

A History of Modern Psychology

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FDA Raid: Target Coca-Cola

During the evening of October 20, 1909, U.S. federal agents stopped a truck on the highway outside of Chattanooga, Tennessee. They were conducting a drug bust under the provisions of the recently enacted Federal Food and Drugs Act. Their target was a shipment of 40 barrels and 20 kegs containing a substance the government claimed was poisonous and habit-forming. The syrup in the kegs and barrels was the basis of Coca-Cola; the deadly, addictive ingredient was caffeine.

If found guilty, the management of the Coca-Cola Company would have been in serious trouble. They spared no expense preparing for the case that finally went to trial in 1911. As the court date grew closer, the corporate lawyers realized that they had no evidence to demonstrate that the amount of caffeine in the soft drink had no harmful effects on human behavior or thought processes. They needed to recruit a psychologist to conduct an impressive research program—and hope that the results would prove their point.

First they asked James McKeen Cattell, one of the most prominent psychologists in the United States, but he was not interested, nor were several others. But one man was eager to accept what he perceived as a great opportunity. His name was Harry Hollingworth.

"With me there was a double motive at work," he wrote. "I needed money, and here was a chance to accept employment at work for which I had been trained, with not only the cost of the investigation met but with a very satisfactory retaining fee and stipend for my time and services" (quoted in Benjamin, Rogers, & Rosenbaum, 1991, p. 43).

Hollingworth was then teaching at Barnard College in New York City, being paid little more than a subsistence wage. His wife, Leta Stetter, had been unable to secure a teaching job (because of her married status), and she had been unsuccessful in selling her short stories. She had hoped to go to graduate school, but the couple could not afford it. Thanks to the Coca-Cola case, however, she was appointed assistant director of the research program and together the Hollingworths earned enough money to pay her way through the graduate program.

Despite the financial gain, Harry Hollingworth insisted on the highest ethical standards. He would not be accused of providing only the answers the company desired. Coca-Cola agreed to his terms. He would be permitted to publish his results even if they proved harmful to the company; in turn, the company agreed not to use his findings in advertising, no matter how favorable they might turn out to be.

The intensive 40-day research program, as rigorous and sophisticated as any conducted in the best equipped laboratory of the finest university, involved approximately 64,000 individual measurements. Data were recorded on a wide range of motor and mental functions under conditions providing various dosages of caffeine. No harmful effects or significant declines in performance were found.

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The Coca-Cola Company won the case, though the verdict was later overturned by the Supreme Court, and the effects on the Hollingworths, and on psychology as a whole, were profound. They demonstrated that sound experimental research could be funded by a major corporate entity without dictating or otherwise prejudicing the results. A more lasting effect was the knowledge that psychologists could have successful and financially rewarding careers in applied psychology without challenging their professional integrity.

Toward a Practical Psychology

Evolutionary doctrine and the functional psychology that derived from it rapidly took hold in the United States toward the end of the nineteenth century. We have seen that American psychology was guided much more by the ideas of Darwin, Galton, and Spencer than by the work of Wundt. This was a curious, even paradoxical, historical phenomenon. Wundt trained many of the first generation of American psychologists in his form of psychology, yet they brought few of his ideas home with them. When these students of Wundt's—these new psychologists—returned to the United States, they set about establishing a psychology that bore little resemblance to what Wundt had taught them. Thus, the new science, not unlike a living species, was changing to adapt to its new environment.

Wundt's psychology and Titchener's structuralism could not long survive in their original form in the American intellectual climate—the American *Zeitgeist*—and so they evolved into functionalism. They were not practical kinds of psychology; they did not deal with the mind in use and could not be applied to everyday demands and problems. American culture was oriented toward the practical; people valued what worked. “We need a psychology that is usable,” wrote G. Stanley Hall. “Wundtian thoughts can never be acclimated here, as they are antipathetic to the American spirit and temper” (Hall, 1912, p. 414).

The new American psychologists transformed the German species of psychology in aggressive American fashion. They began to study not what the mind is but what it does. While some American psychologists—notably James, Angell, and Dewey—were developing the functionalist approach in academic laboratories, others were applying it in settings outside the universities. This move toward a practical psychology was occurring at the same time that functionalism was being founded as a separate school of thought.

The applied psychologists took their psychology into the real world, into the schools, factories, advertising agencies, courthouses, child guidance clinics, and mental health centers. In doing so, they changed the nature of American psychology even more radically than had functionalism's academic founders. The professional literature reflects their impact. By around 1900, 25 percent of the research articles published in American psychology journals dealt with applied psychology and less than 3 percent involved introspection (O'Donnell, 1985). The approaches of Wundt and Titchener, themselves so recently the “new” psychology, were rapidly being overtaken by a newer psychology. Even Titchener, the great structural psychologist, recognized this sweeping change in American psychology. In 1910 he wrote, “If, then, one were asked to sum up, in a sentence, the trend of psychology during the past ten years, one's reply would be: Psychology has leaned, very definitely, toward application” (quoted in Evans, 1992, p. 74).

The Growth of American Psychology

Psychology grew and prospered in the United States. The vibrant development of American psychology during the years 1880 to 1900 was a striking phenomenon in the history of science:

- *In 1880, there were no laboratories in the United States; by 1900 there were 41, and they were better equipped than laboratories in Germany.*
- *In 1880, there were no American psychology journals; by 1895 there were three.*

- In 1880, Americans had to go to Germany to study psychology; by 1900, most chose to enter graduate programs at home; by then there were some 40 doctoral programs at U.S. universities.
- From 1892 to 1904, over 100 Ph.D.s were awarded in psychology, more than in any other science except chemistry, zoology, and physics.
- In 1910, more than 50 percent of all published articles in psychology were written in the German language; only 30 percent were in English. By 1933, 52 percent of the articles published were in English and only 14 percent in German (Wertheimer & King, 1994). By the end of the twentieth century, English had become the dominant language at international meetings and in the published literature; the APA journal *Psychological Abstracts* no longer covered publications in languages other than English (Draguns, 2001).
- The British publication *Who's Who in Science* for 1913 stated that the United States was predominant in psychology, having more of the world's leading psychologists (84) than Germany, England, and France combined (Benjamin, 2001; Joncich, 1968; Wertheimer & King, 1994).

In little more than 20 years after psychology began in Europe, then, American psychologists assumed undisputed leadership of the field. In his 1895 APA presidential address, James McKeen Cattell reported:

[The] academic growth of psychology in America during the past five years is almost without precedent. Psychology is a required subject in the undergraduate curriculum ... and among university courses psychology now rivals the other leading sciences in the number of students attracted and in the amount of original work accomplished. (Cattell, 1896, p. 134)

Along with growing student interest in psychology, the number of psychology laboratories increased rapidly. The 41 laboratories in the United States in 1900 represented the majority of the research labs worldwide. The European countries counted no more than 10 (Benjamin, 2000a). Thus, psychology was advancing in the classroom, in the experimental laboratory, and in the real world.

The general public took an immediate and avid interest in this fledgling discipline. Students began flocking to both undergraduate and graduate programs. Popular magazines devoted feature articles to the discipline's promising new discoveries ... and anticipated exciting practical applications in education, industry, and medicine. (Fuller, 2006, p. 221)

Psychology made its debut before an eager American public at the 1893 Chicago World's Fair. In a program similar to Galton's anthropometric laboratory in England, psychologists organized exhibits of research apparatus and a testing laboratory in which visitors could have their sensory capacities measured for a small fee. People were delighted:

Magazines and newspaper reports on the fair applauded the psychological laboratory, which contained the largest collection of instruments and appliances ever brought together in America, as the exposition's greatest educational contribution. The fact that psychologists were given an official exhibit there for the first time at an international fair demonstrated that the discipline had finally conceded popular recognition. (Shore, 2001, pp. 72, 83)

An even more extensive exhibition was mounted at the 1904 Louisiana Purchase Exposition in St. Louis, Missouri. This star-studded event featured talks by some of the leading psychologists of the day: E. B. Titchener, C. Lloyd Morgan, Pierre Janet, G. Stanley Hall, and John B. Watson. Such a popular display of psychology would not have found favor with Wundt, and of course nothing like it ever took place in Germany. The popularizing of psychology reflected the American temperament. It substantially

remade Wundt's form of psychology into functional psychology and extended it far beyond the experimental laboratory.

Thus, America embraced psychology with enthusiasm and quickly welcomed it into college classrooms and everyday life. The scope of the field today is far broader than its founders ever thought possible, or even desirable. One current evaluation noted that "psychological research is dominated by Americans" who conduct more research than psychologists in all other countries, even though the United States accounts for less than 5 percent of the world's population (Arnett, 2008, p. 602).

Economic Influences on Applied Psychology

Although the American *Zeitgeist*—the intellectual spirit and temper of the times—helped foster the emergence of applied psychology, other more practical contextual forces were also responsible for its development. In Chapter 1 we discussed the role of economic factors in shifting the focus of American psychology from pure research to application. While the number of psychology laboratories was increasing toward the end of the nineteenth century, the number of Americans with doctoral degrees in psychology was growing even faster. Many of these new Ph.D.s, particularly those without an independent source of income, were forced to look beyond the university for means of economic survival, as was the case with Harry Hollingworth and his work for Coca-Cola.

Hollingworth performed applied research for a number of companies; for example, determining the most effective advertisements for a firearms manufacturer and also for Wrigley's chewing gum. He reported that the act of chewing gum relaxed muscle tension and helped people feel at ease (Hollingworth, 1939). He once told a friend that he "never considered any of his investigations to lie in the field of applied psychology. He thought of them as straightforward efforts to discover the nature of certain facts and relationships" (see Poffenberger, 1957, p. 139).

Hollingworth was not alone in conducting research that could be applied to real-world problems. Other pioneers in applied psychology also acted out of economic necessity. This does not mean that they did not find challenge and stimulation in their practical work. Most did, and they also came to recognize that human behavior and cognitive activities could be studied in real-world settings as effectively as in academic laboratories. Also, some psychologists chose to work in applied areas out of a genuine desire to do so. Yet the fact remains that many of the first generation of applied psychologists in the United States were compelled to abandon their dreams of pure academic experimental research as the only way to escape a life of poverty.

The situation was more critical for psychologists teaching at less endowed state universities in the Midwest and West. By 1910, one-third of American psychologists held such positions, and as their numbers grew so did the pressure on them to deal with practical problems and thus prove to their college administrators and state legislators that the new field of psychology had some financial worth.

In 1912, C. A. Ruckmick surveyed psychologists in the United States and concluded that psychology was held in low esteem by administrators at colleges and universities, despite its popularity with students. The courses were under-funded and the laboratories poorly equipped, and there seemed to be little hope for improvement. It appeared that the only way to increase departmental budgets and faculty salaries was to demonstrate to college administrators and politicians that the science of psychology could help cure society's ills.

G. Stanley Hall advised a Midwestern colleague to make psychology's influence felt "outside the university, lest some irresponsible, sensational man or party criticize it in the legislature." Cattell urged colleagues to "make practical applications and develop a profession of applied psychology" (quoted in O'Donnell, 1985, pp. 215, 221).

The solution was obvious: make psychology more valuable by applying it. But applying it to what? Fortunately, the answer soon became clear. Public school enrollments were increasing dramatically. Between 1870 and 1915 they rose from 7 million to 20 million, and government spending on public education during that period grew from \$63 million to \$605 million (Siegel & White, 1982). Education had become a big business, and this development caught the attention of psychologists.

Hall proclaimed that the “one chief and immediate field of application for [psychology] was its application to education” (Hall, 1894, quoted in Leary, 1987, p. 323). Even William James, who could not be considered an applied psychologist, wrote a book called *Talks to Teachers*, about the uses of psychology in the classroom (James, 1899). By 1910 more than one-third of American psychologists expressed interest in applying psychology to problems in education, and three-fourths of those calling themselves applied psychologists were already working in that area. Psychology had begun to find a place in the real world.

We discuss in this chapter the careers and contributions of four applied psychologists who extended the new science into other areas, including industry, psychological testing, the criminal justice system, and mental health clinics. These psychologists were trained by Wundt at Leipzig to become academic psychologists, but they all moved away from Wundt’s teachings when they began their careers in American universities. They provide striking examples of how American psychology came to be influenced more by Darwin and Galton than by Wundt, and how the Wundtian approach was refashioned when transplanted to American soil.

Mental Testing

The functionalist spirit of American psychology was also well represented in the life and work of James McKeen Cattell, who promoted a practical, test-oriented approach to the study of mental processes. Cattell’s psychology was concerned with human abilities rather than the content of consciousness, and in this respect he comes close to being a functionalist.

James McKeen Cattell (1860–1944)

Cattell was born in Easton, Pennsylvania. He earned his bachelor’s degree in 1880 at Lafayette College, where his father was president. Following the custom of going to Europe for graduate studies, Cattell went first to the University of Göttingen and then to Leipzig and Wilhelm Wundt.

A paper on philosophy won Cattell a fellowship to Johns Hopkins University in 1882. At the time his major interest was philosophy, and during his first semester at Hopkins no psychology courses were offered. Apparently Cattell became interested in psychology as a result of his own experiments with drugs. He tried a variety of substances—hashish, morphine, opium, caffeine, tobacco, and chocolate—and found the results to be of both personal and professional interest. Some drugs, notably hashish, cheered him considerably and reduced his depression. He recorded in a journal the effects of the drugs on his cognitive functioning.

“I felt myself making brilliant discoveries in science and philosophy. My only fear being that I could not remember them until morning.” Later he wrote, “Reading has become uninteresting. I keep reading without paying much attention. It takes a long time to write a word. I’m rather confused” (quoted in Sokal, 1981, pp. 51, 52). Cattell was not so confused that he failed to recognize the psychological importance of the various drugs, however, and he observed his own behavior and mental state with increasing fascination. “I seemed to be two persons, one of whom could observe and even experiment on the other” (quoted in Sokal, 1987, p. 25).

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JAMES MCKEEN
CATTELL

During Cattell's second semester at Hopkins, G. Stanley Hall began to teach classes in psychology, and Cattell enrolled in Hall's laboratory course. Cattell chose to conduct experiments on reaction time—the time required for different mental activities—and the results of this work reinforced his desire to become a psychologist.

Cattell's return to Wundt in Germany in 1883 is the subject of legends in the history of psychology, and these legends provide additional examples of how historical data can be distorted. Cattell said he appeared at the University of Leipzig and boldly announced to Wundt, "Herr Professor, you need an assistant, and I shall be your assistant" (Cattell, 1928, p. 545). Cattell made it clear to Wundt that he would choose his own research project on the psychology of individual differences, a topic that was not central to Wundtian psychology. Wundt was said to have characterized Cattell and his project as *ganz Amerikanisch* [typically American], which was a prophetic remark, if true. The interest in individual differences, a natural outcome of an evolutionary point of view, has since been a feature of American psychology, not German psychology.

In addition, Cattell supposedly gave Wundt his first typewriter, on which most of Wundt's many books were written. For this gift Cattell was teased by his colleagues for having "done a serious disservice ... for it had enabled Wundt to write twice as many books as would otherwise have been possible" (Cattell, 1928, p. 545).

Careful archival research on Cattell's letters and journals has questioned these stories (see Sokal, 1981). Cattell's accounts written many years later are not supported by his correspondence and journal entries written at the time the events occurred. Wundt thought highly of Cattell and appointed him laboratory assistant in 1886. There is no evidence that Cattell wanted to study individual differences at that time. Cattell showed Wundt how to use a typewriter but did not give him one.

Cattell did not lack self-confidence as Wundt's student, as typified in his letters to his parents. "I suppose you won't consider it egotistical when I say that I know a great deal more about [reaction time] than [Wundt] does.... I'm quite sure my work is worth more than all done by Wundt and his pupils.... Prof. Wundt seems to like me and to appreciate my phenomenal genius" (quoted in Benjamin, 2006a, pp. 64, 65).

After obtaining his doctoral degree in 1886 Cattell returned to the United States to teach psychology at Bryn Mawr College and the University of Pennsylvania. He went to England to lecture at Cambridge University, where he met Francis Galton. The two shared an interest in individual differences, and Galton, then at the peak of his fame, "provided [Cattell] with a scientific goal—the measurement of the psychological differences between people" (Sokal, 1987, p. 27).

Cattell admired Galton's breadth of interests and his emphasis on measurement and statistics. Under Galton's influence, Cattell became one of the first American psychologists to stress quantification, ranking, and ratings, even though personally he was "mathematically illiterate" and often made simple errors when adding and subtracting (Sokal, 1987, p. 37). Cattell developed the widely used order-of-merit ranking method (described later in this chapter) and was the first psychologist to teach the statistical analysis of experimental results.

Wundt did not favor statistical techniques, so it was Galton's influence on Cattell that was responsible for the emphasis on statistics that came to characterize the new American psychology. This emphasis also explains why American psychologists began to focus on studies of large groups of subjects, for which statistical comparisons could be made, rather than on individual subjects, as Wundt did.

The graphic display of data was used frequently by Galton, Ebbinghaus, Hall, and the American psychologist Thorndike in the closing decades of the nineteenth century. The British statistician Karl Pearson, who had proposed the formula for calculating the correlation coefficient, in 1900 devised the chi-square test. Both techniques were used more widely by American psychologists than by their counterparts in England. In 1907, John Edgar

Cover, a psychologist at Stanford University, was apparently the first to advocate the use of experimental and control groups (Dehue, 2000; Smith, Best, Cylke, & Stubbs, 2000).

In addition to statistics, Cattell was interested in Galton's work in eugenics (see Chapter 6). He argued for the sterilization of delinquents and so-called defective persons and for offering incentives to healthy, intelligent people if they would intermarry. He promised his seven children \$1,000 each if they would marry sons or daughters of college professors (Sokal, 1971).

In 1888 Cattell became professor of psychology at the University of Pennsylvania, an appointment arranged by his father. Learning that an endowed chair in philosophy was to be established at the university, the elder Cattell lobbied the school's provost, an old friend, to secure the post for his son. The elder Cattell urged his son to publish more articles to enhance his professional reputation, and he even traveled to Leipzig to obtain Wundt's personal letter of recommendation. He told the provost that because the family was wealthy, the salary was unimportant, and thus Cattell was hired for extremely low pay (O'Donnell, 1985). Cattell would later claim, inaccurately, that his was the world's first psychology professorship, but his appointment was actually in philosophy. He stayed at the University of Pennsylvania only three years until he became the professor of psychology and department head at Columbia University, where he remained for 26 years.

Because of his dissatisfaction with Hall's *American Journal of Psychology*, Cattell began the *Psychological Review* in 1894 with J. Mark Baldwin. Cattell acquired from Alexander Graham Bell the weekly journal *Science*, which was about to cease publication for lack of funds. Five years later it became the official journal of the American Association for the Advancement of Science (AAAS). In 1906 Cattell instituted a series of reference books, including *American Men of Science* and *Leaders in Education*. He bought *Popular Science Monthly* in 1900; he sold the name in 1915 and continued to publish it as *Scientific Monthly*. Another weekly, *School and Society*, commenced in 1915. Although it was Cattell who began or purchased these publications, his wife Josephine served as the unacknowledged "managing editor" for the journals (Sokal, 2009, p. 99).

During Cattell's career at Columbia, more doctorates in psychology were awarded there than at any other graduate school in the United States. Cattell advocated independent work and gave his students considerable freedom to conduct their own research. He believed that a professor should maintain some distance from university concerns, so he made his home 40 miles from the campus. Reflecting his growing truculent attitude toward the university, he called his home "Fort Defiance" (Sokal, 2009, p. 99). Cattell established a laboratory and an editorial office at home and visited the campus only a few days each week.

This aloofness was one of several factors that strained relations between Cattell and the university administration. He urged greater faculty participation, arguing that faculty, not administrators, should be making many of the decisions about university governance. To this end, he helped found the American Association of University Professors (AAUP). He was not seen as tactful in his dealings with Columbia's administration and was described as "ungentlemanly, irretrievably nasty, and lacking in decency" (Gruber, 1972, p. 300).

Cattell's biographer wrote, he "often exhibited a self-righteous egotism that led him to expect others to defer to his view [and an] impatience with all groups of which he was not the center." he was also characterized as difficult, disagreeable, and sarcastic (Sokal, 2009, p. 90).

On three occasions between 1910 and 1917, the university trustees considered forcing Cattell to retire. The deciding blow fell during World War I, when Cattell wrote two letters to U.S. congressmen protesting the practice of sending draftees into combat. This was an unpopular position, but Cattell remained adamant. He was dismissed in 1917, charged with disloyalty to the United States. He sued the university for libel, and although he was awarded \$40,000 (a large sum of money at that time), he was not reinstated.

Cattell isolated himself from his colleagues and wrote satirical pamphlets about the university administration. A bitter man to the end, Cattell made many enemies. He never returned to academic life, and instead he devoted himself to his publications and to the AAAS and other learned societies. Within psychology, his promotional efforts elevated the new science to a higher standing in the scientific community.

In 1921 Cattell realized one of his ambitions—promoting applied psychology as a business. He organized the Psychological Corporation, with stock purchased by members of the APA, to provide psychological services to industry, the psychological community, and the public. Initially the venture was a failure; in its first two years the company realized a profit of \$51. As long as Cattell remained president, the situation did not improve. By 1969, however, the Psychological Corporation had generated \$5 million in sales and was bought by publisher Harcourt Brace, which 10 years later reported \$30 million in sales from the venture Cattell began.

Mental Tests

Mental tests: Tests of motor skills and sensory capacities; intelligence tests use more complex measures of mental abilities.

In an article published in 1890, Cattell used the term **mental tests**, and while at the University of Pennsylvania he administered a series of such tests to his students. Cattell wrote: "Psychology cannot attain the certainty and exactness of the physical sciences unless it rests on a foundation of experiment and measurement. A step in this direction could be made by applying a series of mental tests and measurements to a large number of individuals" (Cattell, 1890, p. 373). This is precisely what Cattell was attempting to do. He continued the testing program at Columbia and collected data from several classes of entering students.

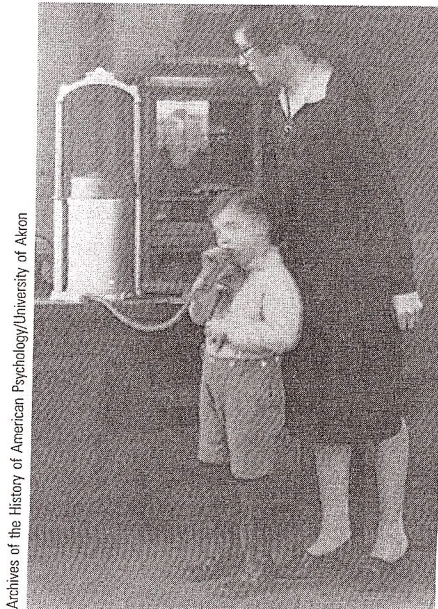
The kinds of tests Cattell used in trying to measure the range and variability of human capacities differed from the intelligence or cognitive ability tests psychologists developed later, which use more complex mental tasks. Cattell's tests, like Galton's, dealt primarily with elementary sensorimotor measurements, including dynamometer pressure, rate of movement (how quickly the hand can move 50 cm), two-point skin sensitivity threshold, amount of pressure on the forehead necessary to cause pain, just noticeable differences in judging weights, reaction time for sound, and time for naming colors.

By 1901 Cattell had amassed enough data to correlate the test scores with measures of the students' academic performance. The correlations proved disappointingly low, as did inter-correlations among individual tests. Because similar results had been obtained in Titchener's laboratory, Cattell concluded that tests of this type were not valid predictors of college achievement or, by assumption, of intellectual ability.

Comment

Cattell's strongest influence on American psychology was through his work as an organizer, executive, and administrator of psychological science and practice, and as an articulate link between psychology and the greater scientific community. He became an ambassador of psychology, delivering lectures, editing journals, and promoting practical applications of the field.

Building on Galton's work, Cattell investigated the nature and origin of scientific ability, using his order-of-merit ranking method. Stimuli ranked by a number of judges were arranged in a final rank order by calculating the average rating given to each stimulus item. The method was applied to eminent American scientists by having competent people in each scientific field rank their outstanding colleagues. The source book *American Men of Science* emerged from this work. Despite the book's title, it also included American women of science. The 1910 edition lists 19 female psychologists, about 10 percent of the psychologists cited (O'Donnell, 1985).



A young boy uses an instrument to measure vital capacity, which is the maximum volume of air that is exhaled after deep inhalation. Vital capacity was believed to be related to intelligence.

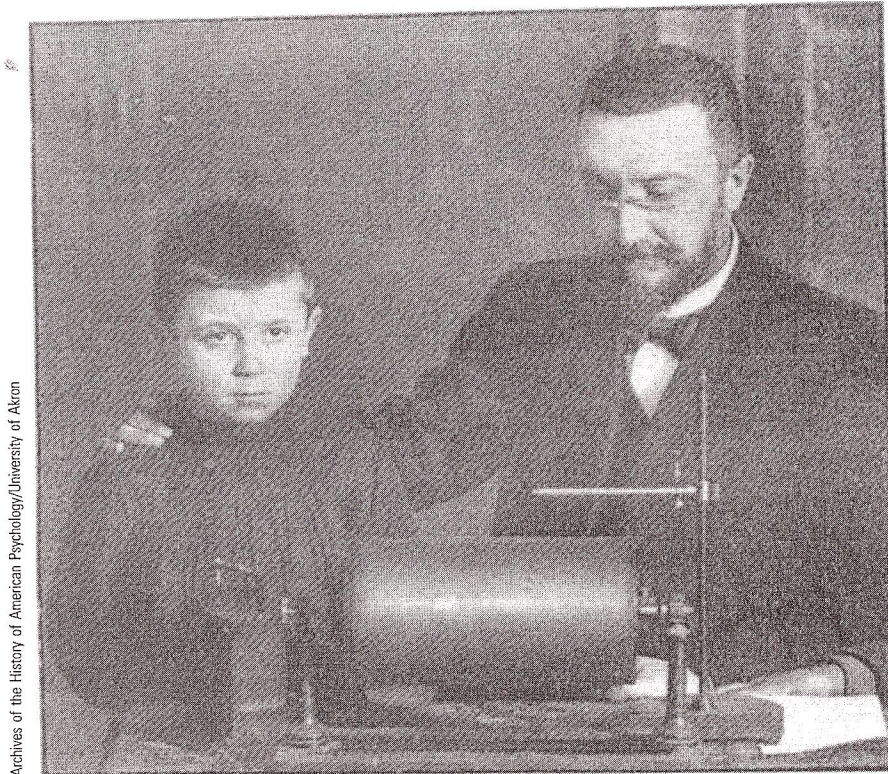
Through his work on mental testing, the measurement of individual differences, and the promotion of applied psychology, Cattell energetically reinforced the functionalist movement in American psychology. When Cattell died, the historian E. G. Boring wrote to Cattell's children, "In my opinion your father did more than William James even to give American psychology its peculiar slant, to make it different from the German psychology from which it stemmed" (quoted in Bjork, 1983, p. 105).

The Psychological Testing Movement

Binet, Terman, and the IQ Test

Although Cattell coined the term *mental tests*, the first truly psychological test of mental ability was developed by Alfred Binet (1857–1911), who entered the field of psychology "quite by accident and who failed miserably, repeatedly, and publicly until he created the exams that are the foundation of intelligence tests today" (Murdoch, 2007, p. 29). Independently wealthy, Binet explored careers in law and medicine but did not like either. Recovering from a nervous breakdown at age 22, he discovered psychology, which he studied on his own. He went on to publish more than 200 books and articles, and he wrote four plays that were performed in Paris theaters. By using more complex measures than those selected by Cattell, Binet provided an effective measure of human cognitive abilities and thus initiated the era of modern intelligence testing. He also conducted research on issues in developmental, experimental, educational, and social psychology.

Binet disagreed with Galton and Cattell's approach, which used tests of sensorimotor processes to attempt to measure intelligence. He believed that assessing such cognitive functions as memory, attention, imagination, and comprehension would provide a more appropriate measure of intelligence. He reached this conclusion on the basis of research he conducted at home with his two young daughters as subjects. Initially he administered the same kinds of sensorimotor tests used by Galton and Cattell, but he found that his children performed just as well and as fast as adults did. It was then that



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Alfred Binet developed the first truly psychological test of mental ability, which has evolved into the widely used Stanford-Binet Intelligence Scale.

he turned to tests of cognitive ability; for these kinds of tasks, he did find significant differences between his daughters and adult subjects.

In 1904, in response to a practical need, the opportunity arose for Binet to prove his point. The French ministry of public instruction appointed a commission to study the learning abilities of children who were having difficulties in school. Binet and Théodore Simon (a psychiatrist) were appointed to the commission, and together they investigated the intellectual tasks that the majority of children could master at different ages. From their identification of these tasks they constructed an intelligence test consisting of 30 problems arranged in ascending order of difficulty. The test focused on three cognitive functions: judgment, comprehension, and reasoning.

Three years later they revised and expanded the test and introduced the concept of **mental age**, defined as the age at which children of average ability could perform specific tasks. If a child with a chronological age of four passed all the tests mastered by the sample of average five-year-old children, for example, then that four-year-old child was assigned a mental age of five.

A third revision of the test was prepared in 1911, but after Binet's death progress in intelligence testing shifted to the United States. Binet's work soon proved more popular in the United States than in France; large-scale intelligence testing efforts did not become widely accepted in France until the 1940s.

Binet's test was translated from French and presented to American psychologists in 1908 by Henry Goddard (1866–1957), who was the only undefeated head football coach at the University of Southern California (USC), a rare distinction for a psychologist

Mental age: The age at which children of average ability can perform certain tasks.

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LEWIS TERMAN

Intelligence quotient (IQ): A number denoting a person's intelligence, determined by the following formula: mental age divided by chronological age, multiplied by 100.

(Benjamin, 2009b). Goddard then headed east and earned his Ph.D. from G. Stanley Hall at Clark University. He later worked at a school for children who had mental disabilities. Goddard called his translation of the intelligence test the *Binet-Simon Measuring Scale for Intelligence*. In his writings on intelligence testing he also introduced the word *moron*, derived from the Greek word for "slow."

In 1916 Lewis M. Terman, who had also studied with Hall, developed the version of the test that has since become the standard. Terman named it the *Stanford-Binet*, after the university with which he was affiliated, and adopted the concept of the **intelligence quotient (IQ)**. The IQ measure—defined as the ratio between mental age and chronological age—had originally been developed by the German psychologist William Stern. The *Stanford-Binet* has undergone several revisions and continues to be widely used.

World War I and Group Testing

On the day in 1917 that the United States entered World War I, a meeting of Titchener's Society of Experimental Psychologists was being held at Harvard University. The president of the APA, Robert Yerkes, urged the group to consider how psychology could aid the war effort. Titchener declined to participate, on the grounds that he was a British citizen. He actually picked up his chair and removed it, and himself, from the room in order to avoid being involved in any further talk of war. The more likely reason for Titchener's lack of enthusiasm is that he disliked the idea of applying psychology to practical problems, fearing that psychology would be trading "a science for a technology" (O'Donnell, 1979, p. 289).

As the American army mobilized, military leaders faced the problem of assessing the level of intelligence of great numbers of recruits, to classify them and assign them suitable tasks. The *Stanford-Binet* was an individual intelligence test and required a highly trained person to administer it properly. Obviously that test could not be used when so many people needed to be evaluated in a short time. The army needed a group test that was simple to administer.

With an army commission as a major, Yerkes assembled a staff of 40 psychologists to develop a group intelligence test. They examined a number of proposed tests, none of which was in general use, and selected as their basis the one prepared by Arthur S. Otis, who had studied with Terman. Otis's most important contribution to testing was the multiple-choice type of question. The Yerkes group then prepared the *Army Alpha* and *Army Beta*. (The *Beta* is a version for non-English-speaking and illiterate people; instead of oral or written directions, instructions are given by demonstration or pantomime.)

Work on the program proceeded slowly, and formal orders to actually begin testing the army recruits were not given until three months before the war ended. More than 1 million men were eventually tested, but by then the military no longer needed the information, which was fortunate because the results surprised the psychologists who had carried out the program. The data revealed that "far more Americans were illiterate than had been previously thought. One out of every four men who took the tests could not read or comprehend articles in a daily newspaper or even write letters home" (Murdoch, 2007, p. 86). Although the program had little direct effect on the war effort, it had a significant impact on the field of psychology. The publicity enhanced psychology's stature, and the army tests became prototypes for many that were devised later.

The psychologists' war work also spurred the development and application of group testing for personality characteristics. Previously, only limited attempts had been made to assess the human personality. At the end of the nineteenth century, the German psychiatrist Emil Kraepelin, once a student of Wundt's, had used what he called a "free association test," in which a patient responded to a stimulus word with the first word that came to mind (a technique originated by Galton). In 1910, Carl Jung developed a similar device, his word-association test, to determine personality complexes in his patients (see

Chapter 14). Both of these approaches were individual personality tests. When the army expressed interest in separating out neurotic recruits, Robert Woodworth constructed the *Personal Data Sheet*, a self-report inventory on which respondents were instructed to check the nervous symptoms that applied to them. Like the *Army Alpha* and *Army Beta*, the *Personal Data Sheet* served as a prototype for future group tests.

Psychological testing won its own victory in the war—the success of public acceptance. Millions of employees, schoolchildren, and college applicants soon faced batteries of tests, the results of which would determine the course of their lives. In the early 1920s up to 4 million intelligence tests were being purchased every year, mostly for use in public schools. Terman's *Stanford-Binet* sold over a half million copies in 1923 alone. The public education system in the United States was reorganized around the concept of the intelligence quotient, and IQ scores became the most important criterion for student placement and advancement.

Eventually, many psychologists found gainful employment developing and applying psychological tests (Bottom, 2009). Some enterprising psychologists even hoped to use tests to identify potential baseball players. The great Babe Ruth agreed to be tested at Columbia University's psychology laboratory, where, in an effort to establish the characteristics that made him such an outstanding player, they measured his performance on tasks using sensory and motor skills. The tests were similar to those used by Galton and Cattell (Fuchs, 2009). The endeavor was unsuccessful, but as one historian noted:

The faith that psychology was a science capable of discovering the basis of extraordinary feats of hitting attests to the success of psychologists in establishing the public identity of the discipline and to the faith of the informed public in the ability of science to provide answers to their questions. (Fuchs, 1998, p. 153)

An epidemic of testing swept the United States, but in the haste to answer the urgent call of business and education, it was inevitable that some poorly designed and inadequately researched tests would be promoted, leading to disappointing results. As a result, many organizations abandoned their use of psychological tests for a time.

Ideas from Medicine and Engineering

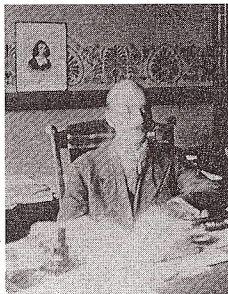
To lend authority and scientific credibility to their fledgling enterprise, intelligence testers had adopted terminology from the older disciplines of medicine and engineering. Their purpose was to persuade people that psychology was just as legitimate, scientific, and essential as the more established sciences.

Psychologists described the people they tested not as subjects but as patients. Tests were said to be analogous to thermometers, which at that time were available only to physicians. No one who lacked proper training was permitted to use a thermometer, a claim also made for psychological tests. Tests were promoted as X-ray machines that enabled psychologists to see inside the mind and to dissect their patients' mental mechanisms. "The more [psychologists] sounded like doctors, the more willing the public was to accord them similar status" (Keiger, 1993, p. 49).

Metaphors from engineering also were cited. Schools were referred to as education factories, and tests as ways to measure a factory's products (the students' levels of intelligence). Society was likened to a bridge, and intelligence tests were the scientific tool preserving the strength of the bridge by detecting its weakest elements—its feeble-minded citizens—who could then be removed from society and institutionalized.

Racial Differences in Intelligence

The growth of the psychological testing movement became part of a social controversy that continues today. In 1912 Henry Goddard, who had translated the Binet test, visited Ellis Island in New York, the entry point for millions of European immigrants to the



HENRY GODDARD

United States. There was considerable public concern that the physicians at Ellis Island who were examining the new arrivals were “failing to prevent mentally retarded people from entering the country” (Richardson, 2003, p. 143). Goddard believed that the doctors were identifying no more than 10 percent of those people with mental retardation. He proposed that psychologists conduct the examinations instead by using his translation of the Binet intelligence test.

On his first visit to the Ellis Island processing facility Goddard selected a young man whom he thought looked mentally deficient and confirmed his diagnosis by administering the Binet test with the aid of an interpreter. Although the interpreter pointed out that he himself could not have answered the questions when he was a new arrival in the United States and that the test was unfair to people unfamiliar with the English language or American culture, Goddard disagreed (see Zenderland, 1998).

Later testing of immigrant populations (all of which had limited command of the English language that was used for the tests) revealed, according to Goddard’s test results, that the majority—87 percent of Russians, 83 percent of Jews, 80 percent of Hungarians, and 79 percent of Italians—were feeble-minded, with a mental age less than 12 (Cannato, 2009; Gould, 1981). This evidence from the tests was later used to support federal legislation restricting the immigration of racial and ethnic groups assumed to be inferior in intelligence.

The idea of racial differences in intelligence received additional support in 1921 when the results obtained from the World War I testing of the army recruits were made public. The data showed that blacks and immigrants from Mediterranean and Latin American countries had lower measured IQs than whites. Only northern European immigrants had IQs equal to those measured for whites. These findings raised questions among scientists, politicians, and journalists. How could any democratically elected government survive if its citizens were so stupid? Should groups with low IQs be allowed to vote? Should the government refuse entry to immigrants from low-IQ countries? How could the notion that people were created equal be meaningful?



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An immigrant’s mental ability is being tested at Ellis Island. Three different examiners would administer the tests with the aid of an interpreter.

The concept of racial differences in intelligence had been advanced in the United States as early as the 1880s, and many calls had been made for quotas on immigration from Mediterranean and Latin American countries. The allegedly inferior intelligence of American blacks had also been widely accepted, even before the development of intelligence tests.

A vocal and articulate critic of this idea was Horace Mann Bond (1904–1972), an African-American scholar and president of Lincoln University in Pennsylvania. Bond, who earned a doctoral degree in education from the University of Chicago, published a number of books and articles in which he argued that any recorded differences in the IQ scores between blacks and whites were attributable to environmental rather than inherited factors. His research showed that blacks from northern states scored higher on intelligence tests than whites from southern states, a finding that severely damaged the charge that blacks were genetically inferior (Jackson, 2004).

Many psychologists had responded to this issue by charging that the tests were biased, but in time the controversy faded. It was revived in 1994 with the publication of *The Bell Curve* (Herrnstein & Murray, 1994), a book arguing that, based on intelligence test scores, blacks are inferior in intelligence to whites. A preponderance of evidence now shows that the more soundly researched intelligence tests are not culturally biased in any significant way (Rowe, Vazsonyi, & Flannery, 1994; Suzuki & Valencia, 1997). Further, 52 mainstream testing experts endorsed that conclusion as follows: “Intelligence tests are not culturally biased against American blacks or other native-born, English speaking peoples in the U.S. Rather, IQ scores predict equally accurately for all such Americans, regardless of race and social class” (Gottfredson, 1997, p. 14).

A report prepared by the APA’s Board of Scientific Affairs agreed that today’s cognitive ability tests did not seem to discriminate against minority groups but reflected, in quantitative terms, the discrimination that had been created by society over time (Neisser et al., 1996).

Contributions of Women to the Testing Movement

We have seen that for much of psychology’s history, women were effectively prohibited from seeking university positions. For that reason, many female psychologists found employment in the applied fields, particularly the helping professions such as clinical and counseling psychology, child guidance, and school psychology. Women have made significant contributions in those areas, notably in the development and application of psychological tests.

Florence L. Goodenough received her Ph.D. from Stanford University in 1924. She developed the *Draw-A-Man Test* (now the *Goodenough-Harris Drawing Test*), a widely used nonverbal intelligence test for children. A pioneer in test construction, Goodenough worked for more than 20 years at the Institute of Child Development at the University of Minnesota. She published a detailed review of the psychological testing movement (Goodenough, 1949) and wrote several works on child psychology.

Maude Merrill James, director of a psychological clinic for children in California, wrote with Lewis Terman the 1937 revision of the *Stanford-Binet Intelligence Test*, which became widely known as the Terman-Merrill test. Thelma Gwinn Thurstone (a 1927 Ph.D. from the University of Chicago) married psychologist L. L. Thurstone and, like many women who work with their husbands, found her contributions overlooked and uncredited. She helped develop the *Primary Mental Abilities* test battery, a group intelligence test, and was professor of education at the University of North Carolina and director of the psychometric laboratory. Her husband described her as a “genius in test construction” (Thurstone, 1952, p. 317).

Psyche Cattell (1893–1989) was the daughter of James McKeen Cattell, who refused to support her college education because he thought she was not smart enough.

Nevertheless, she earned her doctoral degree in education from Harvard University in 1927. Her contributions to the testing movement included extending the age range of the *Stanford-Binet* downward with the *Cattell Infant Intelligence Scale*. Her test could be used with infants as young as three months old.

The long career of Anne Anastasi (1908–2001) at Fordham University established her as an authority on psychological testing. She was successful from an early age, entering college at 15 and earning her doctoral degree at 21. She decided to become a psychologist because of the influence of one of her professors, Harry Hollingworth. Anastasi wrote more than 150 articles and books, including a popular textbook on psychological testing (Anastasi, 1988, 1993). In 1971, she served as APA president and received many professional honors, including the National Medal of Science. One survey named Anastasi the most prominent female psychologist in the English-speaking world (Gavin, 1987).

A year after Anastasi married, at the age of 25, she was diagnosed with cervical cancer. The treatment left her unable to bear children, yet she viewed the cancer as “one of the principle reasons for her success. Women of her generation frequently had to choose between motherhood and a career. That choice was taken from her, and she was free to concentrate on her career without conflict or guilt” (Hogan, 2003, p. 267).

Although some women became successful in areas such as testing, working in applied psychology put them at a professional disadvantage. Jobs in nonacademic institutions rarely provide the time, financial support, or graduate-student assistance required to conduct research and write scholarly articles, which are the primary vehicles for professional visibility. In an applied setting such as a business agency or a clinic, one’s contributions often go unrecognized beyond the confines of that organization.

Thus, the tremendous growth of applied psychology in the United States—the legacy of the functionalist school of psychology—offered employment opportunities for women, but it also meant that they remained largely removed from mainstream academic psychology, where the theories, research, and schools of thought were being developed.

Many academic psychologists held a negative view of applied work, considering it menial and inferior. Applied areas such as counseling were belittled as “women’s work.” Published histories of psychology tended to undervalue applied psychology and the contributions of the many women pioneers who worked in hospitals, clinics, businesses, research institutes, and military and government agencies. It is interesting to note that no woman was elected president of the American Association for Applied Psychology, despite the fact that by 1941 one-third of its members were women (Rossiter, 1982). Also by that time, approximately half of all psychology jobs in educational and clinical organizations were held by women (Gilgen, Gilgen, Koltsova, & Oleinik, 1997).

The Clinical Psychology Movement

While Cattell was changing forever the nature of American psychology by applying it to the measurement of mental abilities, a student of Cattell and Wundt was applying psychology to the assessment and treatment of abnormal behavior. Just 17 years after Wundt defined and founded the new science of psychology, we have yet another of his former students using psychology in a practical manner inconsistent with Wundt’s intentions.

Lightner Witmer (1867–1956)

Lightner Witmer taught psychology at the University of Pennsylvania, filling that position when Cattell left for Columbia University. Described as contentious, antisocial, and conceited (Landy, 1992), Witmer began the field he called clinical psychology. In 1896 he opened the world’s first psychology clinic.

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LIGHTNER WITMER

The kind of psychology Witmer practiced in his clinic was not clinical psychology as we know it today. Witmer did not practice psychotherapy, a technique he “detested” and knew little about (Taylor, 2000, p. 1029). Instead, he was interested in assessing and treating learning and behavioral problems in schoolchildren, an applied specialty area now called school psychology. Although Witmer was instrumental in developing clinical psychology and used the term freely, the field has become much broader than he ever envisioned.

Witmer offered the first college course on clinical psychology and started the first journal, *Psychological Clinic*, which he edited for 29 years. He was one of those pioneers of the functionalist approach to psychology who believed that the new science should be used to help people solve problems rather than to study the contents of their minds.

Witmer's Life

Born in 1867 in Philadelphia, Witmer graduated from the University of Pennsylvania in 1884 and taught history and English at a Philadelphia private school before returning to the university for law courses. He apparently had no thought of a career in psychology at the time but changed his mind for a practical reason. He wanted a paid assistantship, and one of the few available was with Cattell in the psychology department. Here again we see the influence of economic forces. Witmer's biographer noted:

Witmer's actual entry into psychology was occasioned in part by the very down-to-earth need for the additional income that would be provided by an assistantship. (McReynolds, 1997, p. 34)

Witmer began research studies on individual differences in reaction time and expected to earn his Ph.D. from Penn, but Cattell had other plans. He thought so highly of Witmer that he chose him as his successor. This was a remarkable opportunity for the young man, but Cattell placed one condition on the appointment: Witmer would have to go to Leipzig to earn his doctorate from Wundt. Because the prestige of a German Ph.D. was still paramount in the 1880s, Witmer agreed to go.

He studied with Wundt and with Külpe; Titchener was one of his classmates. Witmer was not impressed with Wundt's research methods, calling them slovenly. He described how Wundt once made Titchener repeat an observation “because the results obtained by Titchener were not such as he, Wundt, had anticipated” (quoted in O'Donnell, 1985, p. 35). Witmer participated as a subject in Wundt's reaction time studies, but his service did not last long because his reaction times “were the quickest ever recorded in Wundt's laboratory. This led to Wundt claiming that Witmer was not doing the task as a proper introspectionist should.” Wundt refused to use Witmer's data; Witmer quickly came to doubt the usefulness of the introspective method (Benjafield, 2010, p. 56).

Witmer later said he got nothing out of his Leipzig experience but his degree. Wundt refused to allow Witmer to continue the reaction-time work he had begun with Cattell and restricted Witmer's studies to introspective research on the elements of consciousness.

Nevertheless, Witmer did receive his degree, and he returned to his new position at the University of Pennsylvania in the summer of 1892, the same year Titchener earned his degree and went to Cornell University. This also was the year another of Wundt's students, Hugo Münsterberg, was brought to Harvard University by William James, and the year Hall started the APA with Witmer as one of the charter members. Thus we see that the functional, applied spirit had begun to take hold of American psychology.

For two years Witmer worked as an experimental psychologist, conducting research and presenting papers on individual differences and on the psychology of pain. At the same time, he was searching for an opportunity to apply psychology to abnormal behavior. The chance came in March 1896, resulting from an incident that originated in the economic circumstances of the time: the growth in funding for public education.

Many state boards of education were establishing college-level departments of pedagogy to offer instruction in the principles and methods of teaching. Psychologists were being asked to offer courses to education majors and to public school teachers working for advanced degrees. Psychologists were urged to shift the focus of their laboratory research from experimental work to finding ways to train students to become educational psychologists. Psychology departments profited handsomely from this sudden influx of students because then, as now, departmental budgets were contingent on enrollments.

Witmer taught some of the courses established for public school teachers at the University of Pennsylvania. In 1896 one of these teachers, Margaret Maguire, consulted Witmer about a problem with a 14-year-old student who was having difficulty learning to spell, although he was progressing in some other subjects. Could psychology help? Witmer wrote, "It appeared to me that if psychology was worth anything to me or to others, it should be able to assist the efforts of a teacher in a retarded case of this kind" (quoted in McReynolds, 1997, p. 76).

Witmer organized a makeshift clinic and thus embarked on his lifelong work. Within a few months, Witmer was preparing courses on methods for treating mentally defective, blind, and disturbed children. He published an article in the journal *Pediatrics* titled "Practical Work in Psychology," recommending that psychology be applied to practical affairs:

The practical side of psychology deserves serious attention from professional psychologists. The practice of psychology may become as well defined a pursuit of a trained professional class as is the practice of medicine. (quoted in McReynolds, 1997, p. 78)

He presented a paper on the topic at the annual APA meeting, using the term "clinical psychology" for the first time. In 1907 he founded the journal *Psychological Clinic*, the first and for many years the only journal in the field. In the first issue Witmer proposed the new profession of clinical psychology. The following year he established a boarding school for retarded and disturbed children, and in 1909 he expanded his university clinic as a separate administrative unit.

Witmer remained at the University of Pennsylvania, teaching, promoting, and practicing his clinical psychology. He retired from the university in 1937 and died in 1956 at the age of 89, the last of the small group of psychologists who had met in G. Stanley Hall's study in 1892 to found the APA.

Clinics for Child Evaluation

As the world's first clinical psychologist, Witmer had no examples or precedents for his actions, so he developed diagnostic and treatment approaches as needed. "The absence of any principles to guide me made it necessary to apply myself directly to the study of these children, working out my methods as I went along" (Witmer, 1907/1996, p. 249).

Children who had been referred to Witmer's clinic showed a broad range of problems, some of which he identified as hyperactivity, learning disabilities, and poor speech and motor development. As his experience and confidence grew, he developed standard programs of assessment and treatment. In time he added physicians, social workers, and psychologists to the clinic's staff.

Witmer recognized that emotional and cognitive functioning could be affected by physical problems, so he had physicians examine the children to determine if malnutrition or visual and hearing deficits were contributing to a child's difficulties. The patients were then tested and interviewed by the psychologists, and social workers prepared case histories on their family background.

Initially Witmer believed genetic factors were largely responsible for behavioral and cognitive disturbances, but he later realized that environmental factors were more important. He foresaw the need to provide a variety of sensory experiences early in a child's life, anticipating a Head Start type of enrichment and intervention program. He believed

in involving families and schools in the treatment of his patients, arguing that if home and school conditions were improved, a child's behavior might change for the better.

Comment

Many psychologists soon followed Witmer's example. By 1914 almost 20 psychology clinics were operating in the United States, the majority patterned on Witmer's clinic. In addition, the students he trained spread his approach and taught new generations of students about clinical work. Witmer's influence spread to the area of special education. His student Morris Viteles extended Witmer's work by establishing a vocational guidance clinic, the first such facility in the United States. Other followers applied Witmer's clinical approach to adult patients.

The Profession of Clinical Psychology

In addition to Witmer's efforts to apply psychology to the assessment and treatment of abnormal behavior, two books provided an impetus to the field. Clifford Beers, a former mental patient, wrote *A Mind That Found Itself* (1908), which became immensely popular and focused public attention on the need to deal humanely with mentally ill people. Hugo Münsterberg's *Psychotherapy* (1909), also widely read, described techniques for treating a variety of mental disorders. Münsterberg promoted clinical psychology by describing specific ways in which disturbed persons could be helped.

The first child guidance clinic was established in 1909 by a Chicago psychiatrist, William Healey. More such clinics followed. Their purpose was to treat childhood disorders early so that the problems would not develop into more serious disturbances in adulthood. These clinics used Witmer's team approach, in which physicians, psychologists, psychiatrists, and social workers combined to evaluate all aspects of a patient's problem.

The ideas of Sigmund Freud were crucial to the advancement of clinical psychology and moved the field far beyond its origins in Witmer's clinic. Freudian psychoanalysis both fascinated and outraged segments of the psychology establishment and the American public. Freud's ideas provided clinical psychologists with their initial psychological techniques of therapy.

Nevertheless, clinical psychology advanced slowly as a profession. As late as 1918, nine years after Freud's visit to the United States, there were still no graduate programs in clinical psychology. Even by 1940, clinical psychology remained only a minor part of psychology. Few treatment facilities existed for disturbed adults and, consequently, there were few job opportunities for clinical psychologists. Training programs for new clinical psychologists were limited. Job duties rarely extended beyond administering tests.

However, the situation changed when the United States entered World War II in 1941. Large numbers of draftees "showed up at induction centers with severe anxieties, depression, antisocial demeanors, uncontrolled anger, and generally unstable psychic presentations. They were bed-wetters, dropouts, and chronic misfits" (Engel, 2008, pp. 43-44). By the time the war ended in 1945, almost 2 million men had been rejected for military service for psychiatric reasons. Of those accepted, 1 million had to be hospitalized for treatment of mental disorders during their time on active duty, and another 500,000 were discharged for the same reason. The military leadership quickly concluded that a lot of men needed help and there were not enough psychologists or mental health counselors to do the job. That stimulus helped make clinical psychology the dynamic applied specialty area it has become. The army established training programs for hundreds of clinical psychologists so they could treat the emotional disturbances of military personnel.

After the war the need for clinical psychologists was even greater. The Veterans Administration (the VA, now the Department of Veterans Affairs) found itself responsible

for more than 40,000 veterans diagnosed with psychiatric problems. More than 3 million others needed vocational and personal counseling to help them return comfortably to civilian life. Some 315,000 veterans expected assistance in adjusting to physical disabilities resulting from war wounds. The demand for mental health professionals was staggering and far exceeded the supply.

To help meet these needs, the VA funded university-level graduate programs and paid tuition for graduate students willing to work at VA hospitals and clinics. One outcome of these programs was that clinical psychologists would be dealing with a different type of patient. Prior to the war, most of their work had been with children who had delinquency and adjustment problems, but the veterans' postwar needs brought adult patients with more severe emotional problems. The Department of Veterans Affairs remains the largest employer of psychologists in the United States.

Today, clinical psychologists are employed in mental health centers, schools, businesses, and private practices. Clinical psychology is the largest of the applied specialty areas, with more than one-third of all graduate students enrolled in clinical programs.

The Industrial-Organizational Psychology Movement

Another student of Wundt's at Leipzig, Walter Dill Scott, left the world of pure introspective psychology to apply the new science to advertising and business. Scott dedicated much of his adult life to make the marketplace and the workplace more efficient and to determine how business leaders could motivate employees and consumers.

Walter Dill Scott (1869–1955)

Scott's work reflects the concern of the functionalist school of psychology with practical issues. One historian of psychology noted:

Upon returning from Wundt's Leipzig to turn-of-the-century Chicago, Scott's publications shifted from Germanic theorizing to American usefulness. Instead of explaining motives and impulses in general, Scott described how to influence people, including consumers, lecture audiences, and workers. (Von Mayrhauser, 1989, p. 61)

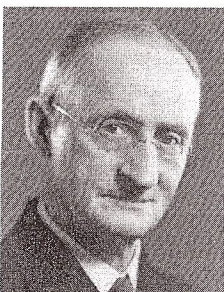
Scott compiled an impressive list of firsts. He was the first person to apply psychology to personnel selection, management, and advertising. He was the author of the first book in the field and the first to hold the title of professor of applied psychology. In addition, he was the founder of the first psychological consulting company, and the first psychologist to receive the Distinguished Service Medal from the U.S. Army.

Scott's Life

Born on a farm near the town of Normal, Illinois, the young Scott was struck by the idea of workplace efficiency while he was plowing a field. Because his father was often ill, the 12-year-old boy bore much of the responsibility for the operation of the small family farm. One day he paused at the end of a plowed furrow to rest his two horses. Gazing in the distance at the campus buildings of Illinois State Normal University, he suddenly realized that if he were ever going to achieve anything in this world, he would have to stop wasting time. Here he was losing 10 minutes out of every hour's plowing to rest the horses! That added up to about an hour and a half every day, time he could use for studying. Scott decided to carry books with him and to spend every spare moment reading.

To earn his college tuition, he picked and canned blackberries, salvaged scrap metal to sell, and took on odd jobs. He saved some of the money and spent the rest on books. At age 19 he enrolled at Illinois State Normal University to begin his long journey away

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WALTER DILL SCOTT

from the farm. Two years later he won a scholarship to Northwestern University in Evanston, Illinois, and took tutoring jobs to make extra money. He played varsity football and met Anna Marcy Miller, the woman he would marry.

He also chose his career; he decided to become a missionary to China, although it meant three more years of study. By the time Scott graduated from a Chicago theological seminary, prepared to depart for China, there were no vacancies for missionaries—China was full. It was then that his thoughts turned to psychology. He had taken a psychology course and liked it and had read a magazine article about Wundt's Leipzig laboratory. With his scholarships, tutoring, and frugal lifestyle, Scott had saved several thousand dollars, enough to pay for the passage to Germany and to get married.

On July 21, 1898, Scott and his bride departed. While he studied with Wundt, Anna Miller Scott worked on her Ph.D. in literature at the University of Halle, 20 miles away. Often they saw each other only on weekends. Both received doctoral degrees two years later. Scott joined the faculty of Northwestern University as instructor of psychology and pedagogy, showing he was already influenced by the trend toward applying psychology to problems in education.

A few years later his interests changed when an advertising executive asked him to attempt to apply psychology to make advertisements more effective. The idea intrigued him. In keeping with the spirit of American functionalism, Scott's path continued to diverge from Wundtian psychology as he found more ways to use psychology to deal with real-world concerns.

Scott wrote *The Theory and Practice of Advertising* (1903), the first book on the topic, and followed it with other books and magazine articles. His expertise, reputation, and contacts in the business community broadened quickly. He also directed his attention to problems of personnel selection and management. In 1905 he was promoted to professor, and in 1909 became professor of advertising at Northwestern's school of commerce. In 1916 he was appointed professor of applied psychology and director of the bureau of salesmanship research at Pittsburgh's Carnegie Technical University.

When the United States entered World War I in 1917, Scott offered his skills to the army to help select military personnel. At first Scott and his proposals were not well received, as not everyone was convinced of psychology's practical value. The army general with whom Scott dealt was outraged and voiced his suspicions of professors. "He said it was his function to see that college professors did not get in the way of progress, that we were at war with Germany and that we had no time to fool with experiments" (Scott, quoted in Von Mayrhauser, 1989, p. 65). Scott calmed the irate man, took him to lunch, and persuaded him of the value of his selection techniques. Apparently Scott proved his point; the army later awarded him its Distinguished Service Medal.

After the war, Scott formed his own company (called, imaginatively, The Scott Company) to provide consulting services to corporations that sought assistance with problems of personnel selection and worker efficiency. He also served as president of Northwestern University from 1920 to 1939. The university's Scott Hall is named for both Walter Dill Scott and Anna Miller Scott.

Advertising and Human Suggestibility

The imprint of Scott's training in Wundt's physiologically oriented experimental psychology and his attempt to extend it into the realm of the practical are evident in his writings on advertising. For example, he noted that the human sense organs were the

... windows of the soul. The more sensations we receive from an object, the better we know it. The function of the nervous system is to make us aware of the sights, sounds, feelings, tastes, et cetera, of the objects in our environment.

Advertisements are sometimes spoken of as the nervous system of the business world. The advertisement of musical instruments which contains nothing to awaken images of sounds is a defective advertisement. As our nervous system is arranged to give us all the possible sensations from every object, so the advertisement which is comparable to the nervous system must awaken in the reader as many different kinds of images as the object itself can excite. (quoted in Jacobson, 1951, p. 75)

Scott argued that because consumers often do not act rationally, they can be easily influenced. He cited emotion, sympathy, and sentimentality as factors that heighten consumer suggestibility. He also believed, as was common at the time, that women were more persuadable than were men. Applying his law of suggestibility, he recommended that companies use direct commands—such as *Use Pears Soap*—to sell products. He promoted the use of return coupons because they required consumers to take direct action, such as tearing the coupon out of the newspaper, filling in their name and address, and mailing it to the company to receive a free sample. These techniques were eagerly adopted by advertisers and by 1910 were widely used.

Employee Selection

For selecting the best employees, especially among salespeople, business executives, and military personnel, Scott devised rating scales and group tests to measure the characteristics of people who were already successful in those occupations.

Like Witmer in clinical psychology, Scott had no prior work on which to base his approach. He questioned army officers and business managers, asking them to rank their subordinates on appearance, demeanor, sincerity, productivity, character, and value to the organization. He then ranked job applicants on the qualities found to be necessary for effective job performance, a procedure similar to that in use today.

Scott developed psychological tests to measure intelligence and other abilities, but instead of assessing individual applicants he constructed tests to administer to groups. When large numbers of candidates must be evaluated within a short period of time, it is more efficient and less expensive to test groups.

Scott's tests differed from those being developed by Cattell and other applied psychologists. Scott was not only measuring general intelligence but in addition was interested in determining how a person used his or her intelligence. In other words, he wanted to understand how people processed information and how intelligence operated in the everyday world. Scott defined intelligence not in terms of specific cognitive abilities but in practical terms such as judgment, quickness, and accuracy. The latter were the characteristics needed to perform well on a job. He compared applicants' test scores with the scores of successful employees and was unconcerned with what those test scores might signify about mental elements.

Comment

Scott, like Witmer, received only passing attention in the history of psychology for many years. There are several reasons for this relative neglect. Like most applied psychologists, Scott formulated no theories, founded no school of thought, and trained no loyal core of students to continue his work. He conducted little experimental research and published rarely in the mainstream journals. His work for private corporations and for the military was strictly problem oriented. Many academic psychologists, particularly those in tenured positions with major universities and well-funded laboratories, discounted the work of applied psychologists, believing it contributed little to the advancement of psychology as a science.

Scott and other applied psychologists disputed this notion. They found no conflict between applying psychology and advancing it as a science. Applied psychologists argued

that bringing psychology to the public's attention demonstrated its worth, which in turn increased the recognition of psychological research in the academic laboratories. Thus, the pioneers of applied psychology reflected the American functionalist spirit and the goal of making psychology useful.

The Impact of the World Wars

World War I brought about a monumental increase in the scope, popularity, and growth of industrial-organizational psychology. We noted that Scott volunteered his services to the U.S. Army and developed a rating scale for selecting army captains based on his tests for rating business leaders. By the end of the war, he had evaluated the job qualifications of 3 million soldiers, and his work provided another highly publicized example of psychology's practical worth. After the war, business, industry, and government clamored for the services of industrial psychologists to reorganize their personnel procedures and to prepare psychological tests to help select the best employees.

World War II brought even more psychologists into war work for testing, screening, and classifying recruits. Also, by then the weapons of war (such as high-speed aircraft) had become increasingly complex, requiring more highly skilled people to operate them. The need to identify those military personnel who possessed the ability to learn the required skills led psychologists to refine their selection and training procedures. These necessities of war also spawned a new specialty within industrial psychology variously called engineering psychology, human engineering, human factors engineering, or ergonomics.

Engineering psychologists work closely with weapons systems engineers to supply information about human capacities and limitations. Their work directly influences the design of military equipment to make it more compatible with the abilities of the people who use it. Engineering psychologists today work not only on military hardware but also on consumer products such as computer keyboards and the display of information on computer monitors, office furniture, home appliances, and automobile dashboard displays.

The Hawthorne Studies and Organizational Issues

The primary focus of industrial psychologists during the 1920s was the selection and placement of job applicants—matching the right person with the right job. In 1927, the scope of the field broadened considerably with an innovative research program conducted by the Western Electric Company at its Hawthorne plant in Illinois (Roethlisberger & Dickson, 1939). These studies extended the field beyond selection and placement to more complex problems of human relations, motivation, and morale.

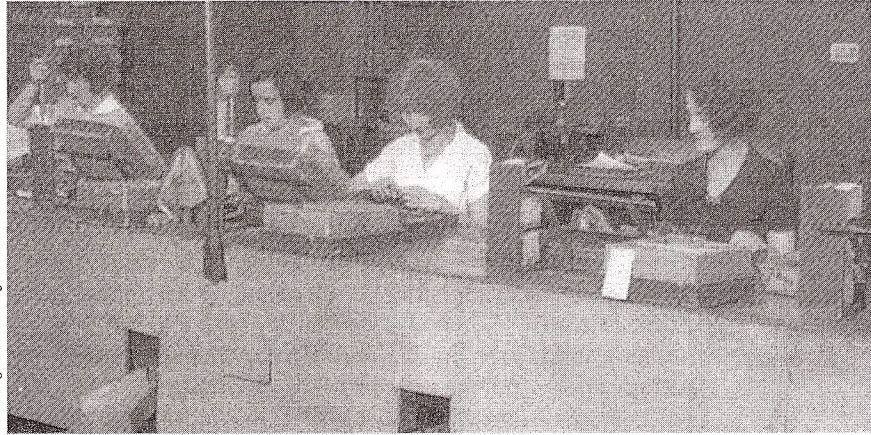
The research began as a straightforward investigation of the effects of the physical work environment—such as conditions of lighting and temperature—on the efficiency of the employees. The results astonished the psychologists and the plant managers. They found that social and psychological aspects of the workplace were much more important than the physical conditions.

For example, researchers conducted

... 20,000 interviews of workers and found that it was not the substance of the interviews but the very fact of being interviewed (i.e., being given attention, scrutinized, surveyed, watched, listened to) that defused their griping and made them more docile and "better adjusted." (Lemov, 2005, p. 65)

In other words, just the fact of being questioned or observed on the job as part of a research program persuaded many workers that management cared, that their boss was truly interested in them as individuals and not merely as interchangeable cogs in the great industrial machine.

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Studies conducted during the 1920s and 1930s at the Hawthorne, Illinois, plant of the Western Electric Company led applied psychologists into the complex areas of human relations, leadership styles, and employee motivation and morale.

The Hawthorne studies led psychologists to explore the social-psychological work climate, including the behavior of leaders, informal work groups, employee attitudes, communication patterns between workers and managers, and other factors capable of influencing motivation, productivity, and satisfaction. Business leaders soon came to recognize and accept the impact of these forces on job performance. Psychologists today study different types of organizations, their communication and organizational styles, and their formal and informal social structures. Recognizing the importance of organizational variables, the APA's Division of Industrial Psychology was renamed the Society for Industrial and Organizational Psychology.

Contributions of Women to Industrial-Organizational Psychology

Industrial-organizational psychology as a profession historically has provided career opportunities for women. The first person to receive a Ph.D. in the field was Lillian Moller Gilbreth (1878–1972), who earned her degree in 1915 from Brown University. With her husband, Frank Gilbreth, she promoted time-and-motion analysis as a technique to improve efficiency in job performance. However, many business leaders of the day refused to accept female psychologists in their offices or factories.

When Lillian and Frank wrote a book on industrial efficiency, the publisher refused to put her name on the cover, explaining that a woman's name would detract from the book's credibility. Her own book about the psychology of management was published only when she agreed to be named L. M. Gilbreth instead of Lillian Gilbreth; it was said that businessmen would never buy it if a woman's name was on it. She overcame these and other barriers to have a long, successful career (Kelly & Kelly, 1990; Lancaster, 2004). Her likeness even appeared on a U.S. postage stamp.

And Lillian Gilbreth did it all while raising 12 children. "Between 1905 and 1922, Lillian gave birth 13 times, at 15-month intervals; one child died at the age of 5" (Lepore, 2009, p. 88). She worked well into her nineties and was responsible for major changes in the way in which work is managed and the efficiency with which it is carried out both in organizations and in the home. For example, open your refrigerator and look at the shelves inside the door. That was Lillian Gilbreth's idea. As a result, refrigerators have a

greater capacity and a more efficient design. For more about Lillian Gilbreth, go to www.webster.edu/~woolfm/gilbreth2.html. Today, more than half of all Ph.D. candidates in industrial-organizational psychology are women.

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HUGO MÜNSTERBERG

Hugo Münsterberg (1863–1916)

Hugo Münsterberg, the stereotypical German professor, for a time was a phenomenal success in American psychology and much in the public eye. He wrote hundreds of popular magazine articles and almost two dozen books in such applied areas as clinical, industrial, and forensic psychology. He was a frequent visitor to the White House as the guest of presidents Theodore Roosevelt and William Howard Taft. Münsterberg was a powerful consultant to business and government leaders and counted among his acquaintances the rich and famous, including Germany's Kaiser Wilhelm, steel magnate Andrew Carnegie, philosopher Bertrand Russell, and assorted movie stars and intellectuals.

For a time Münsterberg was an honored professor at Harvard University. He was elected president of both the APA and the American Philosophical Association. A founder of applied psychology in the United States and Europe, he was also one of only two psychologists ever accused of being a spy.

Münsterberg has been described as a "prolific propagandizer for applied psychology" (O'Donnell, 1985, p. 225). According to his biographer, Münsterberg was also a successful publicist, "blessed with an uncanny flair for the sensational. [His] life can be read as a series of promotions—of himself, his science, and his [German] fatherland" (Hale, 1980, p. 3).

He was extremely self-centered and had a strong sense of self-importance. The philosopher George Santayana described him as "pompous" and "egotistical beyond endurance." Münsterberg once told Santayana, during a transatlantic crossing, that it was "surprising how many people are sailing on this ship simply because I am here" (quoted in Benjamin, 2006b, p. 419).

Toward the end of his life Münsterberg became a figure of scorn and ridicule, the subject of newspaper cartoons and caricatures, an embarrassment to the university he had served for many years, and "one of the most hated individuals in America" (Benjamin, 2000b, p. 113). When he died in 1916, there were few eulogies for the man who had once been a giant in American psychology.

Münsterberg's Life

In 1882, at the age of 19, Münsterberg left his birthplace in Danzig, Germany (now Gdansk, Poland), and traveled to Leipzig, intending to study medicine at the university. When he took a psychology course with Wilhelm Wundt, however, his career plans changed. The new science excited him, promising opportunities that medical research and practice did not. He earned his Ph.D. from Wundt in 1885 and an M.D. from the University of Heidelberg two years later, expecting that both degrees would equip him better for a career in academic research. He accepted a teaching position at the University of Freiburg and set up a laboratory in his home, at his own expense, because the university lacked suitable facilities.

Münsterberg wrote articles about his experimental work in psychophysics, which Wundt criticized because the research dealt with the mind's cognitive contents rather than feeling states. But Münsterberg's work attracted followers, and soon students from throughout Europe were flocking to his laboratory. He seemed well on his way to securing a major professorship and a reputation as a respected scholar.

William James enticed Münsterberg from this career path in 1892, offering him the chance to become the highly paid director of Harvard's psychology laboratory. James resorted to flattery, writing to Münsterberg that Harvard was America's greatest university

and needed a genius to run its laboratory. Münsterberg preferred to stay in Germany, but his ambition led him to accept James's offer.

The transition from Germany to the United States and from pure experimental psychology to applied psychology was difficult. At first Münsterberg disapproved of the spread of applied psychology specialties. In an article in the American magazine *Atlantic Monthly* (1898), he attacked colleagues who were applying psychological knowledge to education or who used questionnaires and other mental measurement techniques (Benjamin, 2006b). In so doing, he alienated many leading psychologists, including Cattell. He also criticized those American psychologists who wrote for the general public, gave paid lectures to business leaders, and offered their services for a fee. However, it was not long before Münsterberg was doing the same.

After a decade at Harvard, perhaps realizing that no university in Germany was ever going to offer him a professorship, he wrote his first book in English. *American Traits* (1902) was a psychological, social, and cultural analysis of American society. A rapid and gifted writer, Münsterberg was able to dictate to a secretary a 400-page book in less than a month. James remarked that Münsterberg's brain never seemed to get tired.

The enthusiastic response to Münsterberg's book encouraged him to direct subsequent writings to the general public rather than to colleagues, and soon his work was a staple in popular magazines instead of psychology journals. He abandoned psychophysical research on the mind's contents to deal with everyday problems that psychologists could solve. His articles covered courtroom trials and the criminal justice system, advertising for consumer products, vocational counseling, mental health and psychotherapy, education, issues in business and industry, and even the psychology of motion pictures. He prepared correspondence courses on learning and business and made films about mental tests that were shown in movie theaters nationwide.

Münsterberg never shied from controversy. During a sensational murder trial, he administered almost 100 mental tests to the confessed killer of 18 people who had accused a labor union leader of paying for the murders. On the basis of the test results, Münsterberg announced, even before the jury reached its verdict in the labor leader's trial, that the murderer's confession implicating the labor leader was true. When the jury acquitted the labor leader, the damage to Münsterberg's credibility was enormous; a newspaper dubbed him Professor Monster-work.

In 1908, Münsterberg became involved with Prohibition, the movement to ban the sale of alcoholic beverages. He argued against Prohibition, citing his expertise as a psychologist, and expressed the position that alcoholic beverages in moderation could be beneficial. German-American beer brewers, including Adolphus Busch and Gustave Pabst, were delighted to have Münsterberg's support and made sizable financial contributions to Münsterberg's efforts to bolster Germany's image in the United States. In an unfortunate and suspicious bit of timing, Busch donated \$50,000 for Münsterberg's proposed Germanic Museum only a few weeks after Münsterberg published an article denouncing Prohibition. The coincidence received considerable attention in the news media.

Münsterberg's beliefs about women were also controversial. He was supportive of the education of several female graduate students at Harvard, including Mary Whiton Calkins (see Chapter 7), but in general he thought that graduate work was too demanding for women. He declared that women should not be trained for careers because that took them away from the home. Nor should women teach in the public schools because they were poor role models for boys. And women should not be allowed to serve on juries because they were incapable of rational deliberation; this last remark generated international newspaper headlines.

Harvard's president as well as many of Münsterberg's colleagues were not pleased with his sensational comments to the press on controversial issues, nor did they approve

of his interest in applied psychology. Strained relations reached the breaking point over Münsterberg's vocal defense of his German homeland during World War I. American public opinion was decidedly anti-German. Germany was the aggressor in a war that had claimed millions of lives, but Münsterberg, still a German citizen, openly defended Germany.

Newspapers reported that Münsterberg was a secret agent, a spy, or a high-ranking German military officer, and clamored for his resignation from Harvard. A London newspaper called him one of the Kaiser's American agents. Neighbors suspected that the pigeons his daughter fed in the backyard of their house were carrying messages to other spies. A Harvard alumnus offered \$10 million if the university would fire Münsterberg (Spillmann & Spillmann, 1993).

Colleagues snubbed him, and he received death threats in the mail. The ostracism and virulent public attacks broke his spirit. On December 16, 1916, the newspapers published speculations about peace talks in Europe. "By spring we shall have peace," he told his wife (Münsterberg, 1922, p. 302). He set off on foot through the deep snow to teach his morning class and was exhausted by the time he reached the lecture hall. Münsterberg entered the classroom and had lectured "for about a half hour when he appeared to hesitate and a moment later stretched his right hand toward the desk as though to steady himself" (*New York City Evening Mail*, December 16, 1916).¹ He fell to the floor without saying another word and died instantly of a massive stroke.

Forensic Psychology and Eyewitness Testimony

Forensic psychology deals with psychology and the law. Münsterberg wrote magazine articles on such topics as crime prevention, using hypnosis to question suspects and administering mental tests to detect guilty persons and the questionable trustworthiness of eyewitness testimony. He was particularly interested in the latter—the fallibility of human perception in viewing a criminal event and subsequently describing it.

He conducted research on simulated crimes in which witnesses were asked immediately after seeing the crime to describe what had occurred. The subjects disagreed on the details, even though the scene was still fresh in their memory. Münsterberg asked how accurate such testimony could be in a courtroom when the event under discussion would have taken place many months earlier.

In 1908 he published *On the Witness Stand*, which described the psychological factors that can affect a trial's outcome. These include false confessions, the power of suggestion in the cross-examination of witnesses, and the use of physiological measurements (heart rate, blood pressure, and skin resistance) to detect heightened emotional states in suspects and defendants. The book was reprinted as recently as 1976, almost 70 years after its publication, because of a resurgence of interest in the issues he had raised (see Loftus, 1979; Loftus & Monahan, 1980). The American Psychology-Law Society was established at that time as a division of the APA to promote basic and applied research on forensic psychology.

Psychotherapy

Münsterberg's 1909 book, *Psychotherapy*, focused on a different applied area. He treated patients in his laboratory rather than in a clinic, and he never charged a fee. He insisted that his position conveyed a certain authority that gave him the right to make direct suggestions to patients about how they could be cured. He believed mental illness was really a behavioral maladjustment problem, not something attributable to underlying unconscious conflicts, as Sigmund Freud claimed. "There is no subconscious," Münsterberg announced (quoted in Landy, 1992, p. 792). When Freud visited Clark University in 1909,

¹We are grateful to Dr. Ludy T. Benjamin, Jr., for supplying this information based on his research on the Münsterberg papers in the Boston Public Library.

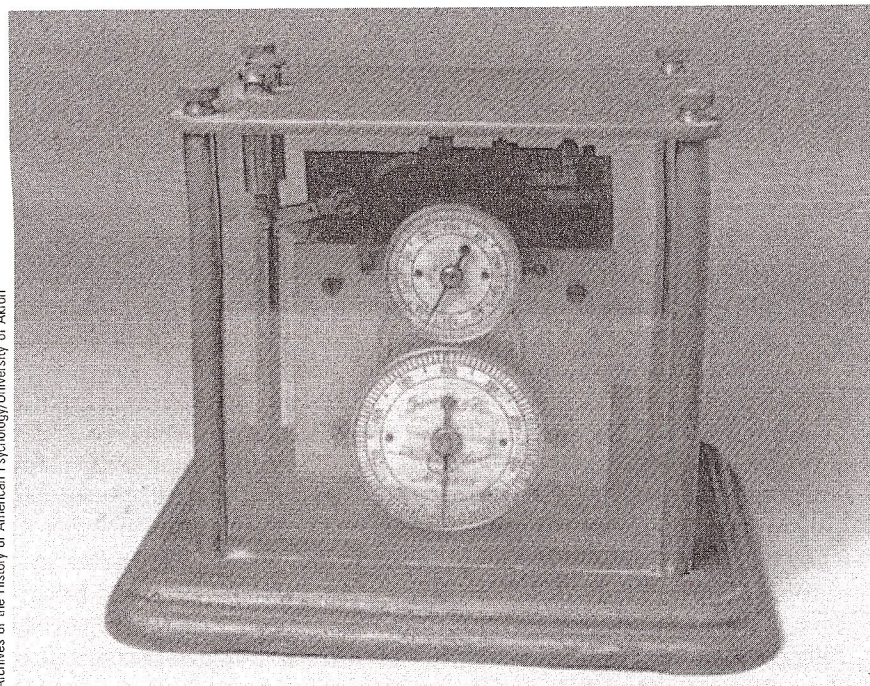
at the invitation of G. Stanley Hall, Münsterberg left the country to avoid a confrontation. He returned only after Freud went back to Europe.

Although Münsterberg's book on psychotherapy did much to bring the field of clinical psychology to public attention, it was not well received by Lightner Witmer, who had opened his clinic at the University of Pennsylvania several years before. Witmer had never achieved, nor had he desired, the popular acclaim Münsterberg thrived on. In an article in his journal, *Psychological Clinic*, Witmer complained that Münsterberg had "cheapened" the profession by hawking claims of cures in the marketplace. He referred to Münsterberg as little better than a faith healer because of the "jaunty way in which the professor of psychology at [Harvard] goes about the country, claiming to have treated in his psychological laboratory hundreds and hundreds of cases of this or that form of nervous disorder" (quoted in Hale, 1980, p. 110).

Industrial Psychology

Münsterberg was also a promoter of industrial psychology. He embarked on this work in 1909 with an article titled "Psychology and the Market," which covered several areas to which psychology could contribute: vocational guidance, advertising, personnel management, mental testing, employee motivation, and the effects of fatigue and monotony on job performance.

He worked as a consultant for several companies and performed a great deal of practical research for them. He published his findings in *Psychology and Industrial Efficiency* (1913), written for the general public. The book made the best-seller list. Münsterberg argued that the best way to increase job efficiency, productivity, and satisfaction was to select workers for positions that matched their mental and emotional abilities. How? By



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Münsterberg designed the chronoscope to measure time intervals in units of hundredths of a second for his research on worker efficiency.

developing the proper psychological selection techniques, such as mental tests and job simulations, to assess the applicants' knowledge, skills, and abilities.

Münsterberg conducted research on such diverse occupations as ship captain, street-car driver, telephone operator, and salesperson, to show how his selection techniques could improve job performance. His studies also showed that talking while working decreased efficiency. His solution was not to prohibit conversation among the workers, which would likely engender hostility, but to redesign the workplace to make it difficult for workers to talk to one another. He suggested increasing the distance between machine work stations in the factory or separating office workers' desks with partitions (a forerunner of today's office cubicles).

Comment

Münsterberg formulated no theories, started no new school of thought, and conducted no academic research once he became an applied psychologist. His research served the purposes of business; it was functional research that was oriented toward helping people in some way. Although he had been trained by Wundt in the introspective method, he criticized colleagues who were unwilling to use other psychological methods and findings for the betterment of humanity. The overriding idea that characterized Münsterberg's colorful and controversial career was that psychology be useful. For all his Germanic temperament, he was the quintessential American functional psychologist, reflecting and displaying the spirit of his times.

Applied Psychology in the United States: A National Mania

The contributions of psychologists during World War I put psychology "on the map and on the front page" (Cattell, quoted in O'Donnell, 1985, p. 239). Hall wrote that the war had "given applied psychology a tremendous impulse. This will, on the whole, do good for psychology; [we] must not try to be too pure" (Hall, 1919, p. 48). Some journals, such as the *Journal of Experimental Psychology*, ceased publication during the war years, but the *Journal of Applied Psychology* thrived. By the time the war ended in 1918, applied psychology had become far more respectable within the profession as a whole. "Applied psychology is scientific work," declared Thorndike. "Making psychology for business or industry or the army is harder than making psychology for other psychologists, and intrinsically requires higher talents" (quoted in Camfield, 1992, p. 113).

Academic psychology also benefited from the success of applied psychology during the war years. For the first time there were enough jobs and financial support for university psychologists. New psychology departments were established, new buildings and laboratories constructed, and more funds appropriated for faculty salaries. APA membership increased threefold, from 336 in 1917 to over 1,100 in 1930 (Camfield, 1992). Still, most academic psychologists disdained applied psychology. Lewis Terman, who developed the *Stanford-Binet* intelligence test, recalled that "many of the old-line psychologists regarded the whole test movement with scorn. I had the feeling that I hardly counted as a psychologist" (Terman, 1961, p. 324).

The APA, controlled by the academic branch of psychology, changed the membership requirements in 1919. Candidates for membership had to have published experimental research. In effect, this eliminated the possibility of membership for many applied psychologists and certainly for most female psychologists, whose employment opportunities were largely limited to applied work.

Despite this negative attitude toward applied psychology on the part of many university psychologists, its popularity skyrocketed and it became something of a "national mania"

(Dennis, 1984, p. 23). People came to believe that psychologists could fix everything—from marital disharmony to job dissatisfaction—and sell everything from automobiles to toothpaste. New magazines promoted the field. Among the most popular were *The Modern Psychologist* and a magazine with the even more promising-sounding title *Psychology: Health, Happiness, Success* (Benjamin & Bryant, 1997). A 1923 editorial in *The New York Times* noted that “the new psychology is making its way into one domain after another of human activity, and always proves its value” (quoted in Dennis, 2002, p. 377).

An increasing clamor for solutions to real-world problems drew more and more psychologists away from academic research and into applied areas. In the 1921 edition of Cattell’s *American Men of Science*, more than 75 percent of the listed psychologists reported doing applied work; in 1910 the figure had been 50 percent (O’Donnell, 1985). The meetings of the APA’s New York branch in the early 1920s show a substantial increase from prewar days in the number of papers dealing with applied issues (Benjamin, 1991).

However, by the 1930s, the decade of the worldwide economic depression, applied psychology came under attack for failing to live up to its promises. Business leaders complained that industrial psychologists were not curing all their corporate ills. For example, bad experiences with poorly designed selection tests had led them to hire unproductive workers.

Perhaps the expectations of psychologists and their clients had been too high, but whatever the reason, disenchantment with applied psychology set in. One vocal critic was Grace Adams, a student of Titchener’s. In “The Decline of Psychology in America,” an article in a popular magazine, Adams argued that psychology had “forsaken its scientific roots so that individual psychologists might achieve popularity and prosperity” (quoted in Benjamin, 1986, p. 944). *The New York Times* and other influential newspapers criticized psychologists for overstating their abilities and failing to ameliorate the malaise created by the economic depression. Public attention to psychology declined, and its image was not restored until 1941, when the United States entered World War II. Thus we see again that war has been a significant influence on psychology’s development.

World War II (1941–1945) provided a different set of problems for psychology and revived and expanded its influence. Fully 25 percent of American psychologists were directly involved in the war effort, and many others made indirect contributions through research and writing. Women psychologists had few opportunities to participate in war work; some were advised to do community volunteer work. Of the 1,006 psychologists who served in the U.S. armed forces, only 33 were women (Gilgen et al., 1997). “World War II and the changed conditions of postwar American life resulted in exponential growth in every area of psychology and created the need for a greater number of professional psychologists than ever before in the nation’s history” (Pickren, 2007, p. 279).

In the last half of the twentieth century, applied psychology outstripped the academic, research-oriented psychology that had dominated for so many years. No longer was it true that the majority of psychologists worked in universities conducting experimental research. Before World War II, almost 70 percent of the doctorates awarded in psychology were in experimental psychology. By 1984 that figure had dropped to 8 percent (Goodstein, 1988). Before the war, 75 percent of all psychologists with doctoral degrees worked in academic settings. By 1996, that number had fallen to 34 percent (Borman & Cox, 1996). Currently, nearly 65 percent of all psychologists work in applied areas.

One result has been a shift in power within the APA, where applied psychologists (particularly clinical psychologists) now assume a commanding position. In 1988 a group of academic and research-oriented members revolted and founded their own organization, the American Psychological Society (APS).

Comment

The nature of American psychology changed immensely in the years since Hall, Cattell, Witmer, Scott, and Münsterberg studied with Wilhelm Wundt in Germany and brought that psychology to the United States. Psychology is no longer restricted to lecture halls, libraries, and laboratories but extends into many areas of everyday life. Today applied psychologists work in testing, educational and school psychology, clinical and counseling psychology, industrial-organizational psychology, forensic psychology, community psychology, consumer psychology, population and environmental psychology, health and rehabilitation psychology, family services, exercise and sports psychology, military psychology, media psychology, addictive behaviors, religion, culture, and concerns of minority groups.

None of these areas of application would have been possible had psychology remained focused on mental elements or the contents of conscious experience. The people, ideas, and events described in Chapters 6, 7, and 8 on the functionalist school of thought compelled American psychology to move far beyond the confines of Wundt's Leipzig laboratory.

Consider the following factors:

- *Darwin's notion of adaptation and function.*
- *Galton's measurement of individual differences.*
- *The American intellectual focus on the practical and the useful.*
- *The shift within academic research laboratories from content to function brought about by James, Angell, and Woodworth.*
- *Economic and social factors and the forces of war.*

All these forces intertwined to bring forth the active, assertive, engaging, and influential science of psychology that has changed our lives. This overall movement in American psychology toward the practical was reinforced by the next school of thought in psychology's evolution—the school known as behaviorism.

Discussion Questions

1. What was the significance for psychology of the Coca-Cola trial and Hollingworth's research?
2. Why did the approaches to psychology pursued by Wundt and by Titchener fail to survive in the United States?
3. In what ways did psychology grow and prosper in the United States in the period from 1880 to 1900? Give specific examples.
4. How did economic forces influence the development of applied psychology? Do you think applied psychology would have developed when it did without these forces?
5. How did Cattell's work alter the nature of American psychology? How did he promote psychology to the public?
6. Compare the approaches of Cattell and Binet to the development of mental tests.
7. Describe the impact of World War I on the testing movement.
8. Define the concepts of *mental age* and *IQ*. How are they calculated?
9. Why did some organizations abandon the use of psychological tests in the 1920s despite their popularity?
10. How were tests used in the United States to support the notion of racial differences in intelligence and the alleged inferiority of immigrants?
11. In your opinion, are intelligence tests biased against members of minority groups? Defend your answer.
12. Discuss the role of women in the testing movement. Why was their work at a professional disadvantage?
13. How did the work of Witmer and Münsterberg influence the growth of clinical psychology?
14. How did Witmer and Münsterberg differ in their views of clinical psychology?

15. Discuss the roles of Scott and Münsterberg in the origin of industrial-organizational psychology.
16. How was industrial-organizational psychology affected by the Hawthorne studies and the wars?
17. What role did women play in the development of industrial-organizational psychology?
18. Describe Münsterberg's contributions to forensic psychology.
19. Why were Münsterberg's outspoken views often unpopular with other psychologists? How did he come to be a despised figure among the general public?
20. Compare the growth and popularity of applied psychology in the 1920s, the 1930s, and the period since the end of World War II.

Recommended Resources

- Engel, J. (2008). *American therapy: The rise of psychotherapy in the United States*. New York: Gotham. A comprehensive survey of American health-care practices. Traces the rise and fall of psychoanalysis and the growth of more target therapies as well as medications.
- Fuchs, A. H. (1998). Psychology and "The Babe." *Journal of the History of the Behavioral Sciences*, 34, 153-165. Describes an instance of psychology's application to sports; baseball's greatest player, Babe Ruth, was tested at Columbia University's psychological laboratory to assess his batting skills in the hope that these quantitative measures would lead to tests for identifying potential outstanding players.
- Kunda, D. P. (1976). The concept of suggestion in the early history of advertising psychology. *Journal of the History of the Behavioral Sciences*, 12, 347-353. Discusses early psychological theories of advertising and suggestibility proposed by Walter Dill Scott and others.
- Lancaster, J. (2004). *Making time: Lillian Moller Gilbreth: A life beyond "Cheaper by the Dozen."* Boston: Northeastern University Press. An engaging biography of the psychologist and engineer who emphasized the human component of the work environment and challenged women's traditional roles.
- Landy, F. J. (1992). Hugo Münsterberg: Victim or visionary? *American Psychologist*, 47, 787-802. Examines Münsterberg's contributions to applied psychology.
- McReynolds, P. (1997). *Lightner Witmer: His life and times*. Washington, DC: American Psychological Association. Describes Witmer's life and career and the development of his clinic at the University of Pennsylvania.
- Murdoch, S. (2007). *IQ: A smart history of a failed idea*. New York: Wiley. Traces efforts to measure intelligence from Binet's first tests to more complex assessment instruments. Examines issues of racial discrimination, the misuse of test results to justify questionable procedures, and the dangers of an over-reliance on standardized testing.
- Sokal, M. M. (Ed.). (1991). The origins of The Psychological Corporation. *Journal of the History of the Behavioral Sciences*, 17, 54-67. Traces the development of The Psychological Corporation as a major undertaking for American applied psychology.
- Spillmann, J., & Spillmann, L. (1993). The rise and fall of Hugo Münsterberg. *Journal of the History of the Behavioral Sciences*, 29, 322-338. Describes Münsterberg's life, his psychological laboratory at Harvard, and his contributions to forensic and industrial psychology.
- Von Mayrhauser, R. T. (1989). Making intelligence functional: Walter Dill Scott and applied psychological testing in World War I. *Journal of the History of the Behavioral Sciences*, 25, 60-72. Describes the efforts of Scott, Thorndike, and others in constructing group intelligence tests.
- Zenderland, L. (1998). *Measuring minds: Henry Herbert Goddard and the origins of American intelligence testing*. New York: Cambridge University Press. Reviews Goddard's contributions to the intelligence testing movement and its widespread applications in the United States.