Decision making

• Fundamental topic
• Strategy = set of choices
• Activity system = the result of decisions made throughout the organization through time
• Organizational factors of decision making (incentive systems, allocation of decision rights, coordinating mechanisms)
• Focus today is on individual decision making
• Some biases and heuristics are “hard-wired” in our brains
• By becoming aware of them we might help improve the decision making ability of others
Do the two table tops, as drawn, have the same shape?
- Now imagine I show you this picture on a computer screen and ask you to pinch your fingers as if you want to pick up first the left table, then the right table.
- Then we take a photo of your fingers and measure how far apart they are.
- They are exactly the same distance apart!
- The pathway from your visual system to your motor cortex is different than the pathway that interprets the length/width and that is influenced by the perspective!

⇒ Our cognitive self can be fooled
⇒ Not everything that happens in our brains is accessible to our cognitive self
A tale of two systems

• System 1
• System 2

• The two-systems approach will allow us to see some overarching patterns across a variety of decision biases
• Most examples from: Daniel Kahneman, *Thinking Fast and Slow*, 2011
System 1

- Fast
- Effortless
- No voluntary control, automatic
- Continuously on
- Pattern matching
- Tacit knowledge/skills [2*2=; riding bike]
- Bad at statistics and logic
- Impulsive and intuitive
- Involved and influenced by associative activation/memory recall
- Related to creativity
- Activated by good mood
- Maintains and updates a model of your world which represents what is normal in it
- Likes coherence and will create it

System 2

- Slow
- Effortful (“it hurts”)
- Requires attention (which is limited; “pay attention” is an apt phrase; don’t compute 17*68 while making a left turn in heavy traffic)
- Agency, choice, conscious reasoning self
- Cautious and lazy
- Activated by surprises, non-expected outcomes
- Activated by bad mood

Kahneman (2011)
Three quick questions
Three quick questions

• A bat and a ball cost $1.10. The bat cost $1 more than the ball. How much does the ball cost?

• If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?

• In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?
Three quick questions

• A bat and a ball cost $1.10. The bat cost $1 more than the ball. How much does the ball cost? $1.05 (+ 0.05 = $1.10)

• If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets? 5

• In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake? 47
System 2 is lazy

• System 1 constantly generates suggestions for System 2: impressions, intuitions, intentions, and feelings.

• If endorsed by System 2, intuitions and intentions convert into beliefs, and impulses turn into voluntary actions.

• How closely does System 2 monitor the answers that System 1 suggests? It takes effort not to choose the “obvious” answer.

Kahneman (2011)
Shared Pool of Mental Energy

- All variants of voluntary effort – cognitive, emotional, and physical – draw at least partly on a shared pool of mental energy.
- For instance, if you walk briskly and ask someone to compute $19 \times 68$, most likely they’ll stop.
- Self-control is tiring and a limited resource (“pay attention”).

Gaillot & Baumeister (2007); Danziger et al. (2011)
Shared Pool of Mental Energy

• For instance, one study asked participants to stifle their emotional reaction to an emotionally charged film. Later, they performed worse on a test of physical stamina.

• Glucose depletion: Fewer requests for parole were granted, the longer after a judge had eaten.

⇒ Your decisions might be subtly influenced by your physical state
⇒ When during the day do we make important decisions?

Gaillot & Baumeister (2007); Danziger et al. (2011)
Glucose depletion: Fewer requests for parole were granted, the longer after a judge had eaten.

Fig. 1. Proportion of rulings in favor of the prisoners by ordinal position. Circled points indicate the first decision in each of the three decision sessions; tick marks on x axis denote every third case; dotted line denotes food break. Because unequal session lengths resulted in a low number of cases for some of the later ordinal positions, the graph is based on the first 95% of the data from each session.
Your decisions might be subtly influenced by your physical state

When during the day do we make important decisions?

Gaillot & Baumeister (2007); Danziger et al. (2011)
System 1 is autonomous

• A definite choice is made and you don’t even know it. Only one interpretation comes to mind and you never were aware of the ambiguity.
• System 1 is a “machine to jump to conclusions.”
• Another example of autonomy of System 1: System 2 now knows the two tables have the same size, but System 1 still perceives them to be of different shapes.
• That’s why it’s difficult to catch oneself making these errors. It’s more likely you can help others than yourself.
Which do you choose:
• Get $900 for sure, OR 90% chance to get $1,000 and 10% chance to get nothing?

Which do you choose:
• Lose $900 for sure, OR 90% chance to lose $1,000 and 10% chance to lose nothing?

You are offered a gamble on the toss of a coin.
• If the coin shows tails, you lose $100
• If the coin shows heads, you win $125.
Is this gamble attractive? Would you take it?

⇒ Most people are risk averse in gains; risk seeking in losses
⇒ Most people show loss aversion

Kahneman (2011)
Prospect Theory

Psychological Value

Losses

Gains

Risk averse

Reference Point

Risk seeking

Loss aversion

Kahneman & Tversky (1979)
Theatre

Imagine that you have decided to see a play and paid the admissions price of $80 per ticket. As you enter the theatre, you discover that you have lost the ticket. The seat was not marked and the ticket cannot be recovered.

Would you pay another $80 for a new ticket?

Imagine that you have decided to see a play where admission is $80 per ticket. As you enter the theatre, you discover that you lost four $20 bills.

Would you still pay $80 for a ticket for the play?

Kahneman (2011); Thaler (1999)
Mental accounts

• Mental accounts are another form of narrow framing
• They can be helpful as a commitment device (X-mas savings account), but they are usually sub-optimal
• Credit-card debt vs savings rate
Framing Summary

• When decisions are being presented, ask to have them presented with different frames
  – What’s the reference point?
  – Are cash outflows expressed as: Losses vs. Costs vs. Investments?
  – Are we considering this decision in isolation (narrow framing) or as a portfolio of decisions (at this time and over time)?
  – Does our incentive structure (and budgeting system) lead to narrow framing? => role of leadership
Logical Statement

• Set of cards, each card has on one side a letter (e.g., A, B, C ....) and a number on the other side (e.g., 1, 2, 3 .....)
• Here is a rule that I claim to be true: If a card has a D on the one side, it has a 3 on the other side, i.e., if D then 3.
What is the smallest number of cards you have to turn around from this set below, to verify whether this rule holds?

DF37
Logical Statement

• Law: Drinking alcohol requires to be of age 21 or older.
• You are the bouncer in a bar and have to enforce this rule
• 4 patrons sit in the bar with each having a glass in front of them, who do you have to check (age or drink)?

A: You know drinks beer
B: You know drinks water
C: You know is over 21
D: You know is not 21 yet
Confirmation Bias

• We seek information that confirm what we already believe to be true (consistency seeking)

• We filter out/ down play counter evidence (yes, but .....)

• Why is this problematic?

• We may operate in suboptimal (or even completely wrong) territory → biased decision making with potentially huge downsides!

• start with counter arguments and data to see if the hypotheses holds (allows to identify boundary conditions)
Randomness

• System 1 is bad at statistics

• What do probabilities really mean?

• What does randomness look like?
Halo Effect
Question substitution

• System 1 likes to substitute an easier question for a difficult one. Questions asked to some German students:
  – How happy are you these days?
  – How many dates did you have last month?

• No correlation between the answers.
• But when the questions were reversed, high correlation!
• The question of “how happy” is not easy. When asked about dating first, there was an easy substitution available. “How happy are you with your love life?”

➢ Consider the ordering: How satisfied are you with your job? How satisfied are you with your pay?

Strack et al. (1988)
Anchoring
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Ariely (2008)
Anchoring

• Anchoring on irrelevant alternatives
• Influencing the reference point
• People rarely choose the cheapest or the most expensive item (in a store; off a menu)
Remember

1. When during the day do we make decisions? What’s our physical, emotional, cognitive state? (Give System 2 resources)
2. When decisions are being presented, ask to have them presented with different frames (overcome the framing effect)
3. Be aware of the order in which information is being presented (mitigate the halo effect)
4. Beware of (extreme) findings from small samples
5. Seek information that could disconfirm your hypothesis (overcome confirmation bias)
6. Be aware that small probabilities are either overvalued or completely ignored
7. Be extra careful in situations when losses have high probabilities
When we embark the future ...

... how can we maximize our happiness and prosperity?
Let’s look what we know from studying the elderly!
When we embark the future ... how can we maximize our happiness and prosperity?

Harvard Longevity Study: follows 700 men since they were teenager (start. 1938); ~60 original participants (now in their 90s) still participating
- Blood samples, interviews, MRI scans, regular questionnaires, etc.

What did not matter for happiness, health, and longevity?
- Background (privileged or humble beginnings)
- Experienced personal triumphs or travails

What did matter the most (by far) and supported by additional meta studies:
- Social connections (being connected to family, friends, community)
- Loneliness is toxic (isolation)
- Quality of relationships (warm, deep connections):
  “people in the study who were most satisfied in their relationships at age 50 were the healthiest at age 80”; “Being in a securely attached relationship is protective in your 80s. Those people's memories stay sharper longer”

https://www.health.harvard.edu/mental-health/can-relationships-boost-longevity-and-well-being
When we embark the future ... how can we maximize our happiness and prosperity?

**Cornell legacy project:** asked 1,500 Americans, age 65+ “what do you regret when you look back on your life”? (and other life lessons).

The scholars were prepared for big answers, but were surprised to hear, over and over again:

"I regret that I worried so much about everything."

- Worries about things that may happen consume from our shared mental energy (less energy to actually do things!)
- Worries and rumination is often different from “concrete problem solving” as well as often in the absence of “concrete problems”!

The elderlies advice: **“Focus on the short-term rather than the long-term” and “Prepare instead of worrying”**

“It's a good idea to plan ahead if possible, but you can't always do that because things don't always happen the way you were hoping they would happen. So the most important thing is one day at a time.” — **Eleanor Madison, 102 years old,** from “30 Lessons for Living.”
When we embark the future ... how can we maximize our happiness and prosperity?

More generally, we seem to regret inaction more than action.

In many interviews, the elderly regretted not doing/trying/pursuing things in life; more so than mistakes they have made.

This is a great chapter in our life to ask us: what are the things I want have done/ tried/pursued when I look back in 10, 20, 30+ years?
Thank you!

• I had a great time. I hope you had a good time, too.

• Please stay in touch! Let me know where your careers take you.

• All the best to you!