

# The development of experimental psychology throughout history



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The introduction of experimentation into psychology was a turning point for this discipline, as the past notion was that mental processes could only be analyzed by philosophical and theological points of view, building a foundation of speculation as a way of explaining mental phenomena. However, this climacteric, known as experimental psychology or modern psychology, contradicted the original, widely-accepted thoughts by utilizing scientific inquiry to make conclusions about psychological abnormalities and the human psyche overall. The switch from a philosophical to a physiological frame of mind allowed psychologists to, “bring [sic] the experimental method to the investigation of the mind,” as related in *American Psychologist* (Benjamin, 2000, 318-321). Therefore, the use of the scientific method led to significant advances in the clinical aspect of psychology, providing more effective evaluation and treatment of patients with psychiatric abnormalities. The ideas originally introduced into this discipline by experimental psychology shaped modern thinking in that they served as a foundation for the line of thought that is still in use today, which is why it is often referred to as “Modern Psychology”. By discovering how to perform experiments on the mind, the realm of psychology switched from a philosophical perception to a scientific one, providing more accurate data due to the repetition of observations and detailed recordings. We will begin by distinguishing the landmark in history that defined experimental psychology as well as the prior events that led up to it. Important psychologists and physiologists, particularly Wilhelm Wundt, will be reviewed along with their contributions to this conversion of inquiry. In that, we will look not only at how experimental psychology has evolved over time, but

also how the specifics of the laboratory, which serves an essential purpose, has changed to adapt to new advances in technology.

*American Psychologist* conveys the true event that started it all by relating, “It is the establishment of the laboratory that marks the transition of psychology from philosophy to science” (Benjamin, 2000, 318-321). The laboratory to which is being referred was founded in 1879 by Wilhelm Wundt—who is also dubbed the “father of psychology”—and was located at Leipzig University in Germany (Nicolas & Ferrand, 1999, 194-203). However, while this establishment officially marks the beginning of utilizing scientific methods to analyze the mind, there were other contributors that explored this concept prior to Wundt at Leipzig as well. To look at these other individuals, it is necessary to first explore the first thought patterns that supported psychology as a science. *History of Psychology* relates that these thoughts stem from, “the Newtonian conception of science.”; or, the measuring of the something quantitatively, as opposed to the qualitatively, to explain, “general laws of nature.” The article continues to identify one of the first tries at using quantitative measurement for psychological purposes—mental chronometry, or, “the measurement of reaction times” (Boynton & Smith, 2006, 113-143). This measuring tool was used pragmatically by astronomers, in the time period around 1816, to analyze the exact movements of stellar material. However, in terms of psychological utilizations, mental chronometry was used by Hermann von Helmholtz in 1950 to compute a frog’s reaction time, by way of measuring, “the speed of neural impulse in a frog’s leg.” The method used was characterized by administering an electrical stimulation, “to the motor nerve near the muscle

versus farther from the muscle” (Boynton & Smith, 2006, 113-143). This computing of neural impulses used physiological input, electricity to the motor nerve, to evaluate a psychological response, a muscle twitch in the frog’s leg, which successfully associated the mind with the body. It’s important to note that this experimentation happened prior to the “ actual” beginning of experimental psychology—Wundt’s laboratory at Leipzig.

Gustav Fechner is another psychologist who some consider to be the founder of experimental psychology alongside Wundt. Fechner’s main contribution was his concept of psychophysics, or the connection between mind and body. *American Psychologist* distinguishes Fechner by describing his, “ crucial insight on October 22, 1850, about how the physical and psychological worlds could be compared quantitatively,” as his salient contribution to experimental psychology (Benjamin, 2000, 318-321). He drew influence from what *History of Psychology* relates as a, “ sensory physiologist,”—Ernst Weber—who is known for his research, occurring during the 1840s, on, “ the just noticeable difference,” or the percentage change in sensory stimulus, which he believed remained at a, “ constant ratio” (Robinson, 2010, 424-433). However, in the 1850s, Fechner built on the foundation laid by Weber and came to a conclusion he coined, “ the ‘ Weber law’,” in which, in terms of sensation, “ the just noticeable difference, or threshold, was a stable unit of measurement” (Robinson, 2010, 424-433). This renewed version of this sensory concept served as the basis for Fechner’s *Elements of Psychophysics*, published in 1860.

Another individual who incorporated experimentation into their psychological research prior to Wundt was F. C. Donders, relevant alongside Fechner in the <https://assignbuster.com/the-development-of-experimental-psychology-throughout-history/>

1860s. He was a, “ Dutch physiologist,” who drew from Helmholtz’s concept of the infinity of neural impulses, “ in an attempt to measure the speed of central psychological processes;” The experiments he ran were comprehensive and thorough, with results revealing, “ he had successfully measured the time required for mental actions,” which was a new accomplishment to the discipline of psychology at that time (Boynton & Smith, 2006, 113-143). The experimental method used by Donders in his observations, coined the Donders method, was an influencer on the perspective of the true father of psychology, Wilhelm Wundt. Boynton and Smith relate the early concepts Wundt adopted including making, “ Donders-style mental chronometry a cornerstone of research at his Leipzig Institute for Experimental Psychology” (Boynton & Smith, 2006, 113-143).

The events prior to the formal beginning of experimental psychology set the tone for the eventual acceptance of utilizing scientific methods to analyze the mind. Wundt followed in the footsteps of Fechner, Donders, and the like by expanding upon their methods of experimentation and officially introducing psychology as a science in 1879 at his laboratory in Leipzig. Five years prior, though, he published, “ *Grundzüge der Physiologischen Psychologie*, the book that offered the first compendium of the 19<sup>th</sup>-century work that was the basis for the science of psychology,” as stated in *American Psychologist* (Benjamin, 2000, 318-321). While Wundt played a crucial role in reinventing this discipline with experimentation, he was most passionate about a different domain of psychology, which Wundt referred to as “ *Völkerpsychologie*”, or psychology associated with culture. *History of Psychology* relates how this domain differs from experimental psychology in <https://assignbuster.com/the-development-of-experimental-psychology-throughout-history/>

that it, “ studies the ‘ higher’ mental phenomena (such as concept formation),” and describes it as the psychology of, “ languages, customs, myths, and so on” (Nerlich & Clark, 1998, 179-204). This concept is important to note in discussing Wundt’s role in the history of psychological experimentation because he considered Völkerpsychologie to be that of, “ the most satisfying experiences in his working life.” This is considered, “ a branch of the human sciences,” which differs from his more recognized work, experimental psychology, which was, “ a branch of the natural sciences,” (Wong, 2009, 229-265).

Furthermore, during the time period around the establishment of Wundt’s laboratory in 1879, the majority perception of psychology by the general public had an opposing view to that of Wundt’s. *American Psychologist* details the consensus point of view of the public, in that they generally, “ associated psychology with spiritism, the occult, and other paranormal subjects.” Psychologists attempted to alter the public’s perception, “ with articles in newspapers and popular magazines, public exhibitions, and popular speeches,” concerned with promoting, “ the new science of psychology” (Benjamin, 2000, 318-321). Some of their trials did gain attention and were able to increase knowledge of some; however, the public did not widely accept the incorporation of science into psychology until the turn of the 19<sup>th</sup> century, which will be further elaborated on.

While psychology laboratories were abundantly significant in Germany, particularly at Leipzig, experimental resources in America were lagging behind. So, why was this new branch of psychology flourishing in Germany?

*American Psychologist* attributes the success to Wundt's method of using a, "community approach," in the laboratory; since he was the first to view experimentation as an, "organized and self-conscious activity of a community of investigators." Benjamin continues in his article, discussing how the new methods of experimentation, used by Wundt, differed from Helmholtz, Fechner, Donders, and others who influenced his perspective, in that they, in comparison practiced, "solitary investigations" (Benjamin, 2000, 318-321). By conducting experiments with others of like interests, Wundt allocated added importance to the laboratory by making it a shared place to promote scientific inquiry as well as a place where one can utilize colleagues by adding to and extending their research. This newfound take on a psychological laboratory introduced the science aspect of the mind to other parts of the world, such as the United States; however, most individuals seeking a doctoral degree had to attend an institution in Europe, prior to 1900 (Benjamin, 2000, 318-321).

In fact, one individual who traveled to Leipzig from America, "for postdoctoral study," was G. Stanley Hall in 1879; however, he primarily studied under another professor there, aside from Wundt, Carl Ludwig, who led, "the physiological laboratory" located at the university (Benjamin, 2000, 318-321). Hall's increased knowledge and experience allowed him to become the first to open a laboratory specifically dedicated to psychological experimentation in America, which he achieved in 1883 at Johns Hopkins University, as conveyed by Benjamin (Benjamin, 2000, 318-321). However, even with this accomplishment, America still did not completely excel in this branch of psychology. With Wundt being the widely acknowledged pioneer in

this field, it was essential that his concepts and methods were capable of being conveyed to those who did not speak his native language—German. Wong writes in his *History of Psychology* article from Wundt's daughter, Eleonore's, perspective, which is considered the most accurate account of her father's history; it is explained that America's lack of knowledge was due to the limited number of Wundt's published works that were translated to English. Wong states, "Of the seven items selected for translation..., four of them fall into the category of general and experimental psychology" (Wong, 2009, 229-265). So, how could American laboratories draw influence from Wundt in attempt to match his methods if they are not able to comprehend his published works? It started with Hall, who had studied, directly and indirectly, under Wundt and brought the correct methods from Leipzig to America. Others followed suit in establishing psychological laboratories in the United States. Benjamin notes, "Many of the American laboratories that followed in the last two decades of the 19<sup>th</sup> century were founded by individuals who had studied with Wundt or Hall" (Benjamin, 2000, 318-321). Therefore, the difficulty in understanding Wundt's methods were mediated by the continuation of passing down information from professor to student.

Two past doctoral students of Wundt, who also were early founders of laboratories in America, were James McKeen Cattell and Harry Kirke Wolfe, who both graduated from Leipzig in 1886. They faced similar challenges that were common to experimental psychologists in America at that time, characterized by a lack of support and resources to achieve the laboratory standards set by Wundt in Germany. Additionally, Benjamin recounts a letter written by Cattell that describes his time studying under Wundt by stating, "

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We discover new facts and must ourselves invent the methods we use. We work in a new field, where others will follow us, who must use or correct our results" (Benjamin, 2000, 318-321). Therefore, the struggles they faced in getting the public to accept modern psychology was partly due to the novelty and unfamiliarity surrounding it. While Cattell had better success at establishing laboratories at Columbia University and the University of Pennsylvania, Wolfe was not as fortunate in his attempt at starting a laboratory in 1889 at the University of Nebraska. Benjamin relates part of Wolfe's argument for the university to provide funding, stating, "'No field of scientific research offers such excellent opportunities for original work; chiefly because the *soil is new*' (Benjamin 1993, p. 58)" (Benjamin, 2000, 318-321). While his individual efforts proved not to be fruitful, the public opinion of modern, or experimental, psychology in America altered not long after, as, " By the 1890s, the founding pace accelerated," with psychology laboratories becoming included in the curriculum of numerous universities (Benjamin, 2000, 318-321).

The turn of the century proved to be yet another climacteric in the history of experimental psychology. Benjamin explores this time period by describing a shift in the United States, characterized by a decrease in the number of students attending universities overseas; he states, " in the 25 years after 1904 less than 15% of American psychologists had earned degrees from foreign universities" (Benjamin, 2000, 318-321). Furthermore, in those that pursued secondary education in psychology after 1900, it became the norm to be required to endure a mandatory, " year-long laboratory course" (Benjamin, 2000, 318-321). In continuance, similar to Wundt's establishment

of the standards for psychological laboratories in Germany, pioneers in America, specifically Edward B. Titchener, also produced text on methods and guidelines to follow in a laboratory setting, providing a set standard for American universities to follow.

With the rapid expansion and overall development of psychological laboratories at the turn of the century, the need for advances in the instruments used developed as well. *History of Psychology* reiterates this point by providing evidence by stating, “ the sheer number of instruments used...grew, as witnessed by the growth of a market for psychological instrument makers around 1900” (Sturm, 2005, 3-34). For example, retracing back to Helmholtz’s use of mental chronometry, we can look at the development of the instrument used in this mode of recording reaction times—the Hipp chronoscope. Sturm explains the use for this instrument precedes it’s function in psychology by first being, “ developed and applied in physics, ballistics, and physiology” (Sturm, 2005, 3-34). However, Helmholtz use introduced how this instrument could be applied to psychology as a precise means of measuring reaction times. The Hipp chronoscope continued to be utilized in psychology laboratories well into the 20<sup>th</sup> century; but, eventually newer, more accurate, and even more simple means of measurement were discovered. For example, according to Sturm, “ applied psychologists soon gave up using the Hipp chronoscope,” because, “ a stopwatch may be all that is needed to check reaction times in applied contexts” (Sturm, 2005, 3-34). However, as technology further developed, many of the original instruments used were, according to Benjamin, “ replaced largely by a single instrument, the computer” (Benjamin, 2000, 318-321).

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Throughout the duration of switching from philosophical psychology to experimental psychology, many factors, and individuals, have contributed to its development. What started as a far-fetched and abnormal view on explaining the mind, seen in the efforts of Helmholtz, Fechner, Donders, and others prior to Wundt's establishment at Leipzig, ended with the line of thought practiced and accepted today—modern psychology. While there were many opposing arguments and consternation about accepting psychology as a science, Capshaw in *American Psychologist* relates two, “themes,” that did remain constant after experimental psychology took off after the turn of the 19<sup>th</sup> century. Capshaw explains one as the, “consensus that laboratory experimentation lies at the heart of scientific psychology,” and the other being the salience psychologists have consistently placed on the role of instruments in conducting experiments (Capshaw, 1992, 132-142). These constant, repeated thought patterns show the immense impact of all those involved in the founding of experimental psychology had on what the majority now refer to simply as “psychology”.

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