

Block 1.4: History & Methods of Psychology

History of Psychology

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Definition of Psychology

Psychology is the **study of the mind and behavior**.

The discipline embraces all **aspects of the human experience** — from the functions of the brain to the actions of nations, from child development to care for the aged.

In every conceivable setting from scientific research centers to mental healthcare services, “**the understanding of behavior**” is the enterprise of psychologists.

(American Psychological Association, APA)

Goals of Psychology

- Describe behavior
- Understand or explain behavior
- Predict the behavior
- Control or modify behavior

How Old is Psychology?

Ancient Greek



- Philosophy addressed many psychological questions
 - Mind-body problem
 - Introspection
 - Epistemology
 - Free will problem

- Old medicine
 - Depression & melancholia
 - Anxiety
 - other psychiatric disorders

Before 1870 Psychology was not a separate discipline

Modern Academic Psychology

- **Wilhelm Wundt** (1832-1920)
 - first experimental laboratory in Psychology in **1879** at the University of Leipzig, Germany
 - generally considered as the “*father of psychology*”
- The American Psychological Association (APA) was established in **1892**.



Predecessors of Psychology

Predecessors of Psychology

Plato (427-347 BC)

- **Truth** has two properties
 1. It must be true in all times and all places
 2. It must be rationally justifiable
- to find truth is through logical reasoning → **rationalism**
- knowledge comes from one's immortal soul (innate) → **nativism**
- **Mind and body problem**: distinction between body and soul → not a classical *dualist*

Predecessors of Psychology

Aristotle (384–322 BC)

- relied on information via observation and the senses for knowledge → **empiricism** (vs. Plato's **rationalism**)
 - no physical and ideal world, not a dualist
- all beings have souls, which animate them. Humans, however, have rational souls. Psychological Questions
- link between psychological & physiological phenomena
- theorized about learning, memory, motivation, emotion, perception and personality

Rene Descartes (1596–1650)

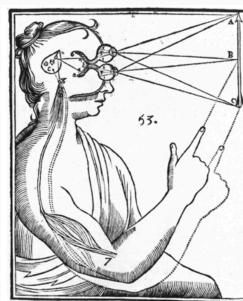
- *Cogito, Ergo Sum. (I think, therefore I am)*
- Dualism (i.e., *Cartesian Dualism*) . . .
- Conception of the body as a machine that can be studied
- Mind and body can influence each other
- But, inborn store of knowledge: some ideas (such as God, the self, perfection & infinity) are innate



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Descartes: Perception-Action Coupling and Reflex



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First Empirical Approaches to Psychology

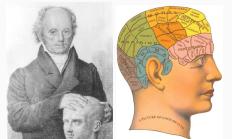
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"Early Brain Science and Psychology"

Franz Gall (1758–1828)

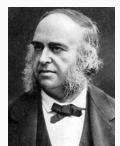
- The mind and personality depends on the brain
- **Phrenology:**
The shape of a person's skull reveals mental faculties and personality traits



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Pierre Broca (1824–1880)

- localization of function
- "Broca's area": speech production areas



Carl Wernike (1848–1905)

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Phineas Gage: Landmark Case in Neuroscience

- hard-working craftsman in the US (born 1848)
- The rod entered Gage's cheek and came out above his right temple.
- Despite the severe injury, Gage survived



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Predecessor Disciplines: Biology & Medicine

Charles Darwin (1809–1882)

- Law of Natural Selection or Theory of Evolution
- inspired the psychological school of Functionalism (e.g. James, 1890)



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Early Psychophysics

Physicians started experimenting with behavior through scientific methodologies

Ernst Weber (1795–1878)

- Studies on sensation and touch
- "just-noticeable difference"



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Gustav Fechner (1801–1887)

- Founder of psychophysics
- Non-linear relationship between psychological sensation and the physical intensity
- Weber-Fechner Law



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Weber Law

Just Noticeable Difference (JND)

- smallest change in stimuli that can be perceived
- *JND* between two stimuli varies in direct proportion to the size of the stimulus (*s*):

$$\text{constant} = \frac{JND}{s}$$

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Weber-Fechner Law: Illustration



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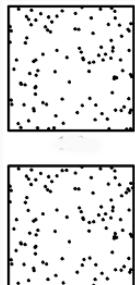
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Weber-Fechner Law: Illustration

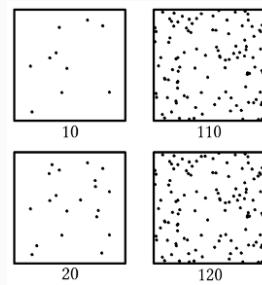


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Weber-Fechner Law: Illustration



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Ophthalmology¹ and Psychophysics

Herman von Helmholtz (1821–1894)

- Theory of colour vision : eye's retina consists of three different kinds of light receptors or red, green and blue
- Theories on human vision and audition



Reaction time measurements

- stimulated the nerves in frogs' legs to determine the speed of neural transmission
- foundations for later measurements of cognitive processing speed

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Helmholtz Statue in front of the Humboldt University Berlin



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In the Netherlands



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Franciscus (Franz) Cornelius Donders



Donders Institute for Brain, Cognition and Behavior in Nijmegen

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Franciscus Cornelius Donders (1818-1889)

- Dutch ophthalmologist
- reaction time measurements
- **mental chronometry**

How long does the cognitive process of deciding take?

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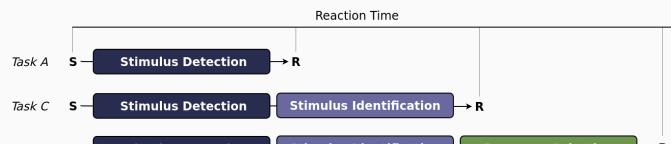
Donders' Method of Subtraction

- **Task A: Simple reaction time task**
 - Stimulus detection
 - Motor preparation & execution
- **Task B: Choice reaction time task**
 - Stimulus detection
 - Stimulus identification
 - Response selection
 - Motor preparation & execution
- **Task C: Go/No-Go reaction time task**
 - Stimulus detection
 - Stimulus identification
 - Motor preparation & execution

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Donders' Method of Subtraction



[A] Simple reaction time task
[C] Go/No-Go reaction time task
[B] Choice reaction time task

→ Stimulus identification = Go/No-Go RT - Simple RT

Further developments by Saul Sternberg (1966), Additive factor logic

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Modern Academic Psychology

Modern Academic Psychology

Established in the last decades of the 19th century

Characterized by

- empirical approach to behavior
- based on quantifiable & objective measurements
- application of scientific and experimental methods

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Founding Fathers of Psychology



Wilhelm Wundt



William James



Stanley Hall

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Experimental Psychology: Europe

Wilhelm Wundt

- 1874: first experimental psychology textbook
 - "Grundzüge der physiologischen Psychologie (Principles of Physiological Psychology)"
- 1879: first experimental psychology lab
 - founded in Leipzig, Germany.
- coined the label **New psychology**



Focus of research

- study the building blocks of mind
- psychology as the study of conscious experiences
- Method of introspection

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Wundt's Method of Experimental Introspection

- Internal perception:
 - "pre-scientific" method of armchair subjective introspection
- Experimental self-observation/introspection:
 - **trained observers**
 - were exposed to situations & asked to describe experiences
 - "scientifically valid" form of introspection
 - possible to exactly recreate the same experience in different observers

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Experimental Psychology: Europe

Herman Ebbinghaus

- 1885: published his famous “Über das Gedächtnis” (“On Memory”).
- In the work, he described his learning and memory experiments that he conducted on himself.



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Psychometrics in Europe

Alfred Binet (France, 1905–1911)

- first practical IQ test,
- concept of mental age
- IQ tests were later adapted for the military to screening recruits for the army in World War



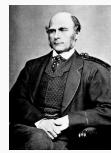
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Psychometrics in Europe

Francis Galton (UK, 1822–1911)

- concerned with the study of individual differences
- first lab for IQ measurement
- considered as the **father of psychological tests**



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Psychological Labs in United States

Few years after Wundt, several psychological lab were established in the USA

- 1883: **G. Stanley Hall** opened the first experimental psychology lab in the United States at John Hopkins University
- 1887: **James McKeen Cattell** first professor of psychology in USA, visited Wundt in Europe and established afterwards experimental psychology lab at University of Pennsylvania
- 1891: **Mary Whiton Calkins** established an experimental psychology lab at Wellesley College, becoming the **first female researcher** to form a psychology lab.

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Psychology as a discipline: United States

William James

- 1890: published his classic textbook “*The Principles of Psychology*”
- applied psychology
- educational psychology: including advice to teachers

Stanley Hall

- 1890: founded the American Psychological Association (APA)
- the first and still largest professional and scientific organization of psychologists

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Psychological Schools or Theoretical Approaches

- **Structuralism** (Wundt, Titchener)
 - Searching for the building blocks of the mind
 - Introspection to study conscious experiences and the self
- **Functionalism** (James)
 - mind has the function of helping us adapt to the environment
 - inspired by Charles Darwin
 - brain and mind are constantly changing, no building block
 - more interested in intraindividual differences than general principles

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Witmer & the first clinical psychology clinics

Wundt and James had medical training neither contributed to the study of mental illness

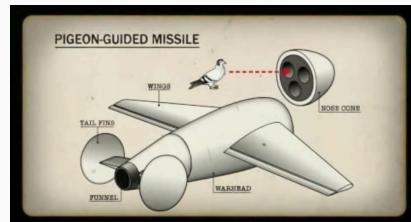
Lightner Witmer (1867–1956)

- Wundt's student in Leipzig (returned back to US)
- coined the term **clinical psychology**
- school for care and treatment of children with intellectual or behavioural problems
- founded first speech clinic in 1914.



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Skinner's Pigeon-Guided Missiles



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Thank you very much