope for large gain Reject favorable settlement Start gambling Supplements, acupuncture, Chiropractic?</p>	<p><b>Risk Averse</b> (over-weigh potential harm)</p> <p>Fear of large loss Take unfavorable settlement Buy insurance Unwarranted diagnostic testing</p>

# Loss aversion

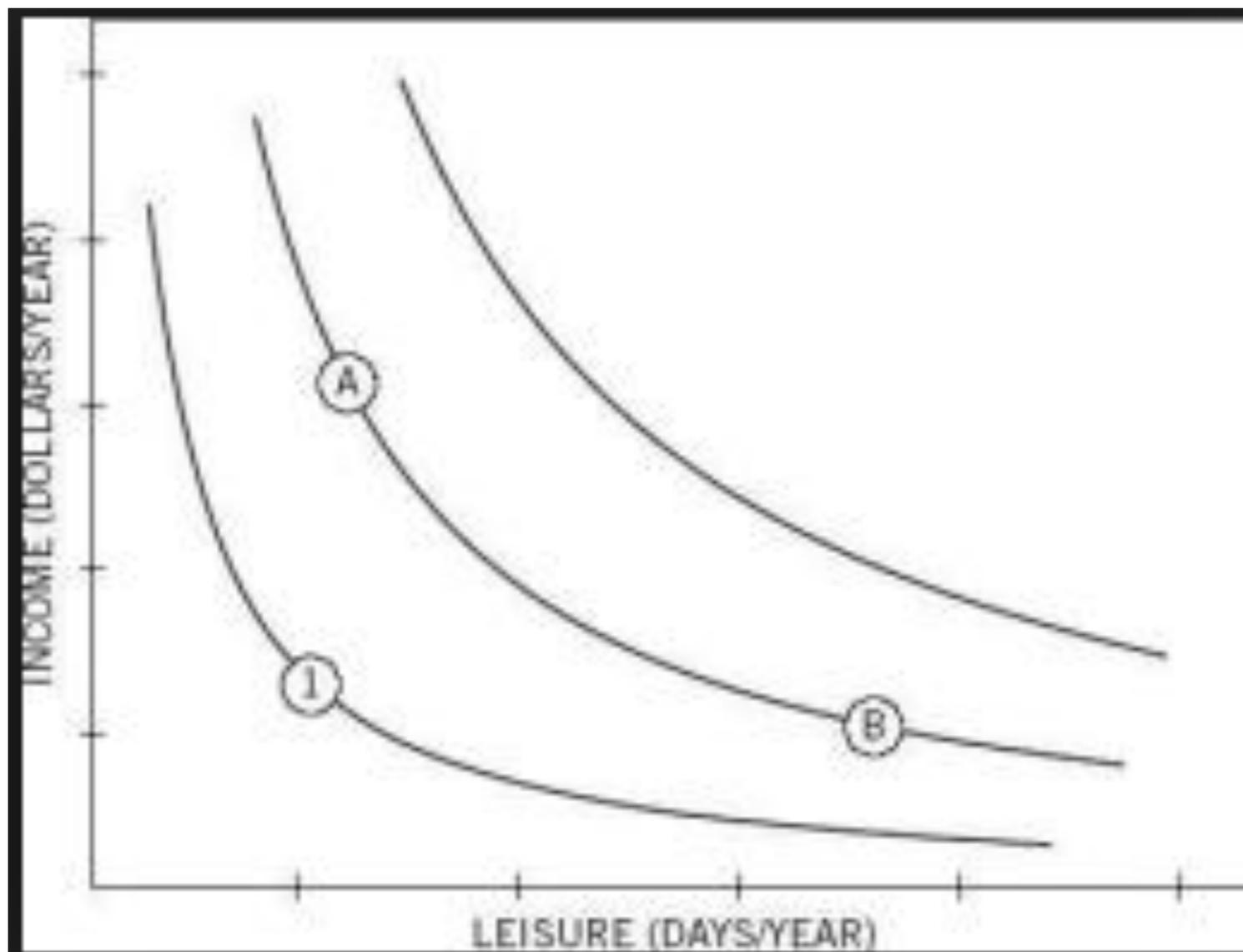
- “The concept of loss aversion is certainly the most significant contribution of psychology to behavioral economics” Daniel Kahneman
  - Endowment effect
  - Sunk-cost fallacy
  - Not enough risk seeking
  - Status Quo Bias
  - Disposition Effect
  - Framing



# Not enough risk taking

- Imagine you all are managers in the same company. Every one of you faces the following investment opportunity?
  - 50% chance of gaining 2 million EUR
  - 50% chance of losing 1 million EUR
  - Would you take it or leave it?
- How about a big picture.... How would your CEO feel about your prospects?

# Status quo bias (the power of current state and defaults)

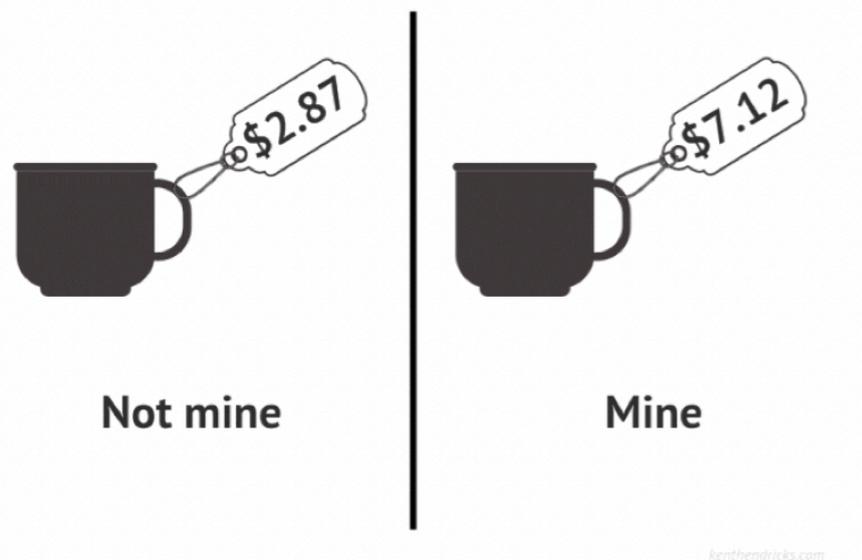


- If you're faced with many options to choose from and you can't devote time and energy to think them through, or you aren't sure what to do with them, what's generally the best thing to do? Don't change anything.
- We should generally assume people will stick with the status quo. That's true whether it's a deep-seated historical status quo or one that is arbitrarily chosen and presented as the status quo: to change is to risk loss .

# Sunk-Cost fallacy

- The Sunk Cost Fallacy describes our tendency to follow through on an endeavor if we have already invested time, effort, or money into it, whether or not the current costs outweigh the benefits.
- In economic terms, sunk costs are costs that have already been incurred and cannot be recovered. It therefore should not be a factor in our current decision-making, because it is irrational to use irrecoverable costs as a rationale for making a present decision. If we acted rationally, only future costs and benefits would be taken into account, because regardless of what we have already invested, we will not get it back whether or not we follow through on the decision.
- The sunk cost fallacy means that we are making irrational decisions because we are factoring in influences other than the current alternatives. The fallacy affects many different areas of our lives leading to suboptimal outcomes.
- These outcomes range from deciding to stay with a partner even if we are unhappy because we've already invested years of our lives with them, to continuing to spend money renovating an old house, even if it would be cheaper to buy a new one because we've already invested money into it.
- <https://www.theguardian.com/money/1999/nov/26/workandcareers1>

# The endowment effect



- The endowment effect is the finding that people are more likely to retain an object they own than acquire that same object when they do not own it.
- The endowment theory can be defined as "an application of prospect theory positing that loss aversion associated with ownership explains observed exchange asymmetries."
- This is typically illustrated in two ways. In a valuation paradigm, people's maximum willingness to pay (WTP) to acquire an object is typically lower than the least amount they are willing to accept (WTA) to give up that same object when they own it—even when there is no cause for attachment, or even if the item was only obtained minutes ago. In an exchange paradigm, people given a good are reluctant to trade it for another good of similar value.

# Disposition Effect

Game 1: you are given \$30,000. It's yours to keep. Then you are asked to choose between the following two possibilities:

(A) Receive an additional \$10,000 for sure

(B) Toss a coin: if it comes up Heads, you get an additional \$20,000; if tails, you get nothing.

Game 2: you are given \$50,000. Then you are asked to choose between the following two possibilities:

(C) A guaranteed *loss* of \$10,000

(D) Toss a coin: if it comes up heads, you lose \$20,000; if tails, you lose nothing.

If you picked (A) in the first game, and (D) in the second, you are in very good company: this pair is the most commonly selected combination

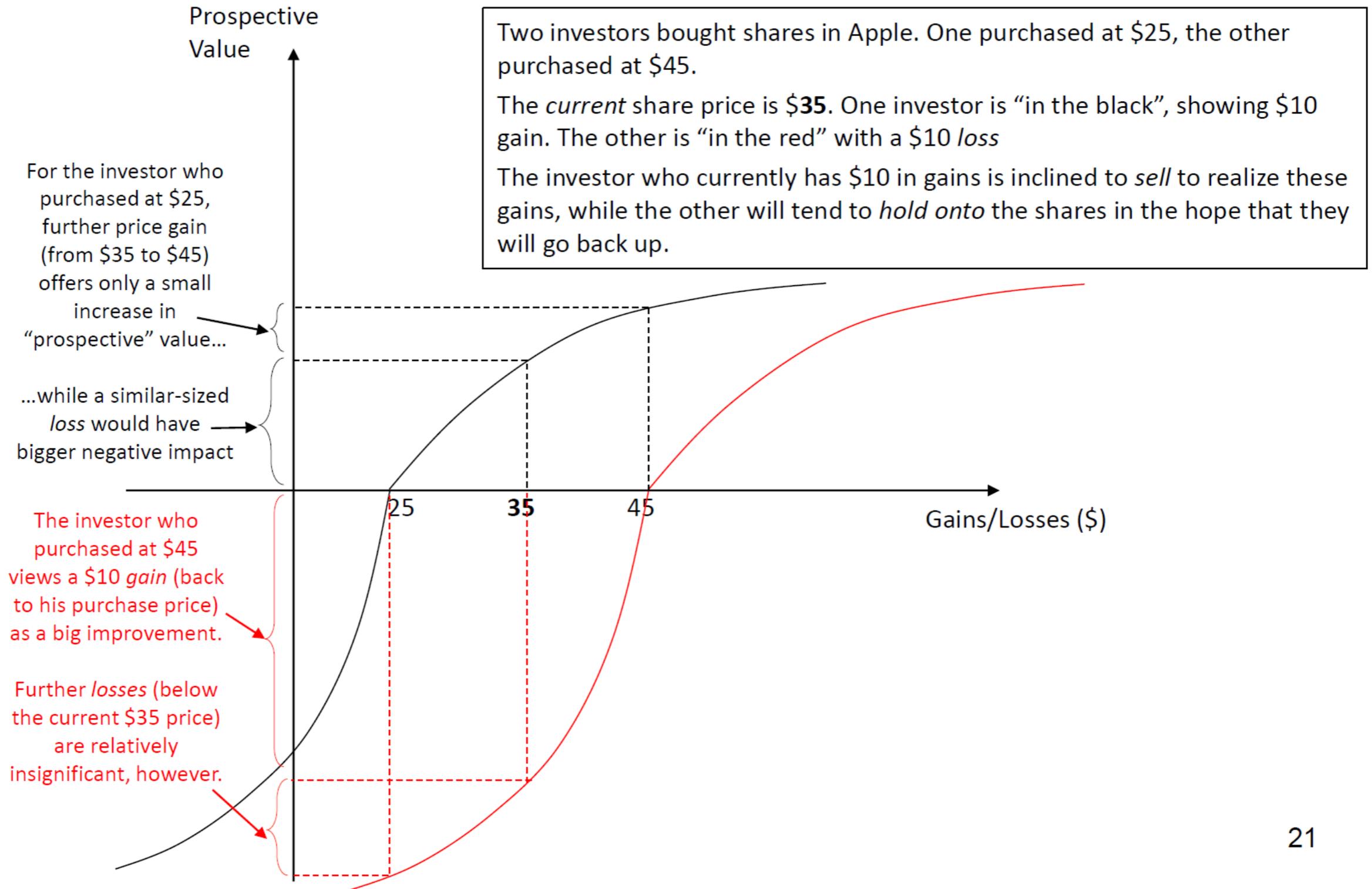
Note, however, that the outcomes in the combination (A) and (C) are identical: in both cases, you walk away \$40,000 richer.

Similarly, (B) and (D) are identical: together, they generate a 50% chance of either \$30,000 or \$50,000.

This preference “switch” is known as the **Disposition Effect**. Why do so many people “flip” their preferences? If they selected (A) in Game 1, why not stick with (C) (which has identical outcomes in all scenarios) in Game 2?

# Prospect Theory

## Reference Points



# Gain vs. Loss framing

## Gain Frame

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

*If Program B is adopted, there is a 1/3 probability that 600 people will be saved, and 2/3 probability that no people will be saved.*

## Loss Frame

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

*If Program D is adopted, there is a 1/3 probability that nobody will die, and 2/3 probability that 600 people will die.*

# Omission vs. Commission

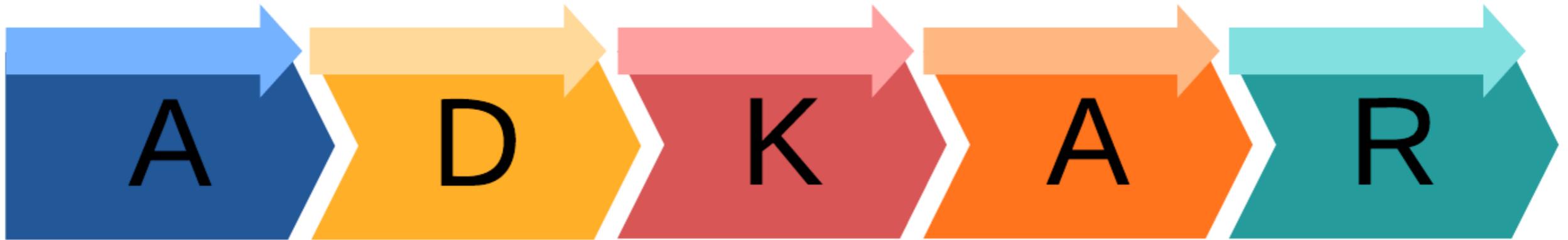
- Please read about Paul and George and assess who would feel worse in these situations: Paul owns shares in Company A. During the past year he considered switching to stock in Company B, but he decided against it. He now finds that he would have been better off by \$1,200 if he had switched to the stock of Company B. George owned shares in Company B. During the past year he switched to stock in Company A. He now finds that he would have been better off by \$1,200 if he had kept his stock in Company B.
- Who feels more regret?
  - A. Paul
  - B. George

# Loss Aversion and Change Management

<b>Change from business perspective</b>	<b>Change from people perspective</b>
Identification of a need/opportunity	Awareness
Project definition	Desire
Designing a solution	Knowledge
Craftin and testing of the solution	Ability
Solution implementation	Reinforcement

# Loss Aversion and Change Management

- For a group or organization to change, all the individuals within that group or organization must change. This means that to affect change in our organizations, businesses and communities, we must first understand how to affect change one person at a time.
- Awareness of the business reasons for change. Awareness is a goal or outcome of early communications related to an organizational change.
- Desire to engage and participate in the change. Desire is a goal or outcome of sponsorship and resistance management.
- Knowledge about how to change. Knowledge is a goal or outcome of training and coaching.
- Ability to realize or implement the change at the required performance level. Ability is a goal or outcome of additional coaching, practice and time.
- Reinforcement to ensure that change sticks. Reinforcement is a goal or outcome of adoption measurement, corrective actions, and recognition of successful change.



### Awareness

- Announce the change to employees well ahead of time.
- Explain your reasoning behind the change, including current pain points and potential ROI of the new solution.
- Give employees an opportunity to ask questions and make suggestions.

### Desire

- Gauge employees' reactions to the change.
- Identify champions.
- If employees are resistant or indifferent, address their concerns or show them how the change benefits them personally.

### Knowledge

- Provide training or coaching to show what employees need to do after the change takes place.
- Address any skill gaps.
- Offer resources, such as process flowcharts, that employees can reference later on.

### Ability

- Schedule practice runs before the change is fully implemented.
- Monitor performance immediately following the change and provide constructive feedback.
- Set reasonable goals and metrics at the start.
- Adjust processes as necessary.

### Reinforcement

- Monitor the change over time to ensure it fulfills your desired outcome.
- Use positive feedback, rewards, and recognition to encourage employees to keep following the new process.

