Chapter 1: Cognitive Psychology

# Chapter Context

This chapter serves as the background for the whole text: the scientific study of human memory and cognition. We consider a broad range of subjects, from basic perception through complex decision making; from seemingly simple mental acts, such as recognizing a letter of the alphabet, to very complicated acts, such as having a conversation.

# Outcome-based Outline

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| **Outcome** | **Learning Objectives** |
| Critical Thinking | 1.4 Interpret how human problem solving involves planning that guides behavior |
|  | 1.5 Compare human information processing to the operations of a computer program |
| Knowledge of Discipline | 1.2 Differentiate memory and cognition |
|  | 1.6 Explain the mental processes that take place while doing a task |
|  | 1.7 Describe the seven themes of cognition |
| Cultural Competence | 1.3 Recount the history of cognitive psychology |
| Information Literacy | 1.1 Analyze the mental processes behind our thoughts |

# Discussion Question Bank

This discussion question bank provides a listing of discussion questions (1–2 per module), which are included for in-class use.

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| **Module** | **Discussion Question(s)** |
| 1.1 Thinking about Thinking | 1. Create your own definitions of perception, remembering, reasoning, and problem solving. How are these processes similar?  2. Describe two mental processes: one that seems to occur with little awareness and one that seems to require considerable effort. Compare and contrast these mental processes. |
| 1.2 Memory and Cognition Defined | 1. Search your memory for information related to: (1) your knowledge of airplanes; (2) your recollections from elementary school; and (3) your ability to perform a task like peeling a potato or swinging a baseball bat. Examine the processes you used to find the requested information. Were the processes the same or different? Was it easy or difficult to find the requested information? Where do you think the information was stored? Explain your answers.  2. Create a description that synthesizes memory and cognition. Is one part of the other, or are they separate mechanisms? Provide an example that supports your assertion about the separability of the two concepts. |
| 1.3 An Introductory History of Cognitive Psychology | 1. Engage in introspection (or imagine doing so) while you are writing a paper or solving a series of mathematical problems. Was it difficult to maintain focus on the introspective element of the activity? How well do you believe you were able to report on your own inner sensations and experiences? Describe how attempting to introspect might have influenced the processes you used as you attempted a specific cognitive activity. Evaluate introspection as a data collection tool based on your experience.  2. Compare and contrast the behaviorist and cognitivist approaches to the study of behavior. Which approach fits best with your worldview? Explain your perspective. |
| 1.4 Cognitive Psychology and Information Processing | 1. Describe the individual threads (i.e., Chomsky’s 1959 review; Miller’s “Magical number 7 plus or minus two”) that came together in the late 1950s—early 1960s to become cognitive psychology. Identify and analyze the common themes among the early contributors to cognitive psychology.  2. Discuss the arguments between behaviorism and cognitive psychology. |
| 1.5 Measuring Information Processes | 1. A student notices that it seems to take less and less time to complete homework assignments for a mathematics class. For example, at the beginning of the current unit, the student would spend two or more hours completing readings and suggested exercises. After studying the content for several days, however, the student now finds that the time required to complete readings and exercise assignments is substantially less. Explain this student’s experience in terms of human information processing.  2. Provide an example in which you believe you were able to conduct several cognitive processes simultaneously. How efficient was your processing? How precise were your processes? Do you believe you were able to effectively control the multiple processes or did your cognitive system get overwhelmed? Use your example to illustrate your answers to these questions. |
| 1.6 The Standard Theory and Cognitive Science | 1. Compare and contrast how a computer and a human process information. 2. Compare and contrast sequential processing and parallel processing. Give examples that clearly distinguish between the two processing types. Does sequential processing lead to parallel processing? Explain your answer. |
| 1.7 Themes | 1. Describe how data-driven (bottom-up) processing and conceptually driven (top down) processing can occur simultaneously during learning. Provide an example that supports your explanation.  2. Distinguish between the types of information you believe made it into your memory through implicit versus explicit processes. Do implicit or explicit processes appear to be more or less responsible for processing specific types of information? Explain your answer. |

# Research Assignments

The following research assignments pertain to the main topics and/or themes of the chapter. Please respond by writing a paper consisting of 1,000–1,500 words.

## Early Research in Cognitive Psychology

Many research experiments from the early days of cognitive psychology have stood the test of time. One such experiment is that of Bousfield (1953)—see reference below. Using Bousfield’s original wordlists and general procedures, replicate this study with five or six friends or family members serving as research participants. Write a report of your findings in which you compare and contrast the results of your experiment with Bousfield’s.

Reference:

Bousfield, W. A. (1953). The occurrence of clustering in the recall of randomly arranged associates. *Journal of General Psychology*, *49*, 229–240.

# Lecture Suggestions

**Lecture Suggestions (Effectiveness/Student Reactions)**

* Discuss the interpretation of response times (you can leverage an example of a discussion of Stroop effects). In doing so, be aware that some students will not realize that “faster” is associated with less cognitive work (this is an inherent assumption of most response time studies). Additionally, many students may have difficulty reading simple RT graphs (faster is on the BOTTOM of the y-axis).
* The first difficulty many people have with cognitive psychology is an inability to understand why anyone would be interested in it. The following are two suggestions to rectify this particular perspective:

1. After going over the syllabus for the first time, have people call out the different “types” of psychology. Afterward, briefly describe (or ask for suggestions on) how each area or “type” of psychology could benefit or be relevant to cognitive psychology. Be sure to include clinical (types of deficits), learning (studying for exams: massed versus distributed practice), and human factors (driving a car and talking on the cell phone = dual-task attentional demands).

2. When developing your syllabus, be sure to include an assignment within each component of the course. The purpose of the assignment is to tie the theoretical knowledge that the students are exposed to from your lecture and the textbook to “real life.” This has the advantage of providing a much more resilient memory trace (you can discuss this logic on Day 1—foreshadowing important topics such as depth of processing).

* If possible, use student names when responding to questions. For larger classes, make it a requirement that a student needs to answer at least one question from you during class over the course of the semester.
* It is easier to go from a “hard” stance regarding make-up exams or late assignments to a softer one than it is to be too soft in the beginning and then tighten your policies.

**Lecture Suggestions (Content)**

* Additional content: The first mention of “*psychologie*” as a field of research was in the context that there could not be a scientific study of *psychologie* (science of the mind).
* Part of what motivated Wundt to study the laws that regulate the mind was the success of scientific approach in other fields and the regularity of visual illusions (e.g., the horizontal–vertical illusion and the Oppel-Kundt illusion), which suggested to him that laws could govern psychological experience.
* Cognition:

cognito = “to know”

co = “together”

gnoscere = “know”