

# IB9AN-15 Principles of Cognition

**20/21**

**Department**

Warwick Business School

**Level**

Taught Postgraduate Level

**Module leader**

Nicholas Chater

**Credit value**

15

**Module duration**

10 weeks

**Assessment**

100% coursework

**Study location**

University of Warwick main campus, Coventry

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## 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] Introduction to cognitive science. Viewing the mind as a computer. The relationship between experimental and computational approaches. The notion of general principles that may apply

across many areas of thought.

[2] Scale Invariance 1. Exploring the notion of scaling and how some natural, social and cognitive phenomena are invariant over scales (whether space, time, or others).

[3] Scale Invariance 2. Examples of scale invariance, and how they capture a wide range of cognitive and social phenomena.

[4] Logic and Probability 1. What are the fundamental principles that underpin human reasoning? The logic based approach. Does the experimental evidence fit with the assumption that people are logical?

[5] Logic and Probability 2. Could the mind, instead, be adapted to uncertainty, the domain of probability? The Bayesian approach to cognition. Does this analysis fit with experimental data which seems to show people make systematic probability reasoning errors.

[6] Simplicity 1. 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?

[7] Simplicity 2. A variety of applications and critique of the simplicity principle.

[8] Candidate general principles. How far is it possible to find general principles of cognition? A consideration of various further candidate principles, with empirical evidence.

[9] Limitations of cognitive science. What aspects of the mind can potentially be tractable to scientific inquiry? Are there limits to cognitive science?

## Learning outcomes

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

- Understand the research methods and results of research on basic cognitive processes.
- Identify key principles governing human cognition, from judgement and decisionmaking to perception and memory.
- Critically evaluate existing theoretical and experimental research.
- Understand and apply a range of theoretical perspectives on human cognition.
- Apply understanding to real world problems in society
- Analyse how general theoretical ideas may be applied in specific contexts.
- Critically evaluate theoretical ideas and their limits.
- Explore the degree to which empirical data can decide between theories.

## Indicative reading list

Chater, N., Tenenbaum, J., & Yuille, A. (2006) (Eds.) Probabilistic models of cognition. Special Issue. Trends in Cognitive Sciences, 10.

Fodor, J. A. (1983). Modularity of mind. Cambridge, MA: MIT Press.

Feldman, J. (2000) Minimization of Boolean complexity in human concept learning. Nature, 407, 630-633.

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

Kahneman, D.; Tversky, A. (1984). "Choices, values and frames". American Psychologist 39: 341–350.

Maylor, E. A., Chater, N., & Brown, G. D. A. (2001). Scale invariance in the retrieval of retrospective and prospective memories. Psychonomic Bulletin, & Review, 8, 162-167.

Oaksford, M., & Chater, N. (2009). Precis of “Bayesian rationality: The probabilistic approach to human reasoning” (with commentary and replies). *Behavioral and Brain Sciences*, 32, 69-120.

Pickering, M., & Chater, N. (1995). Why cognitive science is not formalized folk psychology. *Minds and Machines*, 5, 309-337.

Pickering M.J., Garrod S. (2004) Toward a Mechanistic Psychology of Dialogue. *Behavioral and Brain Sciences*, 27, pp. 169–225.

Mercier, H., Sperber, D. (2011) “Why do humans reason? Arguments for an argumentative theory” *Behavioral and Brain Sciences*. (Target article)

### **Subject specific skills**

Critical evaluation of experimental data; assessing the external validity of lab results.

Critically analyse the basic assumptions built into specific psychological and economic models of human behaviour

### **Transferable skills**

Demonstrate logic and justification within skills of argument construction,

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

Demonstrate business relevant presentation skills

Write in an academically appropriate way

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## **Study**

### **Study time**

<b>Type</b>	<b>Required</b>
Lectures	9 sessions of 2 hours (12%)
Seminars	9 sessions of 1 hour (6%)
Private study	49 hours (33%)
Assessment	74 hours (49%)
Total	150 hours

### **Private study description**

Private study to include preparation for lectures and seminars

### **Costs**

No further costs have been identified for this module.

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## Assessment

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

### Assessment group A1

	<b>Weighting</b>	<b>Study time</b>
3000-Word Essay	100%	74 hours

### Feedback on assessment

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

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## 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

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)