

How do we make
decisions


13

Human Computer Interaction

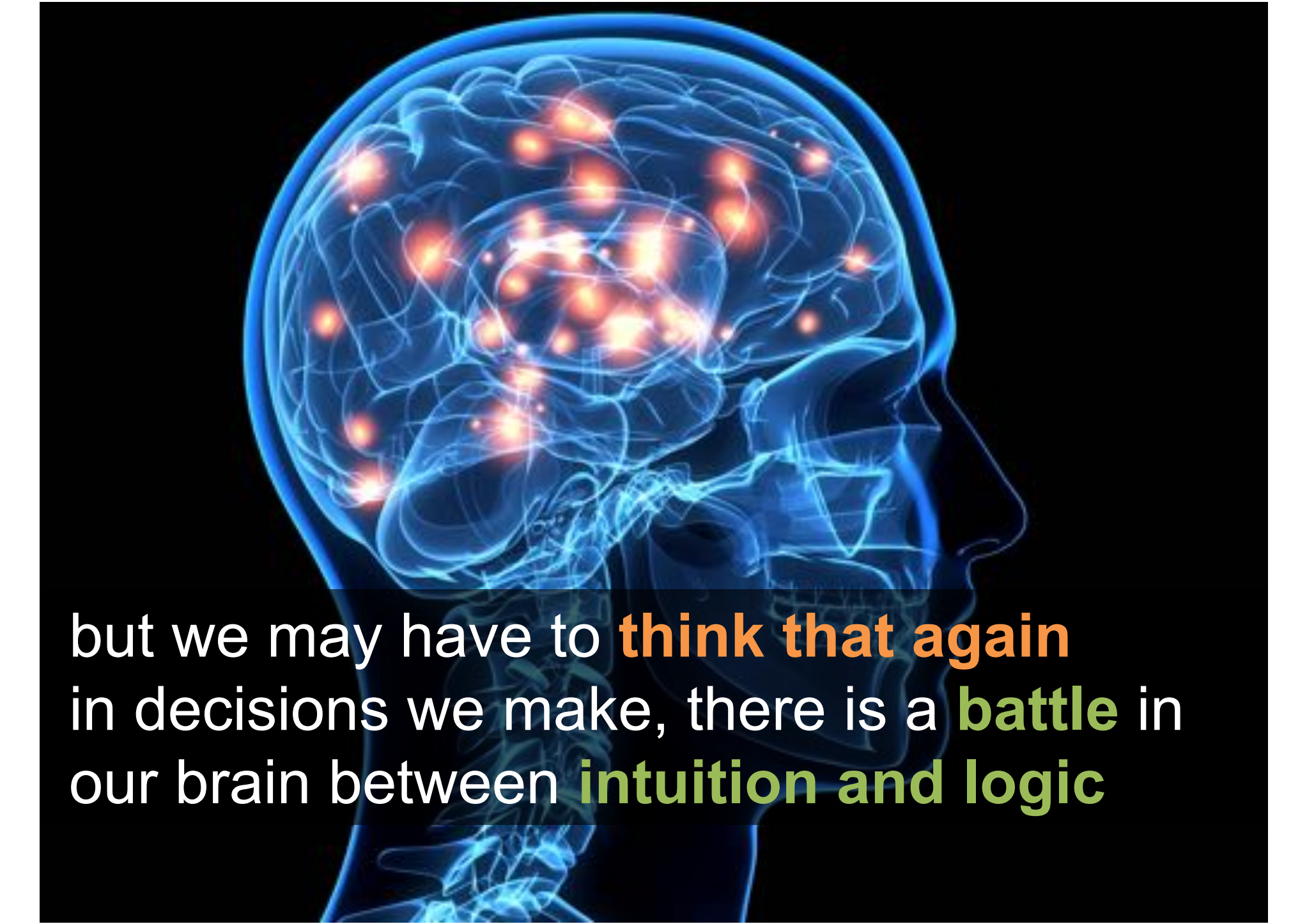
COMS21301

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Inspired from Daniel Kahneman

A large, diverse crowd of people, mostly young adults, looking towards the camera. The image is slightly blurred, suggesting a candid shot at a public event. The text is overlaid on a semi-transparent dark band across the middle of the image.

we like to think that, as a species, we are
pretty smart, rational creatures



but we may have to **think that again**
in decisions we make, there is a **battle** in
our brain between **intuition and logic**

and it plays out in **every aspects of our life**

what we eat

who we love

what we believe

etc.

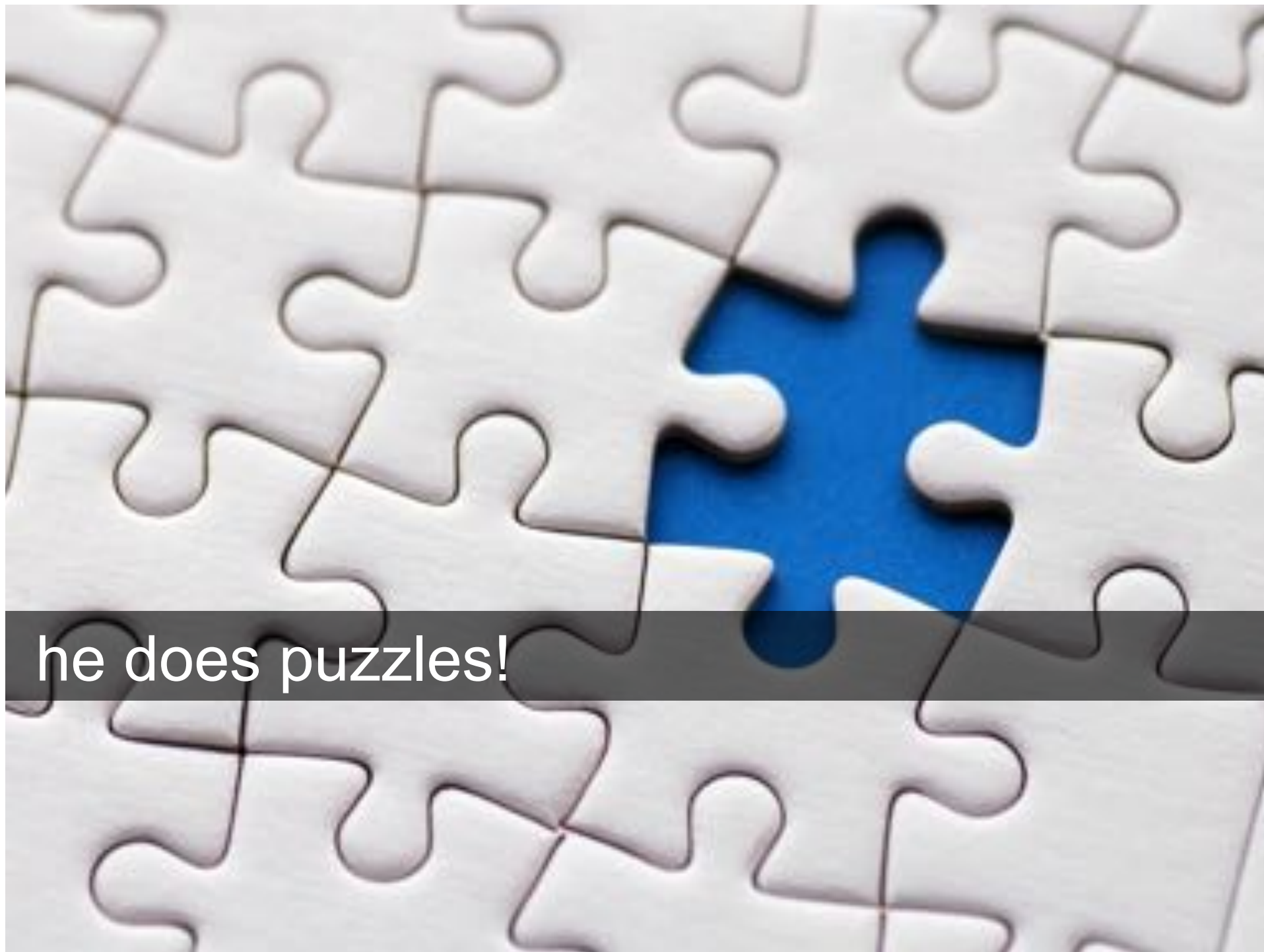


Daniel Kahneman

regarded as the most influential psychologist

notable for his work on psychology of judgment, decision-making, behavioral economics

Nobel Memorial Prize in Economic Sciences (shared with Vernon L. Smith).



he does puzzles!

puzzles




in US, an individual is described by a neighbor:

“Steve is very shy and withdrawn, invariably helpful but with very little interest in people or in the world of reality. A meek and tidy soul, he has a need for order and structure, and a passion for detail.”

is Steve more likely to be a librarian or a farmer?





imagine a dictionary, I am going to pull a word at random

which is more likely?

a) the word as the letter R in first position

b) the word as the letter R in 3rd position



most people reply quickly: **more likely to be a librarian**

surely he resembles a librarian. Our associative memory quickly creates a picture of Steve in our minds that is very librarian-like

what we do not think is that **there are five times as many farmers as librarians in the US**

base rates do not come to mind and thus prevent an accurate computation and answer

69% **letter R in first**

easy to think about examples


in fact **3 times as many with R in 3rd position**

but it is not what our intuitions tell us



say you love Rome and Paris equality

which would you prefer for the same price:

- a) vacation in Rome with a free breakfast
 - b) vacation in Paris with a free breakfast
 - c) vacation in Paris **without** free breakfast
- 

75% go for Paris if offered the “**bargain**” option

irrational behaviour:

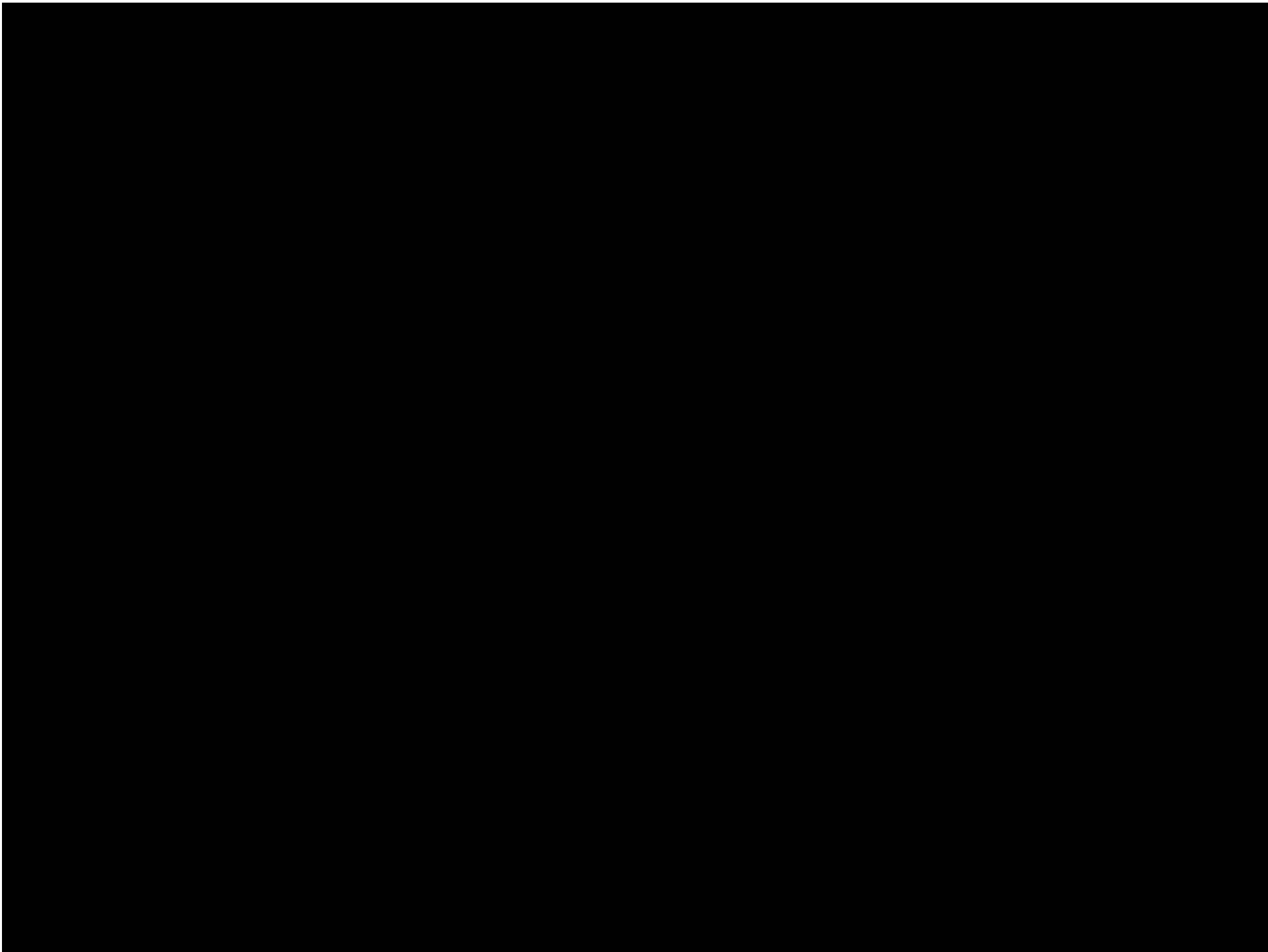
in the presence of two equal options, we couldn't decide between the two

the presence of a third, inferior option, shouldn't cause us to suddenly prefer one of the two

so we are doing mistakes!

pattern of **human errors** that affects everyone of us!

**Inattentional
blindness**



Inattentional blindness is failing to notice something that you would expect to notice because your attention is focused on another task



Kenny Conley

a Boston police officer, was chasing a shooting suspect. During the chase, he ran past a **brutal assault**

Conley claimed he **saw nothing**
How could he have missed the fight?

jurors assumed he was part of a cover up of police misconduct

originally convicted of **perjury and obstruction of justice**

a bunch of researchers wondered if this could have been an instance of inattention blindness

recreated the situation as part of a real-world experiment

people run around a $\frac{1}{4}$ mile route, 30 feet behind a researcher. Had to count the number of times he patted his head

part-way, they ran past a staged fight (15s). The fighters were making a bit of noise

Chabris, Weinberg, Fontaine, and Simons (2011)



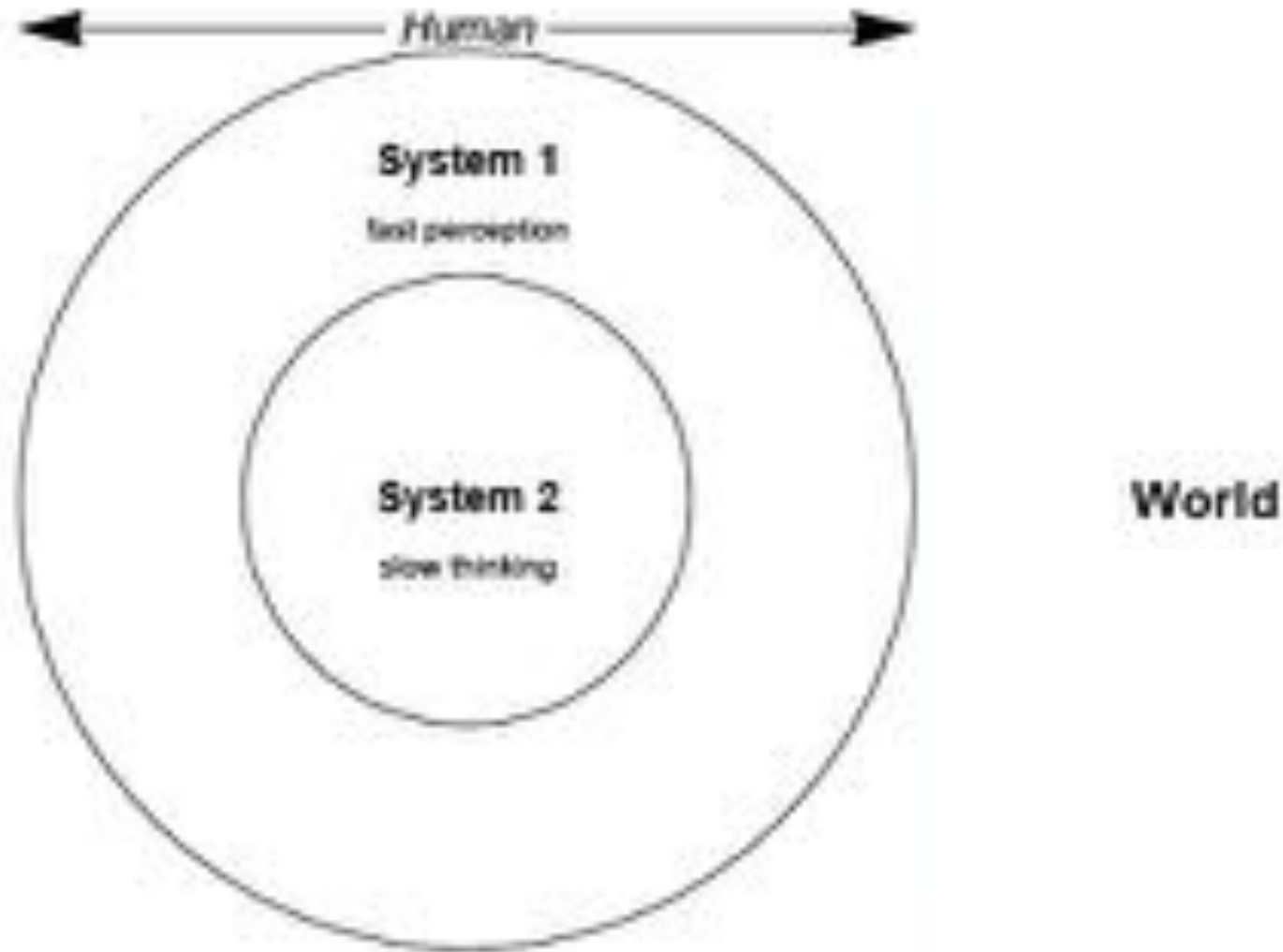
almost 50% did not see the fight (daylight)

we glide through the worlds,
blissfully unaware of what we do!

but how do we do then?

everyday we make around **2000-3000 decisions!**

we make all these decisions without realizing



two ways to make decision



$$1 + 1 = ?$$

system 1



$$2 + 2 = ?$$

system 1


$$18 + 37 = ?$$

system 2



system 2 is clever but slow and lazy



ask someone to walk around with you
then ask him/her to count backward from 100

they will probably **stop** walking to concentrate



system 1::

brilliant, use a lot for all automatic things we are doing
and that is good, powerful and do most of the driving

system 2::

provides rationalization
but is slow and requires concentration

the problem is that there is a **battle between the two
when making a decision**



logic went all the way to the window

the price people are willing to pay depends on a number
on a ping pong ball

we think we use system 2 but we use system 1

when making decision, we look at similar decisions made in the past and take them as “good decision”

system 1 is a master at doing shortcuts and we don't even notice them

this is why we do mistakes = **cognitive biases**

hundreds of them!

cognitive
biases



anchoring effect::

tendency to rely too heavily on the first piece of information offered (the "anchor") when making decisions

e.g. with the bottle of champagne



what color is snow?

what color are clouds?

what color is whipped cream?

what color are polar bears?

what do cows drink?



priming::

memory effect in which exposure to one stimulus influences the response to another stimulus.



availability heuristic::

mental shortcut that relies on immediate examples that come to a given person's mind when evaluating a specific topic, concept, method or decision

e.g. 'R' in 1st or 3rd letter puzzle



illusory truth effect::

tendency to believe information to be correct because we are exposed to it more times





bandwagon effect::

phenomenon whereby the rate of uptake of beliefs, ideas, fads and trends increases the more that they have already been adopted by others

e.g. elevator experiment





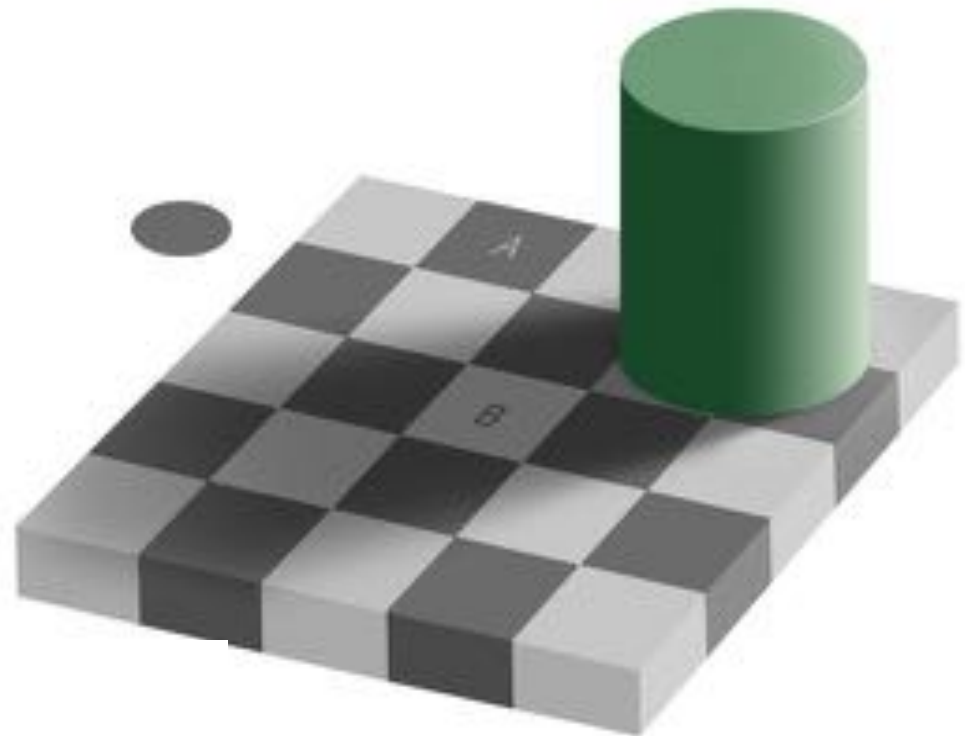
conjunction fallacy::

occurs when it is assumed that specific conditions are more probable than a single general one

e.g. farmer vs. librarian



contrast effect::



decoy effect::

preferences for either option changes when presented with a 3rd (lower) option similar to one

e.g. Paris or Rome puzzle





functional fixedness::

bias that limits a person to using an object only in the way it is traditionally used



Task:

Fix a lighted candle on a wall (a cork board) in a way so the candle wax won't drip onto the table below

Materials provided:

- Candle
- Box of thumbtacks
- Book of matches





ikea effect::

consumers place a disproportionately high value on products they partially created





omission bias::

tendency to judge harmful actions
as worse, or less moral than equally
harmful omissions (inactions)
because actions are more obvious
than inactions





pareidolia::

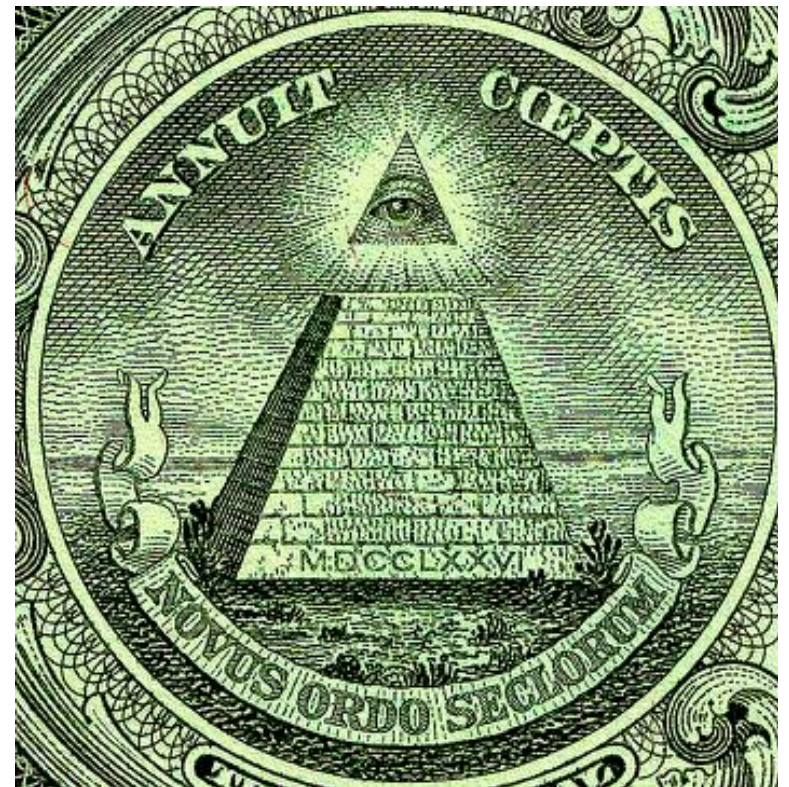
can cause people to interpret random images, or patterns of light and shadow, as faces





confirmation bias::

tendency to search for or interpret information in a way that confirms one's preconceptions, leading to statistical errors



and so on ...

we are so biased it is hard to believe we make proper decisions

let me finish with this one

**loss aversion
bias**



I have 20£ in my hands. I give you 10£. It is for you.

now you have to make a choice:

a) Safe: I give you 5£

b) Risk: I flip a coin, either 10£ or nothing

most people a)





I have 20£ in my hands. **I give you 20£.** It is for you.

now you have to make a choice:

a) Safe: you loose 5£

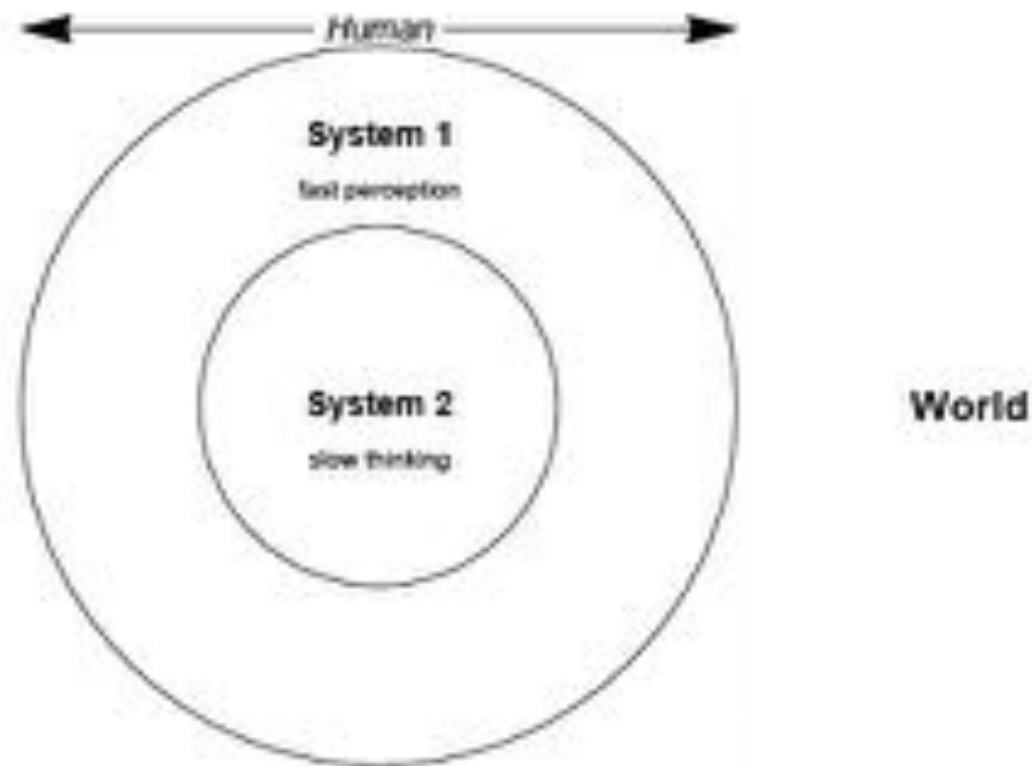
b) Risk: I flip a coin, either loose 10£ or nothing

most people b)



in either case you finish with 15£ but most people will take the risk

... **system 1** make a quick guess of changes, and system 1 does not like loosing



when we think we are winning we don't take risk
when we loose we are reckless!

has massive impact on economics



how can we handle economy **if we are so biased?** (actually created a new branch called behavioral economics)

what can we do about these systematic mistakes?

origin



does monkey have same biases than us?

A portrait of Laurie Santos, a woman with long, dark, curly hair, smiling. The image is partially obscured by the title text.

Laurie Santos

Professor Psychology
Harvard University

Investigated loss aversion
bias with monkeys

she introduced a **currency**
to a group of monkeys

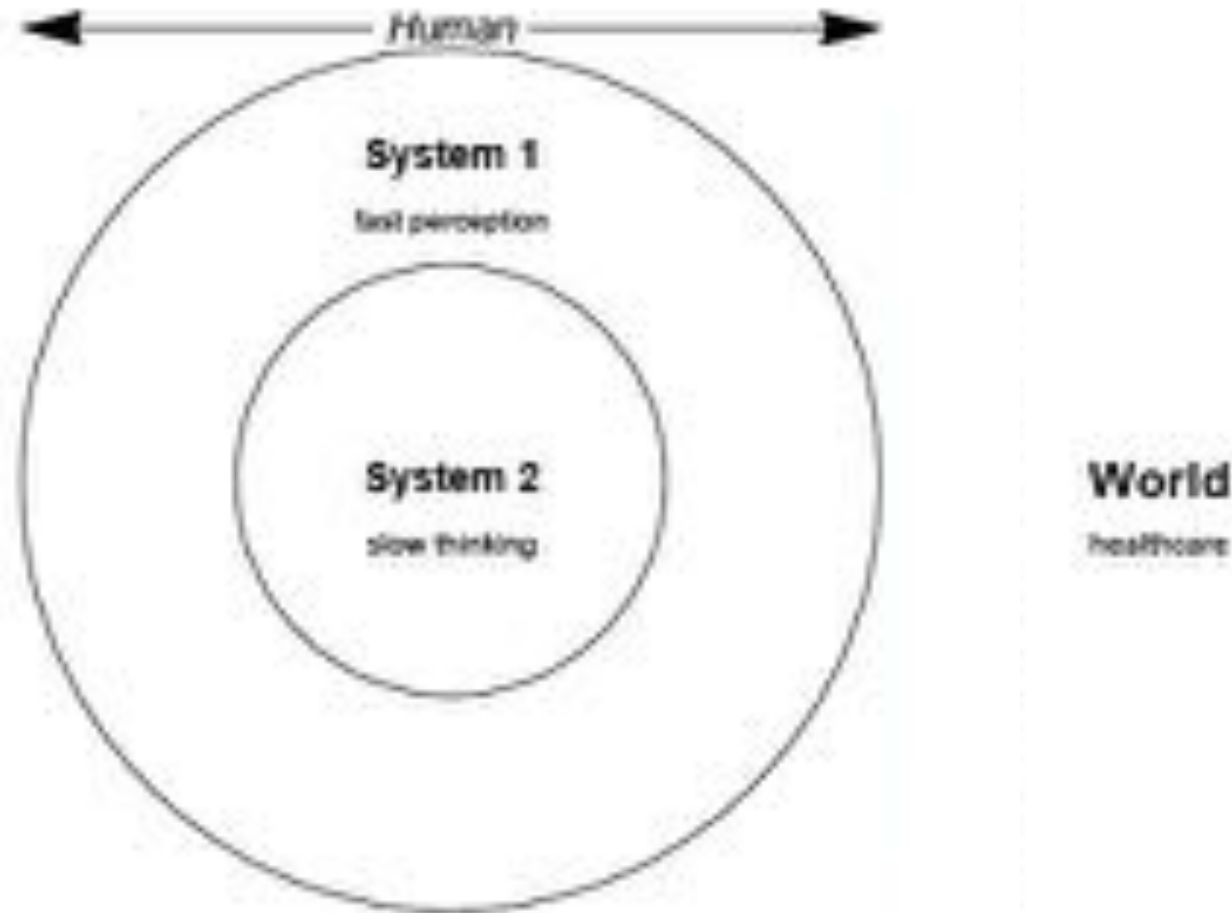


monkey paying with a coin for the 3 grapes



if biases are really that old, thinking of overcoming them
will not work

stuck with intuitive inner-stranger
human nature to make these mistakes



1st time in evolution :human system 2
realized there is a system 1
-> **reshape the environment**

we can try to build a world to make us making better decisions (e.g. computer systems)!

THINKING,
FAST AND SLOW



DANIEL
KAHNEMAN

WINNER OF THE NOBEL PRIZE IN ECONOMICS

if you want to know more,
this book is for you!



last

hyperbolic discounting::

human tendency to prefer smaller payoffs now over larger payoffs later, which leads one to largely disregard the future when it requires sacrifices in the present

(being mortal creatures with limited lifespans and resources, the human survival instinct has evolved to appreciate that one cannot enjoy a conserved resource tomorrow if one doesn't survive today)



promised a 2nd marshmallow if resist to eat the 1st one until lady comes back (20mn)




next week: presentation of results in class
(5 min presentation + 5 min feedback)

prepare ppt or pdf slides (5 slides max) with **graphs**
illustrating your study results

**don't worry if no complete stats, you will have more
time to polish the results**

send by email (csxar@bristol.ac.uk)
by Monday 30 9:00am



end