

Introduction to Cognitive Psychology

1. Cognitive psychology definition

It is the study of how people perceive, learn, remember, and think about information. A cognitive psychologist might study how people perceive various shapes, why they remember some facts but forget others, or how they learn language.

2. Philosophical Antecedents of Psychology

- **Rationalism versus Empiricism**

Where and when did the study of cognitive psychology begin? Historians of psychology usually trace the earliest roots of psychology to two approaches to understanding the human mind:

- **Philosophy** seeks to understand the general nature of many aspects of the world, in part through introspection, the examination of inner ideas and experiences (from intro-, “inward, within,” and -spect, “look”);
- **Physiology** seeks a scientific study of life-sustaining functions in living matter, primarily through empirical (observation-based) methods.

Two Greek philosophers, Plato (ca. 428–348 B.C.) and his student Aristotle (384–322 B.C.), have profoundly affected modern thinking in psychology and many other fields. Plato and Aristotle disagreed regarding how to investigate ideas.

Plato was a rationalist. A rationalist believes that the route to knowledge is through thinking and logical analysis. That is, a rationalist does not need any experiments to develop new knowledge. A rationalist who is interested in cognitive processes would appeal to reason as a source of knowledge or justification.

In contrast, Aristotle (a naturalist and biologist as well as a philosopher) was an empiricist. An empiricist believes that we acquire knowledge via empirical evidence that is, we obtain evidence through experience and observation. In order to explore how the human mind works, empiricists would design experiments and conduct studies in which they could observe the behavior and

processes of interest to them. Empiricism therefore leads directly to empirical investigations of psychology.

In contrast, rationalism is important in theory development. Rationalist theories without any connection to observations gained through empiricist methods may not be valid; but mountains of observational data without an organizing theoretical framework may not be meaningful. We might see the rationalist view of the world as a thesis and the empirical view as an antithesis. Most psychologists today seek a synthesis of the two. They base empirical observations on theory in order to explain what they have observed in their experiments. In turn, they use these observations to revise their theories when they find that the theories cannot account for their real-world observations.

The contrasting ideas of rationalism and empiricism became prominent with the French rationalist **René Descartes** (1596–1650) and the British empiricist John Locke (1632–1704). Descartes viewed the introspective, reflective method as being superior to empirical methods for finding truth. The famous expression “cogito, ergo sum” (I think, therefore I am) stems from Descartes. He maintained that the only proof of his existence is that he was thinking and doubting. Descartes felt that one could not rely on one’s senses because those very senses have often proven to be deceptive (think of optical illusions, for example). Locke, in contrast, had more enthusiasm for empirical observation (Leahey, 2003). Locke believed that humans are born without knowledge and therefore must seek knowledge through empirical observation. Locke’s term for this view was *tabula rasa* (meaning “blank slate” in Latin). The idea is that life and experience “write” knowledge on us. For Locke, then, the study of learning was the key to understanding the human mind. He believed that there are no innate ideas.

In the eighteenth century, German philosopher **Immanuel Kant** (1724–1804) dialectically synthesized the views of Descartes and Locke, arguing that both rationalism and empiricism have their place. Both must work together in the quest for truth. Most psychologists today accept Kant’s synthesis

3. Psychological Antecedents of Cognitive Psychology

Cognitive psychology has roots in many different ideas and approaches. The approaches that will be examined include early approaches such as structuralism

and functionalism, followed by a discussion of associationism, behaviorism, and Gestalt psychology.

3.1. Understanding the Structure of the Mind: Structuralism

Structuralism seeks to understand the structure (configuration of elements) of the mind and its perceptions by analyzing those perceptions into their constituent components (affection, attention, memory, sensation, etc.).

Wilhelm Wundt (1832–1920) was a German psychologist whose ideas contributed to the development of structuralism. Wundt is often viewed as the founder of structuralism in psychology. Wundt used a variety of methods in his research. One of these methods was **introspection**. Introspection is a deliberate looking inward at pieces of information passing through consciousness. The aim of introspection is to look at the elementary components of an object or process.

The introduction of introspection as an experimental method was an important change in the field because the main emphasis in the study of the mind shifted from a rationalist approach to the empiricist approach of trying to observe behavior in order to draw conclusions about the subject of study. The method of introspection has some challenges associated with it.

- First, people may not always be able to say exactly what goes through their mind or may not be able to put it into adequate words.
- Second, what they say may not be accurate.
- Third, the fact that people are asked to pay attention to their thoughts or to speak out loud while they are working on a task may itself alter the processes that are going on.

Wundt had many followers. One was an American student, Edward Titchener (1867–1927). Titchener (1910) is sometimes viewed as the first full-fledged structuralist. In any case, he certainly helped bring structuralism to the United States. His experiments relied solely on the use of introspection, exploring psychology from the vantage point of the experiencing individual. Other early psychologists criticized both the method (introspection) and the focus (elementary structures of sensation) of structuralism. These critiques gave rise to a new movement—functionalism.

3.2. Understanding the Processes of the Mind: Functionalism

An alternative that developed to counter structuralism, functionalism suggested that psychologists should focus on the processes of thought rather than on its contents. Functionalism seeks to understand what people do and why they do it. This principal question about processes was in contrast to that of the structuralists, who had asked what the elementary contents (structures) of the human mind are. Functionalists held that the key to understanding the human mind and behavior was to study the processes of how and why the mind works as it does.

Functionalists were unified by the kinds of questions they asked but not necessarily by the answers they found or by the methods they used for finding those answers. Because functionalists believed in using whichever methods best answered a given researcher's questions, it seems natural for functionalism to have led to pragmatism. Pragmatists believe that knowledge is validated by its usefulness: What can you do with it? Pragmatists are concerned not only with knowing what people do; they also want to know what we can do with our knowledge of what people do. For example, pragmatists believe in the importance of the psychology of learning and memory. Why? Because it can help us improve the performance of children in school. It can also help us learn to remember the names of people we meet.

A leader in guiding functionalism toward pragmatism was William James (1842–1910). His chief functional contribution to the field of psychology was a single book: his landmark *Principles of Psychology* (1890/1970). Even today, cognitive psychologists frequently point to the writings of James in discussions of core topics in the field, such as attention, consciousness, and perception. John Dewey (1859–1952) was another early pragmatist who profoundly influenced contemporary thinking in cognitive psychology. Dewey is remembered primarily for his pragmatic approach to thinking and schooling. Although functionalists were interested in how people learn, they did not really specify a mechanism by which learning takes place. This task was taken up by another group, Associationists. An Integrative Synthesis: As

3.3. An Integrative Synthesis: Associationism

Associationism, like functionalism, was more of an influential way of thinking than a rigid school of psychology. Associationism examines how elements of the mind, like events or ideas, can become associated with one another in the mind to result in a form of learning. For example, associations may result from:

- contiguity (associating things that tend to occur together at about the same time);
- similarity (associating things with similar features or properties); or
- contrast (associating things that show polarities, such as hot/cold, light/dark, day/night).

Hermann Ebbinghaus (1850–1909) was the first experimenter to apply associationist principles systematically. Another influential associationist, Edward Lee Thorndike (1874–1949), held that the role of “satisfaction” is the key to forming associations. Thorndike termed this principle the law of effect (1905). A stimulus will tend to produce a certain response over time if an organism is rewarded for that response.