

Heuristics & Biases (Tversky & Kahneman, 1974)

Gigerenzer argues that actually these heuristics lead to reasonably accurate judgments most of the time, it is just the obscure scenarios that cause most of the experimental effects.

Facts & Figures – People may be less likely to make the same inferences if they **observe** a fact than if they are **told** a fact.

Adaptiveness – It could be argued that we would have not have evolved heuristics that lead to systematically biased judgments. Heuristics may be evidence of evolutionary adaptation.

Criticisms

We have seen that people do not always make decisions based on the highest possible value and that they find making probabilistic judgments difficult. It is often sensible or **procedurally rational** to use heuristics.

A **heuristic** is based on trial and error. It is a rule that is loosely defined or a "rule of thumb".

An example of a heuristic is to follow crowds when wanting to get out of the Fez medina. A map would be an algorithm but no full map exists.

"Occasionally, beliefs concerning uncertain events are expressed in numerical form as odds or subjective probabilities. What determines such beliefs?... People rely on a limited number of heuristic principles which **reduce the complex tasks of assessing probabilities** and predicting values to **simpler** judgmental operations" Tversky & Kahneman, 1974

Anchoring & Adjustment

This is the tendency to rely too heavily (or "anchor") on one trait or piece of information when making decisions. Once an **anchor** is set, there is a bias toward **adjusting** or interpreting other information to reflect the anchored information.

Overadjustment – Tversky & Kahneman (1974) gave participants a random number and then asked them to predict the proportion of African countries in the UN. Those participants given 65 gave a median estimate of 45% and those given 10 gave a median estimate of 25%.

This may effect opinion polls and so has applications for questions about sentence framing.

Underadjustment –Siegal et al. (1980) found higher initial positions in bargaining elicited better outcomes.

Primacy – Greenberg et al. (1986) found that jurors gave harsher sentences when harshest possible verdict was presented first compared to when most lenient possible verdict was presented first.

The Representativeness Heuristic
Many probabilistic questions ask: What is the probability that **object A** belongs to **class B**?
What is the probability that event A originates from process B?

The Availability/Imaginability Heuristic.
People assess the probability of an event by the ease of which instances or occurrences are brought to mind.

In answering these questions, people often answer using **the degree to which A is representative of B**, that is, by the degree to which A resembles B.

People calculate the degree that Steve is a librarian for example by the assessed degree to which he is representative of, or similar to, the stereotype of a librarian.

Tversky & Kahneman (1974) asked subjects to estimate the probability that a description of a person (which was stereotypical to an engineer) was an engineer or a lawyer. In one condition, participants were told that this description came from a sample of 30 lawyers and 70 engineers. Other condition vice versa. Participants in both condition estimated essentially **the same probability**.

This is an example of **Base Rate Neglect**. Participants ignored the base rates (i.e. the 30-70 weighting). Tversky et al. call this 'Insensitivity to Sample Size'

However, when asked what the probability that an engineer would be drawn from the sample, they made correct predictions.

Misperceptions of Chance/Randomness People expect that a random sequence of events will represent random characteristics. So participants will consider H-T-H-T-T-H as more likely to be produced by 6 coin tosses than H-H-H-T-T-T.

The "Hot Hand" – People perceive independent events as having a predictable pattern, based on the idea that there is a 'streak' or a 'run'. Gilovich, Vallone & Tversky (1985) found that basketball players were actually less likely to make a hit following a hit.

The Gambler's Fallacy – People believe bad luck in the past makes bad luck less likely next time. They also believe an alternation will occur so that the sequence of outcomes will look more random than it would if the run continued (e.g. A coin lands on heads 3 times in a row, what side will you bet your £100 on for the next toss?)

Probability Matching – People tend to match probabilities in an estimate so that they are representative of the base rate. E.G When people are asked to guess the colour of cards and are told that 80% of cards will be red and 20% will be black, they tend to guess 80% red and 20% black. However, this will tend to yield 68% correct answers, whereas guessing 100% red will certainly yield 80% correct. Is this **adaptive** in an evolutionary sense? Population proportion at a food source matches the proportion of food found there (Milinski, 1979 found this with fish).

People tend to consider events covered in the media (and thus more available) as more likely than less covered events (e.g. Shark attacks kill more than diabetes) (**Slovic**).

Biases due to the effectiveness of a search set
– People are more likely to count a letter in a sentence from words that begin with that letter than from words that have it in the middle, even for consonants like r or k, which are more frequent in the third position.

Biases of Imaginability – John Carroll (1978) asked people to imagine watching televised coverage of the American presidential election in 1976. In one condition they were told that Carter won and in the other they were told that Ford won. The results showed that subjects who imagined one event considered that event to be more probable.

However, Sherman et al. (1985) found that events **less easy to imagine** were less likely to elicit these effects. He tested this by asking participants to imagine a disease that either had **concrete** symptoms (muscle aches etc.) or difficult to imagine symptoms (inflamed liver etc.). In the difficult to imagine condition, participants considered themselves to be **less likely** to contract the disease.

Denial – Imagining events that are highly emotionally valenced elicits lower predictions that they will occur (Rothbart, 1970). For example, participants asked to imagine nuclear war predicted the probability as low. However, those asked to predict the path to nuclear war predicted the probability as higher.