

## 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)

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### Goals of Psychology

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

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### 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

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### 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**.

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## Predecessors of Psychology

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### 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*

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### 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

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## Rène Descartes (1596–1650)

9 / 41

- *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

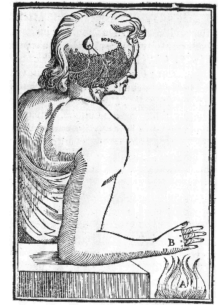
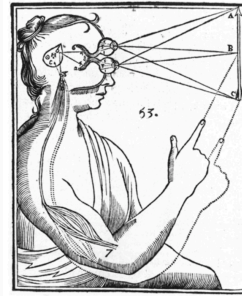


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## Descartes: Perception-Action Coupling and Reflex

10 / 41



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## First Empirical Approaches to Psychology

11 / 41

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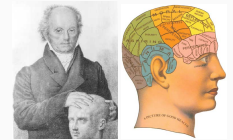


## “Early Brain Science and Psychology”

12 / 41

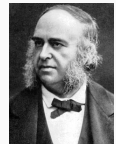
**Franz Gall** (1758–1828)

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



**Pierre Broca** (1824–1880)

- localization of function
- “*Broca's area*”: speech production areas



**Carl Wernike** (1848–1905)

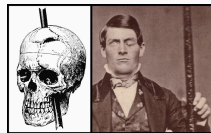
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## Phineas Gage: Landmark Case in Neuroscience

13 / 41

- 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



- **Personality Change:** impulsive, irritable and very unreliable
- demonstrates a connection between
  - brain areas and cognitive functions
  - frontal lobes and personality/behavior

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## Predecessor Disciplines: Biology & Medicine

14 / 41

**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

15 / 41

Physicians started experimenting with behavior through scientific methodologies

**Ernst Weber** (1795–1878)

- Studies on sensation and touch
- “just-noticeable difference”



**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

16 / 41

**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

17 / 41



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## Weber-Fechner Law: Illustration

18 / 41

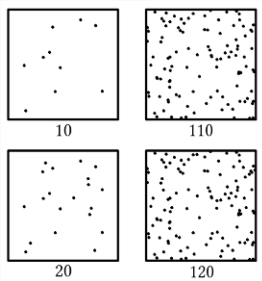


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## Weber-Fechner Law: Illustration

19 / 41



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## Ophthalmology<sup>1</sup> and Psychophysics

20 / 41

**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

1. ophthalmology = oogheelkunde

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## Helmholtz Statue in front of the Humboldt University Berlin

21 / 41



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## In the Netherlands

22 / 41



??

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## Franciscus (Franz) Cornelius Donders

23 / 41



**Donders Institute for Brain, Cognition and Behavior  
in Nijmegen**

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## Franciscus Cornelius Donders (1818-1889)

24 / 41

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

*How long does the cognitive process of deciding take?*

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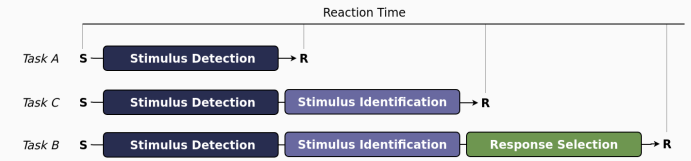
## Donders' Method of Subtraction

- **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

History of Psychology

25 / 41

## 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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26 / 41

## Modern Academic Psychology

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27 / 41

## Modern Academic Psychology

Established in the last decades of the 19<sup>th</sup> century

Characterized by

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

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28 / 41

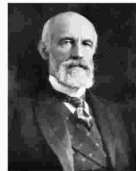
## Founding Fathers of Psychology



Wilhelm Wundt



William James



Stanley Hall

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29 / 41

## 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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30 / 41

## Wundt's Method of Experimental Introspection

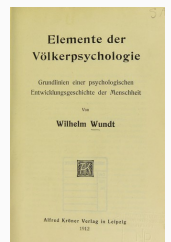
- Internal perception:
  - "pre-scientific" method of armchair subjective introspection
- Experimental self-observation/**introspection**:
  - **trained observers**
  - were exposed to situations & asked to describe experiences
  - "scientifically valid" form of introspection
  - possible to exactly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

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31 / 41

## Wundt's folk-psychology ("Völkerpsychologie")

- 10-volume book on Völkerpsychologie
- topics like language, religion, society, art, culture & law
- similarities to modern anthropology or ethnography
- Importantly, Wundt rejected to examine "higher mental processes" experimentally
- His influential students, like **Edward Titchener** (1867–1927), did not agree with folk psychology



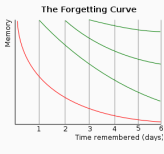
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32 / 41

## 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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Ebbinghaus Illusion



33 / 41

## 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**



- but see the idea **Eugenics**
  - ethically not acceptable (racist) ideology
  - “improving” human populations through systematic testing and controlled “breeding”
  - promoting discrimination, forced sterilization and human rights violations based on flawed concepts of genetic superiority.

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34 / 41

## 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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35 / 41

## 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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36 / 41

## 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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37 / 41

## 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
- **Behaviorism** (Watson, 1913)
  - Emphasized the need to study what is observable
  - aim: predict and control behavior.
  - people are controlled by their environment (S-R psychology)
  - classical conditioning, Pavlov (1905)

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38 / 41

## 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**.

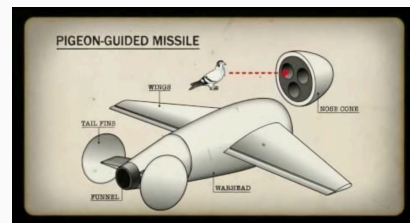


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39 / 41

## Skinner’s Pigeon-Guided Missiles



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40 / 41

**Thank you very much**

