Content 3: Thinking and decision-making.
A. Dual-process and dual systems theories.

KEY STUDY: *Tversky & Kahneman (1974). Judgement under uncertainty: Heuristics and biases.*

Background
Heuristics and biases – review and overview of the main heuristics that affect thinking and decision-making under System 1 thinking.

Aim
To provide an overview of the ways in which a range of heuristics may affect the processes of thinking and decision-making. *(Note: this study can also be used for biases in thinking and decision-making).*

Main comments and findings
The authors of this paper review a range of research in which they themselves have tested a range of heuristics, looking for evidence of ways in which System 1 thinking (effortless, fast, a short-cut to the answer) may operate when tested under specific conditions. What follows is a sample of their observations:

- The **representative heuristic** is based on the idea that one event is representative of other events very similar to it, using the idea of how *probable* something is according to the individual's prior knowledge of it. Tversky and Kahneman set up a study in which pps were asked to guess the occupations of people from a set of particular details. They were also given base-rate information: e.g. that 70% of the descriptions had referred to engineers, while 30% had referred to lawyers. The actual description given could apply equally well to either engineers or lawyers. For example, one typical description might be something like: *John is a 30 year-old married man with two children. He has high ability and motivation, and promises to be quite successful in his field. He is well-liked by his colleagues.* Logic would assume that base-rate information would be used and that the participant would say that John is an engineer as 70% of the descriptions were of engineers. The participants, however, did not do this: they judged that there was an equal chance of John being either an engineer or a lawyer.

- Another **representativeness study** presented participants with this scenario: *Steve is very shy and withdrawn, invariably helpful, but with little interest in people, or in the world of reality.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. Does Steve work as a musician, a pilot, a doctor, a salesman or a librarian?* The researchers found that most of the participants chose librarian, presumably because his personality characteristics matched some of the stereotypical features of this job. In this way, the representative heuristic could explain stereotypes: a quick and easy way of categorising someone without having to expend too much effort.

- The **availability heuristic** works by people tending to judge an event using the probability of its occurring: e.g. a middle-aged man with chest pains might be assumed to be a heart attack but a four-year-old child with similar pains would not elicit the same response as four-year-old

children do not tend to have heart attacks. Tverksy and Kahneman investigated the availability heuristic by presenting participants with lists of 19 famous people and 20 less famous people to memorise. In theory, the participants should have been able to recall more of the less-famous names simply because they occurred more frequently than the non-famous names. What actually occurred was that the participants recalled more of the famous names, with the inference being that because they were well-known they were more available to access in their memory.

- **Adjustment and anchoring** involves an initial value or starting-point in an information-processing task determining how the final value is arrived at. The researchers tested high school students asking them to estimate, in their heads one of the following: 8x7x6x5x4x3x2x1 or 1x2x3x4x5x6x7x8. Of course, each answer is the same as the numbers are identical per list. What Tversky and Kahneman found was that the descending list (8x7x6 etc.) produced a much higher estimate than the ascending scale (1x2x3 etc.) with the researchers concluding that the first value anchored the value as either high or low and that this is what caused the adjustment to the estimations.

Conclusion

Heuristics provide a short-cut method of thinking and decision-making, but this can sometimes be at the cost of accuracy.

Evaluation of Tversky & Kahneman (1974)

Strengths

✓ The authors present a very appealing and accessible version of how people think, which makes for entertaining reading: the examples of research they include in their article are fascinating whilst also being very easy to relate to and to replicate, if desired.

✓ The article includes several examples of research which helps to validate their theory as one set of findings agrees with other sets of findings.

Limitations

X The methods employed by Tversky and Kahneman are not scientific as they lack precision and some objectivity (e.g. the 'librarian' question depends on the degree to which participants are aware of the expected traits of a librarian in the first place).

X The research lacks ecological validity as they were conducted in lab conditions so they cannot explain how people operate heuristics in real-life situations.

Reference

Tversky, A., & Kahneman, D. (1974). Judgement under Uncertainty: heuristics and biases. *Science*, *185*(4157), pp. 1124-1131.

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