A HISTORICAL SURVEY OF RESEARCH AND PRACTICE IN INDUSTRIAL AND ORGANIZATIONAL PSYCHOLOGY

Andrew J. Vinchur and Laura L. Koppes

The understanding of psychology is one of the most important roads to success for the modern business man. Industrial and commercial work are in thousandfold contact with mental life. Salesmanship and advertising, learning and training for technical labor, choosing the right position and selecting the right employee, greatest efficiency of work and avoidance of fatigue, treatment of customers and of partners, securing the most favorable conditions for work and adapting the work to one's liking, and ever so many other problems stand before the business world and cannot be answered but by psychology (Münsterberg, 1918, p. v).

The above quotation by Hugo Münsterberg is typical of the ambition and confidence (some might say overconfidence) of at least some of the founders of industrial-organizational (I/O) psychology. Although the results of more than 100 years of applying psychology to organizations have caused us to be a bit more humble and circumspect in our pronouncements, it is true that the science and practice of I/O psychology have made a fair amount of progress in dealing with Münsterberg's concerns. The field has had an interesting and eventful history. As I/O psychology has expanded and matured, we have seen an increased interest in this history. This is most welcome, as it is our belief that knowledge and appreciation of history is essential for deep understanding. Tracing the evolution of ideas in substantive areas of I/O psychology and examining the litany of insights, incremental progress, and missteps that resulted in the current state of the field can lead to a richer appreciation and understanding for researchers and practitioners alike.

Previous historical overviews of I/O psychology vary in emphasis, orientation, and detail. Examples include Ferguson (1962-1965), who built his history around the Carnegie Institute of Technology's (CIT's) Division of Applied Psychology; Baritz (1960), although critical of industrial psychology's close ties with management, provided a great deal of information about early industrial psychology, as did Napoli (1981) in his history of the psychological profession. A chapter by Hilgard (1987) concentrated on the history of I/O psychology in the United States; Warr (2007) provided an overview of the development of I/O outside of the United States; and McCullum (1968) and Vitelles (1932) gave summaries of the early years of the field both inside and outside of America. Katzell and Austin (1992) offered a contextual approach to American I/O psychology history, as did Koppes (2003). A recent book edited by Koppes (2007) took a topical approach to I/O history. Many other excellent histories of I/O psychology have focused on specific content areas, individuals, or time...

We thank Bianca Falbo, Shelly Zedeck, and an anonymous reviewer for their helpful comments. All errors are our own.

1Leonard W. Ferguson completed a series of pamphlets covering 34 chapters (one volume and part of another) of a planned 12-volume history of industrial psychology centered on the accomplishments of individuals associated with the CIT program (Ferguson, 1962).
periods. Where relevant, we refer to these sources in this chapter. Katzell and Austin (1992) and Koppes (2007) provided historical sources and resources for interested readers.

The purpose of this chapter is to provide an overview of the history of I/O psychology. To some extent, we cover much of the same ground as the histories mentioned in the preceding paragraph. Like Ferguson (1962-1965), we emphasize the importance of the CIT applied psychology program and concentrate on early developments in the field. Unlike Burtis (1990), we offer an insider's rather than an outsider's perspective. We attempt a comprehensive history in the manner of Triggard (1987) and Katzell and Austin (1992); however, like the earlier treatments by Viteles (1932) and McCollom (1968), we also examine historical developments outside the United States. In addition, we fold in a brief history of the related field of organizational behavior (OB). And although we emphasize a number of substantive areas such as employee selection and motivation, we do not take the explicitly topical approach of Koppes (2007).

To cover this expansive history in a single chapter, by necessity we had to be selective in deciding what material to include and what aspects to emphasize. It is not possible in a single chapter to do justice to all of the relevant worldwide research, practice, organizations, and contributing individuals, let alone the vast amount of worldwide research, practice, organizations, and contributing individuals, let alone the vast amount of relevant later material: we did not want to reduce this content to a "greatest hits" list. Second, a reasoned historical evaluation often requires the passage of time to determine the relative importance of theories and procedures. Third, the genesis and early development of any field, including I/O psychology, is particularly interesting and informative. Determining the initial motivations, influences, problems, and successes of the early pioneers puts into context present-day practice, and also allows us to develop an appreciation for the efforts of the early applied psychologists. And, finally, readers interested in in-depth coverage of more recent activity in the field need early turn to the content chapters in this handbook.

For both industrial psychology and organizational psychology, we begin with a broad overview and then cover a few selected areas in greater detail, focusing for the most part on the first half of the 20th century but also examining interesting and relevant later developments. Our coverage of industrial psychology begins with late 19th century work on advertising and on fatigue, followed by the contributions of the Division of Applied Psychology at CIT and the impact of World War I on industrial psychology. We then turn to the early history of psychologists in industry and consulting, as well as professional institutes and organizations. Next, we discuss the history of psychology applied to employee selection, performance appraisal, and training. On the organizational psychology and OB sides, we look at the evolution of interest in work environments, examine the influential Hawthorne studies, and discuss the history of the human relations movement. This is followed by histories of psychology's efforts in leadership, employee motivation, and job satisfaction.

**INDUSTRIAL PSYCHOLOGY**

Although it can be instructive and entertaining to look for precursors to I/O psychology in the writings of philosophers and historians from antiquity through the 18th century (see Kaiser, 1989, for a chronology beginning in 2100 BC), we begin our story in the second half of the 19th century—the moment when psychology emerged as a scientific discipline distinct from philosophy and physiology. The establishment of Wilhelm Wundt's laboratory at the University of Leipzig in 1879 is often taken as a convenient starting point. As Murphy (1930), Viteles (1932), and others have emphasized, however, the founding of Wundt's laboratory was really more the accumulation of a series of events moving psychology from a philosophical to an empirically based science than the actual beginning of scientific psychology. In addition, as Campbell (2007) noted, because many non-psychologists made early contributions to the field, it is overly simplistic to view I/O psychology as an outgrowth of Wundt and his students. Nevertheless, it is true that a number of important contributors to industrial psychology, such as James McKeen Cattell, Hugo Munsterberg, and Walter Dill Scott, received their doctorates at Leipzig under Wundt. This new self-consciousness of scientific psychology soon spread beyond Germany, and although initial efforts were confined to the laboratory, the fledgling discipline was soon branching out with real-world applications, including applications in business and industry (Koppes & Pickren, 2007; Viteles, 1932).

In the United States, early industrial psychologists were influenced by functionalism, an orientation that emphasized the consequences or utility of adaptive behavior and individual differences. A number of prominent early industrial psychologists were trained in graduate programs at Columbia University and the University of Chicago that emphasized this functionalist approach (Vinchur, 2007). Also influential was scientific management, which emphasized predictability over understanding and focuses on the importance of utilitarian consequences (Austin & Villanueva, 1992). This was evident, for example, in test score selection, where the relationship between test scores and success, rather than what the test measured, was judged most important (e.g., Fryd, 1923-1924). Finally, early industrial psychology was dependent on advances in measurement and statistics, particularly the accurate measurement of individual differences. We illustrate this dependency in our discussion of employee selection.

Cultural forces in the late 19th and early 20th century were supportive of psychology's forays into business and industry. There was a great deal of concern about social problems, government reform, and the power of large corporations (Zickar & Gibbey, 2007). Progress and interest in science was on the upswing, and science, including psychology, was viewed as a source for pragmatic solutions (Koppes & Pickren, 2007). The acceptance of science was on the rise. As organizations increased in size, they became increasingly difficult to manage. In response, a professional manager class emerged, along with reliance on specialized departments to make decisions that were formerly made by first-line supervisors. In addition, concern for the welfare of workers resulted in legislation, welfare programs, and an increase in labor organizations (Nelson, 1975). Psychology, in the form of testing and selection, offered a potential method for helping to manage the labor market by use of procedures based on merit (Hale, 1992). At roughly the same time that psychologists were beginning to apply psychology outside the laboratory, engineer Frederick W. Taylor was developing a system to improve worker productivity and efficiency known as scientific management or "Taylorism" (Taylor 1911) argued for a two-pronged approach: improving machinery (e.g., developing the most efficient shop design) and improving the individual worker by analyzing the job and determining the optimal way to perform that job. Under scientific management, the organization would benefit from improved productivity; the worker would benefit from increased pay via a piece-rate incentive system. These two approaches of this approach included Frank B. Gilbreth and his wife.

Psychologists working in industry were subjected to a variety of labels during these early years; many with slightly different connotations. Labels included economic psychologists, business psychologists, consulting psychologists, employee psychologists, human resource psychologists, and industrial psychologists. Although industrial psychology was not in common usage during psychology's early years (Viteles, 1932), for consistency's sake we use this term.

Although it is possible to speculate that general social, cultural, economic, and political forces and trends influenced the general development of the field, identifying which specific forces affected which specific development, and how that influence took place, is important. Difficult task is that beyond the scope of this short chapter.
psychologist Lilian M. Gilbreth, who developed time-and-motion studies to analyze tasks and time needed to complete them. The Gilbreths recognized that there needed to be more concern for the worker in scientific management, and they worked to eliminate accidents and fatigue (Lane, 2007). The influence of scientific management on industrial psychology was indirect but clear. Although Viteles (1932) noted that scientific management contributed little to industrial psychology and established an economic objective for the field (Hilgard, 1987), Viteles also stated that scientific management contributed little to industrial psychology theory and practice. Certainly the early industrial psychologists and advocates of scientific management were aware of each other (Solal, 1984). Scientific management did influence engineering psychology or human factors (Lane, 2007), and Kanigel (1997) argued that the effect of scientific management on current business practices is much greater than is commonly perceived. Scientific management, however, exhibited a number of serious drawbacks. The major criticism of Taylorism was the dehumanizing effect it had on the worker. Workers were understandably resentful toward outside experts who purported to tell them how to best perform their jobs, and the system produced labor unrest (Asken, 1985; Mucio, 1920). Contemporary psychologists were critical of the system's impact on the worker, see, for example, British psychologist Charles S. Myers (1925), German psychologist Otto Lipmann (Vincent, 2005), and American psychologiest such as Viteles (1932).

The first forays by psychologists into industry were research on fatigue and energy in Europe and studies on the workers in the United States. Early European researchers on the science of work included E. J. Marie of France, who conducted experiments on fatigue as early as 1878. Angelo Mosso, who in 1886 invented the ergograph to measure muscle fatigue and the corresponding reduction of work potential (Fryer & Henry, 1950),

Gaspar Fechner of Germany, who used weights to study fatigue (Münsterberg, 1913); and Wundt's student Emil Kraepelin, who studied physical and cognitive fatigue and developed work curves to demonstrate the reduction of production over time (Koppe & Pickren, 2007). Hugo Münsterberg (e.g., Münsterberg, 1913), first in Germany and later in the United States, focused on improving worker output and decreasing accidents through his research on fatigue, labor, and training (Koppe & Pickren, 2007).

Two of Wundt's students, Edward W. Scripture and Harlow Gate, were most likely the first in America to apply psychology to advertising. Scripture (1895), although not conducting research, discussed psychological issues relevant to advertising and business. Gate (1896) conducted both laboratory and survey studies and may have been the first to use the order-of-merit procedure to rank-order brands based on advertising data (Schumann & Davidson, 2007). Other early researchers of note in this area include Daniel Starch (1910), who published extensively in advertising and who led academia to start a marketing research company in 1932; Harvey Levi Hollingworth, who was interested in purchase behavior and constructed the first panel to systematically track consumer behavior (Karna, 1976; cited in Schumann & Davidson, 2007); and Edward K. Strong, Jr., who at Hollingworth's suggestion evaluated the relative merits of advertisements in his 1911 Columbia University dissertation (Hansen, 1987).

Of particular note was Walter Dill Scott, another Wundt student and a Northwestern University professor, who in 1901 was asked by magazine editor Thomas L. Balmer to give a talk on the usefulness of psychology in advertising (Ferguson, 1962–1965). Initially reluctant due to the perceived stigma in academia for applied psychology, Scott eventually agreed. A series of magazine articles followed and resulted in two books (Scott, 1903, 1908) on the psychology of advertising. It was Scott's 1910 book *Increasing Human Efficiency in Business, however, that Hilgard (1987) called the beginning of serious industrial psychology in America, although Münsterberg's *Psychology and Industrial Efficiency (1913; published in Germany in 1912) is another viable contender for this honor. Determining the beginning of an enterprise as multifaceted as industrial psychology is probably an exercise in futility. This also true for identifying the founder, although Ferguson (1962–1965) made a compelling case that Scott should have this honor. Scott did have a number of firsts to his credit. In 1916 at CIT he was the first in the United States to have the title of professor of applied psychology; he started the first industrial psychology consulting firm, the Scott Company, in 1919; and he was the first and only psychologist awarded the Distinguished Service Medal for his service in World War I.

Like Scott, Hugo Münsterberg received his Ph.D. under Wundt at Leipzig. Both men were also elected president of the American Psychological Association (APA). Scott in 1919; Münsterberg in 1909. Münsterberg initially was recruited by William James to run the psychology laboratory at Harvard University. He eventually branched out to applied psychology, making contributions to clinical, educational, and forensic psychology along with his work in industrial psychology. Münsterberg's initial publication on applying psychology to business appeared in McClure's Magazine in 1909, and resulted in the consulting work that was included in his 1913 book (Benjamin, 2000). This book set the initial agenda for industrial psychology: Topics included employee selection, vocational guidance, training, monotonous attention, fatigue, social and physical influences on work, advertising, selling, and buying. Münsterberg was responsible for organizing the 1904 International Congress of Arts and Sciences as part of the St. Louis World's Fair of that year. The congress showcased well-known academicians from around the world, including a number of prominent psychologists. Visitors also had the opportunity to experience the new mental and physical tests (Brown, 1992). Although the unpopularity of Münsterberg's support for Germany in World War I and his premature death in 1916 resulted in a decrease in his influence, in recent years there has been a resurgence of interest in his career (e.g., Benjamin, 2000; Landy 1992, 1997; Spillmann & Spillmann, 1993).

Around this time, two events critical for the development of industrial psychology occurred. The first, graduate program in industrial psychology at CIT was founded, and World War I provided the opportunity for psychologists to demonstrate the usefulness of their science.

**THE DIVISION OF APPLIED PSYCHOLOGY**

The early industrial psychologists were trained in traditional graduate programs that emphasized laboratory research. In 1913 Walter Van Dyke Bingham accepted an invitation from the president of CIT to found a program in applied psychology. The Division of Applied Psychology under the direction of Bingham was the first graduate program in industrial psychology in the United States. Supported by a number of wealthy Pittsburgh businessmen, the division, arranged into various bureaus and departments, served as a model for cooperation between business and academia. The Bureau of Salesmanship Research, proposed by insurance executive Edward A. Woods and directed by Walter Dill Scott, was sponsored by pledges from organizations who believed they would benefit from the bureau's research on sales (Ferguson, 1962–1965). Under the supervision of Scott, the bureau developed materials to aid in the selection of salespersons, including model application blanks, interviewers' guides, and tests of intelligence, alertness, carefulness, imagination, resourcefulness, and verbal ability (Prien, 1991).

Under the direction of James B. Miner and then W. W. Charters, the Bureau of Retail Training began in 1918. This bureau focused on both

---

8 Walter Van Dyke Bingham began a long and illustrious career as an industrial psychologist. He received his degree from the University of Chicago, studied with William James at Harvard, where he became acquainted with Münsterberg, and through his European travels was also acquainted with the Gestalt psychologists and growing British industrial psychologists as well as G. E. Myers. Sources of autobiographical and biographical information on Bingham include Benjamin and Baker (2000), Bingham (1987, 1992), and Spillmann and Spillmann (1993).

---


---

For biographical information on Bingham include Benjamin and Baker (2000), Bingham (1987, 1992), and Spillmann and Spillmann (1993).

---

The early industrial psychologists were trained in traditional graduate programs that emphasized laboratory research. In 1913 Walter Van Dyke Bingham accepted an invitation from the president of CIT to found a program in applied psychology. The Division of Applied Psychology under the direction of Bingham was the first graduate program in industrial psychology in the United States. Supported by a number of wealthy Pittsburgh businessmen, the division, arranged into various bureaus and departments, served as a model for cooperation between business and academia. The Bureau of Salesmanship Research, proposed by insurance executive Edward A. Woods and directed by Walter Dill Scott, was sponsored by pledges from organizations who believed they would benefit from the bureau's research on sales (Ferguson, 1962–1965). Under the supervision of Scott, the bureau developed materials to aid in the selection of salespersons, including model application blanks, interviewers' guides, and tests of intelligence, alertness, carefulness, imagination, resourcefulness, and verbal ability (Prien, 1991).

Under the direction of James B. Miner and then W. W. Charters, the Bureau of Retail Training began in 1918. This bureau focused on both

---

For biographical information on Bingham include Benjamin and Baker (2000), Bingham (1987, 1992), and Spillmann and Spillmann (1993).

---

The early industrial psychologists were trained in traditional graduate programs that emphasized laboratory research. In 1913 Walter Van Dyke Bingham accepted an invitation from the president of CIT to found a program in applied psychology. The Division of Applied Psychology under the direction of Bingham was the first graduate program in industrial psychology in the United States. Supported by a number of wealthy Pittsburgh businessmen, the division, arranged into various bureaus and departments, served as a model for cooperation between business and academia. The Bureau of Salesmanship Research, proposed by insurance executive Edward A. Woods and directed by Walter Dill Scott, was sponsored by pledges from organizations who believed they would benefit from the bureau's research on sales (Ferguson, 1962–1965). Under the supervision of Scott, the bureau developed materials to aid in the selection of salespersons, including model application blanks, interviewers' guides, and tests of intelligence, alertness, carefulness, imagination, resourcefulness, and verbal ability (Prien, 1991).

Under the direction of James B. Miner and then W. W. Charters, the Bureau of Retail Training began in 1918. This bureau focused on both
employee and employer attitudes regarding training and organizational research. Vocational guidance, particularly individual interests, was the area researched by the Bureau of Personnel Research. Leadership was provided by Miner, Clarence Yoakum, and Edward K. Strong, who would build on the work started here to produce the Strong Vocational Interest Blank (Strong, 1927).

Despite its many successes, the division had a short existence and closed in 1924. CIT graduate Richard S. Uhrbeek attributed the closing to the following combination of factors: Bingham's new interest in the Personnel Research Federation; the new director Clarence S. Yoakum's lack of success in retaining corporate sponsorship; and a new, less supportive president at CIT (Hilgard, 1987; see also Ferguson, n.d.). It is hard to overstate the influence of the CIT program on I/O psychology. Students and staff associated with the Division of Applied Psychology made major contributions to industrial psychology and psychometrics and were instrumental in spreading industrial psychology to academic and applied settings. A few examples will illustrate:

Bingham, who along with Strong contributed greatly to Army personnel research in World War I, produced more than 200 books and papers (Zusne, 1984), directed the Personnel Research Federation (described in a later section), edited the Journal of Personnel Research, and was chief psychologist for the Adjutant General in World War II. Scott's contributions to the United States Army during World War I are described below. The selection procedures developed at CIT by Scott and his students were widely imitated (Ferguson, 1962–1965). Staff member Louis L. Thustolene later made significant contributions to measurement and factor analysis. Marion A. Bills, who in 1931–1932 was the first woman president of APA Division 14 (which evolved into the Society for Industrial and Organizational Psychology [SIOP]), conducted long-term research in the insurance industry considered a model for collaboration between psychology and business (Ferguson, 1952).

Other staff members of note include Arthur W. Kornhauser, who did important early work in selection and testing, attitude surveys, labor union relations, and employee mental health (Zickar, 2003) and Clarence Stone Yoakum, who was field supervisor of all mental testing for the Army in World War I (Bingham, 1946) and who supervised the doctoral program at CIT. Four students received their doctorates from that program. The first was Bruce V. Moore, whose 1921 PhD is considered the first in the United States from an industrial psychology program (Ferguson, n.d.). Moore was followed by Max Freed, Grace Manson, and Merrill Ream. A description of their contributions along with others from the program can be found in Ferguson (1962–1965).

**WORLD WAR I AND INDUSTRIAL PSYCHOLOGY**

World War I took place from 1914 to 1918; the United States entered the war in 1917. The conflict provided an opportunity for psychologists to contribute to the war effort and to demonstrate the practical value of their new science. APA president Robert Yerkes decided the best use of psychology would be in developing standardized group intelligence tests that could be used in selecting and classifying recruits. Yerkes's group developed two tests, the Army Alpha for individuals with English-language skills, and the Army Beta, for those recruits who were illiterate or did not have strong English-language skills. Working under the Surgeon General, Yerkes and his team of 354 examiners tested 1,726,966 soldiers in 35 camps at a cost of 50 cents per individual (Ferguson, 1962–1965). This effort demonstrated that large groups of individuals could be tested at a reasonable cost. Although the military's response to this testing program was mixed (Samuelson, 1977), the perceived success of the group testing effort would fuel a strong interest by industry for psychological testing after the war ended. In keeping with the hereditary bias regarding intelligence in vase at the time, interpretations of these tests by Brigham (1923)9 and others were used to cast aspersion on the mental capacity of Americans in general and to reinforce racial and ethnic group stereotypes.

Walter Dill Scott strongly disagreed with Yerkes's approach to the war effort. He saw Yerkes as primarily concerned with furthering the interests of psychology, rather than using the tools of industrial psychology to further the war effort (Ferguson, 1962–1965; von Mayhuser, 1987). Along with Walter V. Bingham, Scott went his own way, establishing the Committee on Classification of Personnel under the aegis of Adjutant General's Office. This committee applied the techniques developed in the CIT program to solving Army personnel problems. They adapted rating scales for military use in selecting and rating officers, developed trade specifications and other requirements to match the occupational needs, and personnel specifications; and developed standardized trade tests used on approximately 130,000 soldiers (Bingham, 1919; Strong, 1918). More than 3 million soldiers were classified and rated on job qualifications (Sokal, 1981). This committee also laid the foundation for personnel and job analysis (Katzell & Austin, 1992; see Wilson, 2007, for a history of job analysis). One notable test to emerge from World War I was Woodworth's (1919) Personal Data Sheet, a precursor to tests of personality.

Although he noted pockets of applied psychology activity in Great Britain before World War I, Hearsham (1964) claimed the war produced the real beginning of applied psychology in that country. Concern for the health and well-being of munitions workers, who commonly worked 70 to 90 or more hours per week, resulted in the creation of the Health of Munitions Workers Committee in 1915. Members of this committee, including one of Britain's first industrial psychologists H. M. Vernon (McCollom, 1908), investigated industrial fatigue and accidents, hours of work, ventilation and lighting of factories, and worker efficiency and output. During the war, work was done on employee selection, although not to the degree conducted in the United States. Future industrial psychologists C. S. Myers, T. H. Pear, and others researched selection procedures for submarine detection operators. Myers stated that his initial exposure to industrial psychology was through the writings of Bernard Muscio, one of the first investigators for the Industrial Fatigue Research Board. In 1916, Muscio, an Australian, delivered a series of lectures on industrial psychology in Sydney that were later published in 1917 (Hearsham, 1964). In Germany, World War I necessitated an increased need for aptitude testing for positions such as pilots, radio operators, and transport drivers (Sprung & Sprung, 2001).

**PSYCHOLOGISTS IN CONSULTING AND INDUSTRY**

After hostilities ceased, Scott and others involved in the war effort opened the first personnel consulting organization, the Scott Company, in February 1919. Although successful, the Scott Company was only in business a few years. Experiencing financial difficulties in 1921, the company laid off several consultants, including one of the first women consultant psychologists, Mary Holmes Stevens Hayes (Hoyt, 1921; Koppes, 1987). The Scott Company's demise may have been due to employees leaving for other opportunities (Katzell & Austin, 1992), or perhaps to a recession in 1921–1922 (Ferguson, 1961). Another early consulting firm of note was the Psychological Corporation, founded in 1921 by James McKeen Cattell (Cattell, 1923). This firm, whose primary purpose as conceived by Cattell was to advance psychology through research, operated as a holding company for psychologists. Although the Psychological Corporation was initially unprofitable, a reorganization under Walter V. Bingham and Paul S. Achilles brought eventual success (Sokal, 1984). The early practitioners of industrial psychology were trained in experimental psychology and for the most part maintained academic careers. In time individuals did begin to work full-time in industry (e.g.,

9Although industrial psychology has long been construed as overly favoring the management perspective (e.g., Bottke, 1960) and indifferent at best towards industrial psychology and unions, there is evidence to the contrary (see Zickar, 2003) (for biographical information about Kornhauser, and Zickar, 2004 for more information about industrial psychology and unions).
Henry C. Link in 1912) or for consulting firms. Employment in industry and consulting provided opportunities for psychologists who were unwilling or unable to secure academic employment (e.g., women). Examples include the aforementioned Lillian Gilbreth; Mary Holmes Stevens Hayes, a 1910 University of Chicago PhD who worked for the Scott Company, coauthored a book with Scott (Scott & Hayes, 1921), and became an authority on youth guidance and placement (Koppe, 1997); and Elsie Oschin Bregman, a 1922 Columbia University PhD, who worked as an applied psychologist at R. H. Macy (Bregman, 1921; Oschin, 1918) and for the Psychological Corporation, where she revised the Army Alpha (Bregman, 1926). Also noteworthy are Grace Manson, one of four students to receive PhDs from the CIT program, who conducted selection research for the Bureau of National Service in 1916; and Jocelyn Ueno, the first PhD who worked as an applied psychologist for the Charles Leets Company in 1917. The first masters-level psychologist to work full time in industry was Henry Viteles (Lawrence, 1947; Odoroff, 1939).

PROFESSIONAL INSTITUTES AND ORGANIZATIONS

A number of institutes were founded in the early years of industrial psychology. In Germany they included the Institute for Applied Psychology and General Psychological Research in Neubabelsberg, founded by Otto Urban and William S. Sears in 1906, and the Institute for Industrial Psychotechnology at the Technical College in Berlin—Charlottenburg founded in 1918 by Walter Moeck and Georg Schlesinger. Curt Piorowski and Lipmann established the Institute for Vocational and Business Psychology in Berlin in 1920, and a year later Hans Rupp and Carl Strump founded the Division of Applied Psychology at Berlin University's Institute of Psychology. These institutes engaged in activities such as aptitude testing, ergonomics, and career counseling (Spring & Sprung, 2001; see also Viteles, 1932). In addition, by 1922 at least 22 large companies had established their own psychological laboratories (Viteles, 1923) and by 1926 more than 100 firms, including Krupp, the Siemens Company, and the Loewe Company, were using psychological selection methods (Viteles, 1932). In Great Britain, the National Institute of Industrial Psychology was founded in 1921 by businessman H. J. Welch and pioneering industrial psychologist Charles S. Myers1 to conduct research and do applied work in industrial psychology (Myers, 1936).

Other countries were also establishing institutes dedicated to applied psychology. As early as 1889, L. O. Pantiel founded a Laboratory of Work Psychology in Moderna, Italy (deWolff & Shimmin, 1976), and in 1923 Agostino Gemelli founded the Institute of Psychology at the Catholic University in Milan, where some industrial psychology work took place (McCollom, 1968). In Switzerland, Jules Suter established an Institute of Industrial Psychology in Zurich in 1924 (Heller, 1929–1930). The Institute for Psychotechnics in Krakow, Poland, was founded in 1924 (deWolff & Shimmin, 1976). In Japan, Yoichir Ueno established the Institute of Industrial Efficiency in 1920, primarily to apply the scientific management methods of Taylor and the Gilbreths. The Kumashi Institute of the Science of Labor was founded a year later by Obara, with less of a commitment to scientific management (McCollom, 1968). In Russia, the Central Institute of Labor was established in Moscow in 1920 (see Tagg, 1923), and that same year the Psychotechnic Institute and Center for Vocational Counseling was established in Prague, Czechoslovakia (Warr, 2007). The Australian Institute of Industrial Psychology was founded in 1927 by A. H. Marini (Warr, 2007). In 1921 in the United States, the Personnel Research Federation was created to try to coordinate the large number of agencies conducting personnel research. Chaired by Kimpton, the Federation published the Journal of Personnel Research (later Personnel Journal), a rich outlet for industrial psychology research.

The American Psychological Association was founded in 1895, and in 1934, it adopted its first constitution. The stated objective for APA was "the advancement of Psychology as a science" (Cattell, 1895, cited in Sokal, 1992, p. 115). With this purely scientific goal, APA's leadership decided that applying psychology outside the university laboratory was inappropriate (Benjamin, 1997a). Cattell (1946) estimated that as late as 1917, only 17 of the more than 300 members of APA were working in applications of psychology. Between 1916 and 1938, the number of APA members in teaching positions increased fivefold, from 233 to 1,299; however, the number of members in all applied psychology positions grew dramatically from 24 to 694 (Finch & Odoroff, 1939).

After numerous attempts by applied psychologists to organize under the umbrella of APA, these psychologists formed their own applied psychology organizations, most of which were bound by state lines (Benjamin, 1997a). In 1921, the largest of these groups was established, The New York State Association of Consulting Organizations. In 1930, under the leadership of Douglas Fryer, a New York University psychologist, the New York Association was renamed as the Association of Consulting Psychologists (ACP) to relinquish state boundaries and establish a national presence.

Amidst the continued dissatisfaction over APA's response to professional psychologists during the 1930s, Fryer was nominated to form a new national organization of applied psychologists. Proposed in 1937, the organization was named the American Association of Applied Psychology (AAAP). Consequently, ACP voted itself out of existence (Benjamin, 1997a). The membership of AAAP was divided into four sections: clinical, consulting, educational, and industrial and business. Section D, Industrial and Business Psychology, was formed for applied psychologists in industry (Benjamin, 1997a). Many prominent industrial psychologists were members who offered several professional services; including examining the requirements of occupations, placing workers, and conducting training programs (for a detailed description, see Benjamin, 1997a). In 1941, shortly after the National Research Council called on APA, AAAP, and other psychology groups to organize for "the benefit of the national welfare" (Benjamin, 1997a, p. 464), AAAP merged
with APA to form APA Division 14, Industrial and Business Psychology (Benjamin, 1907b), in 1943. Bruce V. Moore was the first president of APA Division 14. In 1962, "business" was dropped from the name of APA Division 14, which became the Division of Industrial Psychology. In 1973, the name changed again because of the evolving nature of the discipline. The title Psychotechnics was added and the division became labeled as APA Division 14, Industrial and Organizational Psychology. To achieve some independence from the APA, the APA Division 14 incorporated as the Society for Industrial and Organizational Psychology in 1982 (Hakel, 1979).

Since 1943, the organization has experienced changes in structure, membership, and activities, primarily due to the growth of discipline and the membership (Koppes de Pickren, 2007). Membership has grown from 130 members (fellows and associates) in 1945 (David Nershi, Executive Director; SIOP, personal communication, July 6, 2005) to 4,015 members (fellows, members, associates, international affiliates, retired) and 3,682 student members in early 2009. The international presence of SIOP has increased. In 1997, 8.9% of professional SIOP members were living outside the United States; by 2008 that figure had almost doubled to 12.1% (Tracy L. Vanneman, SIOP Membership Services Manager, personal communication, February 17, 2009). Benjamin (1907a, 1907b) provided a more complete historical account of the development of professional organizations in I/O psychology.

Professional organizations were established in countries other than the United States. The International Association of Psychotechnics was founded in 1920 by Eduard Claparede and Pierre Bovet (Pieklen & Fowler, 2003) during the first international conference of psychotechnics applied to vocational guidance in Geneva. Original members were from Belgium, Bulgaria, France, Germany, Greece, Holland, Italy, Spain, Switzerland, the United Kingdom, and the United States (Warr, 2007). Conferences of the International Congress of Psychotechnics were held in several European cities in the 1920s and 1930s, but the term psychotechnics eventually fell out of fashion; in 1955, the International Association of Psychotechnics became the International Association of Applied Psychology (IAAP).

While Edwin Fleishman was president, IAAP reorganized into a divisional structure in 1962. Division I was named the Division of Organizational Psychology under the leadership of Bernard Bass of the United States (Warr, 2007). Since its inception IAAP has been instrumental in the globalization of industrial and organizational psychology (Warr, 2007). The organization has provided numerous opportunities for communication and collaboration among psychologists around the globe (e.g., Fleishman, 1979, 1990). Activities include the IAAP's journal Applied Psychology: An International Review and meetings every 4 years in different countries. IAAP has facilitated regional meetings and sponsored programs in developing countries (Fleishman, 1979, 1990).

For example, Cheung (2008) reported activities of an IAAP task force on developing communications between IAAP and applied psychologists in the Asian region. Recently, IAAP, along with SIOP and the European Association of Work and Organizational Psychology, signed an agreement to strengthen the collaboration among these organizations (IAAP Division 1, n.d.).

The international presence of SIOP has increased. In 1997, 8.9% of professional SIOP members were living outside the United States; by 2008 that figure had almost doubled to 12.1% (Tracy L. Vanneman, SIOP Membership Services Manager, personal communication, February 17, 2009). Benjamin (1907a, 1907b) provided a more complete historical account of the development of professional organizations in I/O psychology.

Professional organizations were established in countries other than the United States. The International Association of Psychotechnics was founded in 1920 by Eduard Claparede and Pierre Bovet (Pieklen & Fowler, 2003) during the first international conference of psychotechnics applied to vocational guidance in Geneva. Original members were from Belgium, Bulgaria, France, Germany, Greece, Holland, Italy, Spain, Switzerland, the United Kingdom, and the United States (Warr, 2007). Conferences of the International Congress of Psychotechnics were held in several European cities in the 1920s and 1930s, but the term psychotechnics eventually fell out of fashion; in 1955, the International Association of Psychotechnics became the International Association of Applied Psychology (IAAP).

While Edwin Fleishman was president, IAAP reorganized into a divisional structure in 1962. Division I was named the Division of Organizational Psychology under the leadership of Bernard Bass of the United States (Warr, 2007). Since its inception IAAP has been instrumental in the globalization of industrial and organizational psychology (Warr, 2007). The organization has provided numerous opportunities for communication and collaboration among psychologists around the globe (e.g., Fleishman, 1979, 1990). Activities include the IAAP's journal Applied Psychology: An International Review and meetings every 4 years in different countries. IAAP has facilitated regional meetings and sponsored programs in developing countries (Fleishman, 1979, 1990).

For example, Cheung (2008) reported activities of an IAAP task force on developing communications between IAAP and applied psychologists in the Asian region. Recently, IAAP, along with SIOP and the European Association of Work and Organizational Psychology, signed an agreement to strengthen the collaboration among these organizations (IAAP Division 1, n.d.).

We now turn to the history of some of the substantive areas of industrial psychology. Although space considerations do not permit broad coverage of the many topic areas involved, we would like to elaborate on three influential areas: employee selection, performance appraisal, and training.

**EMPLOYEE SELECTION AND TESTING**

The principle activity of the early industrial psychologists in the United States was employee selection. Zickar and Gibby (2007) identified the focus on selection and differential psychology as one of the four themes that characterize the history of American I/O psychology. Because accurate measurement of individual differences is a prerequisite for a scientific approach to selection, measurement and empirical verification of procedures were central concerns. That is, psychologists needed a way to demonstrate empirically that their predictors, primarily psychological tests, accurately predicted job performance. Early work on the measurement of individual differences focused on physiological and sensory abilities (e.g., Cattell, 1930). These measures proved unsatisfactory to predict academic performance (Wissler, 1924). Wissler's study was one of the first uses of the correlation coefficient, developed by Francis Galton, William Weldon, and Karl Pearson, among others, to determine the predictive accuracy of a test (von Mayrhauser, 1992). Early efforts at evaluating tests focused on their cost efficiency and on reliability or freedom from measurement errors. As Bingham (1923) noted, simply evaluating a test by its reliability was inadequate. What was needed is a method to determine the relationship between the test and a measure of success, the criterion.

By around 1910, the cognitive-based tests pioneered by Binet were replacing the anthropomorphic tests of Castell (Sokal, 1984). The test-criterion method, evaluating a test by its correlation with the criterion, was becoming standard procedure by this time, although the current term to describe this validity, was not commonly used until the 1920s (T. B. Rogers, 1939). The use of the term criterion to describe a measure of an employee's success (Bingham, 1926) or job proficiency (Burt, 1926) also emerged in the 1920s (Austin & Villanova, 1992). This test-criterion method, familiar to present-day I/O psychologists and described in the 1920s by sources such as Bingham (1923-1924), Konrathauer and Kingbury (1924), and Bingham and Frydl (1926), consisted of the following general steps: (a) A job analysis is conducted to obtain relevant factors necessary for job success; (b) A criterion, or measure of success, is selected. Criteria can be objective (e.g., number of items sold) or subjective (e.g., supervisor ranking); (c) Select or construct a predictor, generally some type of test; (d) Correlate predictor scores with criterion scores to see whether there is a relationship; and (e) If there is a relationship, use a decision rule, regression for example, to determine acceptance or rejection of individual applicants.

Frydl (1923-1924) discussed comparing the new procedure with existing procedures (what today is termed incremental validity) and Bingham and Frydl (1926) included issues of adequate sample size, reliability and validity of criteria, and the necessity of cooperation from the organization.

Not all psychologists were comfortable with a strictly quantitative approach. Vitesd (1925), for example, argued for an approach more compatible with practice in Europe and advocated a combination of statistical and clinical procedures that give consideration to the well-being and interests of individual workers. This period also saw an anticipation of the concept of utility in Hull's (1928) Index of Forecasting Efficiency (H. C. Taylor & Russell, 1939).

Industrial psychology was not only concerned with finding the best worker for a job, the question of selecting jobs for individuals, what came to be termed vocational psychology, was also an issue. Although considered a mainstream activity in industrial psychology during the early years of the field's development, beginning in the 1930s psychologists interested in career guidance began to split from those interested in industrial applications. By the 1950s this activity was well on its way to becoming a part of counseling psychology (Savickas & Bakar, 2005). In addition to the antecedents already mentioned for selection and industrial psychology in general, predecessors to vocational psychology can be found in vocational counseling work after the Civil War by the Young Men's Christian Associations and in the vocational guidance work of Boston University law professor Frank Parsons (1909), who pioneered the model that vocational adjustment involves a fit between the requirements and routines of a job and the capabilities and characteristics of the individual in the job.
individuals\(^2\) (Savickas & Baker, 2005). Particularly important for vocational placement was the later development of vocational interest tests pioneered in the CIT Division of Applied Psychology program.

Moving from the laboratory to the real world was not without criticism by mainstream academic psychologists (e.g., Moore, 1961), for a personal reminiscence. To establish a profession, it was important for applied psychologists to differentiate themselves from non科学家 practitioners. This was particularly true for industrial psychologists involved in selection.

Popular pseudo-scientific selection procedures such as Katherine Blackford’s character analysis system (Blackford & Newcomb, 1914) for selecting individuals based on physiognomic characteristics such as face shape and hair color were subjected to scientific scrutiny and determined to be without merit (Clepton & Knight, 1924; Paterson & Ludgate, 1922–1923). Other nonscientific procedures such as phrenology, graphology, palmistry, and mind reading were put to the test and also found wanting (Moore & Hartmann, 1931a). Psychologists were not immune to cloaking preconceptions in scientific garb, for example, Münsterberg’s “group psychology” that assigned mental traits to various ethnic groups (Barratt, 1960).

Countries outside the United States were also involved in selection research and practice. For example, Salgado (2001) noted Ugo Pazzelli of Italy was selecting apprentices with tests as early as 1901, and Agostino Gemelli used psychological procedures for selecting aviators for the military in 1917 (McCollom, 1968). Jean Marie Lahy of France was using tests for selecting stenographers in 1917 (Viteles, 1923) and streetcar drivers in Berlin Tramways (Viteles, 1923). The perceived successes of psychology in World War I, particularly psychological testing, contributed to a boom in the field’s popularity in the United States in the 1920s. The country was prosperous and employment levels were high. For industrial psychology and testing, there was initial success, followed by overconfidence and overselling in the mid-1920s (disillusion by business, and a period of decline in the late 1920s (Sokal, 1984). To be fair, individuals other than psychologists were promoting tests, and reputable psychologists (e.g., Kornhauser & Kingsbury, 1924) were careful not to oversell the usefulness of these tests. In addition, there were psychologists who went beyond the simplistic “square peg in a square hole” view of personnel selection. The Scott Company, for example, when staffing personnel departments used a “worker in his work” approach, which viewed the worker and the job as an integral unit, each capable of change in response to the other (Ferguson, 1961).

With a worldwide depression and subsequent high level of unemployment, demand for industrial psychology in the United States declined greatly in the 1930s (Hale, 1992). In Germany, while individual psychologists such as Otto Lipmann and William Stern were dismissed from their posts by the Nazi regime, demand by the military for selection contributed to an increased need for industrial psychology. Psychotechnics, once almost exclusively in industry, became not only an academic discipline but also a standard tool for selecting individuals based on physiognomic characteristics such as face shape and hair color (Frey & Henry, 1950). It was in Germany, however, where the emphasis on selection was comparable with that in the United States (Viteles, 1923). Industrial psychology, referred to as psychotechnik, got an early start in Germany. In 1907, Otto Lipmann co-founded with William Stern the journal Zeitschrift für angewandte Psychologie [Journal for Applied Psychology] (Viteles, 1932). Walter Moede and Curt Piekowski were selecting army chauffeurs by 1916. In addition, in 1917, Stern investigated streetcar drivers; a selection laboratory was established by the Saxon Railway Company in Dresden in 1917 (Viteles, 1923–1926); and in 1918 motormen were studied by the Greater Berlin Tramways (Viteles, 1923).

The perceived successes of psychology in World War I, particularly psychological testing, contributed to a boom in the field’s popularity in the United States in the 1920s. The country was prosperous and employment levels were high. For industrial psychology and testing, there was initial success, followed by overconfidence and overselling in the mid-1920s (disillusion by business, and a period of decline in the late 1920s (Sokal, 1984). To be fair, individuals other than psychologists were promoting tests, and reputable psychologists (e.g., Kornhauser & Kingsbury, 1924) were careful not to oversell the usefulness of these tests. In addition, there were psychologists who went beyond the simplistic “square peg in a square hole” view of personnel selection. The Scott Company, for example, when staffing personnel departments used a “worker in his work” approach, which viewed the worker and the job as an integral unit, each capable of change in response to the other (Ferguson, 1961).

With a worldwide depression and subsequent high level of unemployment, demand for industrial psychology in the United States declined greatly in the 1930s (Hale, 1992). In Germany, while individual psychologists such as Otto Lipmann and William Stern were dismissed from their posts by the Nazi regime, demand by the military for selection contributed to an increased need for industrial psychology. Psychotechnics, once almost exclusively in industry, became not only an academic discipline but also a standard tool for selecting individuals based on physiognomic characteristics such as face shape and hair color (Frey & Henry, 1950). It was in Germany, however, where the emphasis on selection was comparable with that in the United States (Viteles, 1923). Industrial psychology, referred to as psychotechnik, got an early start in Germany. In 1907, Otto Lipmann co-founded with William Stern the journal Zeitschrift für angewandte Psychologie [Journal for Applied Psychology] (Viteles, 1932). Walter Moede and Curt Piekowski were selecting army chauffeurs by 1916. In addition, in 1917, Stern investigated streetcar drivers; a selection laboratory was established by the Saxon Railway Company in Dresden in 1917 (Viteles, 1923–1926); and in 1918 motormen were studied by the Greater Berlin Tramways (Viteles, 1923).
its separate way, despite attempts at a rapprochement in recent years (see Lane, 2007). Human factors goes by other names, such as ergonomics, human factors engineering, human engineering, and engineering psychology; variations that have been defined with varying degrees of difference. All are generally concerned with fitting the job or environment to the human operator and as such, have roots in both experimental and applied psychology.20

Experimental psychology, the functionalist worldview, scientific management, and the anthropometry pioneered by Francis Galton and James McKeen Cattell were all influences on human factors management procedures of Taylor, the Gilbreths, and others, with their emphasis on reducing fatigue and errors and increasing efficiency. The demands of World War I provided psychologists opportunities to apply their skills to developing displays and controls for the increasingly complex tanks, planes, and other equipment. Although activity slowed following the war, there was continuing work done in the 1920s (e.g., Ohio State University and the automobile industry) and the 1930s, particularly in aviation psychology (Lane, 2007). World War II brought an increased set of demands to what were now being called engineering psychologists. This war also saw the expansion of human factors to the point where human operator and as such, have roots in both experimental and applied psychology.

PERFORMANCE APPRAISAL AND TRAINING

As we noted in the section on employee selection, performance ratings were used early on as criteria for test validation. Paterson (1930) credited Karl Pearson with the first psychological rating scale for his 1907 scale used to estimate intelligence. It was Walter Dill Scott and his colleagues at the Division of Applied Psychology at CIIT, however, who in 1917 developed the prototype of rating scales subsequently used in I/O psychology. First developed for use in selecting salespeople and later termed the Man-to-Man Rating Scale (Ferguson, 1961), the scale was modified by Scott for use in rating Army officers in World War I. As Ferguson (1962–1965) described in detail, the Army was initially reluctant, but by dogged determination Scott convinced them of the scale's usefulness and eventually it was used to evaluate more than 180,000 officers. Farr and Levy (2007) noted that although Scott's scale was popular, it was not without problems. Raters constructed their own scoring scales, a difficult and time-consuming process that did not permit comparability across raters. Farr and Levy discussed other rating scales available at the time, such as the Specific Instance Scale, a forerunner of Behaviorally Anchored Rating Scales (Smith & Kendall, 1963) in that scale authors were developed not by the raters, but were performance examples generated by scale developers; and the Descriptive-Term Scale that used descriptive adjectives as anchors and was very popular in the 1920s. It was the graphic rating scale, however, that had the greatest impact.

According to Freyd (1923), the graphic rating scale originated in the Scott Company laboratory. To use this popular scale, the rater simply needs to make a mark on a continuum corresponding to where the rate falls on a particular behavior or trait. Anchors are provided for reference. Psychologists were aware early on that consistent rating errors could occur with this method. Thorndike, for example, described the halo error in a 1920 article. Farr and Levy (2007) pointed out, however, in the 1920s graphic rating scales were scored normatively and not in raw score form, which made rating errors such as leniency and central tendency less of a problem. As was true for their effect on selection research, for performance appraisal the dire economic conditions of the 1930s likely resulted in a suppression of new activity (Katzell & Austin, 1992). Farr and Levy (2007), however, did note some precursors of later developments that occurred in the 1930s. Harry Wherry's groundbreaking theory of ratings research. Not published until the 1980s (Wherry & Barlett, 1982; Wherry, 1983), this theory, although in the test metaphor tradition, included a number of psychological, situational, and procedural variables as potentially affecting the accuracy of ratings (Farr & Levy, 2007). Farr and Levy (2007) noted that by the end of the 1930s and the early 1940s there were two literatures extant in performance appraisal. The first focused on measurement, accuracy, and rating format, with a move away from trait ratings to behavioral ratings. This period saw the development of Behaviorally Anchored Rating Scales (Smith & Kendall, 1963) and then later its acronym-labeled variants such as Monthly Standard Scales (MSS; Blanz & Gianelli, 1972) and Behavior Observation Scales (BOS; Latham & Wexley, 1977). The second literature showed an increased emphasis on the effect of performance ratings on employees' lives and careers and consequent research on feedback. In 1980, Landy and Farr called for a moratorium on format research and an emphasis on researching the cognitive processes underlying appraisal. This research has occurred, with an increased emphasis on cognitive and social factors involved in performance appraisal (Farr & Levy, 2007).

The course of training research and practice in I/O psychology was similar to the field as a whole. Influenced by scientific management and a strong focus on efficiency, training methods concentrated on improving productivity and safety through simplification and standardization in the first quarter of the 20th century. This was followed by the recognition of the importance of employee attitudes and motivation, and, in the latter half of the century, the inclusion of cognitive and systems models of the training process. Prior to 1950, formal training was primarily conducted in apprenticeship programs or perhaps technical or trade schools (Krager & Ford, 2007). Psychologists were optimistic that laboratory workers and training could be used to improve training in industry. Münsterberg (1913), for example, found current unsystematic apprenticeship training to be an enormous waste of energy. He advocated an experimental approach to training, using recent studies on reading acquisition, telegraphy, and typing as an example.

As they grew in size and complexity, businesses began to set up their own factory schools (Krager & Ford, 2007). One of the first formal training programs was instituted in 1912 by the American Steel and Wire Company (Burtt, 1980). A common training method was the use of vestibule schools, usually a room containing duplicates of factory or office machinery where new workers can be trained under careful supervision (Burtt, 1929). Moore and Hartmann (1931a) thought vestibule schools best met the training goals of the company, and Burtt (1929) believed this method resulted in wiser placement of the worker, better instruction because the focus is on instruction rather than productivity, and the ability to keep detailed records of a worker's progress.

As it did for selection and performance appraisal, World War I presented serious challenges for training; there was the need to immediately train approximately a half-a-million workers for almost 100 trade jobs. The need for standardization resulted in the "show, tell, do, check" method of the Energy Fleet Corporation of the U.S. Shipping Board, and by the war's end a number of training principles were posited. These included the view that training should be done on the job by supervisors, who themselves should be instructed on how to train (Krager & Ford, 2007). Although after the war there was a dramatic increase in civilian use of psychological testing and selection, training remained an uncommon activity for industrial psychologists. Contemporary textbooks devoted relatively little space to training, and Krager and Ford (2007) noted that although after
1930 there was a shift in training instruction from the supervisor to a training expert, that expert was rarely an industrial psychologist.

In line with the increasing interest in worker attitudes and motivations of that time period, the focus of training expanded from skill acquisition and standardization to include consideration of personal concerns that may interfere with training (Kraiger & Ford, 2007). At this juncture there had also been recognition of this earlier. Henry C. Link (1923), for example, noted that in addition to developing the ability to do the job, training should arouse interest in the work and should also foster “goodwill” or “institutional spirit” in workers. As noted by Kraiger and Ford (2007), the period between 1930 and 1960 saw an increasing professionalization of the training process. There was also increasing variability of training methods. By 1960, case studies, role playing, human relations training, sensitivity training, and the use of simulations were being used. Needs assessment became a focus, as illustrated by its treatment in McGuire and Thayer (1961), the first I/O psychology book devoted to training. More attention was also being given to training program evaluation. In 1959 Kirkpatrick first discussed his influential four levels of training program criteria: reactions, learning, behavior change, and performance change. By the 1970s, the cognitive revolution and system approaches to organizations began to work their way into training research. In 1974 Goldstein introduced his instructional systems design model of training (Kraiger & Ford, 2007).

ORGANIZATIONAL PSYCHOLOGY AND BEHAVIOR

Organizational psychology and its multidisciplinary sibling organizational behavior are younger disciplines than industrial psychology, although as we will see, their historical roots go back far before they were recognized as formal disciplines. The subject matter, research, practice, and history of organizational psychology and OB overlap to a considerable degree. There is no bright-line distinction between the two disciplines, but attempts have been made to differentiate the two and to separate both from the related orientations of organizational theory (OT) and organizational development (OD). For example, Jex and Britt (2008), although conceding their similarity, noted that organizational psychology tends to be more parochial, relying primarily on other subdisciplines in psychology. OB draws more extensively from fields such as sociology, economics, and anthropology. They also noted that organizational psychology tends to focus on individual behavior to a greater extent than OB, which is more comfortable with multiple levels of analysis. Vecchio (1995) saw OB as taking a theoretical-conceptual orientation at the micro (individual) level of analysis to distinguish it from OT, which also has a theoretical orientation but at a more macro level, and OD, which takes an applied macro perspective. And on a practical level, OB tends to be a staple of business schools; organizational psychology tends to be taught in departments of psychology. These distinctions are probably moot because all of these disciplines share many common pioneers and landmark events and organizational psychology textbooks cover a similar range of topics as OB texts (Hightower, 2007).

Not surprisingly for an interdisciplinary field, the origins of OB tend to be viewed through the disciplinary lens of the individual writer. Lawrence (1987) noted that psychologists tend to focus on the mid-1940s contributions of Kurt Lewin and his colleagues on group behavior and leadership. Sociologists cite the earlier work of bureaucratic sociologists such as Peter Blau, Alvin Gouldner, Robert Morton, and Philip Selznick. Lawrence, however, argued that a plausible starting point centers around three earlier works from the 1930s. Two focused on the Hawthorne studies: Elton Mayo’s (1933) Human Problems of an Industrial Civilization and Fritz Roethlisberger and William Dickson’s (1939) Management and the Worker. The third was New Jersey Bell executive Chester Barnard’s Functions of an Executive (1938). Miner (2002), in contrast, viewed the Hawthorne work as the narrowly defined human relations approach. He placed the genesis of OB as a separate entity in the mid-1930s with the migration of social scientists into the business schools. The present survey goes back further than the 1930s and 1940s in examining the evolution of organizational topics. In the initial sections, landmark events such as the iconic Hawthorne studies that were instrumental in shaping the field are discussed. Then we look at the development of the handbook perspective and following this we focus on the history of topics of particular interest to I/O psychologists: organizational leadership, motivation, and job satisfaction.

EARLY INTEREST IN WORKER WELFARE

Both organizational psychology and OB grew out of a human relations tradition, a concern for the welfare of the individual employee. Although it is true that the early years of American industrial psychology were characterized by an emphasis on productivity and efficiency, these were not the only concerns of the early industrial psychologists, especially for industrial psychologists outside the United States. In Great Britain, for example, there was considerable early emphasis on the happiness of workers (Myers, 1920), although efficiency was not neglected. Worker concern can be illustrated by the considerable criticism of the work of Taylor and the Gilbreths, although Pear (1948), possibly tongue-in-cheek, did note that at least Frank Gilbreth “injected some mull of human kindness” into Taylor’s “inhuman doctrines” (p. 112). Prior to the Hawthorne studies in the United States, Myers (1920) was speculating on psychological causes of restricted output and employee discontent; and in 1925 he described employee behavior that was very similar to what became known as the Hawthorne effect. Myers’s National Institute of Industrial Psychology, founded in 1921, had as its primary goal to “ease the effort required by the worker and not to endeavor to increase output by increased incentives” (Farmer, 1958, p. 265). As noted in an earlier section of this chapter, criticism of psychologists of Taylor’s lack of consideration for the attitudes and emotions of the worker also occurred in other countries, including Germany and the United States.

German psychologists, while sharing the United States’ emphasis on selection, also expressed concern for worker well-being. Otto Lipmann, for example, viewed industrial psychology as broader than the efficiency-based selection or scientific management approaches then popular. In addition to maximal performance to work, Lipmann discussed willingness-to-work, that is, worker motivation and satisfaction. He believed that too much attention was paid to maximal performance through selection and not enough to willingness-to-work (Lipmann, 1931). As described by Vities (1932), in the 1920s Lipmann directed a study by the Efficiency Committee of the German Industrial Inquiry Board to evaluate the effect on workers of the increasing use of machinery in coal mining. Miners objected to the new machinery, although they did use it. Lipmann took these objections seriously and attributed them to the conservative nature of workers, to the deprivation of the companionship workers shared when mining by hand, and to a fear of loss. It is interesting to note the parallels between this early study and the later, better-known Tavistock Institute coal mining studies described later.

Organizational psychology and OB texts that provide brief histories of the field tend to identify the same 20th century landmarks. OB texts stress the foundations laid by Frederick Taylor and scientific management; Henri Fayol and administrative theory; Max Weber and bureaucracy; the writings of Mary Parker Follett; the human relations movement as exemplified by Abraham Maslow, Douglas McGregor, Russel Likert, and Chris Argyris; and then progressing to contingency, open systems, and other more modern approaches to the study of organizations. Organizational psychology (e.g., Jex & Britt, 2008) and I/O texts understandably fold in more of the history of psychology, most notably the contributions of Kurt Lewin, but these texts also emphasize scientific management and human relations. We have discussed scientific management previously; we
take a brief look at some of the other landmarks shortly. First, however, we need to examine a set of studies central to all of these histories: the Hawthorne studies.

HAWTHORNE STUDIES

Just as the activities of the Division of Applied Psychology at CIT can be viewed as foundational to the industrial side of IO psychology, the research conducted at the Western Electric Plant in Hawthorne, Illinois, has an iconic status in organizational psychology and OB. Hawthorne is seen as triggering a paradigm shift: from a mechanistic, efficiency-oriented approach to one more focused on the attitudes, social pressures, and general well-being of the individual worker. Roethlisberger (1941), one of the Hawthorne researchers, stated that the Western Electric research seemed to him to be "the road back to sanity" in employee relations: human problems require human solutions (p. 8).

The perception of the Hawthorne studies' centrality persists, despite a virtual cottage industry over the years of criticism and reassessment (e.g., Highhouse, 2007). That the importance of these studies has endured despite this revisionist history is a testament to the power of the human relations message championed by the researchers, whether or not the data actually supported their conclusions. That the research was conducted and the conclusions drawn by the Hawthorne researcher are familiar to most students of organizations. Those interested in detail beyond this brief summary can find it in primary sources such as Mayo (1923, 1933) and Roethlisberger and Dickson (1939).

The initial studies at Hawthorne were conducted between 1924 and 1927 by an independent group of the gas and electric lighting industry, the Committee on Industrial Lighting. Inspired by claims from industrial psychologists such as Münsterberg and Scott, the committee hoped to demonstrate that improved lighting would result in improved productivity and worker satisfaction (Highhouse, 2007). The research was supervised by C. E. Snow, head of the electrical engineering department at the Massachusetts Institute of Technology (MIT; Hilgard, 1987). The researchers found that any variation in illumination intensity, or even no variation at all, resulted in an increase in productivity. In 1927, Hawthorne managers invited a group of researchers from the Harvard Graduate School of Administration to continue the research. Elton Mayo, who earlier had some success increasing production and decreasing turnover at a Philadelphia textile mill, emerged as the early spokesperson and chief publicist for the Hawthorne studies (Hilgard, 1987). The first study, conducted on a small group of women assembling telephone relays, examined the effects of varying rest periods, day and week length, and wage incentives on fatigue and monotony. Regardless of the manipulation, productivity increased. This increase in output was deemed by Mayo (1925) to be the result of the increased attention given to the workers by supervisors and to improved group dynamics; this effect was termed the Hawthorne effect.

The final study conducted at Hawthorne was the Bank Wiring Room Study, in which the group dynamics of 14 men who wired telephone buns were observed. Despite being paid on an incentive system, the observer noted that the workers restricted output to a group norm. This norm was maintained by the group through group procedures that ranged from minor verbal harassment through physical punishment to, as a last resort, socially ostracizing the offender (Vecchio, 1995). Before the Bank Wiring Room study, a companywide interviewing program was conducted between 1928 and 1931, to allow employees to discuss their working conditions. The final result of the Hawthorne studies was a personal counseling program begun in 1936. Highhouse (2007) noted that the goals of this program were to increase productivity and decrease dissatisfaction by using counseling techniques to create a positive Hawthorne effect (p. 335). Management evaluated the program negatively and closed it in 1936 (Hilgard, 1987).

As noted earlier, the Hawthorne studies were criticized heavily (see Landisberger, 1958). Alternative explanations for the results included financial incentives, managerial discipline, and the fear of layoffs. Roethlisberger and Dickson (1939) were somewhat circumspect in their treatment of the Hawthorne research and they did acknowledge alternative explanations for their findings. It is indisputable, however, that these studies had a major impact on organizational psychology and OB. As Highhouse (2007) put it: "Only the human relations message survived...in the oral history of the Hawthorne experiments" (pp. 334-335).

HUMAN RELATIONS AND BEYOND

Despite the ambiguity regarding their interpretation, the Hawthorne studies ushered in a sea change in the study of organizations. Many topical areas of organizational psychology and OB, such as leadership, motivation, group processes, and job satisfaction, have relevant antecedents in that research. We now turn to post-Hawthorne developments in organizational psychology and OB.

The work of Kurt Lewin20 and his colleagues in the 1930s and 1940s deserves special mention. Lewin immigrated to the United States from Germany in 1933, working first at Cornell University and then at the University of Iowa. While at Iowa, Lewin conducted his groundbreaking research contrasting authoritarian, democratic, and laissez-faire leadership styles (Lewin, Lippitt, & White, 1939). Also in 1939, Lewin was invited to the Harwood Manufacturing Company by company vice president Alfred J. Marrow, who held a doctorate in psychology (Highhouse, 2007). The pajama manufacturing plant was experiencing turnover problems, and Marrow thought Lewin could help. Lewin, along with students Alex Bavelas and John R. P. French, Jr., instituted a number of studies that for a time made Harwood almost as well-known as Hawthorne (Hilgard, 1987). Notable was the work of Lester Coch and John R. P. French, Jr. (1948) on the use of participation to reduce resistance to change. Lewin's work at Harwood set the stage for his action research model that has proven to be very influential in OD practice (W. J. French, 1982). Lewin's (1951)

20Kurt Lewin (1890-1947) provided a basic model of human behavior that emphasized the role of environmental factors in shaping behavior. His work on personality and small group dynamics was foundational to the development of social psychology.
21John R. P. French, Jr. (1907-1982) was a prominent social psychologist who contributed significantly to the study of leadership and group dynamics. His work on the leadership styles of democratic, authoritarian, and laissez-faire leaders was influential in the field of OB.

"unfreezing, change, refreezing" model of change established the conceptual framework for OD (Shafritz & Ott, 1996).

Largely through the recruiting efforts of Douglas McGregor, in the early 1940s Lewin moved from Iowa to MIT, where he established the Research Center for Group Dynamics (W. J. French, 1982). In 1946, Lewin, Kenneth Benne, Leland Bradford, and Donald Lippitt conducted a workshop in New Britain, CT, on reducing intergroup tension, including racial tension. This effort was the genesis of the T-group method of attitude change. After Lewin's death in 1947, the Research Center for Group Dynamics moved to the University of Michigan to join Renis Likert's Survey Research Center. These two entities, along with the Center for Utilization of Scientific Knowledge, became the Institute for Social Research (ISR). In 1962, ISR returned to Harwood, which had just acquired the Weldon Company, to explore Likert's ideas about participative management and group dynamics (Highhouse, 2007; Hilgard, 1987).

The 1950s and 1960s saw a continuation and branching out of research and practice in the human relations vein. Douglas McGregor (1957, 1960) introduced his influential conception of managerial behaviors, or the McGregor's X and Y theory. Managers believe workers find work aversive and therefore need to be closely controlled; Theory Y managers believe workers can be self-motivated if they find the work intrinsically rewarding. Chris Argyris (1957) discussed how modern organizations are in conflict with the personality of mature adults (Shafritz & Ott, 1996). Work on participative management continued with Likert's (1961) "linking pin" model of integrating small groups into the organization and his taxonomy of management systems ranging from System 1 (exploitive-authoritarian) to System 4 (participative manager) (Shafritz & Ott, 1996).

Conflict, decision making, and power topics long of interest in political science, were receiving increased attention in organizations in the 1940s...
and 1950s (Ferron, 1986). Philip Selznick (1949) discussed goal conflict in his study of the Tennessee Valley Authority. In a 1953 address to the Society for the Psychological Study of Social Issues, Darwin Carnarvon argued that leadership, attitude change, and other variables could only be understood through the prism of power (Ott, 1989). J. R. French and Raven (1959) identified five bases of power; that same year Richard Cyert and James March discussed the impact of power and politics on organizational (Shafrir & Ott, 1996). The cognitive limits of decision making and the strategy of “satisficing” rather than working toward the optimal decision were explored by Cyert, March, and Herbert Simon (March & Simon, 1958; Simon, 1947). Their work on decision processes has been very influential. As Miner (2006) stated about OB: “No field could have asked for a more valuable send-off than . . . from the theorizing of Simon and March” (p. 37).

In Great Britain, Eric Trist emerged as the leading spokesperson for the Tavistock Institute of Human Relations and the sociotechnical approach to organizations. Trist was influenced by the work of Kurt Lewin, by psychoanalysis, and by open systems theory and he took a decidedly humanist approach to his research (Miner, 2002). The sociotechnical approach postulates that changes in technology must take into account the social system of the organization. The theory has its origins in the well-known long-wall versus short-wall coal mining studies conducted by Trist and Bamforth (1951). Another influential research study to come out of Great Britain was Joan Woodward’s (1940; 1940; 1940; 1940; 1940). Reviewers of this research were interested in the career advancement of AT&T managers as predicted by diverse trait measures conducted during assessment centers.

Dissatisfied with the inconsistent results of trait studies, researchers turned to identifying behaviors for explaining effective leadership. This approach considers what leaders do and how these behaviors relate to leader effectiveness. At the same time, the postwar economy produced an explosion of psychological applications and research opportunities (Koppe, 2003). Military research centers were formed, psychological research organizations were created, consulting firms were established, and research groups were formed within private companies. One unique research center that partially devoted its efforts to leadership research was located at Ohio State University (OSU).

In the 1950s, research conducted at OSU discovered measures of leadership behaviors through the perceptions of subordinates (Fleishmen, 1953; Halpin & Wilner, 1957). It was determined that subordinates’ views of leader behavior could fall into two major categories: initiating structure or task-oriented behaviors, and consideration or people-oriented behaviors. Two questionnaires resulted from this research. Leader Behavior Description Questionnaire and the Supervisory Description Questionnaire. These measures prevailed for the next 2 decades for survey research on leadership behavior; many of the behavior studies in the 1960s, 1970s, and 1980s were based on the OSU leadership measures. A similar research program was conducted at the University of Michigan under the direction of Daniel Katz (Katz & Kahn, 1953). That program and the OSU studies “represented perhaps the tipping point in the changing zeitgeist toward more situational models of leader effectiveness” (Day & Zaccaro, 2007, p. 391).

In Japan, more than 30 years of research on these two categories revealed that both of these types of behavior are correlated to leader effectiveness (Masami, 1985; Misumi & Peterson, 1985). Based on early studies by Lewin, Lippitt, and White (1939) and Coch and W. L. French (1940), a specific aspect of leadership behavior, participative leadership, and its consequences was developed.

Following the heavy emphasis on behavioral research, the focus shifted to situational or contingency approaches. Fiedler’s contingency theory, published in 1967, is based on the assumption that effective leadership results from leader characteristics and the features of the situation. Fiedler identified two leader characteristics, task-oriented and relationship-oriented, that he measured with the Least Preferred Coworker scale (Fiedler, 1967). Fiedler also introduced the concept of situation favorability for the leader, which is determined by three factors: the relationship between the leader and subordinates (leader-member relations), the degree of structure in a particular task (task-structure), and the formal authority of the leader (position power). As each factor consists of two levels (e.g., high or low position power), eight situations, or octants, are possible.

Task-oriented leaders are most effective in situations of either very high or very low favorability; relationship-oriented leaders are effective in conditions of moderate favorability.

Other theories of note that take the leadership situation into account include the situational theory of Paul Hersey and Kenneth Blanchard (1969) that examined various leadership styles in light of the maturity (i.e., ability to perform the job) level of subordinates and Robert House’s (1971) path-goal theory that evaluates leadership style as a function of the subordinates and the situation. George Graen and his colleagues developed vertical dyad linkage theory, later termed leader–member exchange theory, focusing on the relationship between supervisor and subordinate (Miner, 2006). In the 1980s, charismatic and transformational leadership approaches emerged. Inspired by the work of Max Weber, the premise of charismatic and transformational theories is that leader behaviors and traits influence others as well as inspire them to achieve high goals or better perfor-
mance, which in turn lead to improvement in organizational effectiveness (Judge & Piccolo, 2006).

As noted by Day and Zaccaro (2007), an interesting historical trend in the study of leadership is the change in research focus with regard to the organizational level of the leader. In early studies, the focus was on lower-level leaders such as foremen, student leaders, incarcerated criminal leaders, and military leaders. Noncommissioned and junior officer corps to name a few (e.g., Moore & Hartman, 1931b; Cowley, 1931; Jenkins 1947). Later, researchers began to focus on middle-to-upper level leaders (e.g., Brown, 1951; Shuttle, 1949); however, the current emphasis on middle to upper level leaders resulted from the AT&T studies (Bray, Campbell, & Grant, 1974).

**Motivation and Job Satisfaction**

Before the Industrial Revolution of the mid 1800s, not much systematic attention was given to employee motivation because units of production were small and capital investment was generally minimal. With the increased investment, competition, and emphasis on efficiency and productivity ushered in by the Industrial Revolution, employers focused on improving individual worker productivity, almost exclusively through monetary incentives (Duamette & Kirchner, 1960). Although Taylor did recognize other incentives (Vitelles, 1932), his scientific management approach provides an example of the use of financial incentives tied to performance. As noted previously, these Hawthorne studies are key to the human relations movement and the idea that productivity cannot be viewed separately from the attitudes, motivations, and satisfactions of the worker. In the early part of the 20th century American industrial psychologists were primarily concerned with improving efficiency and productivity, especially through the manipulation of environmental variables such as illumination levels and rest pauses (Hilgard, 1987). The effect was that group processes, norms, and the manipulation of environmental variables such as illumination levels and rest pauses (Hilgard, 1987). The explanation for motivation proved to be a tautology lacking logical and empirical support (Vitelles, 1932).

For the most part, however, it was not until the results of the Hawthorne studies were disseminated that American industrial psychologists began to pay serious attention to social factors in the workplace. As previously noted, these Hawthorne studies are key to the human relations movement and to the idea that productivity cannot be viewed separately from the attitudes, motivations, and satisfactions of the worker.

Efficiency (Vitelles, 1932). Kornhauser and Sharp (1923-1924) also found supervisory practices to be an important influence on attitudes; however, in contrast with the Hawthorne researchers, they found no relationship between employee efficiency ratings and attitudes (Vitelles, 1932).

The development of attitude surveys were central to research on productivity on both motivation and job satisfaction. There were early efforts to measure attitudes via interviews or work participation. Whiting (1925), for example, worked alongside miners, railroad workers, and factory workers to gauge their reactions to their jobs. He concluded that although money was important, it was not a necessary ingredient to job satisfaction.

For the most part, however, it was not until the mid 1920s that standardized attitude questionnaires were developed. Management consultant J. D. Houser (1927) developed a standard set of questions and categorized responses according to the positive and negative emotions, his initial scale, however, required one-on-one interviews (Landy, 1988). Building on the scaling methods of former CIT staffer L. L. Thurstone (1927; Thurstone & Chave, 1929), Rensis Likert in a 1932 doctoral dissertation introduced the simpler and now ubiquitous five-choice format now known as the Likert scale. By the early 1930s Kornhauser (1933), cited in Wright, 2006, was able to identify five methods of measuring attitudes: (a) an impressionistic, informal approach exemplified by the Williams (1925) study discussed above; (b) an unguided interview, in which employees are encouraged to discuss topics important to them; (c) a guided interview; (d) attitudinal questions, such as those used by Houser (1927); and (e) the more psychometrically sound scales such as those developed by Thurstone and later by Likert. Another doctoral dissertation that would prove to be a landmark in attitude and job satisfaction research was conducted by Robert Hoppeck during the early 1930s. Using Thurstone’s scaling techniques, Hoppeck’s research assistant (his father-in-law) interviewed the majority of working adults in New Hope, Pennsylvania (Landy, 1988). Hoppeck (1935) found that the majority of workers reported being satisfied overall, only 12% were classified as dissatisfied. And although there was a fair amount of variability within occupational group, Hoppeck was able to rank order occupational classifications by mean satisfaction. Professional, managerial, and executive employees reported the highest levels of satisfaction, followed by subprofessional, skilled manual and white collar, semi-skilled, and finally unskilled manual laborers.

Wright (2006) noted that research on job satisfaction per se was uncommon until the 1950s, which saw a rise in interest that has continued to the present day. For example, between the year of its inception in 1917 and 1946, only two articles in the journal of Applied Psychology were published with the phrase “job/work satisfaction” in the title. Since the early 1930s thousands of articles have been published, many focusing on the all-important link between job satisfaction and productivity. Examination of this proposed link has a long history in I/O psychology, and it was more or less for granted that a “happy worker is a productive worker” by early researchers, including the Hawthorne researchers (Mayo, 1933). Initial empirical evidence for this link between satisfaction and performance was disappointing. Brayfield and Crockett’s (1955) review found little evidence for a relationship and neither did a review by Vroom (1964), who found a median r of only .14. Laffaldano and Muchinsky’s (1985) meta-analysis found a similarly disappointing mean r = .17. A more recent meta-analysis by Judge, Thoresen, Bonac, and Patton (2003) found a more optimistic estimated population correlation of .30 (Wright, 2006).

It was in the 1930s that noted humanist psychologist Abraham Maslow began development of his need theory of motivation. Developed during the Great Depression and based on his observations of individuals having personal difficulties (Latham & Bodworth, 2007), Maslow’s (1943) hierarchy of needs theory postulates that individuals progressed through five categories of needs: physiological, security, social, esteem, and self-actualization. Once one set of needs is more or less satisfied, the next group of needs becomes operative and motivates the individual.
virtual. Although not particularly well-supported, the theory had a large influence on managers. In 1953, Viteles's book Motivation and Morale in Industry was published. As with his 1932 landmark text, his focus was consistent with the zeitgeist. Interest in motivation and attitudes has continued to be strong ever since.

If research on motivation in industry had been largely atheoretical before 1950 (Latham & Budworth, 2007), this was no longer true after that date. Theories of motivation and motivation/satisfaction appeared on a regular basis in the 1950s and 1960s. These theories, familiar to most readers and a staple of most I/O psychology textbooks, are described only briefly here. Need theories were influenced by Freud's theories of the unconscious and Murray's (1938) early theory of needs (Miner, 2002). Clayton Alderfer's (1972) existence, relatedness, and growth (ERG) theory was developed to deal with problems identified in Maslow's theory. Alderfer postulated three sets of needs (existence, relatedness, and growth) and included a frustration-regression component (if a higher-level need is frustrated, individuals can regress to a lower need). Theories that focus on the personality trait need for achievement were developed by David McClelland, John Atkinson, and Bernard Viner's book on 2007),...
stream academic psychology (Katzell & Austin, 1992). In recent years there has been much discussion of the perceived irrelevance of the published research for practitioners and the corresponding concern by researchers that practitioners are not relying enough on empirically validated procedures. This concern has also been evident from the very beginnings of the field. Although some conflict between the domains for practitioners and the corresponding concern by advocates for a hard-headed, quantitative approach to employee selection (Freyd, 1925) versus or palmistry, and other pseudosciences who were competing in the workplace. Today this struggle for the practitioner. And there is the one of the actual effectiveness of the various procedures applied to organizations. Although answering this question is beyond the scope of this essay, it is true that while I/O psychology can point to many successes, even landmark interventions such as the Hawthorne studies, the Harwood studies, the use of sensitivity training at the U.S. State Department, and the application of Theory Y management procedures at Non-Linear Systems, were much less successful than popularly believed (Blau, 2007; Mintz, 2002).

Finally, there is the question of who applied I/O psychology actually serves, the manager versus worker conflict. Bligham (1933) defined applied psychology as "psychology in the service of ends other than its own" (p. 294, original italics). Münsterberg (1913) argued for a neutral, scientific stance: psychologists should concern themselves only with "means" and not "ends." In the first issue of the Journal of Applied Psychology, Roback (1917) criticized Münsterberg's injunction of impartiality, noting that the applied psychologist operates more as an agent of whoever is paying his fee, rather than a broker who serves both parties fairly. The title of Burt's (1940) book, The Servants of Power: A History of the Use of Social Science in American Industry, left little doubt where he stood on the issue. Burtis stated that, "... managers are in business to make money. Only to the extent that industrial social scientists can help in the realization of this goal will management make use of them" (p. 106). Although there is little doubt that the management perspective has been the dominant one in the history of I/O psychology, this does not necessarily mean that I/O psychologists are antiworker. I/O's history with organized labor, for example, is actually quite nuanced (see Gordon & Burt, 1981; Stagner, 1981; Zicklar, 2001, 2003, 2004). In addition to I/O psychologists' legitimate concern with helping managers improve efficiency, I/O psychologists should recognize they also have an obligation to the worker. As Viteles (1932) noted in the context of reducing worker fatigue, there must be "a willingness to sacrifice economic values when they clearly conflict with human values" (p. 403). The extent to which I/O psychologists have made these sacrifices has been the subject of much debate (e.g., Nordhusen, 1947).

I/O psychology has made a tremendous amount of progress over the past 100+ years. From a few pioneers at the turn of the last century, the field has grown into a vital scientific enterprise that has contributed greatly to our understanding of organizational behavior and to the effectiveness and well-being of organizations and organizational members. Some of those accomplishments are reflected in this chapter; others are detailed in the chapters of this handbook.


References


RESEARCH STRATEGIES IN INDUSTRIAL AND ORGANIZATIONAL PSYCHOLOGY: NONEXPERIMENTAL, QUASI-EXPERIMENTAL, AND RANDOMIZED EXPERIMENTAL RESEARCH IN SPECIAL PURPOSE AND NONSPECIAL PURPOSE SETTINGS

Eugene F. Stone-Romero

With little exception, advances in both the science and practice of industrial and organizational (I/O) psychology and allied disciplines (e.g., human resource management, organizational behavior, organization theory) hinge on the existence of findings from sound empirical research (referred to hereinafter as research). The results of research are used for several purposes. One is to develop theory about phenomena (e.g., individual behavior in organizations). Another is to test predictions stemming from such theory (e.g., expectancy theory). Yet another is to aid in the design and implementation of interventions (e.g., job enrichment) aimed at changing individuals, groups, and organizations (e.g., worker performance, group effectiveness, organizational efficiency).

Whatever the purpose of research, its soundness is a function of the degree to which it allows for valid conclusions about (a) the existence of cause-effect relations between variables (i.e., internal validity); (b) the correspondence between the constructs (i.e., units, treatments, observations, and settings) referenced by a researcher and their empirical realizations (i.e., construct validity); (c) the statistical estimates derived from a study (i.e., statistical conclusion validity); and (d) the extent to which relations found in a specific study generalize across different settings, units, treatments, and observations (i.e., external validity; Shadish, Cook, & Campbell, 2002).

In view of the foregoing, the overall purpose of this chapter is to consider the factors that influence the validity of inferences derived from research, especially those concerned with causal connections between variables. Thus, the chapter has sections that deal with such issues as (a) study design, (b) the purposes of research, (c) the facets of validity in research, (d) the types of settings in which research is conducted, (e) the types of experimental designs that can be used in research (i.e., nonexperimental, quasi-experimental, and randomized experimental), (f) the joint consideration of experimental design and statistical methods, and (g) some conclusions about the design and