

# **DISASTER RISK MANAGEMENT**

Universita di Roma Tor Vergata  
B.A. Global Governance

Spring 2022

Session 15 – Thursday May 26, 2022

Instructor: Erdem Ergin

# Session 15 – Risk Perception

How do we make decisions?

The language

Heuristics and biases

Examples

## Decision Science in a nutshell (cont.)

---

### Bounded Rationality

In decision making, rationality of individuals is *limited* by the finite amount of time they have to make decisions, the cognitive limitations of their minds, and the information they have.

### Satisficing

Instead of optimizing all the time, we do in fact 'satisfice': we define a lower limit of acceptability for the outcome, and adopt an available option that is good enough.

# The language

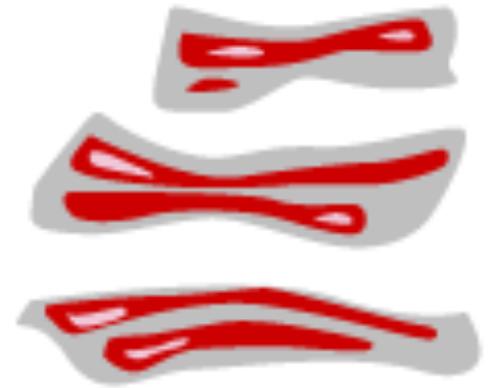
**There is a 30% chance of rain tomorrow.**

Which of the following alternatives is the most appropriate interpretation of the forecast:

1. It will rain tomorrow in 30% of the region.
2. It will rain tomorrow for 30% of the time.
3. It will rain on 30% of the days like tomorrow.

## The language

“Bacon increases your risk of colorectal cancer by **20%**”



“One extra unit a day increases a woman’s risk of breast cancer by **12%**”

“Two units a day reduce the risk of heart disease by about **17%**”



## The language

“One extra unit of alcohol a day increases a woman’s risk of breast cancer by **12%**”

But how bad is that?

# The language

“One extra unit of alcohol a day increases a woman’s risk of breast cancer by **12%**”

**About 10 in every 100 women have breast cancer in a lifetime**



# The language

“One extra unit of alcohol a day increases a woman’s risk of breast cancer by **12%**”

**About 10 in every 100 women have breast cancer in a lifetime**

**If all 100 drink an extra unit of alcohol every day...**

**...that rises to about 11**

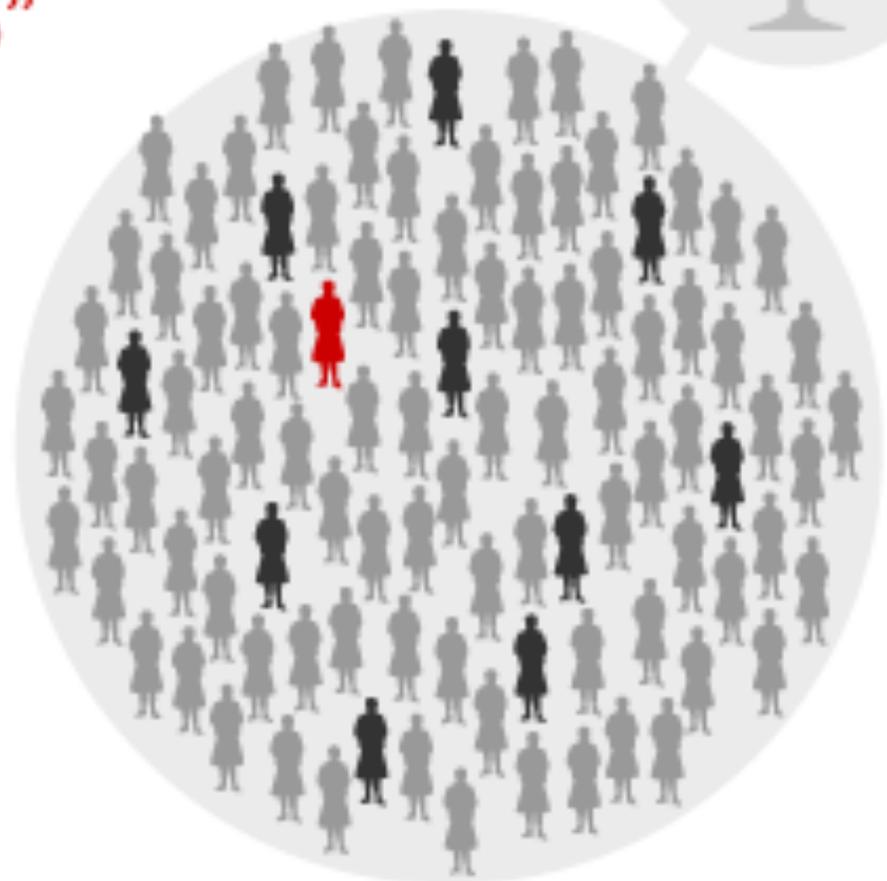


## The language

“One extra unit of alcohol a day increases a woman’s risk of breast cancer by **12%**”

is the same  
as saying

**about one extra  
case in every  
100 women**



## The language

“Two units of alcohol a day  
reduce the risk of heart disease  
by about **17%**”

But how good is that?

# The language

“Two units of alcohol a day  
reduce the risk of heart disease  
by about **17%**”

**About 32 in every 100  
women have coronary  
heart disease in a lifetime**



# The language

“Two units of alcohol a day  
reduce the risk of heart disease  
by about **17%**”

**About 32 in every 100  
women have coronary  
heart disease in a lifetime**

**If all 100 drink  
roughly two units of  
alcohol every day...**

**...that falls to about 27**



# The language

“Two units of alcohol a day  
reduce the risk of heart disease  
by about **17%**”

is the same  
as saying

**about five fewer  
cases in every  
100 women**



## The language

So, depending on the story,  
20% or 12% can equal **one person**,  
while 17% can be the equivalent  
of **five people**.

Don't think percentages,  
**think real people**.

# The thought process

Society has reached equilibrium in its judgment of risks, so whatever risk levels actually existed in society is acceptable.

People will accept risks 1,000 times greater if they are voluntary (e.g. driving a car) than if they are involuntary (e.g. a nuclear disaster).

# Heuristics and biases

Many factors involved in the way we process information: cognitive and emotional.

The brain uses heuristics and biases: judgmental shortcuts that generally get us where we need to go – and quickly – but at the cost of occasionally sending us off course.

Cognitive biases

# Heuristics and biases

Availability: events that can be more easily brought to mind or imagined are judged to be more likely than events that could not easily be imagined

Representativeness: employed when people are asked to judge the probability that an object or event belongs to a class / processes by its similarity

Anchoring and adjustment: people will often start with one piece of known information and then adjust it to create an estimate of an unknown risk – but the adjustment will usually not be big enough

# Heuristics and biases

Asymmetry between gains and losses: People are risk averse with respect to gains, preferring a sure thing over a gamble. On the other hand, people will be risk-seeking about losses, preferring to hope for the chance of losing nothing rather than taking a sure, but smaller, loss (e.g. insurance).

Threshold effects: People prefer to move from uncertainty to certainty over making a similar gain in certainty that does not lead to full certainty. For example, most people would choose a vaccine that reduces the incidence of disease A from 10% to 0% over one that reduces the incidence of disease B from 20% to 10%

# **DISASTER RISK MANAGEMENT**

Universita di Roma Tor Vergata  
B.A. Global Governance

Spring 2022

Session 15 – Thursday May 26, 2022

Instructor: Erdem Ergin