

IB9AN-15 Principles of Cognition

24/25

Department

Warwick Business School

Level

Taught Postgraduate Level

Module leader

Nicholas Chater

Credit value

15

Module duration

10 weeks

Assessment

100% coursework

Study location

Distance or Online Delivery

Description

Introductory description

This module outlines general principles that apply across a wide range of cognitive domains, including judgement, decision-making, reasoning, memory and perception.

Module aims

The module aims to encourage students to see how the insights from this work can:

Understand the fundamental principles on which specific psychological models can be constructed.

Help students critically evaluate theoretical assumptions in psychology and economics, and their real-world applications.

Provide a deeper understanding of the strengths and weaknesses of human cognition, in relation to consumer, managerial, or financial contexts.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

1. From psychophysics to measuring utility. The brain as comparison device. The lack of

- absolute scales for brightness, loudness, and perhaps utility.
2. The mind is flat. The incoherence of human thought and judgements; the brain as an improviser, generating explanations for behaviour retrospectively. The field of judgement and decision making as illustrating incoherence.
 3. Spontaneous rationality. How rationality arises through a patchwork of interactions, within and between people, to try to make our beliefs, preferences and decisions fit together. Connection with financial markets.
 4. Scale-invariance. Exploring the notion of scaling and how some natural, social and cognitive phenomena are invariant over scales (whether space, time, or others).
 5. Simplicity. One powerful method for understanding perception, scientific reasoning, and perhaps common-sense reasoning is to prefer the simplest explanation of the available data. What is the evidence that this principle is used by the brain?
 6. Sampling. The brain may only be able to “sample” one interpretation of some aspect of the world at a time. The sampling process may converge in the long-run, to rational Bayesian inference. But in reality the brain can only take a few samples---this provides a possible explanation of some well-known effects in Judgement and Decision Making.
 7. Rationality and social interaction. The concept of Nash equilibrium from standard game theory provides one model of how people relate to each. But is it right? Models such as team reasoning and virtual bargaining may be required to model social interaction.
 8. Coordination and communication work. Communication involves complex processes of joint inference of incredibly subtlety---language is more a series of clues than a code containing a fixed message.
 9. The logic of appropriateness and ethics. Human behaviour is guided by two “logics.” The logic of consequence involves choosing actions that achieve some objective. The logic of appropriateness asks instead “what is a person like me supposed to do in a situation like this.” Neither viewpoint is reducible to the other; the interplay between the two is crucial to the human ability to create ethical and other norms, rules and organizations.

Learning outcomes

By the end of the module, students should be able to:

- Critically evaluate existing theoretical and experimental research.
- Critically evaluate theoretical ideas and their limits.
- Explore the degree to which empirical data can decide between theories.
- Demonstrate understanding of the research methods and results of research on basic cognitive processes and should be able to Identify key principles governing human cognition, from judgement and decision-making to perception and memory
- Demonstrate understanding, and apply a range, of theoretical perspectives on human cognition
- Demonstrate understanding of real-world problems in society
- Critically analyse the basic assumptions built into specific psychological and economic models of human behaviour

Indicative reading list

Chater, N. (2018). *The Mind is Flat*. London: Penguin, UK.

Chater, N., & Brown, G. D. A. (1999). Scale invariance as a unifying psychological principle. *Cognition*, 69, B17-B24.

Chater, N., Zhu, J.-Q., Spicer, J. Sundh, J., León-Villagrà, P. & Sanborn, A. (in press). Probabilistic biases meet the Bayesian brain. *Current Directions in Psychological Science*.

Colman, A. M. (2003). Cooperation, psychological game theory, and limitations of rationality in social interaction. *Behavioral and brain sciences*, 26(2), 139-153.

Feldman, J. (2016). The simplicity principle in perception and cognition. *Wiley Interdisciplinary Reviews: Cognitive Science*, 7(5), 330-340.

Gabaix X. (2016). Power Laws in Economics: An Introduction. *Journal of Economic Perspectives*, 30(1), 185-206.

March, J. G., & Olsen, J. P. 2004. The logic of appropriateness, ARENA, Centre for European Studies, Working papers 04/09. University of Oslo: ARENA.

Misyak, J. B., Melkonyan, T., Zeitoun, H., & Chater, N. (2014). Unwritten rules: virtual bargaining underpins social interaction, culture, and society. *Trends in Cognitive Sciences*, 18(10), 512-519.

Vlaev, I., Chater, N., Stewart, N., & Brown, G. D. A. (2011). Does the brain calculate value? *Trends in Cognitive Sciences*, 15, 546-554.

Research element

Critically evaluate experimental data; assessing the "external validity" of lab results.

Analyse how general theoretical ideas may be applied in specific contexts.

Subject specific skills

Critically evaluate experimental data; assessing the "external validity" of lab results.

Analyse how general theoretical ideas may be applied in specific contexts.

Transferable skills

Demonstrate logic and justification within skills of argument construction.

Demonstrate confidence in writing theoretical and empirical issues of practical relevance (integrating theory and practice).

Write in an academically appropriate way

Study

Study time

| Type | Required |
|---------------|-----------------------------|
| Lectures | 9 sessions of 2 hours (24%) |
| Seminars | 9 sessions of 1 hour (12%) |
| Private study | 49 hours (64%) |
| Total | 76 hours |

Private study description

Private study to include preparation for lectures and seminars

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group A2

| | Weighting | Study time | Eligible for self-certification |
|-----------------|-----------|------------|---------------------------------|
| 3000-Word Essay | 100% | 74 hours | Yes (extension) |

Feedback on assessment

Feedback will be provided both in-class during case discussion plus written feedback both generic and specific.

Availability

Courses

This module is Core for:

- Year 1 of TPSS-C8P7 Postgraduate Taught Behavioural and Economic Science (Science Track)

This module is Core optional for:

- Year 1 of TPSS-C803 Postgraduate Taught Behavioural and Data Science
- Year 1 of TPSS-C8P7 Postgraduate Taught Behavioural and Economic Science (Science Track)

This module is Optional for:

- Year 1 of TPSS-C8P7 Postgraduate Taught Behavioural and Economic Science (Science Track)
- Year 1 of TECS-C8P8 Postgraduate Taught Behavioural and Economics Science (Economics Track)
- Year 1 of TIBS-N1B0 Postgraduate Taught Business (Marketing)

This module is Core option list A for:

- Year 1 of TPSS-C803 Postgraduate Taught Behavioural and Data Science