

Wundt and German Psychology in the 1800s

By Amy Quarton

Discussion Questions

- Who contributed to German psychology in the 1800s?
- How did Herbart, Weber, and Fechner contribute to German psychology in the 1800s?
- Who was Wilhelm Wundt? How did Wundt contribute to German psychology in the 1800s?
- How did Ebbinghaus, Müller, and Külpe contribute to German psychology in the 1800s?

**Who contributed to
German psychology in the
1800s?**

Who contributed to German psychology in the 1800s?



- Johann Herbart
- Ernst Weber
- Gustav Fechner
- Wilhelm Wundt
- Hermann Ebbinghaus
- Georg Elias Müller
- Oswald Külpe
- And many more!

Who contributed to German psychology in the 1800s?

- In the **early 1800s**, Germany was a popular place to attend university.
 - There were many institutions from which to choose.
 - The atmosphere encouraged scholarly and scientific research, a philosophy known as *Wissenschaft*.
- There are no women on this list in part because they were not allowed to study at the college-level until the **mid-1800s**.

**How did Herbart, Weber,
and Fechner contribute to
German psychology in the
1800s?**

How did Herbart contribute to German psychology in the 1800s?

- **Johann Herbart** (1776-1841) was a German philosopher and founder of **scientific pedagogy**, the science of teaching.
- In **1824**, he published *“Psychology as Knowledge Newly Founded on Experience, Metaphysics, and Mathematics”*.



How did Herbart contribute to German psychology in the 1800s?

- Herbart believed we learn by observing and thinking about external objects (**reals**).
- He also believed ideas compete to be in the conscious.
 - At any given moment, the ideas dominating the conscious form the **apperceiving mass**.
 - He believed ideas with different strengths could be assigned different mathematical weights.

How did Weber contribute to German psychology in the 1800s?

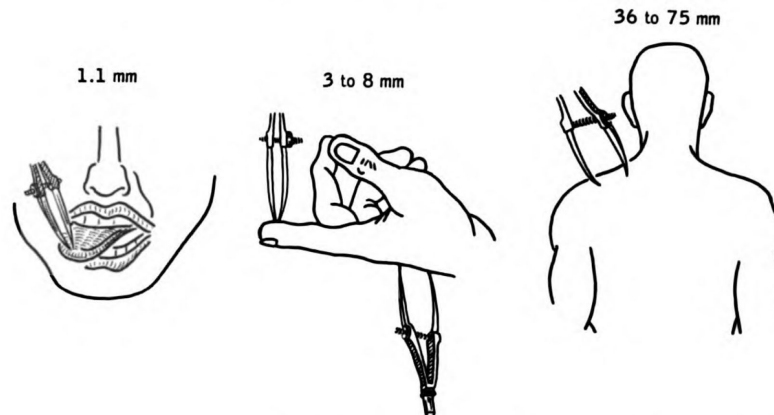
- **Ernst Weber** (1795-1878) was a German physician who conducted human experiments to study the sensation and perception.



- He mapped the skin's tactile sensitivity to identify the **two-point threshold**.
 - This is the distance at which two points on the skin are detected as two separate points instead of one.

How did Weber contribute to German psychology in the 1800s?

- Weber found that sensitive skin had a lower threshold than less sensitive skin.
 - Two points on the tongue must be about 1.1 mm apart before we can feel two distinct points.
 - Two points on the shoulder must be 36-75 mm apart before we can feel a difference.



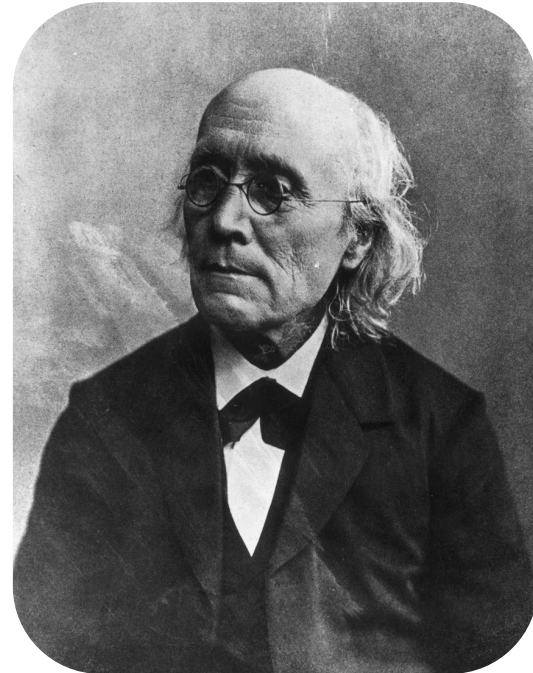
How did Weber contribute to German psychology in the 1800s?

- He also studied how much a stimulus must change for a person to sense/perceive the change.
 - How much heavier must a weight be for a person to notice/feel that it is heavier?
 - The amount of weight that is required is called the **just noticeable difference** (JND).



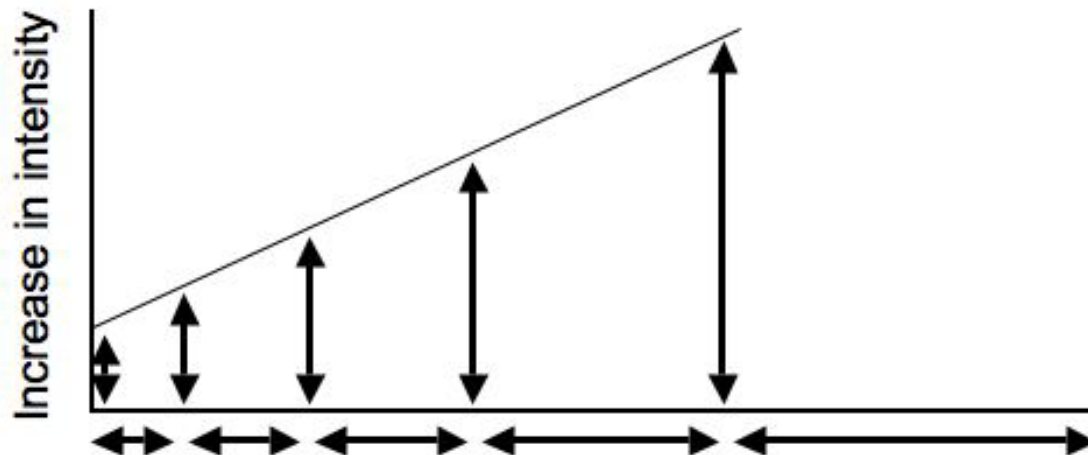
How did Fechner contribute to German psychology in the 1800s?

- One of Weber's students, **Gustav Fechner** (1801-1889), was a German philosopher and physicist.
- He was a pioneer in experimental psychology.
- He also founded **psychophysics**, the study of the relationship between stimuli and sensation.



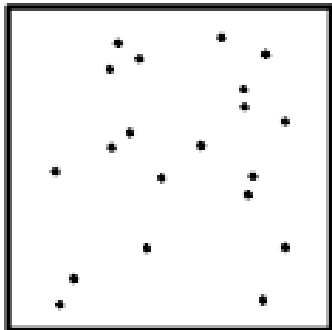
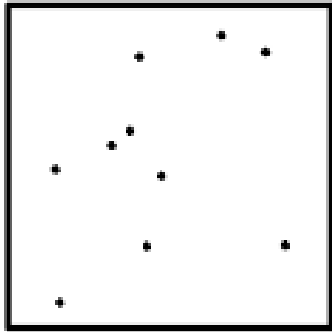
How did Weber contribute to German psychology in the 1800s?

- His **Weber's law** ($JND/S = k$) says as the intensity of a stimulus (S) increases, a greater difference between it and the comparison stimulus is necessary to perceive a change.



How did Weber contribute to German psychology in the 1800s?

- Example #1:

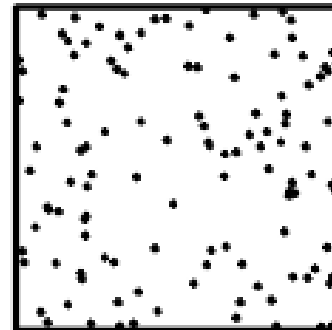
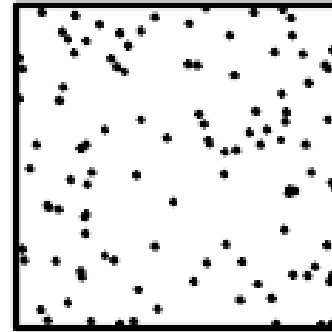


At first glance and without counting the number of dots, do these two boxes have the same number of dots?

How did Weber contribute to German psychology in the 1800s?

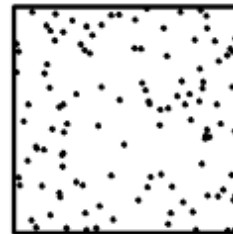
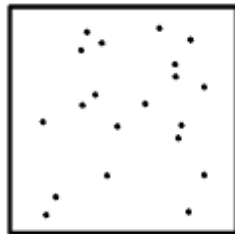
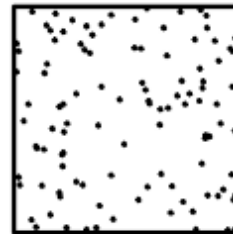
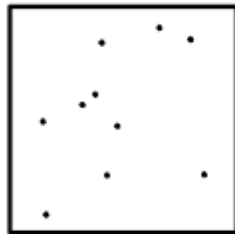
- Example #1:

At first glance and without counting the number of dots, do these two boxes have the same number of dots?



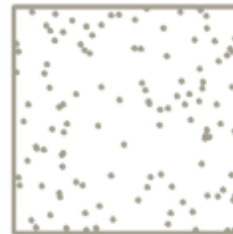
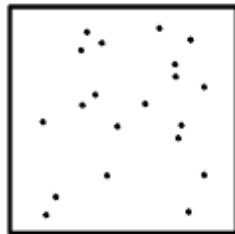
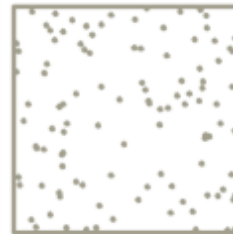
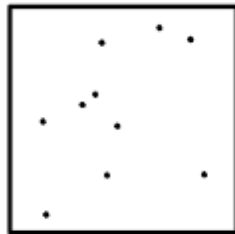
How did Weber contribute to German psychology in the 1800s?

- Example #1:
 - The difference between the two boxes in both sets is 10 dots, but most people take a few milliseconds longer to judge the second set.



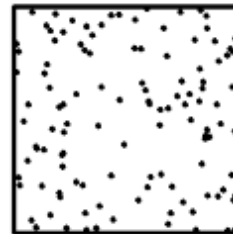
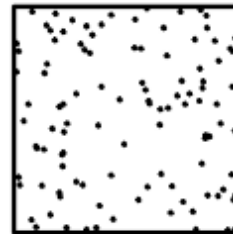
How did Weber contribute to German psychology in the 1800s?

- Example #1:
 - When there are just a few dots in each box, a 10-dot difference is just enough for us to perceive a difference.



How did Weber contribute to German psychology in the 1800s?

- Example #1:
 - When there are many dots in both boxes, a 10-dot difference is not large enough for us to quickly and easily perceive a difference.



How did Weber contribute to German psychology in the 1800s?

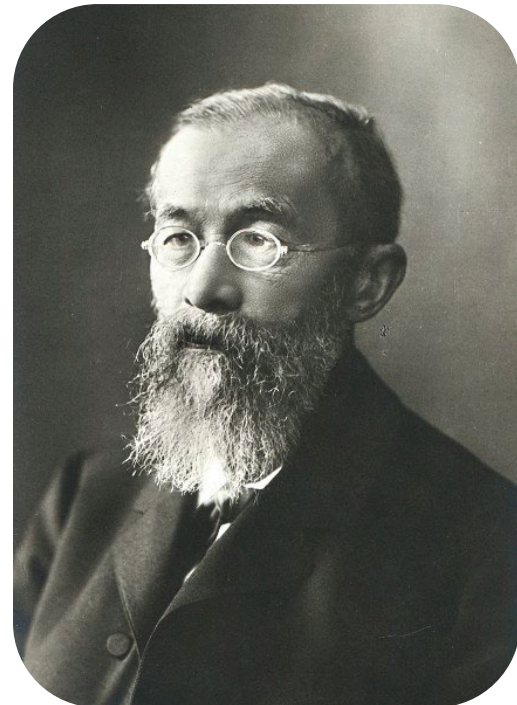
- Example #2:
 - A weightlifter bench pressing 50 pounds notices the addition of 5 pounds.
 - A second weightlifter bench pressing 500 pounds does not notice the additional 5 pounds.



**Who was Wilhelm Wundt?
How did Wundt contribute
to German psychology in
the 1800s?**

Who was Wilhelm Wundt?

- Many historians consider [Wilhelm Wundt](#) (1832-1920), a German physiologist, to be the father and founder of psychology.
- In [1856](#), he earned a MD at the University of Heidelberg.
- Impacted by Bunsen, Müller and Helmholtz, he set out to establish a “new” science.

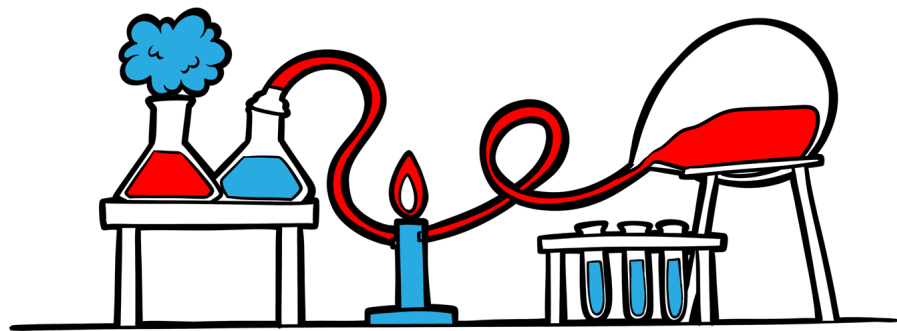


Who was Wilhelm Wundt?

- From 1857 to 1917, he taught physiology courses at several German universities.
- From 1858 to 1964, he assisted in Helmholtz's lab.
- In 1862, he taught the first scientific psychology course at the University of Heidelberg.
- Then, he taught at the University of Zurich in 1874 before becoming a professor at the University of Leipzig in 1875.

How did Wundt contribute to German psychology in the 1800s?

- In **1873-1874**, he published the 1st textbook of psychology, *Principles of Physiological (Experimental) Psychology*.
 - He urged researchers to use precise experimental methods from the physical sciences to study psychology.
 - He included descriptions of brain anatomy and function, the nervous system, and the characteristics of sensation.



How did Wundt contribute to German psychology in the 1800s?

Wundt's illustrations of brain cells

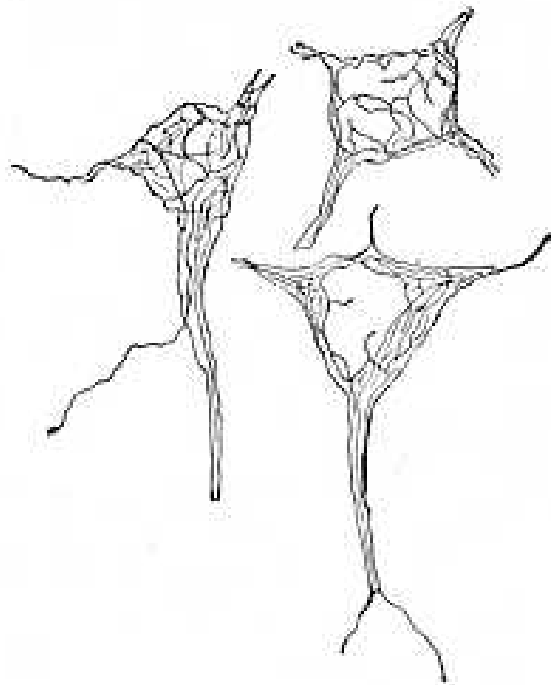


FIG. 13. Pericellular reticula of nerve-cells, stained by the silver method. After Golgi.

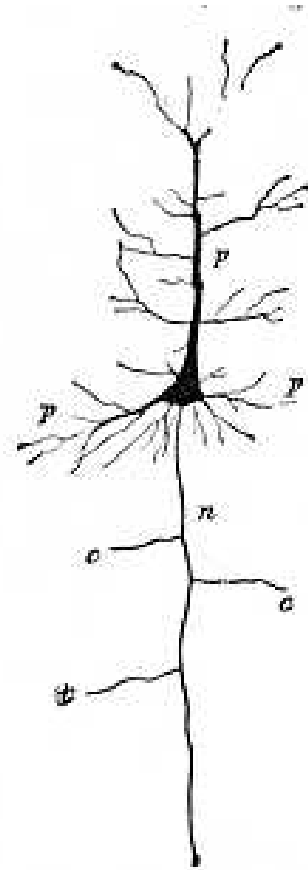


FIG. 14. Pyramidal cell from the cerebral cortex, stained by the silver method. After RAMON Y CAJAL. *pp* Dendrites. *n* Neurite. *c* Collaterals.

How did Wundt contribute to German psychology in the 1800s?

- In the **mid-1870s**, he started collecting equipment in a 400 square foot laboratory for teaching demonstrations.
- E.g., tachistoscopes, chronoscopes, sensory mapping devices, electrical stimulators, pendulums, timers



Wundt's pressure gauge



Wundt's timing apparatus

How did Wundt contribute to German psychology in the 1800s?

- In 1879, Wundt and his students began to conduct human experiments in the lab.
 - They studied only immediate conscious experiences (e.g., sensation and perception) as he did not think higher mental processes could be studied in the lab.
 - Many historians consider this to be the 1st experimental psychology lab!
 - It was destroyed by Allied bombing in World War II.

How did Wundt contribute to German psychology in the 1800s?

- To collect data, Wundt relied on his method of **internal perception**.
 - First, participants experienced some stimuli.
 - Then, they immediately describe their experience and make judgments about the size, intensity, and/or duration of their perceptions and sensations.
 - Eventually, this method becomes Edward Titchener's experimental introspection.

How did Wundt contribute to German psychology in the 1800s?

Wundt sitting
in his lab
surrounded by
some of his
students in
1880



How did Wundt contribute to German psychology in the 1800s?

- Throughout his career, he supervised 186 dissertations!
 - E.g., Hall, Cattell, Kraepelin, Munsterberg, Külpe, Titchener, and Spearman
 - His PhD students established their own laboratories, journals, and graduate programs at other universities.
 - He trained three dozen American students who would eventually bring psychology to the United States.

**How did Ebbinghaus,
Müller, and Külpe
contribute to German
psychology in the 1800s?**

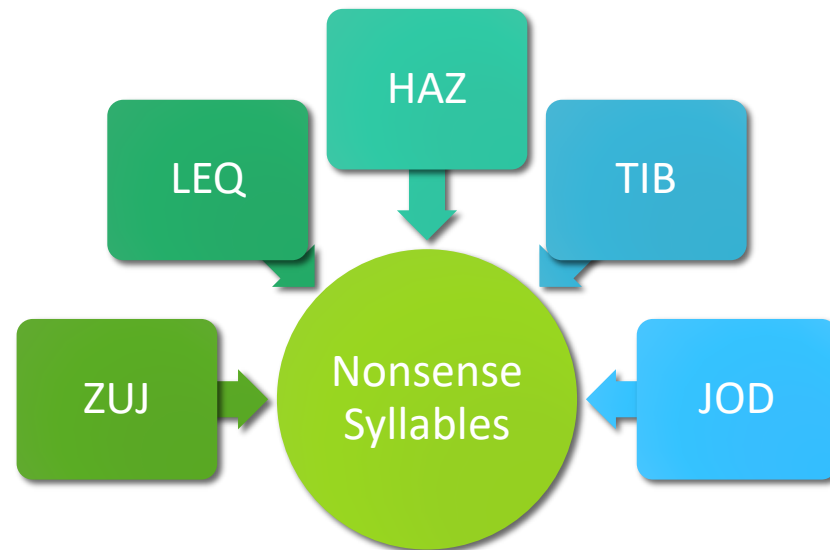
Who is Hermann Ebbinghaus?

- **Hermann Ebbinghaus** (1850-1909) was a German psychologist and pioneer in the experimental study of memory.
- In **1873**, he earned his PhD from the University of Bonn.
- Despite studying only his own memory, his results have been replicated and his conclusions supported by contemporary researchers.



How did Ebbinghaus contribute to German psychology in the 1800s?

- In the **1870s**, he used “nonsense syllables” to study the initial formation of associations.
- He also studied forgetting, practicing, and serial learning.



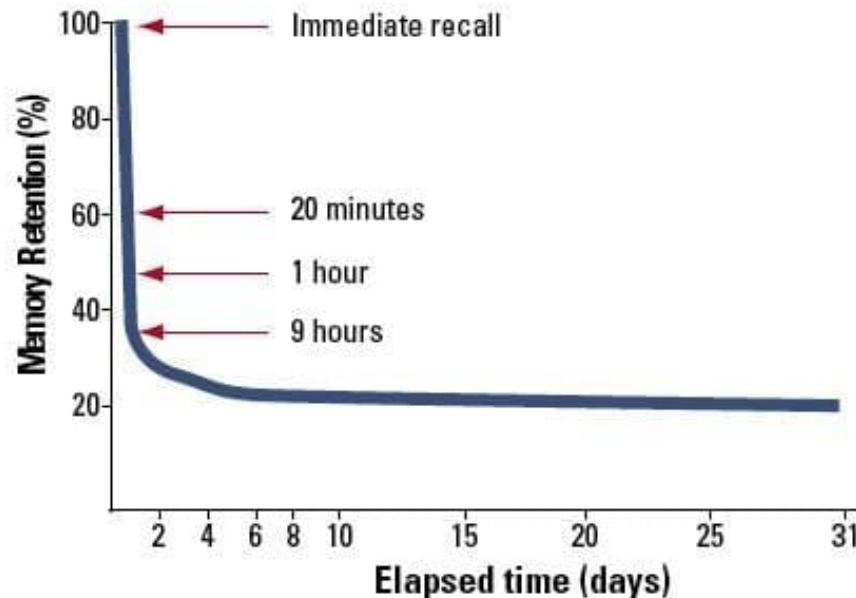
How did Ebbinghaus contribute to German psychology in the 1800s?

- He concluded:
 - Lists with 7 or fewer syllables can be learned in a single repetition.
 - Memory performance is better when learning is distributed over time.
 - The rate of forgetting is rapid at first and then slows over time.

How did Ebbinghaus contribute to German psychology in the 1800s?

- After you take an exam, your memory begins to let go of some information.

The forgetting curve



- In the first few days, you will forget a lot of information.
- In following weeks, you will forget fewer bits of information.

How did Müller contribute to German psychology in the 1800s?

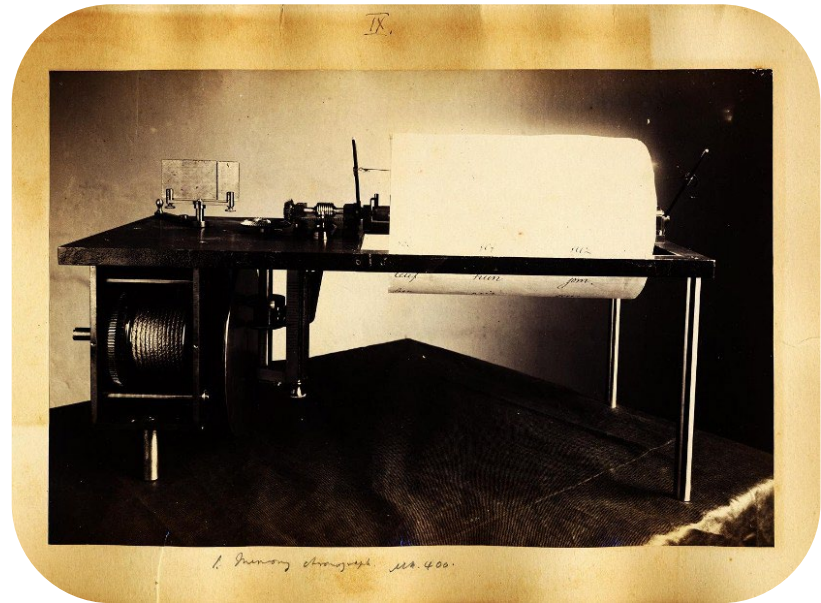
- **Georg Elias Müller** (1850-1934) also studied memory as an experimental psychologist.



- In **1873**, he earned a PhD from the University of Göttingen.
- He believed we are more active learners than Ebbinghaus suggested.

How did Müller contribute to German psychology in the 1800s?

- In 1887, Müller invented the **memory drum** to automatically present stimuli to participants.
- He also discovered **retroactive interference**, which occurs when new and unrelated material makes it difficult to recall previously learned material.



How did Külpe contribute to German psychology in the 1800s?

- **Oswald Külpe** (1862-1915) was a German structural psychologist and known as the second founder of psychology.
 - In **1887**, he earned his PhD from the University of Leipzig and studied with Wundt.
 - He also worked in Müller's lab for one year.



How did Külpe contribute to German psychology in the 1800s?

- Unlike Wundt and Müller, **Külpe** believed complex mental processes could be studied experimentally.
- He adapted Wundt's internal perception and called it **systematic experimental introspection**.
 - Participants described their experience *after* performing a complex task.



How did Külpe contribute to German psychology in the 1800s?

- **Külpe** also discovered evidence for:
 - **Mental sets**, an unconscious problem-solving strategy.
 - **Imageless thought**, the notion that thinking that does not depend on mental images.
- His graduate students (Wertheimer and Koffka) would go on to establish gestalt psychology.