

Teaching Guide

Chapter 4: The cognitive approach to understanding behaviour

Topic map

Section number and name	Learning outcome	Number of hours (suggested)	Relevant material
4.1 The influence of cognition on the behaviour of the individual	Behaviour is strongly influenced by the way the individual mentally processes physiological and environmental inputs.	4	Figures 4.1–4.4
4.2 Cognitive processing: memory, schema theory, and thinking and decision-making processes	<p>Models of memory help to conceptualise the understanding of human memory processes.</p> <p>Cognitive schemas influence the memory processes at the encoding, storage and retrieval stages.</p> <p>Thinking and decision-making may be influenced by intuition and emotions as well as by striving to rationalise.</p>	11	<p>Figures 4.5–4.11</p> <p>Activity 4.1</p> <p>Activity 4.2</p> <p>Self-assessment questions 4.1</p> <p>Self-assessment questions 4.2</p> <p>Self-assessment questions 4.3</p>
4.3 The reliability of cognitive processes	<p>The accuracy of human memory may be adversely influenced by the individual's schema processing, and by the circumstances in which the information is recalled.</p> <p>The desire to optimise thinking and decision-making may be adversely affected by the individual's biases.</p>	10	<p>Figures 4.12–4.16</p> <p>Activity 4.3</p> <p>Self-assessment questions 4.4</p> <p>Short-answer question at the end of the chapter</p>
4.4 Emotion and cognition	Emotions influence both the intensity and efficacy of cognitive processes.	5	<p>Figure 4.17</p> <p>Activity 4.4</p> <p>Self-assessment questions 4.5</p>

4.5 Cognitive processing in the digital world (HL)	The individual's interaction with the digital world influences the nature and efficacy of their mental information processing.	10	Figure 4.18 Self-assessment questions 4.6
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4.1 The influence of cognition on the behaviour of the individual

Overview

Students are likely to be studying this topic for the first time. It can be helpful to emphasise that the cognitive approach to behaviour sees the individual as a processor of information in a similar way that a computer processes information. The processing, however, may not always be accurate.

The biological, cognitive and social-cultural approaches to behaviour that form the three core topics may be studied in any order.

Suggested activities

Possible starters

- Can computers think like humans? In groups, students can produce a table with two columns, suggesting tasks where computers can outperform humans and tasks where humans can outperform computers. Then show the video from Fw:Thinking [How to make a living when robots take our jobs](#). Use it for a follow-up discussion: how far might it be possible to program a robot to think like we do? What could robots such as these do for us?
- People do not all process the same information in the same way. Pick an event that was shared by members of the group, perhaps a recent school trip. Ask each student to write down (a) the purpose of the event, (b) two enjoyable things experienced on the trip, (c) one thing on the trip that did not work out perfectly, and (d) one thing that the trip experience taught them. Then ask them to compare results and discuss the differences. Use the result to lead into a discussion on why individuals process information differently. The purpose is for the class to discover the cognitive reality that not all individuals process the same inputs in the same way.

Main lesson content

- Use the TEDEd lesson, [Rethinking thinking](#), by Trevor Maber. The video presents the 'ladder of inference'. This introduces key concepts in cognitive psychology without the terminology. It can be revisited when studying cognitive schemas, thinking and decision-making, and the influence of emotion on cognitive processes. The 'Dig Deeper' section contains a number of group follow-up activities on the ladder of inference.
- Cognitive studies should be presented as a distinctive approach in psychology. They emphasise that we can study behaviour by considering how we mentally process inputs from the environment. Cognitive studies may also illustrate that our individual life experiences promote the constant personal upgrading of our schemas – our unique, personal mental 'software'. The mind-is-a-computer analogy can be introduced, and its validity may be critically discussed.

- You may wish to introduce techniques used in cognitive psychology, including experiments, interviews, observations and brain scans. Possible studies could be Peterson and Peterson (1959) on memory recall and Bransford and Johnson (1972) on the effects of various aids on understanding and recalling the contents of a text.

Common misunderstandings and misconceptions

Ensure that students do not confuse cognitive psychology with socio-cultural psychology. Emphasise that cognitive psychology focuses on the brain functions (e.g. memory and decision-making) that process environmental inputs into thoughts and behaviours.

Supporting your students

Some students may confuse the cognitive and socio-cultural approaches. The emphasis for cognitive should be on how the mind processes information. Optical illusions can enjoyably reinforce this point, for example the Blivet, the Frazer spiral and the endless staircase.

Challenging your students

Ask the students who need a further challenge to apply the idea that the workings of our mental software influence our behaviour to the following questions:

- How is it possible for a student to quote the details of every motor vehicle manufactured in the last 20 years, and yet not manage to recite a single poem from memory?
- Can a person who lied sincerely believe that he or she was telling the truth?
- How can two people watch the same yellows, reds, oranges and pinks in the same sunset, and yet feel and act on completely different emotions?

Homework suggestions

- Students could view optical illusions online, such as (above) the Blivet, the Frazer spiral and the endless staircase. You could then ask them to list five behaviours that occur because of optical illusions in real life. One example could be buying something that they never use. They can then research and explain why these real-life optical illusions occur.

Cross-references with other topics

10.1 Introduction to research methods in psychology

10.2 Elements of researching behaviour

4.2 Cognitive processing: memory, schema theory, and thinking and decision-making processes

Overview

The study of how individuals mentally process information is a vast field. The syllabus narrows it down to three main areas: memory models, schema theory, and models of thinking and decision-making. Students need to understand the workings of key models, and appreciate that they are starting points for critical inquiry into how cognitive processes actually operate.

Suggested activities

Possible starter

Use the following opener to illustrate the differences between explicit and implicit memory. Ask the students to write down on paper the 26 letters of the alphabet in the order that they appear on the computer keyboard, from top row to bottom row. They may not look at the keyboard. Ask the students to time how long it took for them to complete the task.

Students then go to their computers. Set the timer. Then ask them to type the following sentence: 'The quick brown fox jumped over the lazy dogs'.

Ask the students to suggest why the second task with same content as the first task took less time, and use their responses to create a distinction between implicit memory and episodic (declarative) memory.

Main lesson content

- The workings of human memory can be introduced by Peter Doolittle's TED talk, [How your working memory makes sense of the world](#). It can be followed up with the IB Psychology InThinking website's [lesson on the serial position effect](#). Both of these sources should tie in well with the multi-store memory model in the coursebook.
- Students should consider studies that support/limit the content of the multi-store memory model and the working memory model that provides a framework for the conceptualising of human memory processes over time. For the multi-store model, these could include Murdock (1962) and the biological support in Newcomer et al. (1999) referred to in the text, and could also include Miller's Magic Number study (1956), Peterson and Peterson (1959), and Glanzer and Cunitz (1966). For the working memory model, the three short-term memory subsystems are supported by experimental research, such as Landry and Bartling (2011) applied to multi-tasking, and biological evidence, for example D'Esposito et al. (1995).
- You can introduce cognitive schemas by reading aloud the 'War of the Ghosts' passage (Bartlett, 1932) in Section 4.2.2 of the coursebook, and then asking students to write down as many details of the story as they can remember. Collect and photocopy all the students' responses on a single page. Distribute both the photocopies and the text of the story to each student, asking them to categorise details tending to be accurately recalled, details tending to be inaccurately recalled, and details tending not to be recalled at all. Aim to come to a class consensus and then ask the students to account for the patterns in the recall accuracy of different parts of the story. You can use the IB Psychology InThinking website's activity, [Airlines news flash](#), as an enjoyable follow-up exercise.
- You may wish to add studies on the influence of cognitive schemas on behaviour, such as Rosenthal and Jacobson (1968) on the 'expectancy effect': how far an individual child's academic progress at school may be influenced by the level of teacher expectation.
- Other areas of schema processing supported by schema theory include top-down and bottom-up processing, stereotyping-based behaviour and the influence of culture. At least two of them should be studied in detail, with supporting research studies such as those in the coursebook. Emphasise that schemas save cognitive energy as they tend to be automatic and non-conscious, but they do not always match reality.
- Thinking and decision-making can be presented through the two-systems model of thinking which distinguishes between the faster, intuitive, relatively undemanding and sometimes emotionally influenced System-1 thinking, and the slower, rational, and relatively painstaking System-2 thinking. This model indicates that decisions associated with System-1 are easily affected by heuristics, framing, loss aversion and appraisal.
- Students can understand more about the principles of the two-systems model by watching [Thinking, Fast and Slow](#) by Nobel prize-winning behavioural economist Daniel Kahneman (2011), whose research indicates that people's spending patterns are influenced by things other than the best buys. Similar patterns appear in the work of Dan Ariely, such as the TED talk, [Are we in control of our own decisions?](#)

Common misunderstandings and misconceptions

Students often confuse short-term and long-term memory. Remind them that short-term memory is very short, lasting only for a few seconds and that the multi-store memory shows the short-term memory as a single store. In contrast, the working memory model shows the short-term memory as several stores operating simultaneously, making multi-tasking possible, if not necessarily most effective.

Supporting your students

Students requiring more support will need to consolidate their understanding of the different types of long-term memory, such as implicit, procedural, explicit (declarative), episodic and semantic. For each memory store, the students could be asked to name two everyday situations where it was used. For example, having to recall detailed information on the different parts of the heart in a test is likely to utilise explicit/semantic memory.

Challenging your students

Ask students who need a challenge to obtain the necessary permissions to monitor a lesson in a subject with difficult, unfamiliar content. Their task would be to observe the way the teacher introduces the new concept, and examine how they made it more accessible by relating it to what the students already know. They should then explain how the methods used by the teacher were designed to resonate with the students' existing subject-specific schemas, facilitate memory encoding and facilitate memory retrieval. Emphasise that an experienced teacher (and a good speaker) tends to automatically present new material in terms of the schemas that the audience is likely to have.

Homework suggestions

- Study Kearins (1981) in the text. This research illustrates how schemas may additionally be influenced by culture. There is follow-up material in the critical thinking questions immediately afterwards. It also creates a suitable link with Chapter 5 on the socio-cultural approach to behaviour.
- Essay response question at the end of the chapter in the coursebook.

Cross-references with other topics

5.2 The individual and the group

5.3 Cultural origins of behaviour and cognition

9.2 Developing an identity

9.3 Developing as a learner

4.3 The reliability of cognitive processes

Overview

This section follows on from *Section 4.2*. It assesses the accuracy of memory recall in various situations, and considers whether or not cognitive short cuts are likely to result in optimum decision-making.

Suggested activities

Possible starter

People do not always think logically in daily life. Errors in cognitive processes can be linked with the use of fast, intuitive System-1 thinking rather than the slower, more logical System-2 thinking. This can be demonstrated in the classroom by fun activities, such as those contained in these video-clips:

- The [Wason selection task](#) (1966) on the Philosophy Experiments website, which may be followed up with a video such as [How logical are you? \(The psychology of reasoning\)](#) for more advanced students. This video links errors in the task with applying deductive and inductive reasoning.
- The well-known problem, [DONALD + GERALD = ROBERT](#), can also be used to show how far people do indeed think logically.

Main lesson content

Reconstructive memory can involve cognitive schemas influencing inaccuracies in memory processing and retrieval. Such errors may result in serious consequences, as explained by pioneer researcher Elizabeth Loftus. Her TED talk, [How reliable is your memory?](#) is an ideal starting point for studying cognitive error.

- It is vital that students know the details of the two experimental studies of Loftus and Palmer (1974), both of which indicate that schema-activating prompts can promote significant memory inaccuracies. That memory can be reconstructive may be reinforced by Brewer and Treyens (1981) and the ‘Lost in the mall’ research of Loftus and Pickrell (1995), yet possibly less so outside the laboratory environment, as demonstrated by the real-life-based research of Yuille and Cutshall (1986).
- Bias-promoted thinking and decision-making errors arising from System-1 thinking form a wide field. The syllabus requires a detailed understanding of two types of cognitive bias. The text focuses on confirmation bias and anchoring bias, but there is a wide range of studies on types of biases such as framing (Tversky and Kahneman, 1981) and peak-end rule (Kahneman et al., 1993). As my students say: ‘Pick whatever floats your boat.’
- The principles in thinking and decision-making in anchoring bias are well-presented in Sara Garofalo’s TED lesson, [The psychology behind irrational decisions](#). The ‘Dig Deeper’ section has some good quality follow-up resources.
- There are situations when System-1 thinking can achieve similar results to the more laborious System-2 thinking, and save much time in the process. This is exemplified in the labour-saving thin slicing heuristic used by experts, as in Ambady et al. (2000).

Common misunderstandings and misconceptions

Schemas are not entities that are separate from memory, thinking and decision-making. On the contrary, they are highly influential in both cognitive processes.

It is important to stress that using heuristic System-1 thinking is not always inaccurate. It can be seen as an individual’s mental energy-saving strategy to cope with the enormous number of decisions being made every day.

Supporting your students

Students should find this topic personally relevant and enjoyable. The concepts are straightforward, but the number of available studies can bewilder the new student. Studies included in the coursebook should cover the examination requirements, but the curious will want to know more. The additional studies listed under the main lesson content above should help.

The home-brewed lemonade activity in Section 4.3.2 can be used to reinforce cognitive bias through anchoring.

Challenging your students

Introduce Daniel Kahneman's popular book, *Thinking, Fast and Slow* (2011), whose essence he covers in his [presentation](#) under the same title on Google Talks. Ask the students to select three additional forms of cognitive bias and design an experiment to test them within their school setting. They can present them for critical debate in a group or full-class situation.

Homework suggestions

- Some studies in the reliability of cognitive processes are particularly suitable for student reproduction as Internal Assessment (IA) investigations. Students can select one such study and write a short 250-word IA proposal.
- As an assignment interacting with theory of knowledge, students could use the research study of Lord et al. (1979) in the coursebook as a starting point to consider the proposal: 'People convinced against their will are of the same opinion still.' They could then research and discuss whether the validity of this proposal depends on whether the individual is thinking faster or thinking slowly, or whether there are emotional elements in cognition (as in the next topic) that are operating, irrespective of the type of thinking applied.

Cross-referencing with other topics

10.1 Introduction to research methods in psychology

10.2 Elements of researching behaviour

4.4 Emotion and cognition

Overview

Psychological and neurological studies indicate that emotions can significantly influence cognitive processing, such as the functioning of memory, and thinking and decision-making.

Suggested activities

Possible starter

Invite students to comment on this question: 'When angry, count to ten before deciding how to respond. Good advice or bad advice?' Then introduce LeDoux's model (1999) of the brain's dual path processing in Section 4.4.1. Discuss the contribution which that model makes to understanding our thinking and decision-making processes. How far does the dual path processing model explain System-1 and System-2 thinking?

Main lesson content

- It is a good idea to emphasise that this topic relates to the previous topics by adding the emotional dimension to our understanding of the working and accuracy of cognitive schemas, memory processes, and thinking and decision-making. LeDoux's model can show that emotions affect cognition through biological pathways.
- Also emphasise that emotions influence situation-adaptive behaviours, such as losing your temper, escaping from the situation as quickly as possible, or smiling. Emotions roused in people even by seemingly trivial stimuli can affect their performance of a cognitive task, as exemplified by the research of Smith et al. (2015).
- You can present flashbulb memory as an emotional, detailed and long-lasting memory that relates to recalling surprising and shocking events. Emotions felt at the time prompt recall not only of the event, but also of things that were happening at the time of the event that otherwise would be forgotten. Use Brown and Kulik (1977) as the pioneer study indicating flashbulb memory. Claims have been made for flashbulb memory in effect being narrative memory (Neisser and Harsch, 1992), though the more recent study of Sharot et al. (2007) may be used to indicate biological support for flashbulb memory.
- Lack of emotions can also adversely affect decision-making, as exemplified in the biological process of neural pruning in adolescent boys seeming to correlate with alarmingly risky behaviours in that age group. This is well presented in Sarah-Jayne Blakemore's TED lesson, [The mysterious workings of the adolescent brain](#). The 'Dig Deeper' section has some follow-up resources.

Common misunderstandings and misconceptions

It is important for students to appreciate that there is an overlap between the cognitive and biological approaches to understanding behaviour through much of this topic. This is exemplified by theories of the emotional brain. Exam responses on specifically cognitive psychology may employ biological principles to explain how emotion influences cognition.

Supporting your students

Activity 4.4 on flashbulb memory in Section 4.4.2 can be used to engage the students in seeking to discover the existence of their own flashbulb memories.

Challenging your students

Students can revisit the research studies that they encountered in *Sections 4.2* and *4.3*. Ask them to choose three studies, and explore how theories of the emotional brain can contribute to explaining the studies' findings.

Homework suggestions

- The 'Dig Deeper' section of Sarah-Jayne Blakemore's [TED lesson](#) contains a range of suitable homework ideas, based on the presentation and its accompanying resources.

Cross-referencing with other topics

3.2 The brain and behaviour

4.5 Cognitive processing in the digital world (HL only)

Overview

This section deals with the way that technology may influence cognitive processes. It is a relatively new field of research, but there are already many research studies, indicating both positive and negative effects.

Suggested activities

Possible starter

In groups, ask the students to find two news articles about the effects of young people using smartphones or playing computer games. One should be positive, and the other one negative. Each group should then summarise the arguments of the articles, design a study that investigates the validity of the articles' claims within their own community, and present their plan to the whole class.

Main lesson content

- Emphasise to the students that this field of research is growing quickly. The focus of the IB requirements is on the ways that digital technology can affect cognitive processes and human interaction. It also considers methods of investigating those two relationships.
- The coursebook includes research studies that develop the above theme in four specific directions: the effects of the use of digital devices on human memory (Sparrow et al., 2011), the effect of computer gaming on promoting cognition skills and learning efficiency (Haier et al., 1992), the effect of computer gaming on children's attention spans in the classroom (Swing et al., 2010) and the effect of social media on social well-being (Shakya and Christakis, 2017). Emphasis should be on the range of methodologies used and an evaluation of the strengths and limitation.
- There are many other suitable studies to choose from. Examples are: whether the process of note-taking on a digital device is more or less likely to assist the learning process than note-taking by hand (Mueller and Oppenheimer, 2014), whether fast-paced computer games are likely to improve strategic thinking (Glass et al., 2013) and the degree that self-esteem is influenced by social-media interaction (Chou and Edge, 2012).
- There is an excellent series of [TED talks](#) on the effects of computer gaming on cognitive processing.

Common misunderstandings and misconceptions

There is a fast-growing body of research studies on cognitive processing in the digital world. However, students are not required by the syllabus to look at all areas, but focus on ways of studying how digital technology interacts with cognition. In particular, theory and research studies need to be chosen to explore the positive and negative effects of digital technology on cognitive processes and human interaction. The four studies in the textbook were chosen to address those objectives.

Supporting your students

Students are likely to find this topic relevant and engaging. However, their interest could be supported with suitable news or internet items about the impact of digital technology on the way we process information and interact with the environment. BBC and CNN News are suitable sources for fast-changing, up-to-date information.

Challenging your students

Students who need more of a challenge can extend the homework suggestion below to select three TED videos and assess the validity of the evidence used in each talk. Elements could include reflexivity and researcher bias.

Homework suggestion

- The students can watch some or all the TED talks on video games. They can tabulate the studies mentioned under the following columns: name of video/study, gaming beneficial or detrimental, evidence used in support.

Cross-referencing with other topics

4.2 Cognitive processing: memory, schema theory, and thinking and decision-making processes

10.4 Evaluating research

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