Heuristic, decision making and journalism

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What this lecture hopes you walk away with ...

- A familiarity with some of the better known decision making biases and heuristics

- An understanding of how people make judgments and decisions

- A deeper comprehension of the way in which journalism can influence decision making in controversies

Decision making is involved when…

- The decision maker must select one of a number of possibilities (sometimes many options).

- The decision often must be made under uncertain conditions (information can or cannot be reliable)

Human Limits

- People are bad at making absolute judgments (but are very good at making relative judgments)

- People have a poor understanding of data in the range of extreme values (very strong significance or very low significance)

Basic Steps In Rational Decision Making

1. Identify all possible options (including doing nothing).

2. Quantify the value (or cost) of consequences which may arise if each course of action is adopted

3. Assess the likelihood of each consequence actually happening.

4. Integrate across all possibilities.

Unfortunately, this is too simple

- Quantifying cost and value, and computing all options is cognitively expensive.

- Expected value doesn't take into account things like "subjective utility" or "subjective risk".

Bayes' Rule

It is the optimal statistical model for making decisions under uncertainty, the starting point for all comparisons.

Posterior Odds   =   Prior Odds * Likelihood Ratio

Do you really know what is the prior odd? People tend to decide on the basis of likelihood ratio.

What's Heuristic?

- Heuristic (Greek: "Εὑρίσκω", "find" or "discover") refers to experience-based techniques for problem solving, learning, and discovery. Where an exhaustive search is impractical, heuristic methods are used to speed up the process of finding a satisfactory solution. In more precise terms, heuristics are strategies using readily accessible information to control problem solving in human beings (and machines).

- Much of the work of discovering heuristics in human decision-makers was done by Amos Tversky and Daniel Kahneman.

Heuristics & Biases

- The Salience Bias
- The "as if" Heuristic
- The Representativeness Heuristic
- The Availability Heuristic
- Overconfidence
- Anchoring and Adjustment
- The Confirmation Bias
- The Framing Effect
- Sunk Costs

The Salience Bias

- We are hardwired to filter information based on the saliency of the stimuli (loud noises, spatial position).

- This means people are biased toward salient information even if salient cues contain less information: e.g. front page news, tabloid style title .

The "As If" Heuristic

- Information extracted from different sources can have different levels of importance, i.e. different weights

- However, people tend to treat all different data cue "as if" they had equal weights

- Decisions are made based more on the total *number* of data cues· without regard to their reliability or importance (ex. how many time news about a specific topic are published on newspapers)

The Representativeness Heuristic

The subjective probability of an event is determined by the degree to which it

- is similar in essential characteristics to its parent population (e.g. a sequence of 6 children composed by 2 boys and 4 girls reflects the average distribution of sexes so it seems more likely to occur than a sequence of 6 boys)
- reflects the salient features of the process by which it is generated

- Sample size is irrelevant and prior probabilities are ignored (cf. Bayes' Rule)

The Representativeness Heuristic/2

- When people rely on representativeness to make judgements, they are likely to judge wrongly because the fact that something is more representative does not make it more likely. This heuristic is used because it is accessible. The problem is that people overestimate its ability to accurately predict the likelihood of an event

Similarity in representativeness

- When judging the representativeness of a new stimulus/ event people usually pay attention to the degree of similarity between the stimulus/ event and a standard/ process (Kahneman & Tversky, 1972). Nilsson, Juslin and Olsson (2008) found this to be influenced by concrete examples of categories that are stored in memory, so that new instances were classed as representative if highly similar to a category as well as if frequently encountered. **Journalists often suffer from the same misperception when they put together stories only by similarity**.

The Availability Heuristic

The probability of events is evaluated by the ease with which relevant instances come to mind. It operates on the notion that "if you can think of it, it must be important." In other words, the easier it is to recall the consequences of something, the bigger we perceive these consequences to be. Sometimes, this heuristic is beneficial, but the frequency that events come to mind is usually not an accurate reflection of their actual probability in reality

The Availability Heuristic

A person claims to a group of friends that drivers of red cars get more speeding tickets. The group agrees with the statement because a member of the group drives a red car and frequently gets speeding tickets. The reality could be that he just drives fast and would get a speeding ticket regardless of the color of car that he drove. Even if statistics show fewer speeding tickets were given to red cars than to other colors of cars, he is an available example which makes the statement seem more plausible (**pay attention to the anecdotes you report in your article to make an assumption appear more reasonable**).

Overconfidence

- People (novices & experts) are in general much more confident about their decisions than it is reasonable given the environment in which they are making their decisions.

- People tend to close off the search for answers before all available evidence can be collected because of overconfidence (so, **have you really checked for all the possible explanations for a given theory in your article?**)

Anchoring

- Anchoring is a cognitive bias that describes the common human tendency to rely too heavily, or "anchor," on one trait or piece of information when making decisions. The first information learned about a subject (or, more generally, information learned at an early age) can affect future decision making and information analysis.

Adjustment

- Adjustment is a psychological heuristic that influences the way people intuitively assess probabilities.

- When asked to guess the percentage of African nations that are members of the United Nations, people who were first asked "Was it more or less than 10%?" guessed lower values (25% on average) than those who had been asked if it was more or less than 65% (45% on average)

Confirmation Bias

- Changing hypothesis requires greater cognitive effort than maintaining the same hypothesis.

The Framing Effect

You are a patient with lung cancer. Which of the following two option would you prefer?

Surgery: Of 100 people having surgery 90 live through the post-operative period, 68 are alive at the end of the first year and 34 are alive at the end of five years.

Radiation Therapy: Of 100 people having radiation therapy all live through the treatment, 77 are alive at the end of one year and 22 are alive at the end of five years.

The Framing Effect

You are a patient with lung cancer. Which of the following two option would you prefer?

Surgery: Of 100 people having surgery 10 die during surgery or the post-operative period, 32 die by the end of the first year and 66 die by the end of five years.

Radiation Therapy: Of 100 people having radiation therapy none die during treatment, 23 die by the end of one year and 78 die by the end of five years.

The Framing Effect

- Results: respondents who favored radiation therapy rose from 18% to 44%· no difference when subjects were patients or physicians.

- How a problem is worded (or framed), either in terms of cost or value, effects how people make decisions.

- There is a huge difference between a perceived loss or perceived gain

The Sunk Cost Effect

- It's the phenomenon where people justify increased investment in a decision based on the cumulative prior investment, despite new evidence suggesting that the cost, starting today, of continuing the decision outweighs the expected benefit. Such investment may include money, time, or — in the case of military strategy — human lives.

The Sunk Cost Effect

As the president of an airline company, you have invested 10 billion dollars of the company's money into a research project. The purpose was to build a plane that would not be detected by conventional radar, in other words, a radar-blank plane. When the project is 90% completed, another firm begins marketing a plane that cannot be detected by radar. Also, it is apparent that their plane is much faster and far more economical that the plane your company is building. The question is: should you invest the last 10% of the research funds to finish your radar-blank plane?

The Sunk Cost Effect

As the president of an airline company, you have received a suggestion from one of your employees. The suggestion is to use the last 1 billion dollars of your research funds to develop a plane that would not be detected by conventional radar, in other words, a radar-blank plane. However, another firm has just begun marketing a plane that cannot be detected by radar. Also, it is apparent that their plane is much faster and far more economical that the plane your company could build. The question is: should you invest the last billion dollars of your research funds to build the radar-blank plane proposed by your employee?

The Sunk Cost Effect

- Sunk costs are irrelevant to current decisions- instead, only incremental costs should influence future decisions.

- Sunk costs have already been paid- you can't get that cost back.

- It is important for journalists to know how this heuristic can influence research policies and scientists' work.

Media and Heuristic

- Risk assessment of new technologies offers an example of how ordinary citizens seek shortcuts to expediently arrive at judgments. Most people maintain a low level of interest in issues that are not central in their daily lives, such as developments in the various fields of science and technology. Media frames can produce powerful heuristics that can have significant impact on public opinion about a given new technology.