

Think Clearly

Eight simple rules to succeed in the Data Age

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Data has always been a basic element of science, its not new.

The difference is that data now surrounds all of us, thanks to digitalization which is the great transformation of the 21 st century.

**Our brains expect things to be proportional.
That's the law they assume by default and it
often works.**

Our difficulty in thinking in terms of exponential growth leads us to make mistakes in our daily life.

The factors that increase the likelihood of something happening are not just multiple, but also interact in complicated ways.

A child's cognitive abilities are less inherited in poor homes than in rich ones.

We interact in groups to create social networks, markets or economic bubbles.

If something is a problem, it must be someone's fault. But some problems are nobody's fault.

In the la Liga , 13 % of players are born in January while only 6 % are born in December.

When you are born in January you have a head start vs your classmates in school, you are a year older and 15 % taller and stronger.

This is known as the relative age effect and goes well beyond sport.

Statistics cannot capture all details, but you will see much less without them.

Choose your metrics carefully and understand them well.

Average is the most used statistic.

If Bill Gates walks into a pub, then on average everyone in the pub is a millionaire!!

Average is a summary statistic, it serves to summarize information.

Mean is more common but median is more valuable when you look at data.

Uncover your data's biases before they skew your conclusions.

All polls in 2016 in Michigan, Pennsylvania and Wisconsin were wrong because pollsters measured amongst white people, who had voted similarly till then.

In 2016, white people without degrees voted 70-30 in favor of Trump, and the polls got that wrong. White people with degree voted equally between Trump and Hillary Clinton.

Producing a representative sample is very complicated.

Correlation does not mean causation

Beware of assuming you know what causes what.

**Everything regresses towards the mean.
After an extreme result, a less extreme
result is most likely. The exceptional is
followed by the normal.**

If we look at football and goal scorers, we see that skill matters but luck also matters from year to year. Someone who scored one goal per match in one season rarely repeats it.

Your predictions should be less extreme than the information they are based on.

**Beware : anecdotal outliers distort reality (
very true for CEOs and board members)**

**Your intuition does not know statistics,
among other problems, it tends to
generalize based on little data.**

Our intuitions tend to invent patterns when they don't exist.

Be careful with winning streaks.

Streaks exist but our brains exaggerate them

When you see patterns,

- 1. start with a hypothesis**
- 2. search for a data set**
- 3. test whether your hypothesis is true.**

Sometimes you don't choose an option because it is good, but because other options are worse.

Chasing after a perfect solution leads to paralysis.

The probability is in the model, not in the world.

You don't need certainty in order to act.

To choose is to renounce. Every decision hides a dilemma, you have to lose something to gain something else.

Excellence is almost always achieved through balance.

Solving the wrong problem serves no purpose.

**Your intuition reasons through similarity
and abuses stereotypes.**

Your brain is such a powerful conclusion drawing machine that it often rushes to judgement.

When you focus on something, it seems more important than it really is.

**People believe they understand things
when they really don't.**

The quantitative view is not the only one we need.