

# PSYCHOLOGY

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## Summary

This article intends to offer an overview of psychology to help the reader to understand the following articles and place them in a proper historical, epistemological, and

applicative context. The first part (Sections 1–12) will deal with some of the main issues in the history and the development of psychology. The second part (Sections 13–19) will concentrate more on some of the most important application of psychology. Finally in Section 20 there is a brief mention of the importance of this discipline for a sustainable development.

*Legi, Patres colendissimi, in Arabum monumentis, interrogatum Abdalam sarracenum, quid in hac quasi mundana scena admirandum maxime spectaretur, nihil spectari homine mirabilius respondisse Cui sententiae illud Mercurii adstipulatur: “Magnum, o Asclepi, miraculum est homo.”*

(I have read, most esteemed fathers, in the records of the Arabians, that Abdallah the Saracen when questioned as to what, on this stage, so to say, of the world, could be seen most worthy of wonder, replied that there is nothing to be seen more wonderful than man. In agreement with this opinion is the saying of Hermes: “a great miracle, Asclepius, is man.”)

(Pico della Mirandola, *Oratio de hominis dignitate*, 1486)

## 1. Introduction

Psychology is the study of mental and behavioral processes. Its classification within the spectrum of scientific disciplines is probably the first problem one has to approach when one wants to describe the nature and scope of psychology. This is because this discipline belongs to both the realms of the natural sciences and social sciences. Any attempt to force it into just one of these areas has led to unilateral and reductive findings that have to be reconsidered. The epistemological placement of psychology results in the validity of many methodological approaches and the realization that a single methodology could never be appropriate.

In order to offer a more exhaustive description of the theme of psychology I will approach it from two different perspectives. The first will be based on a historical overview of the development of its main epistemological conceptualizations. The second will be a brief description of psychology as an applied discipline. This entire theme article is intended to introduce the more detailed and specific ones that follow.

Before I venture into the details of my theme, I should like to point to three issues that should be made explicit, in order to support the reader:

1. The word psychology derives from the Greek *psyché* (soul) and *logos* (“discourse,” or, less literally, “science”). Its translation immediately brings to the fore the most crucial epistemological issue of this discipline, as we may well translate it as “discourse *on* the psyche,” or “discourse *of* the psyche,” i.e. the activity of self-disclosure that the psyche carries out about itself. As the reader will be able to see by reading through the many articulations of the theme “Psychology,” (with ramifications of each all its methodological, epistemological, and applied approach) psychology, in contrast to the other sciences, must deal with the problem of the mind—or the psyche—which speaks about itself and tries to understand itself in some way or another.

2. In the first part, describing its history, I will deal with psychology as a “scientific discipline.” Nevertheless, we should always remember that the term *scientific* is much more slippery than it seems at first sight. In a way, the development of psychology proceeds together with the development of the concept of what is, or can be called, “scientific.” From the earliest psychophysical experiments to today’s complex

constructs in the fields of ecological psychology, social psychology, or dynamic psychology, the dignity of what may be given a “scientific” status has shifted a great deal. The most striking examples of this will become clear when the reader compares what is scientific for the behaviorist, for the Gestaltist, or for the cognitivist.

3. Deeply connected to this argument is the fact that the first part of the following discussion will equate scientific psychology with laboratory or academic psychology. This will be apparent when we will see that the opening of Wundt’s laboratory marks the official birth of modern “scientific” psychology. I have preferred to stick to this reading of the history of psychology in order to offer the reader a stable point of departure; something like a mythical point of creation. In truth, this is, in my opinion, very unsatisfactorily and untrue. Psychology has very many origins, paternities, and dates to be recalled. To punctuate its history, as I will do, is the last remnant of a positivistic unilateral approach. This issue is prominent when we take into consideration the fact that there are several other “psychologies” that were born neither in the laboratory, nor in academia, but that have been distilled in clinical settings (psychoanalysis, analytical psychology, family/systemic psychology, etc.), in social/anthropological settings (social psychology, ecological psychology, environmental psychology; Vygotsky’s cultural approach in developmental-educational psychology, and cross-cultural psychology, including the so called “ethno psychiatry”). If the first category of psychological research, for instance behaviorism, had a deep impact on the clinical-applicative side, the second category of psychological research, far from laboratories and academia, had an impact on further well-structured research. Today such differentiation only marks which direction around the circle one decides to proceed—from a rigorous and replicable research to the application, or *vice versa*—with the underlying aim to always complete the circular path.

The word psychology, although formed by two Greek words, does not go back to classical Greece, but was used in an influential way (although not for the first time) by the logician Rudolph Goclenius, around 1590. Nevertheless, it is in Greece that we find some of the philosophical roots that have influenced our discipline. One of these is Aristotle’s idea of man as an animal that can be studied (an idea that later influenced Descartes and Darwin). Another is the Platonic belief in a pre-existent world of innate potential structures, which we find not only in analytical psychology (see “Analytical psychology,” EOLSS on-line, 2002), but also in many contemporary studies on developmental psychology that deal with the presence of innate sensory schematism observable in the newborn baby (Section 14). A third is the study of human temperaments developed by Hippocrates, who, following Empedocles’ fourfold ontological division of earth, water, air, and fire, divided the psychological characters into blood (air), yellow bile (fire), black bile (earth), and phlegma (water). This description, which was the basis for the exceedingly successful Galenic medicine up until the eighteenth century, has been used in our times—for its taxonomic descriptive force alone, and devoid of its humoral basis—by Pavlov, and even more recently, by H. J. Eisenck .

As we shall see, the birth of modern psychology as an autonomous scientific discipline is normally considered to have taken place with W. Wundt’s opening of the first laboratory of psychology in Leipzig (Germany), in 1876. The conditions that brought about such an event may be traced by following the confluence of several scientific, epistemological, and cultural trends that took place around the second half of the

eighteenth century. The two main fields from which modern psychology was to be born were philosophy and physiology. The role of philosophy as the main branch, from which psychology was an offspring, is evident from the times of Socrates and especially Aristotle and for more than 2,000 years. On the other hand, the role of physiology for the future of psychology was marked by the contributions of some great Germanic scientists of the eighteenth century.

## 2. The Birth of Psychology: Precursors

### 2.1. René Descartes

The Cartesian doctrine of the division between *res cogitans* and *res extensa* defined a clear-cut division between the activity of the unextended mind/soul, and that of the extended body, which René Descartes (1596–1650) viewed, much like Aristotle, as a sophisticated biological machine (here Descartes was supported by Harvey's revolutionary studies on the functions of the heart and the vascular system). This mechanistic view of organic life opened the way for future studies on the body functions that later led to the development of the modern biological sciences, such as physiology. As a matter of fact, to deal with the *res extensa* meant avoiding the very dangerous business of studying the soul (*res cogitans*), which was safely left to the attention of the ecclesiastical authorities as a metaphysical concern. At the same time, the Cartesian hiatus greatly favored the future philosophical schools that based their reflections on strictly observable, mechanistic, experience-based issues, such as the *English empiricists*, and the French *ideologues*. At the same time, in discussing the constituents of the *res cogitans*, i.e. of the "*esprit*" (which I could approximately translate as half-way between "mind" and "soul"), Descartes postulated the existence of three kinds of ideas: first, *innate* ideas; second, ideas derived from the senses, memory, and imagination, and third, ideas directly formed by the mind, such as those of dreams.

This theory of the mind had two important implications for future psychology:

- The first is that the *res cogitans* (the mind) is an autonomous entity that acts *in parallel* to the *res extensa* (the body, or the world of perceptions). This reinforced the autonomy of the future biological sciences based upon a strict materialistic standpoint.
- The second is that the presence of innate pre-dispositions that constitute the newborn's mind, ready as they are to organize (perceive and react to) the world into a specifically human world, which have now been scientifically discovered by contemporary developmental psychology (Section 14). Such discovery regards all fields of psychological activity: behavior, perception, cognition, and emotion, and have re-composed, in a manner closer to Kant than to Descartes, the split between the radical views of the English empiricists, and the metaphysical speculations of the so-called rational psychology (C. Wolff, 1679–1754) about the eternal soul. I will shortly come back to this point later on, when I will deal with this particular subject (see "Philosophy," EOLSS on-line, 2002).

### 2.2. English Empiricism

The schools of thought that had the strongest influence on the birth of psychology as an empirical experimental discipline were, with little doubt, "English empiricism," and "positivism" (see "Philosophy," EOLSS on-line, 2002). English empiricism contributed

to early psychology with its theory of knowledge. Probably its most influential author is John Locke (1632–1704) who, in *An Essay Concerning Human Understanding* (1690), radically rejected the Cartesian theory of the existence of innate ideas—such as that of God, or infinity—and maintained that the infant at birth has no knowledge whatsoever, nor any form of idea at any level of abstraction. His mind is a *tabula rasa* (Latin, for “blank page”), and, in strict terms, it does not exist yet. It is useful to note that when he chooses the title for his essay, Locke does not use the term “mind,” which could suggest an idea of something really existing, like an object or a fixed structure. On the contrary, he chose the term “understanding” which suggests the idea of an ongoing process.

For Locke all knowledge is strictly based on learning from “experience.” Even if Locke recognized that there are two forms of experience—the first based on “sensation” (i.e. the working of the senses), and the second based on “reflection” (i.e. thinking and reasoning)—he clearly stated that all reflexive experiences actually are secondary derivations from those acquired through the senses, even if the mind may produce totally new forms of reflexive experience. This last point means that reflection is not just the mere copy of sensation, although its raw material derives from it.

Another influential theory by Locke is that of the existence of simple and complex ideas. They belong to both fields of experience. While simple ideas are elementary data that the mind passively receives, hence non-reducible to more elementary ones, complex ideas are composed by a mixture of elementary ones. As we shall soon see, this theory will be found in the heart of the so-called structuralist school of psychology. It gave birth to a view of a sort of “mental chemistry” for which the basic components of experience were to be found by a process of de-composition of complex ideas.

One last important contribution by Locke is his view of the subjective character of sensation, according to which each person perceives through the senses the basic elementary data that will determine his experience in a way different from another individual. In other words, each mind is more or less different from another and, most importantly, the mind (as a construct based on such an experience), brings to the fore the role of the individual, the subject, i.e. the future protagonist of psychology.

Two other main exponents of empiricism are George Berkeley (1685–1753), and David Hume (1711–1776). Berkeley developed a theory called “mentalism,” for which there are no simple primary ideas (that do not originate from perception). For Berkeley, every act of reception by the senses is actually perceived by the subject; therefore, becoming immediately a component of the mind it can be attributed to the mind alone. This was based on his radical criticism of the construct of “substance.” Once you take out all qualities of an object—for example the gray color, the weight, the shape of a piece of lead—there is no lead at all anymore. Hence, the “object” of experience is just a complex product of the working of the mind. Berkeley gave another contribution to the birth of modern psychology by stressing the role of the association process for experience. In *An Essay Towards a New Theory of Vision* (1715), he discussed the development of the visual perception of depth as a product of an association between the inputs coming from tactile experiences and those coming from vision. Association as a key process for the formation of the mind represents an exceedingly important epistemological construct for psychology even today.

David Hume also contributed to the development of early psychology with his *Observations on Man, His Frame, His Duty, and His Experience* (1749) by confirming the role of empirical experience based on sensation for the formation of the mind (which *is* this process, and can never be thought as a sort of an object, a structure, or an “inner something”), and developing an accurate theory of association, for which simple ideas (sensations) tend to associate with each other when they are similar, close in space, or near in time.

Many more authors contributed to the development of an epistemology based on the role of experience, the absence of innate ideas, and the working of the associative processes between sensations and then ideas. Among them were David Hartley (1705–1757), James Mill (1773–1836), and John S. Mill (1806–1873). (See “Philosophy,” EOLSS on-line, 2002.)

It must be clear that the role of these philosophers was crucial for the birth of psychology as an empirical and experimental discipline. Nevertheless, their impact on psychology has been deeply revised as psychology evolved. As we shall see, today no psychologist maintains that the infant’s mind is a *tabula rasa*, or that the role of empirical experience determines the whole development of personality. Furthermore, the discipline of psychology has had so many different trends and currents that it was heavily influenced from the start by other philosophical schools of thought, especially by Immanuel Kant, Arthur Schopenhauer, and Friedrich Nietzsche.

### 2.3. The Role of Physiology

During the first half of the eighteenth century physiology became an experimental empirical science under the influence of a group of German-speaking scientists. The work by Johannes Müller (1801–1858) entitled *Handbuch der Physiologie des Menschen* contributed to the vast diffusion of the experimental method of physiological research. Along with Müller, two authors are normally associated with the birth of psychology as a scientific discipline: Ernst Weber and Gustav Theodor Fechner.

Ernst Weber (1795–1878) dedicated his energies to studying tactile and muscular sensations. The rigorous experimental method that he applied to physiology he also applied to those psychological problems that are directly based on physiology. Weber’s position is that of a physiologist at the crossroads with psychology. Weber discovered that if the surface of the skin (for instance the hand) were pricked by two points of a compass, the subject would not be able to discriminate the two pricks if the two points are too close together. Only at a certain precise distance will the subject perceive the sensation of the two distinct pricks (which varies in the different parts of the body). In other words, Weber discovered the existence of a *sensory* threshold beyond which the sensation can be correctly discriminated (*absolute threshold*). Furthermore, he discovered a fixed mathematical proportion that determines what is the *minimum perceivable difference* between two different stimuli. For example, Weber asked a subject to lift two weights, and asked whether they could perceive the difference in weight. By rigorously applying the scientific method he found that the minimum perceivable difference is 1:40. So, for a weight of 40 kg. the subject could perceive a

difference in weight if this was increased by at least 1 kg. Under such a threshold there is no discrimination.

Following the studies by Weber, Fechner was able to determine a law that describes the relationship between the intensity of a sensation and its corresponding stimulus (*Elemente der Psychophysic*, 1860). This law is known as the basic Weber–Fechner formula:

$$S = k \log R$$

This formula states that the sensation  $S$  is proportional to the logarithm of its corresponding stimulus  $R$  (for the German *Reiz*: “stimulus”), where  $k$  is a constant. This serves to describe psychological occurrences (sensations) by physiological and physical means (stimuli), which can be treated objectively and described in rigorous mathematical forms. More precisely, the formula describes two corresponding series: while the variation of the physical stimulus follows a geometric progression, the corresponding variation of the psychological sensation follows an arithmetic progression. In other words: if we add a violin to another violin playing, the effect will be much greater than if we add a violin to ten violins. From these studies the question arose about the minimal differential threshold for the perception of variation of stimuli of all kinds. Fechner’s work made it possible to approach psychology from a firm scientific empirical ground, as it opened the possibility to actually “measure” processes of the “mind” (sensations), by relating them to objective physical stimuli.

These studies marked the birth of “psychophysics,” and had an immense influence on the future of psychology.

#### 2.4. The General Cultural Context

It must be made clear that the studies by Weber and Fechner were not the only ones to influence the birth of psychology. The whole *zeitgeist* contributed to what is normally considered the beginning of psychology as an autonomous science. I should quote the importance of the studies by Pierre Flourens (1794–1867) on the functions of the brain on sensations and perceptions, or the research carried out by Hermann von Helmholtz (1821–1894) on the speed of nervous impulses, or on the perception of colors (known as the Young–Helmholtz theory) or of auditory tones.

Nevertheless, it should be understood that all these studies were able to exert such a tremendous influence on the future birth of psychology because of the exceedingly strong influence of the philosophical theory (although I could also call it an *ideology*) of “reductionism.” The *manifesto* of reductionism was formulated by Hermann Helmholtz, Ernst Brücke, and Emil Du Bois-Reymond in the first quarter of the nineteenth century. It is impossible to underestimate the influence of reductionism on science during the nineteenth, and well into the twentieth century—a point of view that, in my opinion, is quite questionable and one-sided. Around the middle of the nineteenth century, especially in the German-speaking world, it was absolutely clear that, following the reductionistic principle, if a scientific psychology could be born, it had to be firmly rooted upon the underlying rock of biology (and physiology), just as biology had to stand upon biochemistry, and so on down to the most fundamental science: physics. Seen in this light, reductionism was not just a proper and fundamental scientific *attitude*

for which the scientist should never refrain from looking for more elementary and simpler parts of his object of enquiry. In fact, without such a reductionist “attitude,” science would prove to be impossible. On the contrary the reductionism that I am discussing here does not represent just an epistemological “attitude”: it is an ontological prejudice. Far from any theory of complexity, and faithfully trusting the materialistic approach, the only possible justification for any scientific psychology, in those times, had to be based upon biology. According to such an approach, psychology should, one day, cease to exist, and become biology, while the latter should eventually resolve itself into biochemistry, and so on, down to physics (but *which* physics, after all?)

The reductionistic principle was the paradigm for C. Lloyd Morgan’s “canon” (1852–1936), according to which in no case should one interpret an action as the result of higher psychic activity if it can be interpreted as a result of a lower faculty. This was the basis for animal psychology, for the Russian school of reflexology, and for behaviorism, one of the main currents of twentieth-century psychology.

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### **Biographical Sketch**

**Stefano Carta** is a professor of Dynamic psychology and Developmental psycho-dynamics and family relationships at the University of Cagliari, Italy. He is an analytical psychologist and the President of the Italian Association of Analytical Psychology (AIPA) for the years 2002–6. He is also trained in systemic therapy and Gestalt therapy, of which he is a certified trainer. He was the President of the Italian Society of Psychology for the years 1998 to 2000. He is on the Board of the *Journal Psicologia Italiana* and is the director of *Studi Jungiani*. He is the representative for Italy at the international Union of Psychological Sciences (IUPsyS), and is a member of the national board for the certification of specialization institutes for psychotherapy. He has written several books and articles on psychotherapy, family relationships, and clinical psychology.