ROLE OF HEURISTICS IN RISK MANAGEMENT

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"its about time"

We use heuristics to simplify choices in relation to risk. This leads to various biases in decision making which may not always result in good decisions. Through awareness, skill and experience we can avoid pitfalls.

Agenda

■ Two systems

■ Heuristics and Biases:

  ■ Representativeness
  ■ Availability
  ■ Adjustment & Anchoring

■ Conclusion

Our Mind

Glance at the image

$1039 \times 3752 = ?$

Two Systems*
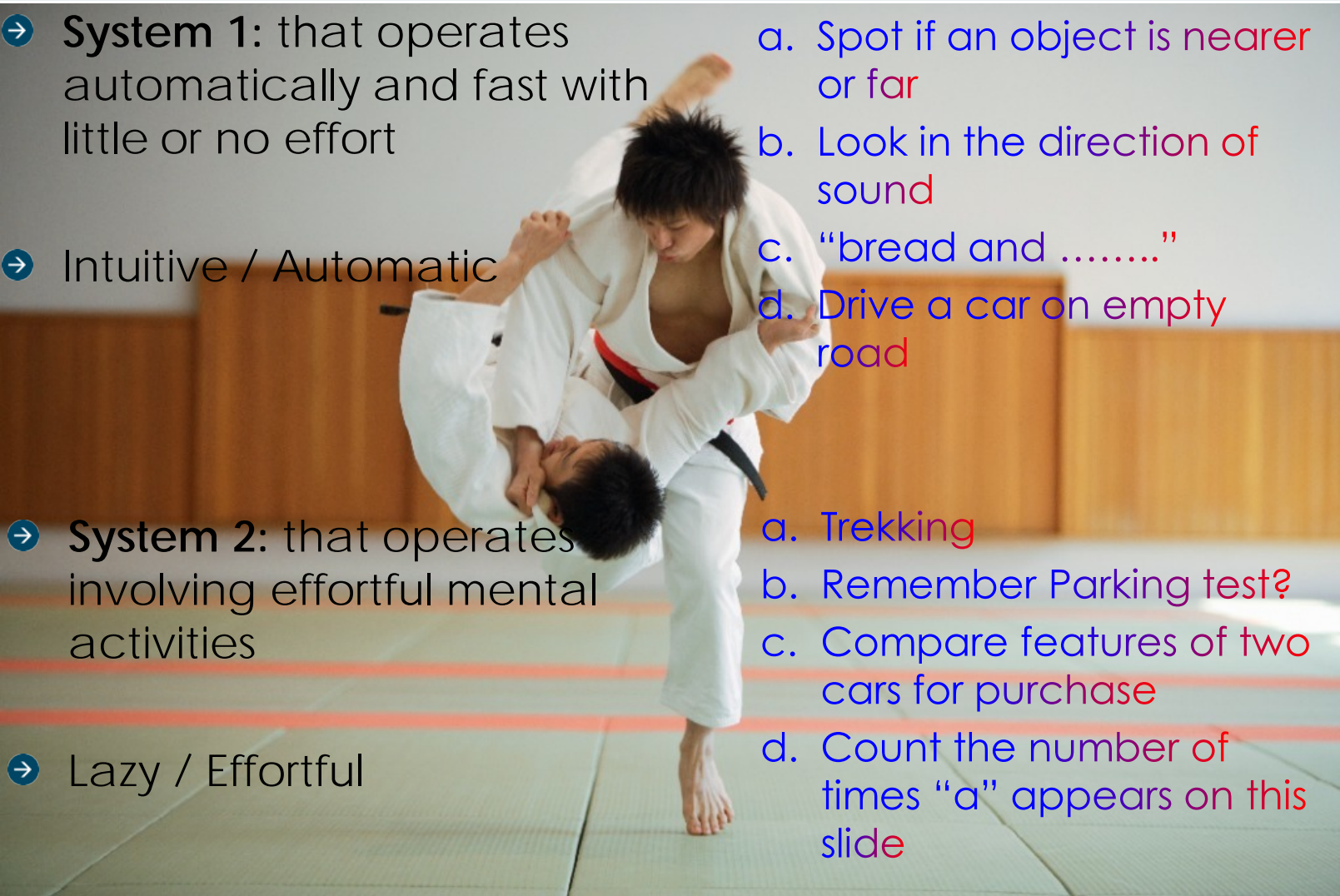
→ **System 1:** that operates automatically and fast with little or no effort

→ Intuitive / Automatic

→ **System 2:** that operates involving effortful mental activities

→ Lazy / Effortful

a. Spot if an object is nearer or far
b. Look in the direction of sound
c. "bread and ...."
d. Drive a car on empty road

a. Trekking
b. Remember Parking test?
c. Compare features of two cars for purchase
d. Count the number of times "a" appears on this slide

Image reference: Photononstop (Axa Creative Gallery)

* **References:** Daniel Kahneman. (2011) Thinking, fast and slow, London: Allen Lane

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redefining / insurance AXA

Two Systems

→ A bat and ball cost $1.1

→ The bat costs one dollar more than the ball.

→ How much does the ball cost?

→ All roses are flowers.

→ Some flowers fade quickly.

→ Therefore some roses fade quickly.

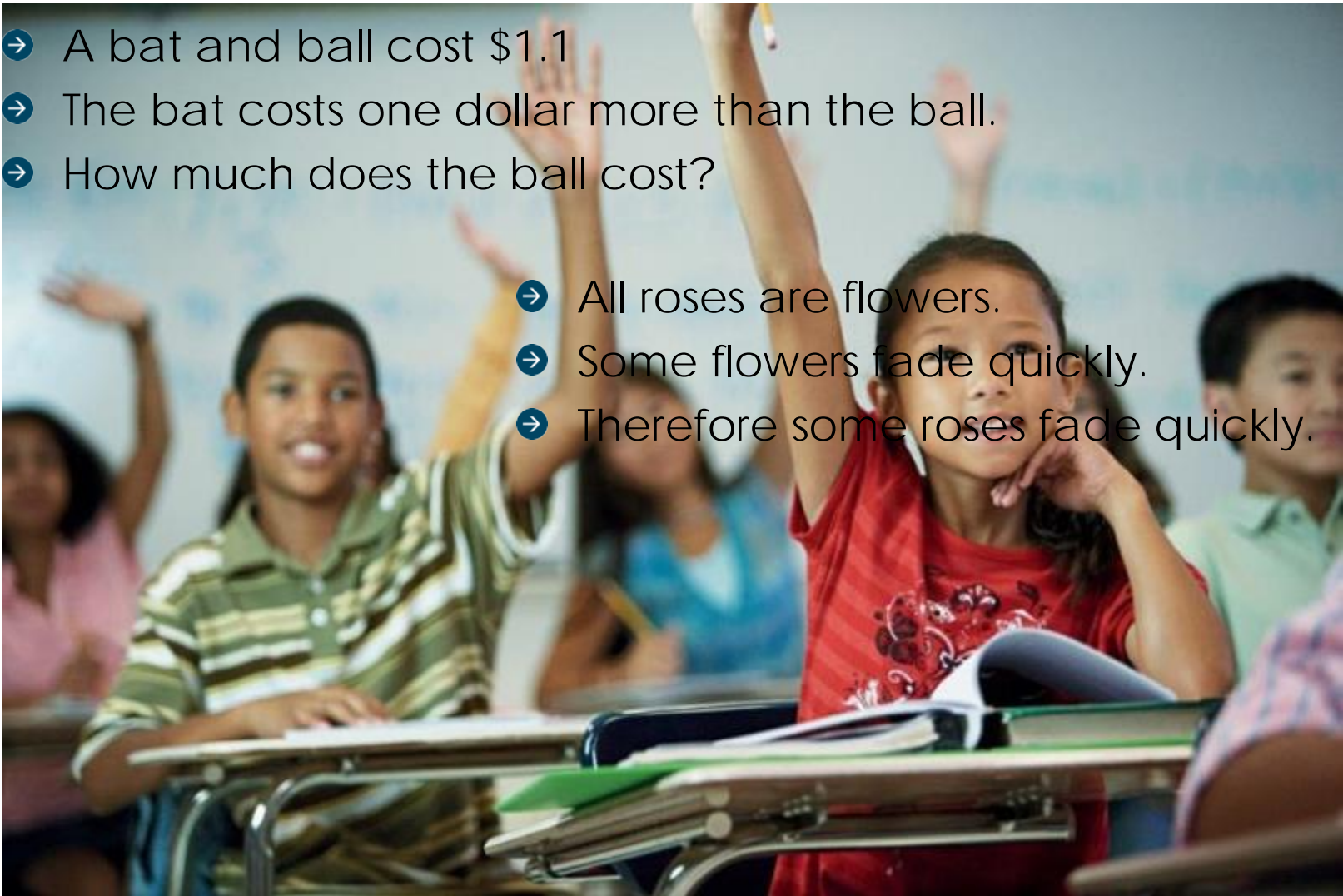Image reference: Getty Images (Axa Creative Gallery)

Fast System*

→ Associative Machine   High Rise   Fire

→ Priming / Coherence   Eat   SO_P

                                 WASH   SO_P

If we believe in conclusion then we automatically believe in argument

→ Substitution   How happy you are with life?

→ Causal stories   WYSIATI (What you see is all there is)

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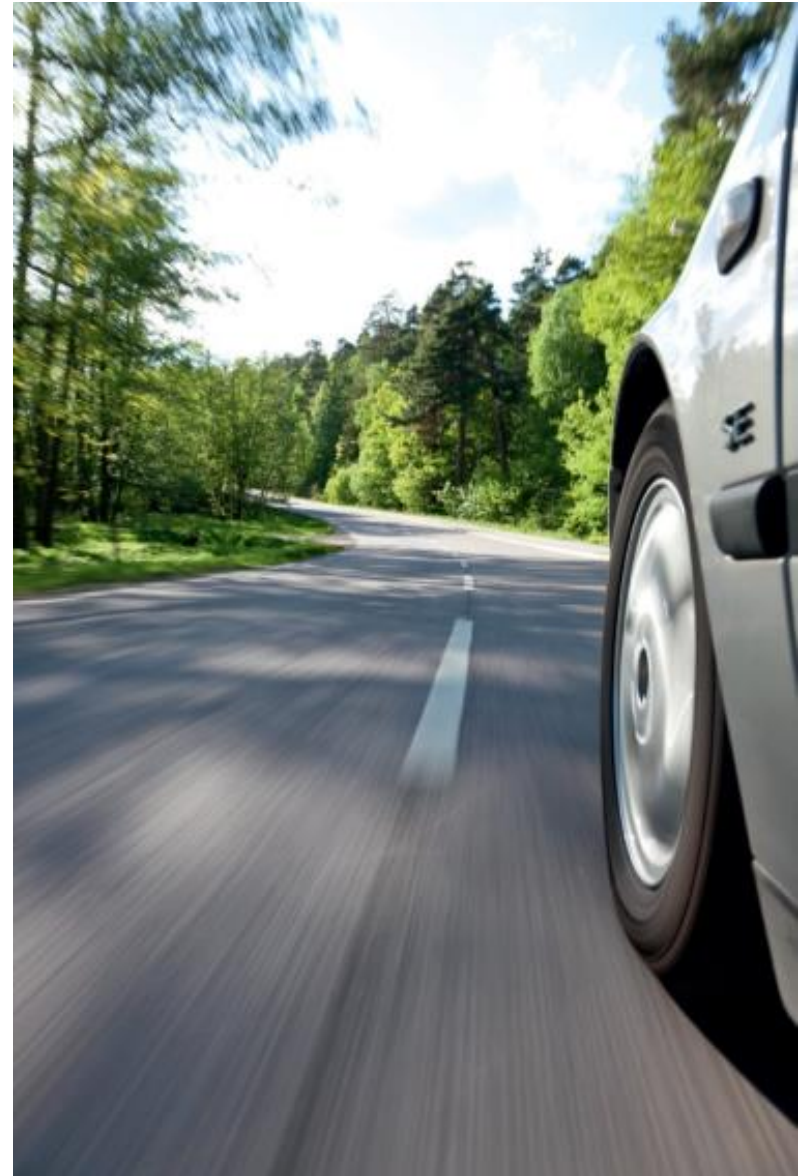redefining / insurance   AXA

Decision Making

Decision making is based on beliefs regarding likelihood of uncertain events.

What happens when assessment of risks are replaced by judgment of certainty

Or are we on auto-pilot when it comes to decision making?

Image reference: Photononstop (Axa Creative Gallery)

Heuristics – Rule of Thumb

We rely on certain heuristics principles/ unconscious routines that reduces the complex method of assessing likelihoods and predicting values to simple judgment operations

We use heuristics to simplify choices in relation to risk

Heuristics lead to biases that effect our decisions

Image reference: Istock (Axa Creative Gallery)

Heuristics

- → Representativeness
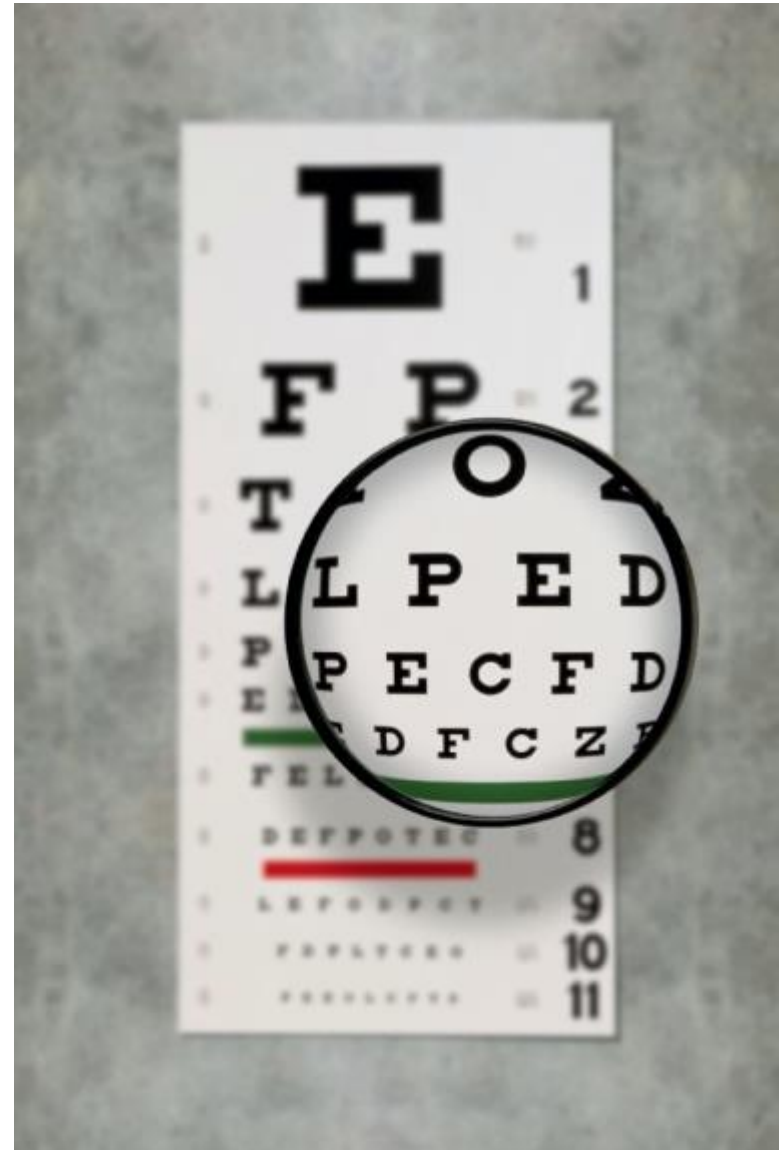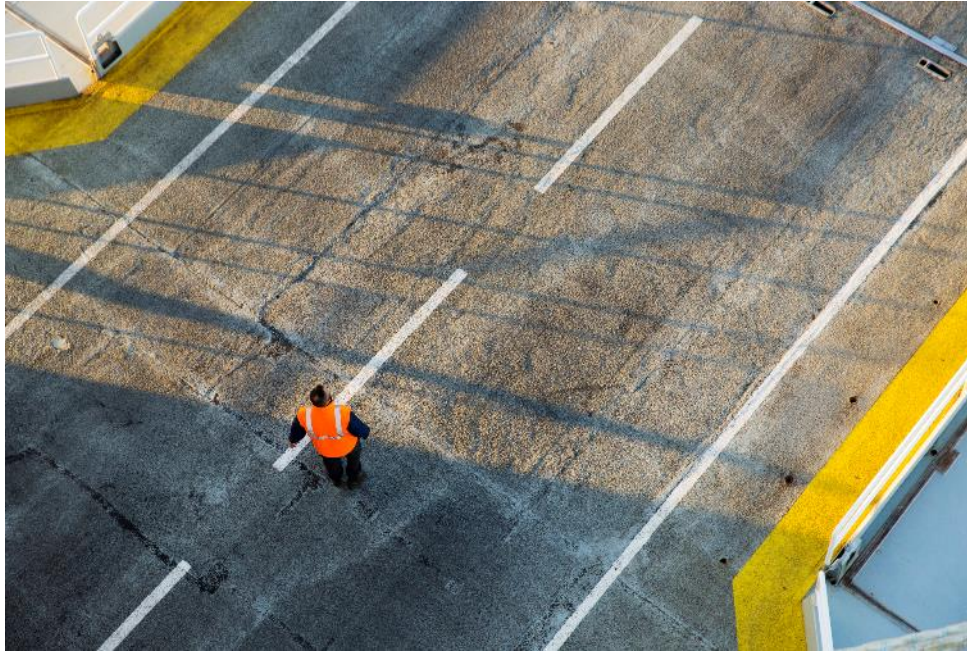
- → Availability

- → Adjustment & Anchoring

Image reference: Istock (Axa Creative Gallery)

Representativeness

We tend to categories new risks on how much they resemble a more familiar risks, even when the resemblance relates to factors irrelevant to the risk*

This approach leads to serious errors, because similarity or representativeness is not influenced by several factors that should affect such judgment.

Image reference: **Philippe Dureuil** (Axa Creative Gallery)

***References:** Lloyds Emerging Risk report (2010) Behaviour Bear, Bull or Lemming?, London

Linda problem*

Linda is a thirty-one years old, single, outspoken, and very bright.

She majored in philosophy.

As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in antinuclear demonstrations.

- Linda is a teacher in elementary school
- Linda works in a bookstore and takes yoga classes
- Linda is active in the feminist movement
- Linda is a psychiatric social worker
- Linda is a bank teller
- Linda is an insurance salesperson
- Linda is a bank teller and is active in the feminist movement

* **References:** Daniel Kahneman. (2011) Thinking, fast and slow, London: Allen Lane

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Representativeness

1. Insensitivity to base rate of outcomes

- On most occasions, people who act friendly are in fact friendly.
- Young men are more likely to drive aggressively than elderly woman
- A professional athlete who is very tall and thin is much more likely to play basketball than football

→ Insensitivity to the quality of evidence

→ When no specific evidence is given, prior probabilities are properly utilized, when worthless evidence is given, prior probabilities are ignored (beware WYSIATI)

References: Daniel Kahneman. (2011) Thinking, fast and slow, London: Allen Lane & Amos Tversky, Daniel Kahneman (1974), 'Judgment under Uncertainty: Heuristics and Biases', Science, New Series Vol. 185, No. 4157, pp. 1124-1131

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Representativeness

2. Insensitivity to Sample Size

Large Hospital

45 babies born/ day

Small Hospital

15 babies born/day

50% of the babies are boys however exact percentage varies from day to day.

For a period of 1 year which hospital you think recorded more number of days on which more than 60% of the babies born were boys?

a. Large hospital (21)

b. Small hospital (21)

c. About the same (53)

Image reference: Istock (Axa Creative Gallery)

References: Amos Tversky, Daniel Kahneman (1974), 'Judgment under Uncertainty: Heuristics and Biases', Science, New Series Vol. 185, No. 4157, pp. 1124-1131

Representativeness

3. Misconception of Chance i.e. Chance is commonly viewed as a self correcting process.

➔ Is Random really Random??
    H-T-H-H-T-H or
    H-H-H-H-T-H or the coin is unfair?

➔ Gambler's Fallacy

➔ Law of small numbers: Extreme outcomes

➔ we assume trend before we should

Jumping to conclusions is a safer sport in the world of our imagination than it is in reality.

References: Amos Tversky, Daniel Kahneman (1974), 'Judgment under Uncertainty: Heuristics and Biases', Science, New Series Vol. 185, No. 4157, pp. 1124-1131

Representativeness

4. Insensitivity to Predictability i.e. predicting future outcomes based on similarity of description to future results

Who is in ?

KIM
- Fresh graduate with 4 CGPA
- Excellent Analytical Skills
- Good talker

JANE
- 5 years experienced similar role
- 3 CGPA
- Team player
- Evidence of good work
- Not good talker

Representativeness

4. Insensitivity to Predictability i.e. predicting future outcomes based on similarity of description to future results

Correcting your intuitions may complicate your life*

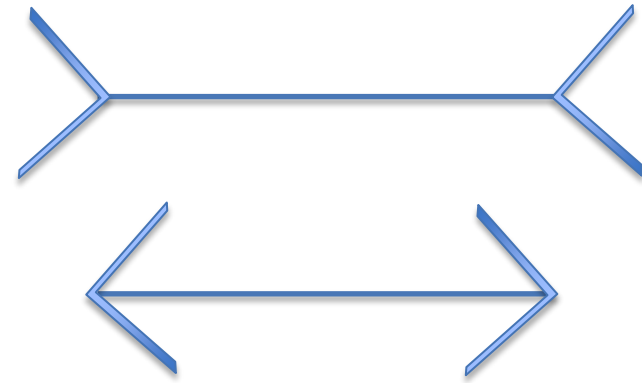

Image reference: Istock (Axa Creative Gallery)

* References: Daniel Kahneman. (2011) Thinking, fast and slow, London: Allen Lane

Representativeness

5.Illusion of Validity i.e. predicting the outcome that is most representative of the input.

Stock Market – when someone sells a stock, who buys it??

Errors of prediction are inevitable because the world is unpredictable.

Cognitive illusions can be more stubborn than visual illusions.

* **References:** Daniel Kahneman. (2011) Thinking, fast and slow, London: Allen Lane

Representativeness

Success = Talent + Luck

6. **Misconception of Regression** i.e. ignoring regression towards the mean

→ Rewards for improved performance work better than punishment of mistakes??

Our mind is strongly biased toward causal explanations and does not deal with "mere statistics".

Image reference: Camille Malissen (Axa Creative Gallery)

* **References:** Daniel Kahneman. (2011) Thinking, fast and slow, London: Allen Lane

Peace in Marriage

Awareness of your own biases can contribute to peace in marriages and probably in other joint projects.

Image reference: Mathieu Beaudet (Axa Creative Gallery)

Availability

→ Assessing frequency of likelihood of an event by the ease with which instances come to mind.

- Number of instances (Slow)
- ease of retrieval (Fast)

- Instances of large classes are recalled better and faster than instances of less frequent classes;
- Likely events are easier to imagine than unlikely events;
- Associative connections between events are strengthened when the events frequently co-occur.

Emotion plays a strong role in availability bias

Image reference: Photononstop (Axa Creative Gallery)

* **References:** Daniel Kahneman. (2011) Thinking, fast and slow, London: Allen Lane

Availability

Ease of Retrievability of instances which is in turn is affected by familiarity, salience and closeness to the event.

Effectiveness of a Search Set that might not relate directly to the class frequency.

Imaginability that which is difficult to construct relates to lower estimation of frequency. E.g. the ease with which disasters are imagined need not reflect their actual frequency.

Illusory Correlation

Adjustment & Anchoring

Image reference: Photononstop (Axa Creative Gallery)

Adjustment & Anchoring

+50

High rise fires in the region last year

Image reference: Photononstop- Axa Creative Gallery

Adjustment & Anchoring

+5

High rise fires in the region last year

Image reference: Photononstop- Axa Creative Gallery

Adjustment & Anchoring

Predict number of actual high rise fire this year

Adjustment & Anchoring

Making estimates by starting from an initial value that is adjusted to yield the final answer.

Adjustment is a deliberate attempt to find reasons to move away from the anchor.

→ Different starting point yield different estimates which are biased towards the initial value.

→ Availability and representativeness may play a major role in starting point

Image reference: Istock (Axa Creative Gallery)

* **References:** Daniel Kahneman. (2011) Thinking, fast and slow, London: Allen Lane

Adjustment & Anchoring

1.Insufficient Adjustment

1 X 2 X 3 X 4 X 5 X 6 X 7 X 8 =

8 X 7 X 6 X 5 X 4 X 3 X 2 X 1 =

Image reference: Istock (Axa Creative Gallery)

* **References:** Daniel Kahneman. (2011) Thinking, fast and slow, London: Allen Lane

Adjustment & Anchoring

2. Evaluation of Conjunctive and Disjunctive events

Conjunctive: when several events all need to occur to result in a certain outcome we overestimate the likelihood that all of them will happen. (Planning)

Disjunctive: if only one of many events needs to occur, we underestimate that probability. (Evaluation of risk)

We overestimate the probability of conjunctive events and underestimate the probability of disjunctive events.

Image reference: Istock (Axa Creative Gallery)

* **References:** Daniel Kahneman. (2011) Thinking, fast and slow, London: Allen Lane

Conclusion

Image reference: Corbis (Axa Creative Gallery)

Conclusion

- Thich Nath Hanh – be mindful and accept yourself that you can make biased decision
- Beware of WYSIATI; Slow down a bit; don't make quick decisions
- System 1 may be the lead hero but System 2 has a strong supporting role
- Look at costs as well as benefits; including opportunity costs
- Stay away from books that feed bias to your system
- Consider multiple scenarios
- Gut feel is informative and should not be ignored however evidence must be sought before acting
- Always play devil's advocate or seek peer review

Thanks for your attention!

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