

**GOVERNMENT ARTS COLLEGE (AUTONOMOUS)  
COIMBATORE-18**

**DEPARTMENT OF PSYCHOLOGY**

**STUDY MATERIALS**

**18MPS11C-HISTORY OF PSYCHOLOGY**

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UNIT 1-CHAPTER 1- PSYCHOLOGY AS A SCIENCE

**ORIGINS OF SCIENTIFIC PSYCHOLOGY**

Historical accounts of the development of scientific psychology place the origins of the discipline in Germany at about the middle of the nineteenth century. The ferment produced by British and continental philosophies of mind and the advances of research in sensory physiology provided the immediate context for the beginning of the new psychology.

The pursuit of knowledge about mind and its processes has a history that is embedded in the history of philosophy. The late-eighteenth-century declaration that a true scientific study of the mind was not possible posed a challenge that was answered in the nineteenth century when the possibility of a scientific study of mind emerged within philosophy by the adoption of the experimental methods employed to study the physiology of the senses. The synergy of these nineteenth century developments gave impetus to the “new psychology” whose history embodies continued efforts to develop and maintain psychology as a scientific

discipline and to extend the methods of science to an ever-widening field of inquiry within the discipline.

### **The Philosophical Context**

Christian Wolff (1679–1754) first popularized the term *psychology* to designate the study of mind. Wolff divided the discipline between empirical and rational psychology. The data of mind that resulted from observing ourselves and others constituted empirical psychology; rational psychology

referred to the interpretation of the data of empirical psychology through the use of reason and logic. These psychologies were characterized as using knowledge acquired through experience (empirical psychology) or using knowledge that

the mind possesses independent of experience (rational psychology) (Murray, 1988). Immanuel Kant (1724–1804) denied the validity of any rational psychology because, he argued, rational mental processes must be activated by mental content derived from experience; therefore, the study of mind must be confined to questions appropriate to an empirical psychology (Leary, 1978). An empirical psychology of mental content could not, Kant contended, become a proper natural science because mental events cannot be quantified (i.e., measured or weighed), and thus its data are neither capable of being described mathematically nor subject to experimental manipulation. Finally,

Kant asserted, the method of observing the mind—introspection—distorts the events observed by observing them. However, Kant suggested, psychology might improve its status as an empirical science by adopting the methods of anthropology to observe the activities of human beings in realistic settings. This study (Leary, 1978), supplemented by drawing upon literature, history, and biography as sources of information about the manifestation of mind in human activity, would base psychology upon objective observations of public events and avoid the limitations of an empirical psychology based solely on internal observation of private events. Responses to Kant were not long in coming. Jakob Friederich Fries (1773–1843) raised the status of introspection

by arguing that it was not inherently more problematic than observing external phenomena; if introspection was unreliable, at least it was not any more so than any other kind of observation. At the same time, Johann Friederich Herbart (1776–1841) offered a system of psychology that was both empirical and mathematical. If psychology needed to be mathematical to be a true science,

Herbart proposed that numbers could be assigned to mental events of different intensities and

a mathematical description of the relationship among them could be formulated. Herbart could assign numbers to describe experiences of different intensities, but he could not actually measure the subjective intensities in accord with an objective standard. Eduard Friederich Beneke (1798–1854) argued that it was premature to apply mathematics to relationships among mental events absent more accurate empirical observations and reliable means of measurement; psychology could hope to become an experimental discipline by testing “empirical results and theoretical hypotheses under controlled conditions and with the systematic variation of variables” (Leary, 1978, p. 119).

Kant’s suggestion that psychology should utilize observations of human beings in their social environment, the rescue by Fries of introspection as a method for observing internal events, Herbart’s suggestion that psychological phenomena could, in principle, be described mathematically, and Beneke’s suggestion that psychological experiments were possible contributed to the inception of scientific psychology. By suggesting that a science of psychology was not possible, Kant stimulated both counterarguments and the search for the means to make psychology a scientific discipline of equal rank with the natural sciences. It remained for others to attempt to establish introspection as a scientific method, to devise the conditions and methods of an experiment in psychology, and to quantify psychological phenomena and formulate theoretical and mathematical descriptions of the relationships among them.

### **The Scientific Context**

The emerging natural sciences of the eighteenth and nineteenth centuries became increasingly specialized as knowledge increased and as opportunities for specialized teaching and research came into being in the German universities (Ben-David, 1971). The study of physiology emerged as a discipline separate from anatomy as the nineteenth century began. Studying intact physiological systems, *in vivo* or *in vitro*, accelerated the understanding of the functional characteristics of those systems and built on the knowledge gained from the study of anatomy via dissection. The methods and

subject matter of physiology, especially sensory physiology, helped to provide the scientific basis for psychology.

### ***Sensory Physiology***

Johannes Müller (1801–1858), the “Father of Physiology,” produced the classic systematic handbook (*Handbuch der Physiologie des Menschen*, 1833–1840) that set forth what was then known about human physiology and offered observations and hypotheses for further research. Among the formulations that Müller provided in the *Handbuch* was the law of specific nerve energies, which stated that the mind is not directly aware of objects as such but can only be aware of the stimulation in the brain conveyed by sensory nerves. The perceived qualities of stimulation depend upon the sense organ stimulated, the nerve that carries the excitation from the sense organ, and the part of the brain that receives the stimulation.

Müller’s pupil, Hermann von Helmholtz (1821–1894), extended the law of specific nerve energies by theorizing that qualities of stimuli within a sensory modality are encoded in the same way that they are encoded among modalities. That is, distinguishing red from green, or a low pitch from a high one, depended upon specialized receptors in the eye or ear, distinct nerve connections within the visual or auditory system, and specific locations within the visual or auditory areas of the brain that receive the stimulation. The testing of the theory depended upon an individual’s report of the sensory experience (“I see red”), the nature of the stimulus to which the individual responded (a specific wavelength of the energy spectrum), and knowledge of the physiological organization of the sensory systems. Relating the experience to the stimulus was a matter of experimental research that could be carried out with intact human beings; detecting the activity of nerves and the location of the brain to which stimulation was transmitted was possible then only with *in vitro* preparations of animals. Relating subjective, psychological experience to specific external stimulation was one step in suggesting how psychology might become science.

### ***Psychophysics***

Experiments on the sense of touch were carried out by the physiologist E. H. Weber (1795–1878), who distinguished among the feelings of pressure, temperature, and the location of stimulation on the skin. In conducting experiments in which he stimulated his own skin, Weber explored skin sensitivity and demonstrated that “on the tip of the forefinger and lips two fine compass points could be felt as two when they were less than one-twentieth of an inch apart, but if they were nearer they seemed to be one” (Hall, 1901, p. 727). Not only could touch sensitivity be measured at different points on the skin, but relative sensitivity at a single point could also be measured. Placing a standard

weight at a given spot on the skin and then asking for a second weight to be judged “heavier” or “lighter” showed that the amount of weight that could be judged heavier or lighter than the standard varied as a proportion of the magnitude of the standard weight. Thus, the minimal detectable difference between two weights was relative to the weights involved; for heavy weights, differences would have to be large, but smaller differences could be detected when the weights involved were light.

G. T. Fechner (1801–1887), a physicist, saw in Weber’s results the possibility of relating mental events to physical events; subjective judgments about physical magnitudes could be compared to the actual physical magnitudes. Fechner had believed since his student days “that the phenomena of mind and body run in parallel” (Marshall, 1982, p. 67). His solution to the problem of relating these two aspects of the world was to make “the relative increase of bodily energy the measure of the increase of the corresponding mental intensity” (Adler, 1966, p. xii). Although Fechner conceived of the possibility independently of Weber’s results, he came to realize that his speculations about arithmetic and logarithmic relations between physical and subjective magnitudes were in fact demonstrated by Weber’s observations (Adler, 1966; Marshall, 1982).

Weber’s results showed that sensory judgments of magnitude formed ratios that were sufficiently regular to assume the status of a law. Fechner designated as Weber’s law the mathematical equation that stated that the increase in perceived intensity of a stimulus (the “just noticeable difference”) was, as Weber had demonstrated, a constant proportion of the intensity of the stimulus to be increased. The regularity in ratios across a wide range of intensities led Fechner to rewrite the law in terms of a logarithmic progression, with the strength of a sensation equal to the logarithm of the intensity of a stimulus multiplied by a constant established experimentally for the sensory system under study (Murray, 1988, pp. 176–185). “Weber’s law” now typically refers to the “simple statement that the just noticeable difference in a stimulus bears a constant ratio to the stimulus” (Adler, 1966, p. xiv), while “Fechner’s law” typically refers to the logarithmic relationship that Fechner formulated. Fechner called the new science that he established *psychophysics* and developed laboratory procedures that became part of the laboratory experiments of the new psychology as well as of the physiological research on the special senses. The measurements of the smallest detectable intensity (absolute threshold) and the smallest detectable difference in intensities between stimuli (difference threshold) for the different

senses were pursued by the several methods that Fechner had devised for the purpose (see, e.g., Woodworth, 1938). Resolving differences in results obtained for different methods, testing psychophysical laws over a wide range of stimulus intensities, and developing scales of psychological measurement offered significant research challenges for psychological laboratories well into the twentieth century (Stevens, 1951; Woodworth, 1938).

### ***Mental Chronometry***

Johannes Müller had speculated in his *Handbuch* that the speed of transmission of a nerve impulse was greater than the speed of light. Helmholtz tested that hypothesis by measuring the time to react (“reaction time”) to stimuli applied to motor nerves of different lengths in a frog and found the time to be much slower than the speed of light (Boring, 1950; Hall, 1901). He extended this research to sensory nerves by measuring the time to respond by a human to a touch on the toe and a touch on the thigh and demonstrated that the time to respond was slower for the impulse that had longer to travel. Helmholtz extended the use of time to measure a sensory-motor response to include spoken responses to words, providing a measure of the time necessary to associate words or ideas.

The determination of reaction times to measure the speed of mental processes was investigated by the Dutch physiologist F. C. Donders (1818–1889). Donders began with the time to make a motor response to a stimulus (simple reaction time) and then added more stimuli, each with a different response. By subtracting simple reaction time from the time taken to make the correct response to one of several stimuli, Donders believed that he had measured the time required to make a choice (Boring, 1950; Woodworth, 1938). He then recognized that his experimental procedure required not only that an observer choose a response from among the several responses possible but also that an observer detect which stimulus had been presented from among the several possible stimuli (discrimination reaction time). Using the subtractive method that he devised, Donders estimated the time for a simple reaction, the time taken to discriminate one stimulus from others, and the time taken to choose a response. The possibility of measuring the time required by mental processes appeared to have been realized, and the reaction-time experiment as well as the subtractive procedure became part of the science of psychology (for modern adaptations, see Posner & Raichle, 1994; Sternberg, 1969).

## **PSYCHOLOGY’S FIRST LABORATORY**

The founding of the first laboratory in experimental psychology has generally been credited (but not without some debate; see Green, 2000) to German physician and physiologist Wilhelm Wundt (1832–1920). Wundt received his MD degree from the University of Heidelberg in 1855. The natural sciences had become legitimized as a proper field of study and were allied with medical training in the universities. Research laboratories for scientific investigations were an accepted part of the university structure, and careers in scientific research were made possible (Ben-David, 1971, pp. 123–124). Wundt, trained in physiology as part of his medical education, pursued independent research as a student and chose physiology, not medicine, for his career (Bringmann, Balance, & Evans, 1975). As a lecturer at the University of Heidelberg, Wundt offered courses privately for a fee, conducted research, and became an assistant to Helmholtz. In 1862, he offered his first course in “psychology as a natural science” (Bringmann et al., 1975) at Heidelberg, and in 1873–1874, the first edition of his book, *Grundzüge der physiologischen Psychologie (Principles of Physiological Psychology)* called for the recognition of psychology as a discipline independent of philosophy and physiology (Blumenthal, 1985a; Fancher, 1996; but see Danziger, 1990). In 1875, at the age of 42, Wundt accepted a position as professor of philosophy at the University of Leipzig, where he established the first experimental research program in psychology. Chairs in science carried more prestige than those in philosophy, but the limited number of chairs available in science at the time made one in philosophy attractive to Wundt (Ben-David & Collins, 1966). Thus, psychology, like other sciences before it, began as part of the curriculum in philosophy; the acceptance of research laboratories as part of the university establishment permitted the founding of a laboratory in conjunction with Wundt’s research.

Wundt had been engaged in psychological research for some time. As early as 1857, he constructed an apparatus in his home to measure reaction time and began accumulating a collection of instruments (kymographs, chronoscopes, tachistoscopes, and devices to measure responses) that were eventually employed in his laboratory (Blumenthal, 1985a, p. 29). Upon his arrival at Leipzig, a space in a former university refectory building was assigned to Wundt to permit him to store his apparatus and to conduct demonstrations associated with his lectures. In 1879, Wundt and students Max Friedrich and American G. Stanley Hall began a program of independent research (Boring, 1965; Bringmann, Bringmann, & Ungerer, 1980) that initiated psychology as “the organized and self-conscious

activity of a community of investigators” (Danziger, 1990, p. 18). In 1881, the first issue of Wundt’s journal, *Philosophische Studien*, appeared featuring Friedrich’s dissertation research, and by 1883, the laboratory had acquired the status and budget of a research institute within the university (Boring, 1965; Bringmann et al., 1980; Danziger, 1990).

Experimental psychology as practiced by Wundt and his students at Leipzig employed the methods of physiology to study the contents and processes of individual human consciousness. Among the studies pursued in Wundt’s laboratory were psychophysical experiments to analyze and measure sensations, reaction-time experiments to measure the duration of mental processes, and experiments on attention, memory, and the association of ideas (Cattell, 1888). Wundt extended Donders’s subtractive procedure to the measurement of other mental processes, including association and judgment. His American student, James McKeen Cattell (1860–1944), elaborated on Donders’ method in his research investigations at Leipzig between 1883 and 1886 and measured the speed of verbal associations. In a particularly innovative set of experiments, he varied the number of letters, numbers, words, or sentences a stimulus card contained and exposed the card to observers very briefly (.01 sec) to measure the number of items that could be contained in consciousness at one time; the result was an estimate of the span of attention, or span of apprehension (Ladd, 1888). Early reports of experiments were enthusiastic in detailing the empirical results that the laboratory could provide but that were beyond the reach of the older philosophical psychology.

Reports that the time taken to name a short word was .05 seconds less than the time taken to name a letter of the alphabet (Jastrow, 1886), or that the time taken to name colors or pictures was “about twice as long as the corresponding times for recognizing and naming letters or words” (Cattell, 1947b, p. 25), exemplify this fascination with quantifying dimensions of mental processes. Intrigued by the individual differences in performance that he observed, Cattell would later explore the range of individual differences in a program of mental testing at Columbia University (Cattell, 1947c; Wundt, 1974; Fancher, 1996; Sokal, 1987). In addition to the psychophysical and reaction time measures that he employed, Wundt’s physiological psychology made use of reports of conscious experience. He distinguished between *Selbstbeobachtung* (self-observation), the introspection of the philosophers, and *innere Wahrnehmung*



(internal perception); the basis of conscious experience. Self-observation, as traditionally employed, could not meet the standard of scientific observation. To make a *scientific* introspection possible required careful control over the stimulus that was to produce the mental event to be observed and as short an interval as possible between the observation of the event and its recall and report. This was to be achieved by the experiment conducted in the laboratory under carefully controlled conditions; *experimentelle. Selbstbeobachtung* was the form of introspection raised to scientific status by experimental procedures (although terminology when translated from the German can be problematic; compare Blumenthal, 1985a, p. 28 and Danziger, 1980, p. 244). In any case, to ensure that this observational procedure could be a rigorous scientific method to assess mental events and did not lapse into the older philosophical reflection, Wundt established rules or guidelines by which introspection might achieve scientific validity:

“(1) The observer, if at all possible, must be in a position to determine when the process is to be introduced;

(2) He must be in a state of ‘strained attention’;

(3) The observation must be capable of being repeated several times;

(4) The conditions of the experiment must be such as to be capable of variation of the strength and quality of the stimuli” (R. I. Watson & Evans, 1991, p. 280).

By knowing when a process is to be introduced (a stimulus presented), an observer may concentrate (strained attention) on the observation to be made and, to ensure reliability, be able to repeat the process. Varying conditions allowed the observer to identify changes in consciousness as a function of changes in the conditions of the experiment.

Replicating conditions enhanced the reliability of the observations to approach those of the observation of external events. These tight restrictions meant, with minor exceptions, that “the introspective reports from his laboratory are very largely limited to judgments of size, intensity, and duration of physical stimuli, supplemented at times by judgments of their simultaneity and succession” (Danziger, 1980, p. 247).

Confidence in the results of introspection depended upon confidence in the skill and experience of the observer who, as the source of the data, was the critical component in psychological experiments. In Wundt’s laboratories, the observer

possessed psychological authority and expertise. Experimental control over the introspective process was obtained not only by the rules for the conduct of an experiment but also by the use of observers whose habits of attentiveness and quickness of observation and reporting provided reliable data (Danziger, 1980). Published reports of experiments conducted in German and American laboratories identified each of the observers and their level of experience in introspection (e.g., Geissler, 1909; cf. Bazerman, 1987). The experimenter played a secondary role in manipulating the apparatus, presenting stimuli, and recording responses. The division of labor between experimenters and observers, who were colleagues and collaborators, was primarily one of convenience; roles were routinely exchanged, with few exceptions: Wundt, for example, served as an observer in some of the Leipzig experiments but never as experimenter. However, the published reports of experiments by Oswald Külpe (1862–1915), a former student of Wundt, failed to identify the observers in experiments that used introspection in his laboratory at the University of Würzburg. Külpe's experiments were designed to explore the thought processes involved in making inferences and judgments. The Würzburg method of introspection, "systematic introspection" (Danziger, 1980; 1990) or "systematic introspectionism" (Blumenthal, 1985b, p. 64), was a form of self-reflection that required thinking about a problem to solve and then retrospectively recounting the thought processes that led to its solution. In these experiments, the experimenter would interrupt the observer's introspective report with questions designed to probe the content of consciousness. This procedure, which shifted the power and authority in the experimental situation from the observer to the experimenter, represented a departure from the careful experimental control over introspection exercised in Wundt's laboratory. Wundt vigorously opposed the Würzburg method as unreliable (Blumenthal, 1985a; Leahey, 1981), particularly as it was applied to those higher mental processes that Wundt believed to be beyond the reach of introspection and, indeed, of any laboratory method. Others pointed out that the "demand characteristics" inherent in this interrogation procedure (Müller, 1911; cited in Kusch, 1995) were likely to bias an observer's responses. The status of introspection as a laboratory method would concern psychology well into the twentieth century.

Wundt argued that experimental self-observation could reveal the existence of mental processes such as apperception (an active attentional process that organized perceptions), volition (will or effort), and emotion, but he strongly believed that these higher mental processes could not be studied using the

experimental method. The only methods appropriate for the study of these hidden, higher cognitive processes were naturalistic observation and history. Wundt's physiological psychology was one of "outer phenomena," sensation, perceptions, and movement, while his "*Völkerpsychologie*," the study of language, religion, myth, and culture, was one of "inner phenomena" (Leahey, 1981). Wundt's *Völkerpsychologie* encompasses 10 volumes. Because so many American students studied at Leipzig (Benjamin, Durkin, Link, Vesta, & Acord, 1992), Wundt assumed a position of particular significance in the accounts of the origins of the new psychology. Nevertheless, pioneers in the new discipline at other German universities attracted their share of students from the United States and from other countries. The development of psychology, even in its early stages, was not the work of a single individual. Much of the development of psychology consisted of attempting to study in the laboratory those psychological processes that Wundt had declared beyond the reach of experiment.

## **BEYOND THE FIRST LABORATORY: EVOLUTION OF THE DISCIPLINE**

### **Psychology in Germany**

One of Wundt's contemporaries who believed that higher mental processes could be the object of experimental investigation was Hermann Ebbinghaus (1850–1909). Inspired by the psychophysics of G. T. Fechner and philosopher J. F. Herbart's attempt to apply mathematics to mental representations, Ebbinghaus used precise quantitative methods to investigate memory (Murray, 1976). He served as both the experimenter and the subject of his investigations. In order to have relatively homogeneous material to learn and to reduce the impact of any previous semantic associations, such as occurred in his early experiments in learning and remembering poetry, Ebbinghaus developed the "nonsense syllable," largely pronounceable consonant-vowel-consonant combinations. He created syllable lists of various lengths that he learned and then later relearned after different lengths of time. The percentage of time saved in relearning the lists became known as the "savings method" of memory (Murray, 1976, p. 206; Hoffman, Bringmann, Bamberg, & Klein, 1987).

Ebbinghaus found that the amount of time spent in relearning lists was greater for longer lists and for longer retention intervals. The graph of his results became the standard curve of forgetting, still reproduced in textbooks as a classic result. The curve showed that recall of learned lists was perhaps 85% after one hour, approximately 50% after one day, and as little as 15% after about six days. These

findings stimulated a long tradition of memory research (e.g., Postman, 1968). After publication of his monograph *Über das Gedächtnis (On Memory)*, Ebbinghaus established laboratories at several universities and attracted some American students, but his time was increasingly devoted to editing a journal and writing (Fuchs, 1997). Leadership of memory research fell to Georg Elias Müller (1850–1931) at Göttingen University. Müller, a dedicated experimentalist, invented the memory drum, a mechanical device for presenting one verbal stimulus at a time, used in conjunction with experiments on serial list learning and list retention. The memory drum, modified subsequently by Müller for research in paired associate learning (Haupt, 1998), became a standard piece of laboratory equipment for studies of verbal learning and memory until replaced by the computer. Müller's research reports on his studies of memory extended from 1893 to 1917 and included "the theoretical contributions of retroactive inhibition, perseveration, and consolidation" (Murray & Bandomir, 2000).

Müller initiated what later was termed the interference theory of forgetting, a position that argues that forgetting is a function of the interference among competing memories at the time that a particular memory is being retrieved and not a function of a decay or loss of memory traces (Murray, 1988). The topic was not addressed directly by Ebbinghaus, but the rapid forgetting that his retention curve recorded has been interpreted as offering evidence of the role of interference in memory (Murray, 1988; Underwood, 1957). Müller's experimental interests were not limited to memory research. He built on the contributions of Fechner, Ewald Hering, and Mary Whiton Calkins in becoming a leader in the development of the methodology of psychophysics, conducting studies on color vision and investigating paired-associate verbal learning (Blumenthal, 1985b; Murray, 1976). His laboratory was well supplied with experimental apparatus (Haupt, 1998) and attracted a number of psychologists to pursue research with him. Müller's laboratory seems to have been especially hospitable to women interested in psychology; among those studying at Göttingen were, for example, Americans Mary Whiton Calkins, Eleanor Gamble, and Lillian Jane Martin. Other laboratories and universities were less open in this regard (Furumoto, 1987; Scarborough & Furumoto, 1987).

### **Psychology in America**

The results of German investigations in sensory physiology and their significance for the philosophy of mind did not go unnoticed by Americans in the period after the Civil War. William James, abroad for his health and to further his medical

studies, wrote to a friend: “It seems to me that perhaps the time has come for psychology to begin to be a science— some measurements have already been made in the region lying between the physical changes in the nerves and the appearance of consciousness at (in the shape of sense perceptions) and more may come of it. Helmholtz and a man named Wundt at Heidelberg are working at it” (James, 1920, pp. 118–119).

In antebellum America, the dominant philosophical tradition was derived from England and Scotland, as exemplified in John Locke’s *Essay on Human Understanding* and the texts of the Scottish common sense realists, Thomas Reid, Dugald Stewart, and Thomas Brown (Evans, 1984, Fay, 1939; Fuchs, 2000a, Roback, 1952) with only modest representation of German (Hickok, 1854; Rauch, 1840) and French (Cousine, 1864) philosophy. British philosophy was empirical, gathering information about mind and mental processes from introspective observation, observation of the behavior of others, and observations of individuals recorded in medical treatises, court proceedings, literature, and poetry.

The data were classified under general faculties or categories of mind, such as the intellect and the sensibilities (cognitive and conative, emotional, or motivational states) and the many possible subdivisions, such as memory and reasoning, instincts, and desires (Fuchs, 2000a, 2000b). Results from the investigations in psychophysics, sensory physiology, and the early experiments in psychology were incorporated into later textbooks of intellectual and mental philosophy (e.g., Porter, 1868; McCosh, 1886, 1887). Adding the empirical data to the theological concerns for “soul” did not change the traditional philosophical position of these texts. Even a textbook by G. T. Ladd (1842-1921) that represented the new psychology did not escape fully the theological concerns of the “old psychology” (Ladd, 1888; Evans, 1984; E. Mills, 1969).

Americans traveled abroad for advanced education at British and continental universities after the Civil War; painters, writers, and scientists went in large numbers. With the postwar establishment of the new land-grant universities, professional opportunities arose for faculty members, especially in the sciences, for education not yet available in the United States. With the zeal of converts and crusaders, the first generation of North American psychologists returned from their study abroad to stimulate the development of graduate education within established American colleges and universities and the newer land-grant universities (Kohler, 1990). They wrote textbooks to incorporate the results of the

continental laboratories, developed courses for undergraduate and graduate students, created laboratories for teaching and research, and founded journals for the publication of research from the newly established laboratories. The laboratories came to be the locus of education in psychology in universities and colleges (Calkins, 1910; Sanford, 1910) and came to symbolize psychology as science, while psychology, lodged within departments of philosophy, became the introductory course required for further study in philosophy (Fuchs, 2000b).

### ***William James and Evolutionary Theory***

The essential break with the mental philosophical past was achieved by William James, whose *Principles of Psychology* (James, 1890) represented the first of the modern textbooks (Evans, 1981). James was a transitional figure, with one foot in philosophy and the other in the empiricism of the new science. His text, while still too philosophical for some of his more empirical colleagues (see, e.g., Evans, 1981; Ross, 1972), nevertheless effectively cut the discipline's past ties to theology. James was attracted to the new psychology by the possibility of using science to pursue philosophical issues more deeply (Croce, 1999) and called for psychology to be a natural science (James, 1892a). He recognized that while psychology was not yet an established science, it constituted the hope of a science (James, 1892b). His textbooks (James, 1890, 1892b) attracted recruits to psychology's banner to attempt to realize that hope. William James had been appointed an instructor at Harvard in physiology in 1872; like Wundt, James had earned an MD degree and, again like Wundt, had no real interest in practicing medicine. In 1875, he offered a graduate course at Harvard on the "Relations between Psychology and Physiology" and, again like Wundt, had rooms assigned to him to use for experimental demonstrations to augment his

teaching. James, however, was never very enthusiastic about laboratory work; he once declared the psychophysics could never have arisen in a country in which the natives could be bored (Boring, 1950). As a text for his course in psychology, James adopted *Principles of Psychology* (1855) by Herbert Spencer (1820–1903). A course featuring discussion of evolutionary theory was a novelty, since the older, pre-Civil War mental philosophy texts ignored evolutionary theory, while textbooks written after the war wrestled uncomfortably and unsuccessfully with integrating evolutionary theory with theological concerns. The theory of evolution by natural selection proposed by Charles Darwin (1809–1882) had an enormous influence on American psychology. In his book *On the Origin of Species* (1859), Darwin presented evidence to support his theory of evolution and

proposed natural selection as the mechanism responsible. To account for the evolution of intelligent behaviors, Darwin appealed to two mechanisms, sexual selection (the evolution of traits that facilitate mating success) and, more tentatively, as a second mechanism, the inheritance of acquired characteristics (Darwin, 1871).

Jean-Baptiste de Lamarck (1744–1829) had proposed that learned changes in behavior that occur during an animal’s lifetime can be passed down to that individual’s offspring through biological inheritance. This view was shared by Herbert Spencer, who, unlike Darwin, viewed the evolutionary process as a linear progression from “lower” to “higher” forms (Spencer, 1855). Spencer coined the phrase “survival of the fittest” to suggest that those individuals who were best adjusted to their environments would survive. Learned behaviors that facilitated this adjustment to the environment would then be passed to subsequent generations. Adjustment was to the individual’s survival what adaptation was to the survival of the species (Boakes, 1984; Buxton, 1985a; 1985b). The absence of evidence for Lamarck’s theory led to its abandonment, and evolutionary theory was left with natural selection as the only mechanism of evolutionary change.

Nevertheless, Spencer’s focus on adaptability during an individual’s lifetime (learning) and Darwin’s emphasis on individual development during childhood, differences among individuals, the relation between structure and function, and the continuity between animals and humans contributed substantially to the expansion of the topics that psychologists pursued in the name of psychological science.

## **THE PSYCHOLOGICAL LABORATORY AND THE PSYCHOLOGICAL EXPERIMENT**

### **The Rise of Laboratories in America**

William James saw in the early results of experiments in psychophysics and sensory physiology the beginning of science in the measurement of phenomena that the mental philosophers could only describe. Like James, G. Stanley Hall

(1844–1924) was impressed by the impetus given to the new psychology by the results from experiments on sensory physiology. Hall, while preparing for the ministry, studied theology and philosophy in Germany and found that science was relevant to these pursuits, especially scientific empiricism. Hall founded the first American laboratory in the new science of psychology at the Johns Hopkins

University in 1883. While Hall's laboratory at Johns Hopkins usually is acknowledged as the first psychological laboratory in the United States, the designation was not without other claimants.

Debate over credit for the establishment of laboratories provides some measure of the importance, real and symbolic, that psychologists attached to the laboratory and to the experimental research that it was designed to foster (Capshe, 1992). By 1893, 20 psychological laboratories were operating in the United States, nearly twice as many as in Europe (Nichols, 1893, as cited by Capshe, 1992). By 1904, there were 49 laboratories of psychology in colleges and universities in the United States (Benjamin, 2000; Camfield, 1973). Psychology had become an accepted part of the curriculum, required for the undergraduate degree in 8 universities and represented in 62 institutions by three or more courses (Miner, 1904). Psychologists argued their case for the new science (and for their own professional careers) to the general public and to trustees and governing boards of academic institutions with some success (Leary, 1987). Not only were courses in psychology and laboratories begun, but journals were established, beginning with Hall's *American Journal of Psychology* in 1887, to make public the results of laboratory investigations as well as to provide an outlet for the theoretical and philosophical articles that were part of the young science. The American Psychological Association (1892) provided annual meetings for the reports of investigations and for psychologists to consider ways to advance the profession. Graduate programs in universities produced over one hundred PhDs between 1892 and

1904; between 1898 and 1903, psychology ranked fourth after chemistry, zoology, and physics in the number of PhDs awarded (Camfield, 1973).

The laboratories founded in American colleges and universities served to initiate students into laboratory practices, familiarize them with standard pieces of laboratory apparatus, and introduce them to the subject matter and opportunities for research in scientific psychology. The experiments of the early laboratory reflected the scientific beginnings of the field: Studies of psychophysics, sensory capacities and sensitivity, memory, attention, and voluntary movement (reaction time) were emphasized in manuals written for the laboratory course (e.g., Judd, 1907; Langfeld & Allport, 1916; Sanford, 1897; Seashore, 1909; Titchener, 1901–1905). The topics represented by these laboratory experiments were also those that continued to be a part of the research agenda of psychologists. Increasingly, however, the interests of psychologists extended beyond Wundt's



line of demarcation between topics that could properly be pursued through laboratory experiments and those that could not. Much of the development of psychology consisted of expanding the range of psychological processes that were amenable to scientific investigation within and outside the laboratory while continuing to debate the definition of the field and the methods most useful to its development.

### **The Evolution of the Laboratory Experiment**

In the experiments with which psychology began, such as Weber's study of tactual sensitivity, Fechner's research in psychophysics, or Ebbinghaus's study of memory, a single individual served as both experimenter and observer. In subsequent research in psychophysics and memory, the roles of experimenter and observer became separated in order to eliminate, or control for, possible biases that might stem from knowledge of the experiment and the expectations that might influence an observation, such as knowing the intensity of stimulus to be judged quantitatively (Dehue, 1997, 2000). Separating the role of experimenter from that of observer, interpolating "catch-trials" (in which no stimulus was presented), and randomizing the presentation of stimuli became common practices in psychophysical research and were adapted to other psychological experiments (Dehue, 1997). Moreover, as psychological research expanded to include experiments that assessed the responses of children and animals, requiring little or no introspection, authority became increasingly centered in the experimenter and participants became "subjects" rather than "observers."

### ***Data Treatment and Research Design***

Early published reports of "even narrowly focused laboratory studies conducted with small samples were capable of generating reams of detailed data; readers of journal reports were sometimes confronted with tables of data that ran on for pages" (Smith, Best, Cylke, & Stubbs, 2000, p. 260). Summary data were presented not only in tables but also in graphic form. Graphs were a common form of data summary in turn-of-the-century scientific reports [the forgetting curve =of Ebbinghaus (1885) and the learning curve of Thorndike (1898) were two influential examples of graphic representation]. In addition, graphs helped to pave the way for the later development of correlation and regression analyses (Smith et al., 2000). In attempting to assess the degree of relation between physical and mental characteristics to each other, Francis Galton (1822–1911) used scatter plots in which one set of scores was arranged as a function of another set, such as the height and weight measures of a group of individuals. From such

graphic plots evolved the regression line, the steepness of which reflected the degree of relation between two variables, and, in the hands of Karl Pearson (1857–1936), developed into the mathematical technique of correlating variables and measuring the degree of their relationship by the coefficient of correlation (Fancher, 1996). The development of these statistical methods became critical to the assessment of individual differences and the use of tests in psychology.

Other statistical procedures were employed to assess comparisons between different groups of individuals. Galton's research, for example, on the efficacy of prayer asked "whether those who pray attain their objects more frequently than those who do not pray, but who live in all other respects under similar conditions" (Galton, 1872, p. 126, as cited by Dehue, 2000). A control group was employed in educational research to assess the effects of transfer of training (the influence of practice in one task on performance in another), and, despite arguments over whether participants should be assigned to an experimental or control group at random or by matching individuals, the use of control groups in psychological experiments became an integral part of research design (Dehue, 1997).

The comparison of control and experimental group performances led to the use of statistical procedures for testing the significance of any differences that might be obtained. Inferential statistics was unknown until the twentieth century: Student's "t" test for comparing mean scores from two groups appeared in 1908. Analysis of variance tests were devised in the 1920s (Smith et al., 2000) but did not become a common part of psychological research designs until the 1930s (Rucci & Tweney, 1980).

With the publication of his *Experimental Psychology* (1938), R. S. Woodworth "introduced a clear distinction between experimental and correlational research" (Winston, 1990, p. 391). The critical distinction made between the two kinds of research was that only in experimental work could the cause of behavior be determined by manipulation of an independent variable; the definition "provided one powerful rationale for the animal research of the thirties, forties, and fifties" (Winston, 1990, p. 397) because manipulations of "causal" variables in animal research provided fewer ethical

or practical problems than research with humans. The search for causes of behavior and the theoretical models of learning embodied this definition of the psychological experiment as the means of testing hypotheses. This model of the experiment helped to establish prescriptions for the use of t-tests and analyses of variance as the statistical treatments of choice for the results of experiments,

while correlational techniques and regression analyses were utilized by those interested in individual differences.

The methodology of research and standards for analyzing and reporting results of experiments in keeping with psychology's status as a science is reflected in the standardization of the reports of experiments and the definition of the experiment. The model for reports of empirical research for publication in journals of the American Psychological Association evolved from a six-and-a-half-page style sheet published in 1929 (Bently et al., 1929) to the 1983 *American Psychological Association Publication Manual* (3rd edition) that contained about 200 pages of rules for preparing a manuscript (Bazerman, 1987) to the current fifth edition of the manual (2001) of 439 pages. Reports initially emphasized either how quantitative experimental results might aid in understanding philosophical problems or simply let complex data speak for

themselves (Bazerman, 1987). The emphasis on hypothesis testing and statistical analyses of comparisons between control and experimental group performance that later came to dominate experimental design and instructions to authors preparing manuscripts reflected the success of Woodworth's definition of what constituted an experiment in psychology.

### **Defining Psychology and Its Methods**

Changes in the psychological experiment in apparatus and methods and the shift in roles of observer and experimenter occurred amid debate over the subject matter of psychology and the methods appropriate to it. The growth in the range of subject matter under experimental investigation and in the methods employed in the study of psychology reflected James McKeen Cattell's definition of psychology's subject matter as anything that a psychologist is interested in, as a psychologist (Cattell, 1947a). The experimental psychology that arose in North America resembled the research practices of G. E. Müller more than those of Wilhelm Wundt in the range of topics addressed in the laboratory and the apparatus and methods that were employed. The psychology that evolved in college and university departments of philosophy and, as the century matured, in independent departments of psychology reflected the functional spirit of the mental philosophers and the influence of the theory of evolution. Mental philosophy had attempted to describe how mind worked, how its cognitive and conative processes operated to produce volitional acts. American psychologists, imbued with the spirit of evolutionary theory, were focused on the utility of mind and consciousness in the adaptation of species and individuals to the

environment. This concern with function (what is mind for? what is its function?—presumably, to aid adaptation) was coupled with other aspects of function, namely, how mind works (how does it function?) and on what mind depends (of what is mind a function? how complex must a nervous system be before mind becomes possible?).

These implicit and broad concerns for mental function in psychology were made more explicit and embodied in a selfconscious school of psychology by James Rowland Angell (1869–1949) in response to the programmatic statement of E. B. Titchener (1867–1927), who advocated a structural psychology. These schools of thought were but two among general systematic positions that competed for dominance in psychology (Heidbreder, 1933; Murchison, 1926, 1930; Woodworth, 1948).

### ***Structural and Functional Psychologies***

Oswald Külpe's method of systematic introspection had a very strong proponent in Edward Bradford Titchener at Cornell University. Titchener had become interested in Wundt's psychology while studying philosophy and physiology at Oxford University. He translated the third edition of Wundt's *Gründzüge* into English and, when he could find no one in England with whom to study the new science, went to Leipzig to complete his doctorate with Wundt in 1892. English universities were unreceptive to the new psychology; Titchener accepted a professorship at Cornell University, where he remained until his death in 1927.

Titchener presented himself as Wundt's representative in North America, but his psychology was not Wundt's voluntarism (Leahey, 1981; Danziger, 1990). Titchener's view of mind was influenced by the English philosophy of John Locke and his heirs that he had studied at Oxford. The British philosophers viewed mind as a recipient of stimulation: Mental content was whatever had entered mind through the senses. The purpose of the study of mind was to understand how complex mental experience and function could arise from combinations of these elements. Laws of association, by which elements combined, played a significant role in understanding how mind grew from sensory elements. Similarly, mind was, for Titchener, composed of elements that he identified as sensations, images, and affections. Sensation was the primary experience resulting from stimulation of the senses, images were complex representations that carried thought, and feelings were the elements of which emotions were comprised. Through the direct systematic introspection of consciousness under laboratory conditions, Titchener pursued three goals: the

reduction of conscious experience to its basic elements, determining how the elements were connected to form complex perceptions, and identifying the underlying physiological processes. The first of these goals provided the primary focus of research at the Cornell laboratory, as the elements were themselves analyzed for their attributes (which, in a later version of the system, became the new elements of consciousness; see Evans, 1972). Pursuit of the other goals was secondary because they depended upon the successful completion of the first.

The subject of psychology, Titchener argued, was the understanding of the human, adult, normal, generalized mind through the use of introspection; only after psychology had completed that task could the nonhuman, child, abnormal, or individual mind be understood. For Titchener, psychology needed to emulate physics, with its pursuit of the analysis of matter into the smaller units of which it was composed.

Titchener stood for rigorous experimental pursuit of the elements of mind, pursued for their own sake and not for any potential application. He disparaged “functional psychology” as essentially the “mind in use” approach of the older, discarded philosophical psychology.

An early response to Titchener’s postulates for his structural psychology came from John Dewey (1859–1952), chair of the Department of Philosophy, which subsumed psychology and pedagogy, at the University of Chicago. Dewey perceived that the new method of laboratory experiment would free the older barren mental philosophy from the theological and philosophical constraints of its past and open the way for a useful psychology that would help resolve problems of the asylum, the classroom, and other practical affairs (Dewey, 1884). He facilitated the establishment of a laboratory at the University of Michigan before moving to Chicago. In 1896, Dewey argued against reductionist approaches to the study of consciousness and for a functional analysis and understanding of mind (Dewey, 1896). A functional approach to mind was embedded in the nineteenth century mental philosophy taught in American colleges (Fuchs, 2000a) and its development at the University of Chicago was influenced by pre-Chicago Associations among Dewey and others (Raphelson, 1973).

James R. Angell, a graduate of the University of Michigan and a student of psychology there, built on Dewey’s approach in his presidential address to the American Psychological Association in 1906 (Angell, 1907), in his successful text books (e.g., Angell, 1905), and from his position as Professor of Psychology

at the University of Chicago. Functional psychology dealt not with mental elements as its primary focus but with mental operations; the role of consciousness in helping to adapt an organism to its environment involved psychology in a concern for mind and body relationships (Angell, 1907, p. 86). Functionalism was interested in the uses of consciousness and its role in guiding behavior; it was profoundly practical and reformist. Psychology and other social sciences were useful to a variety of educational and social reforms promoted during the progressive era (Fitzpatrick, 1990; Milar, 1999). Angell's approach to psychology encompassed the broad range of interests and methods that had developed in psychology since 1879 and reflected the influence that evolutionary theory exerted on psychology in the United States.

The science of mind was pursued in the laboratory; mind was its subject matter, and many methods were available for its study. Psychophysical experiments, research on the connections between physiology, especially the nervous system, and mental processes, and direct observation of others, including children and animals, provided data that could supplement the results of introspection under laboratory conditions (Angell, 1905). The use of a variety of methods would, in Angell's view, supplement the results of the direct observations of mind that introspection provides. Functional psychology was interested in how mind worked (i.e., how it functioned) and on its functional relation to the physiological substrate (i.e., on what did mind depend) and its purpose (i.e., its use or function) and was less concerned the content of mind. Mary Whiton Calkins (1863–1930) attempted to reconcile the differences between the structural and functional psychologies by proposing a psychology of the self that possesses both conscious contents and mental functions. Calkins had begun her study of psychology unofficially at Harvard with William James and Josiah Royce in 1890; Clark University professor Edmund Sanford tutored Calkins privately in experimental psychology. In 1891, Calkins established the first psychological laboratory at a women's college at Wellesley College, one of the first 12 laboratories in the United States (Furumoto, 1980). She developed the paired-associate technique for the study of verbal learning and memory and published papers on her research and on experiments conducted with students in the Wellesley laboratory (Calkins, 1894a, 1894b). She pursued further study in psychology with Hugo Münsterberg at Harvard, but not as an officially registered student. Münsterberg petitioned Harvard's president to allow Calkins to be admitted as a candidate for the PhD, but his request was refused. In May 1895, after an unauthorized examination, the following communication was forwarded to The Harvard Corporation: "At the

examination, held... before Professors Palmer, James, Royce, Münsterberg, Harris, and Dr. Santayana it was unanimously voted that Miss Calkins satisfied all the customary requirements for the degree” (cited in Furumoto, 1980, p. 62). Again, the PhD was denied (Harvard refused to grant the doctoral degree to a woman until 1963). In 1902, four women who had completed graduate study at Harvard were offered PhD degrees from Radcliffe College. Radcliffe, established in 1894, offered almost exclusively undergraduate courses; women who completed graduate work did so at Harvard University. Calkins refused the Radcliffe degree, seeing it as a symbol of Harvard’s refusal to admit women on an equal footing with men (Scarborough & Furumoto, 1987). In 1905, Mary Whiton Calkins became the first woman elected to the presidency of the American Psychological Association.

By 1905, the functional point of view had become the dominant view in American psychology (Leahey, 1992). For his part, Angell claimed that functionalism could easily contain Calkins’s “Self -Psychology,” “were it not for her extreme scientific conservatism in refusing to allow the self to have a body, save as a kind of conventional biological ornament” (Angell, 1907, p. 82). Calkins, and Titchener, did not reject the pursuit of identifying the physiological substrates of mental content and processes but placed that pursuit at a lower priority to the study of mind more directly. Indeed, Calkins extended the use of introspection to the study of abnormal experiences of the normal self and included the study by comparative means of abnormal individuals (Calkins, 1901, 1919) among the range of topics to be studied in the new psychology. In these psychologies, introspection continued to serve as a method for the direct examination of conscious experience, but problems arose when introspective reports from different laboratories contradicted each other. Doubts about the capacity of introspection to serve as a scientific method were brought forcefully into focus by the “imageless thought” controversy. Titchener’s psychology proposed that images were the carrier of thoughts, and introspective observations carried out in his laboratory supported his position. Oswald Külpe and his colleagues at the University of Würzburg, however, failed to observe images in their studies of thought processes and concluded that thinking was carried out by “imageless thoughts.” How could introspection, as a method, reconcile incompatible results when conscious experience was private and not open to public inspection? Supporters of introspection as the primary method of scientific psychology added more instructions in an attempt to improve the method (English, 1921) while others advocated its more limited use among other psychological methods

(Angell, 1905; Dodge, 1912). The question of whether introspective analysis could indeed serve as a scientific method producing reliable data was present at the start of psychology's history as a science. Introspective observations were reliable within limits: A wavelength of light at a given frequency was reported to evoke the same color sensation in all observers of normal vision. The question lay in the capability of introspection to go beyond such limited observations in the search for elements of mind. Meanwhile other research traditions arose.

### ***Child Study***

At Clark University, G. Stanley Hall established a graduate program in psychology that attracted students in numbers sufficient to make Clark a leader in psychology after its opening in 1889. In its first decade, 30 of the 54 doctorates in psychology awarded in the period were earned at Clark (White, 1992). In his laboratory of psychology, Hall fostered the experimental methods that he had learned in Germany and appointed E. C. Sanford (1859–1924) to supervise the experimental work. Hall's primary interest lay in developmental psychology; his recapitulation theory of development reflected the nineteenth-century view that the course of development of an individual parallels the stages of human evolution (Richards, 1992). Thus, "every child, from the moment of conception to maturity, recapitulates, . . . every stage of development through which the human race from its lowest animal beginnings has passed" (Hall, 1923, p. 380). Although the theory was later discredited, it served a useful purpose in stimulating research.

In 1891, Hall introduced the use of child-study questionnaires, the "Clark method" (Danziger, 1985, 1990). Questionnaires were designed to investigate "(a) simple automatisms, instincts, and attitudes, (b) the small child's activities and feelings, (c) control of emotions and will, (d) development of the higher faculties, (e) individual differences, (f) school processes and practices, and (g) church processes and practices" (White, 1992, p. 29). Much of Hall's research on childhood and that of his students culminated in his two-volume *Adolescence* (1904).

Child psychology was not, however, uniquely the property of Hall and his university. James Mark Baldwin's *Mental Development in the Child and the Race* (1895) and its companion volume, *Social and Ethical Interpretations of Mental Development* (1897), were attempts to bring a genetic account of development into the new psychology and "to bridge the gap between the study of social institutions (i.e., sociology) and the study of individual functioning (i.e.,



psychology)” (Cairns, 1992, p. 17). Baldwin’s contributions were fleeting, for many reasons (see Cairns, 1992, p. 22), among which was that his theoretical formulations were out of step with the heavy empirical emphasis prevalent in psychology at the time. Similarly, Hall’s influence was limited by the critical attack from those closely tied to laboratory investigations that his questionnaire research was methodologically weak. Nevertheless, Hall and Baldwin made the psychology of child development and the methods appropriate to its study part of the new psychology.

### *Individual Differences*

Although recapitulation theory influenced Hall’s approach to child study, the direct influence of evolutionary theory on child study was slight (Charlesworth, 1992). However, the theory of evolution strongly influenced the study of individual differences. For natural selection to serve as the primary mechanism of evolution, variation in species populations was necessary for the selection of traits that were the basis for adaptation and survival within different and changing environments. Francis Galton, a cousin of Darwin, contributed to the history of psychology through his measures of physical and mental characteristics of individuals who visited his Anthropometric Laboratory.

The measures of physical characteristics such as head size, arm length, height and weight, and performance characteristics such as reaction time and sensory acuity, used by Galton and adapted from the tasks of the psychological laboratories, were employed as mental tests of intelligence. Head size, for example was (falsely) assumed to indicate brain size and intellectual capacity, and speed of responses and visual acuity were assumed to indicate adaptability and survival capability. The term *intelligence* came to be used to designate differences among individuals in their capacity for such complex behaviors as reasoning and problem solving rather than to denote differences among species in adapting to the environment, the more common use of the term in the nineteenth century.

James McKeen Cattell, who had studied with Hall at Johns Hopkins before earning his PhD with Wundt, pursued his interest in individual variation, labeled “*ganz Amerikanisch*” by Wundt (Boring, 1950), while in Francis Galton’s London laboratory. Cattell returned to establish a laboratory at Columbia University and adapted laboratory tasks familiar to him from both Leipzig and London to identify and measure differences in reaction time, sensory sensitivity, time estimation, and memory span in undergraduate students (Sokal, 1987; Tuddenham, 1962). Like Galton, he theorized that such tasks as reaction time,

sensory acuity, memory, and apprehension spans would reveal an individual's intellectual abilities. His attempt to relate scores on these tasks to academic performance demonstrated little relationship between the performance scores on the laboratory tests to academic performance in courses at Columbia (Sokal, 1987) but nevertheless represents an early effort to measure the intelligence of individuals.

Assessing individual differences among human beings did not necessarily result in appropriate conclusions about the consequences of evolution because of the importance of social and cultural factors in determining differences among individuals. For example, Galton's study of sex differences in psychological characteristics reflected social and cultural views of the capabilities and proper roles for women and men rather than differences that could be attributed to evolutionary forces. This bias was common at the time and addressed by the research of one of James R. Angell's graduate students, Helen Bradford Thompson. Her dissertation, completed at the University of Chicago in 1900 and later published as *The Mental Traits of Sex* (1903), was the first systematic, experimental investigation of sex differences in motor ability, sensations, intellect, and affect. Careful, detailed analysis of the results led to her conclusion that "the psychological differences of sex seem to be largely due, not to difference of average capacity, nor to difference in type of mental activity, but to differences in the social influences brought to bear on the developing individual from early infancy to adult years" (p. 182). Hall, too, had employed evolutionary arguments to bolster stereotyped ideas about the psychological nature and proper roles of men and women. His rather unflattering assessment of women's abilities attracted little argument from American male psychologists of the time (see Diehl, 1986; Shields, 1975) and played a role in denying opportunities for graduate study and professional employment for women (Milar, 2000).

In 1910, Helen Thompson, writing under her married name, Helen Thompson Woolley, reviewed the literature on sex differences and asserted, "There is perhaps no field aspiring to be scientific where flagrant personal bias, logic martyred in the cause of supporting a prejudice, unfounded assertions, and even sentimental rot and drivel, have run riot to such an extent as here" (Woolley, 1910, p. 340). Similar conclusions could have been drawn about comparisons among races begun before the development of evolutionary theory. These comparisons had also served to justify a hierarchy that placed Caucasians in a superior position, and later studies under the aegis of evolutionary theory

continued to be carried out and interpreted in terms of long-held cultural biases (see R. Guthrie, 1998). Influenced by Cattell and Hall's child study movement, Lightner Witmer (1867–1956), attempted to put performance on laboratory tasks to practical use in the new discipline that he labelled "Clinical Psychology" (McReynolds, 1996).

The apparatus and methods of the laboratory experiment were successful in assessing differences among individuals but proved to be of little value for Witmer's purposes (McReynolds, 1996). The failure of laboratory tasks for these applied ends led, in the case of intelligence testing, to the refinement and development of tests modelled on those of Alfred Binet and, in Witmer's case, to the search for more suitable methods for assisting individuals. These efforts also led to attempts to identify characteristics of individuals that, like intelligence, were both measurable and offered promise of relevance, such as personality assessment (Allport, 1937), attitude and aptitude measures, and clinical diagnostic tests (Gregory, 1992). For many psychologists, individual differences were a distraction to the understanding of the general principles governing mind, while for others, the understanding of the individual mind was the most interesting task for psychology. The difference in emphasis and the somewhat separate paths of development of the two pursuits within psychology came to be seen as the two disciplines of scientific psychology (Cronbach, 1957).

### ***The Study of Nonhumans: Animal Psychology***

Darwin's theory of evolution had raised questions about the adaptive utility of consciousness; the relation of human to animal ancestry had raised issues of whether there are instincts in humans and whether animals exhibited human intellectual capacities and consciousness in adapting to changed or changing environments. Learning capacities and consciousness seemed in turn to depend upon the complexity of the nervous system: "If there is a Comparative Anatomy there is also a Comparative Psychology" (Chadbourne, 1872, p. 22). George J. Romanes (1848–1894), a devoted younger friend of the aging Darwin, explored these concerns by collecting anecdotes of wild and domestic animals that provided evidence of capacities for reasoning and problem solving analogous to those exhibited by humans. As part of an animal's intelligent adaptation to an environment, he sought evidence of reason, which he defined as the conscious knowledge of the relation of the means to an end. In addition, Romanes described patterns of instinctive responses that occurred without a conscious awareness of the end to which they were adapted (Romanes, 1892). Romanes' research

methods and anthropomorphic conclusions about the capacities of animals were criticized by C. Lloyd Morgan (1852–1936) for relying on unsubstantiated anecdotes and weak analogical reasoning. Morgan emphasized the importance of observation and encouraged parsimony in interpreting observations of animal behavior (Morgan, 1890–1891, 1896). His caution in this regard came to be known as Morgan's Canon: "In no case should an animal's activity be interpreted in terms of higher psychological processes if it could be interpreted in terms of processes standing lower in the scale of psychological evolution" (R. I. Watson & Evans, 1991, p. 329). Morgan provided a necessary methodological corrective to enthusiastic but unscientific fact gathering by emphasizing both care in making observations and caution in interpreting them. Morgan employed experimental methods and observation in naturalistic settings and hypothesized that animals learned through association of ideas, in accord with the philosophical tradition of associationism (Warren, 1921) that described how the human mind operated (Cumming, 1999; Furumoto & Scarborough, 1987). Although we can know our own consciousness, we can only infer consciousness in others, including animals; for Morgan, the criterion for inferring consciousness in animals is "circumstantial evidence that the animal . . . profits by experience" (Morgan, 1900, p. 42). In this way, Morgan stimulated interest in the study of learning, not only as an adaptation to the environment, but also as the criterion for inferring animal consciousness or mind. At Clark, research in animal behavior attempted to describe the animal mind and to study the development of the nervous system. The former research was represented by Willard Small's use of the maze to study the mental processes of the white rat involved in learning (Small, 1900, 1901). The latter

research was represented by H. H. Donaldson, who attempted to describe the growth of the nervous system in rats and humans (e.g., Donaldson, 1908). One purpose of this research by Donaldson and Small was to relate the complexities of the nervous system between species and between individuals in the same species to differences in behavioral and mental abilities. Small employed a version of the Hampton Court maze (Munn, 1950) that later gave rise to the many variations (e.g., the T-maze, multiple T-maze, and the straight alley maze) that became standard laboratory equipment for the study of learning and the testing of learning theories of the 1930s through the 1950s. Donaldson and Swiss American psychiatrist Adolf Meyer are credited with helping to establish the albino rat as the dominant laboratory animal in American psychological laboratories for many decades (Logan, 1999).

The work at Clark proceeded in the spirit exemplified by Morgan and by E. L. Thorndike (1874–1949), who, in 1898, had insisted that “experiment must be substituted for observation and the collection of anecdotes” (Thorndike, 1898, p. 1126). Thorndike’s dissertation, *Animal Intelligence* (1898), signalled a major shift from a subjective, introspective, anecdotal study of animals to an objective, quantitative experimental approach with an emphasis on learning (Galef, 1998; Stam & Kalmanovitch, 1998). Thorndike’s emphasis on controlled observation was welcomed by Morgan, who advanced “the hope that comparative psychology has passed from the anecdote stage to the higher plane of verifiable observation, and that it is rising to the dignity of science” (Morgan, 1898, p. 250). Thorndike had pursued graduate study at Harvard with an investigation of the behavior of chickens, until the protests of his landlady forced him to move his chicken experiments to the basement of William James’s house (Dewsbury, 1998; Thorndike, 1936). Thorndike subsequently took his two “most educated chickens” to study the inheritance of acquired traits at Columbia University with James McKeen Cattell (p. 265). The topic did not prove very fruitful, and Thorndike chose instead to examine the performance of cats and small dogs in puzzle boxes. The choice of puzzle boxes was influenced by the work of Romanes and Morgan, who had described dogs and cats learning to open garden gates through trial and error (Morgan, 1900). Thorndike’s boxes were designed to permit observation of animals’ attempts to escape from the box to reach food (Burnham, 1972). Various boxes required manipulation of levers, pulling of loops, or combinations of responses to escape (Chance, 1999; Galef, 1998). Thorndike recorded and graphed the time taken to escape from the box as a function of the number of trials. He interpreted the gradual decline of the curve describing the time taken to escape from the box revealed by the graph to mean that learning proceeded gradually, through trial and error. Responses that resulted in escape from the puzzle box appeared to be selected from random movements, in a manner analogous to the process of evolutionary selection. Thorndike insisted that responses were made directly to the stimulus situation, without the mediation of ideas. The bond between response and situation was strengthened if the response was followed by a satisfying outcome, or weakened if it was followed by an unsatisfactory consequence. This statement constituted Thorndike’s “law of effect.” He also held that bonds between the situation and response became strengthened through exercise and weakened by disuse: the “law of exercise” (Thorndike, 1913). Thorndike claimed that these two laws, together with the animal’s “readiness” to respond in the situation, accounted for

most of animal learning (Thorndike, 1913). In his early work in comparative psychology, Thorndike emphasized a discontinuity between animals and humans. By 1911, however, he reversed his position to emphasize instead the universality of the law of effect and other laws of learning (Bruce, 1997). Although the thrust of Thorndike's laws was to specify regular relations between a situation and the responses that it may come to evoke, without any attempt to assess the content of the mind of the responding animal, comparative psychology did not immediately follow his lead. Concerns for the adaptive value of consciousness in humans and animals continued to be addressed in the early decades of the twentieth century (e.g., Judd, 1910). Identifying the levels of complexity of nervous systems that would justify inferences about the nature of animal consciousness and capacity for intelligent behavior (e.g., Yerkes, 1905) is best exemplified by what has sometimes been called the first textbook in comparative psychology, Margaret Washburn's *The Animal Mind* (1908) (Jaynes, 1968, cited in Furumoto & Scarborough, 1987). Margaret Floy Washburn (1871–1939), the first woman to earn a PhD in psychology and the second woman president of the American Psychological Association (1921), summarized and organized the scattered literature on animal psychology, provided a history of the movement, and offered an extensive discussion of methodology for research with animals (Washburn, 1908; Goodman, 1980). E. B. Titchener's first doctoral student, Washburn had applied to study psychology with James McKeen Cattell at Columbia, but Columbia, like Harvard and the Johns Hopkins University, permitted women to attend classes only unofficially as "hearers." Cattell, however, encouraged her to apply to Cornell, where she completed her degree in 1894. A report of her Cornell dissertation on the effects of visual imagery on tactile sensitivity was one of the few studies published in Wundt's *Philosophische Studien* that had not been completed at Leipzig. Washburn sought to understand the animal's conscious experience in an approach to comparative psychology characterized as "subjective, inferential and rigorously logical" (Goodman, 1980, p. 75). Washburn was influenced by the research and writing of both Morgan and Thorndike; like Thorndike, she advocated the use of objective and rigorous experimental procedures, but, like Morgan, she persisted in her view that animals possessed a consciousness that psychology was obliged to define and characterize (Washburn, 1917, 1926, 1936). To carry out its responsibility, psychology needed to adopt objective and rigorous experimental procedures. Despite the growing emphasis on the sufficiency of behavioral data and the emphatic rejection of mind and consciousness as the only legitimate subject matter for a scientific

psychology, as Thorndike advocated, Washburn held to her position (Goodman, 1980).

### ***Behaviorism***

Animal psychology had drawn attention to the importance of behavior as a clue to mind, but inferences from behavior about animal consciousness were part of the expected interpretations of experimental results. But the focus of study was changing: “There is unquestionably a widespread movement on foot in which interest is centered on the results of conscious process, rather than in the processes themselves. This is peculiarly true in animal psychology; it is only less true in human psychology. In these cases interest [is] in what may for lack of a better term be called ‘behavior’; and the analysis of consciousness is primarily justified by the light it throws on behavior, rather than vice versa” (Angell, 1911, p. 47).

The proposal that psychology reject its traditional definition as the science of mind and consciousness and redefine itself as a science of behavior came from John B. Watson (1913). Watson arrived at the University of Chicago in 1900 to begin graduate work following an undergraduate degree in philosophy and psychology from Furman University (Harris, 1999; O’Donnell, 1985). H. H. Donaldson, who had moved to the University of Chicago from Clark University, brought with him his research program that investigated the relation between the development of the nervous system and the behavior of the rat. Animal laboratories were few; in 1909, only about six laboratories were actively engaged in animal research (O’Donnell, 1985). For his dissertation, Watson chose to investigate the neurological correlates of problem solving in the white rat and carried out additional experiments with rats to determine which sensory modalities were necessary for learning a maze by systematically eliminating one modality at a time. He removed the eyes, tympanic membrane, olfactory bulbs, and whiskers and anesthetized the feet of rats and discovered that the animals seemed to use kinesthetic feedback to reach the goal box (Carr & Watson, 1908; Goodwin, 1999; J. B. Watson, 1907). Watson’s first report of these experiments at the annual meeting of the APA held in December 1906 in conjunction with the American Association for the Advancement of Science (AAAS) led to an outcry by antivivisectionists. He was publicly defended by Angell and by then APA president James Mark Baldwin (Dewsbury, 1990).

Watson had become disenchanted with the language of consciousness and mind, with the method of introspection, and was increasingly concerned about the status of animal research in psychology. Writing to fellow comparative psychologist

Robert Mearns Yerkes in 1910, Watson expressed his identity problems: “I am a physiologist and I go so far as to say that I would remodel psychology as we now have it (human) and reconstruct our attitude with reference to the whole matter of consciousness. I don’t believe the psychologist is studying consciousness any more than we are” (Watson, 1910, cited in J. A. Mills, 1998, p. 60). In a series of lectures given at Columbia University in December 1912, Watson laid out his discomfort with a psychology of consciousness and proposed a psychology of behavior to take its place: “Psychology as the behaviorist views it . . . is a purely objective experimental branch of natural science. Its theoretical goal is the prediction and control of behavior. Introspection forms no essential part of its methods, nor is the scientific value of its data dependent on the readiness with which they lend themselves to interpretation in terms of consciousness” (Watson, 1913, p. 158). Although this so-called “Behaviorist Manifesto” did not produce a revolution in psychology (Leahey, 1992; Samelson, 1981), it did help to raise the status of animal research and place a greater emphasis on explaining behavior rather than mind, especially in research on animals (Watson, 1914). Watson’s notion that the goal of psychology was to predict and control behavior incorporated the vision of psychology as a tool for social control and, therefore, its application to education, industry, and other areas of applied psychology (e.g., Buckley, 1982). Titchener accused Watson of turning psychology into a technology rather than a science (Samelson, 1981). But technology or not,

Watson’s view of science as requiring reliability of observations, public and repeatable, vitiated introspection as a scientific method. Watson argued that verbal reports to a stimulus, in a psychophysical experiment, such as “I see red,” were behavioral in the same way that an animal might be trained to discriminate the color red from other colors (Watson, 1919). J. B. Watson (1916) proposed that the conditioned motor reflex could be applied to animals and humans and thus form the building block of behavior. Like Titchener, Watson believed that science proceeded by analysis, but instead of the elements of mind, Watson sought the elements of behavior. The conditioned reflex was the elemental unit from which Watson proposed to build a science of behavior. The study of reflexes has a long history within physiology (Boakes, 1984; Fearing, 1930). The Bell-Magendie law (Boakes, 1984; Goodwin, 1999) distinguished between the sensory and motor nerves at the level of the spinal cord. This distinction set the stage for an understanding of reflex action and stimulated research on the nature and speed of conduction of the nerve impulse that led to the studies of reaction time by Johannes Müller and Hermann von Helmholtz. Russian physiologist Ivan



Mikhailovich Sechenov (1829–1905) demonstrated that cerebral processes could affect reflexive action by stimulating certain areas of the brain with salt crystals to decrease the intensity of reflexive movement of a frog's leg (Boakes, 1984; Koshtoyants, 1965). Sechenov (1863–1965) argued that the cause of psychical or psychological events is in the environment; external sensory stimulation produces all acts, conscious and unconscious, through the summation of excitatory and inhibitory activity in the brain. He suggested that a science of psychology based on introspective reports of humans is too complex and too subject to “the deceptive suggestions of the voice of our consciousness. . . . [O]nly physiology

holds the key to the scientific analysis of psychical phenomena” (Sechenov, 1973 cited in Leahey, 2001, p. 216; see also, Boakes, 1984). Ivan Petrovich Pavlov (1849–1936) was able to instantiate Sechenov's theoretical claims (Koshtoyants, 1965). Pavlov's research on the physiology of digestion that earned him the Nobel Prize in 1904 involved a method of “sham feeding” in which a fistula, or tube, in the esophagus prevented food placed in the mouth of the dog from reaching the stomach. A second tube inserted into the stomach was used to collect gastric juices. In the course of these experiments, Pavlov noted that gastric secretions occurred not only in response to food in the mouth but also merely to the sight of food, or of the assistant who usually fed the animal. He called these “psychic secretions.” By using a fistula that could collect salivary secretions for the studies on digestion, Pavlov's student Stefan Vul'fson noted that not only did the salivary glands respond differently to different substances placed in the mouth, for example, sand, wet food, dry food, but, unlike other digestive organs, they showed the identical response when the dog was teased by only the sight of the substance (Boakes, 1984; Todes, 1997). Vul'fson and Pavlov used mentalistic terms in describing the reaction of the salivary glands to the sight of food: Dogs “judged,” “sorted out,” or “chose” their responses (Todes, 1997, p. 950). Pavlov later changed “psychic reflex,” to “conditional reflex,” after experiments demonstrated the experimental regularity of what his co-worker Tolochinov referred to as a “reflex at a distance” (Todes, 1997, p. 951). Drawing on Sechenov's early experiments with inhibition of spinal reflexes, the work in Pavlov's laboratory focused on the establishment (conditioning) and removal (extinction) of reflexes to a variety of stimuli and their control by excitatory and inhibitory activity in the brain. Other investigators who explored questions of adaptation of organisms to environments paid more attention to the acquisition of new behavior than to the removal of established behaviors (Boakes, 1984). J. B. Watson attempted to demonstrate how research on conditioned reflexes could

reveal the origins of complex behavior patterns. In his most famous experiment, conducted with graduate student Rosalie Rayner, he conditioned emotional responses in an 11-month-old infant, “Albert B.” By striking a steel bar with a hammer, Watson and Rayner were able to elicit crying in the infant; when they subsequently paired presentation of a white rat, to which Albert had shown no fear, with the striking of the bar, Albert showed fear to the rat. They reported successfully conditioning fear of the rat in Albert, and, further, the fear generalized to a rabbit, a dog, a fur coat, and a Santa Claus mask (J. B. Watson & Rayner, 1920; see Harris, 1979). The study was more a dramatic demonstration than a carefully controlled experiment, but nevertheless exemplified Watson’s vision for identifying the origins and development of behavior and provided an approach to the study of the growth and development of children (Mateer, 1918).

### ***Gestalt Psychology***

A response to the introspective analysis of consciousness advocated by Titchener and the behavioral analysis of J. B. Watson came in the form of an approach to psychology that arose in Germany at about the same time that behaviorism had arisen in the United States. The term *gestalt*, translated as “whole” or “configuration,” referred to an organized entity that was different from the sum of its constituent parts. The term was initially introduced by Christian von Ehrenfels, who pointed out that a melody played in two different keys is recognized as such even though the notes in each case are different. He suggested that combinations of elements produced a “*gestaltqualität*,” or whole-quality, that constituted a new element of consciousness. The use of the term by the triumvirate of Max Wertheimer, Kurt Koffka, and Wolfgang Köhler referred not to a new element but to the organized nature of conscious experience. The gestalt psychologists opposed what they perceived to be artificial attempts to reduce experience or behavior to constituent parts and then to synthesize them again into organized wholes, and articulated their views in influential books (e.g., Köhler, 1929). Gestalt psychology was initiated by observations on apparent movement (Wertheimer, 1912), in which two lights located at some distance apart give rise to the experience of one light moving from one location to the other when the lights go on and off in sequence. The phenomena seemed incapable of explanation by introspective identification of sensory elements. The gestaltists proposed that the introspection appropriate to psychology was a description of experience, a naive introspection that described the experience without any attempt to subject it to analysis. Perceptual phenomena and conscious experience

were not the only domains of gestalt theory; Köhler's research on chimpanzees (Köhler, 1926) suggested that learning occurred not through trial and error but by insight that resulted from a perceptual reorganization that produced a new way of seeing the problem to be solved. Neither Thorndike's trial-and-error explanations of learning nor behavioral analysis of organized goal-directed behavior seemed adequate to account for the behavior of the chimpanzees.

The disagreement with the structural approach to mind and the behavioral approach to behavior derived from fundamentally different assumptions about the nature of science. Titchener, and Watson as well, assumed that science proceeded by analysis, by breaking down chemical and material objects into the elements of which they are composed. The elemental analysis that Titchener perceived to be the hallmark of physics was a nineteenth-century model that had given way to analyses in terms of fields in which forces operated to determine organization of particles rather than particles or elements giving rise to organization (e.g., introducing a magnetic force placed among a random pattern of iron filings organizes the filings in terms of the directions of force). Field theory and the laws of organization were proposed to account for many phenomena (e.g., Ellis, 1950), not only of perception and problem solving and learning, but of, for example, social behavior (Asch, 1955), child development (Koffka, 1927), and thinking (Wertheimer, 1959), and served to prompt research designed to test theories in these areas.

### ***Logical Positivism and Operationism***

The abandonment of mind as psychology's subject matter, the increased attention to ensuring that scientific standards were met by procedures for gathering and treating data in laboratory and nonlaboratory research, and increased attention to theory building appeared to be signs of scientific maturity in psychology. These characteristics were most closely identified with the neo-behaviorist theories of learning and behavior that were the focus of much of the laboratory psychology from the 1930s to the 1960s. These theories focused on animal subjects and models of learning and behavior; their theoretical language was influenced by a philosophy of science of the period. Continuing concern for the scientific status of psychology attracted psychologists to an approach to science advocated by Harvard physicist P. W. Bridgman (1927), who made the case for defining unobservable phenomena, such as gravity or hypothesized physical elements such as an electron, in terms of the operations by which their effects on observable events could be measured (Leahey, 2001; Smith, 1986). E. G. Boring's student,

S. S. Stevens (1906–1973), at Harvard in psychology, proposed that psychology adopt a strict operationism (Stevens, 1935a, 1935b, 1939). Only terms that could be defined operationally were scientifically meaningful; for all practical purposes, only a behavioral psychology could meet this criterion (Leahey, 2001; J. A. Mills, 1998; Smith, 1986). The emphasis on operational definitions influenced the language of psychology (Mandler & Kessen, 1959) and the theories of behavior that evolved in the context of operationism and its philosophical forebear, logical positivism, an approach that limited science to observable phenomena. For psychology, it meant defining hunger, for example, in terms of such operations as hours of food deprivation, or a measure of blood sugar level, or the amount of time spent eating, each of which is an observable indicator of the unobservable hypothesized motivational condition of hunger. The neo-behaviorists who shaped what is known as the “Golden Age of Learning Theory” from 1930 to 1950 adopted some ideas from logical positivism and operationism, although each of them was to formulate his own vision of behaviorism (J. A. Mills, 1998; Smith, 1986).

### ***The Neo-Behaviorists: Guthrie, Tolman, and Hull***

Edwin R. Guthrie (1886–1959), the “most starkly empiricist of all the neo-behaviorists” (J. A. Mills, 1998, p. 79), defined mind as “a mode of behavior, namely, that behavior which changes with use or practice-behavior, in other words, that exhibits learning” (E. R. Guthrie, 1935/1960, p. 3). The ability to learn, as C. Lloyd Morgan had suggested, characterized the possession of mind in living creatures. Guthrie’s theory of learning was deceptively simple: Learning occurs through the development of associations between stimuli and responses. These associations are formed by contiguity: “A combination of stimuli which has accompanied a movement will on its recurrence tend to be followed by that movement” (p. 23). He rejected Thorndike’s laws of effect and of exercise, claiming instead that the apparently gradual nature of learning was a result of a series of one-trial situations in which movements, small muscle responses, rather than acts were learned in response to stimuli. The role of the consequences of responding, whether satisfying or annoying, was to change the stimulus situation, not to strengthen some unobservable bond between stimulus and response. In contrast to E. R. Guthrie’s molecular approaches to learning, Edward Chace Tolman (1886–1959) offered a molar theory of the psychology of learning. For E. R. Guthrie and for J. B. Watson, descriptions of learned behavior were confined to descriptions of stimulus events and responses. Tolman, in contrast,

proposed a theory that interpreted behavior in terms of “motive, purpose and determining tendency” (Tolman, 1922, p. 53). For Tolman, cognitive events intervened between the antecedent stimuli and their behavioral consequences. Learning and performance were not synonymous (Innis, 1999; Kimble, 1985; Tolman & Honzik, 1930); performance was the observable behavior, while learning was the hypothesized state that accounted for the change in behavior. Tolman described the action of intervening variables on the functional relationship between the independent and dependent variables; that is, between the environmental stimuli and physiological state of the organism on the one side and the overt behavior on the other (Tolman, 1932, p. 2; see also Innis, 1999; Kimble, 1985). The most important intervening variables were cognitions, defined as expectations about the relationship between signs, stimuli, and significates, rewards or goal objects (J. A. Mills, 1998; Smith, 1986). Tolman hypothesized the formation of “cognitive maps” or cognitive representations of the environment in rats learning a maze.

These cognitive maps could be empirically demonstrated in maze experiments in which, for example, blocking a previously used route to a goal resulted in rats choosing the next shortest path to the goal (Tolman, Ritchie, & Kalish, 1946). Clark Hull (1884–1952) proposed a formal logico deductive theory of behavior: “In science an observed event is said to be explained when the proposition expressing it has been logically derived from a set of definitions and postulates coupled with certain observed conditions antecedent to the event” (Hull, 1943, p. 3). Hull’s theoretical treatment of psychology consisted of a set of postulates and corollaries and their mathematical statements to enable quantitative predictions about behavior. Hull’s goal was to develop psychology as a natural science by demonstrating that behavioral phenomena obey universal, quantitative laws that can be stated by equations comparable to physical laws, “of the type governing the law of falling bodies” (Hull, 1950, p. 221). Even centuries after Kant, Hull was striving to demonstrate that psychology could indeed become a science that met the same standards as the physical sciences. For example, Hull (1934a, 1934b) proposed that the serial position effect in learning a list of words (the phenomena that errors occur more frequently in learning and in the recall of words from the middle of a serial list) exemplifies the same general law that describes the pattern of errors made by rats learning a complex maze (more errors occur in the center of the maze than at the start and the finish).

Hull's research program was directed toward the discovery of such laws and the formulation of the equations that described them. His theory of behavior formulated theoretical variables in operational terms, defined them by equations, and predicted experimental results. Experiments by Hull, Tolman, and their students were designed to provide crucial tests of predictions from their respective theories. For example, Hull's theory hypothesized that learning occurred through reinforcement, defined in terms of the extent to which reinforcement reduced a motivational drive; Tolman, on the other hand, argued that reinforcement in this sense was unnecessary for learning (Tolman & Honzik, 1930). Resolution of such theoretical issues was difficult; moreover, the precise predictions from Hull's formal theory were frequently not confirmed, and criticism of the theory began to mount from a variety of sources, including Hull's own students (J. A. Mills, 1998). Differences between the theories of Hull and Tolman came to seem less substantive and more a preference for particular terminology and the reification of intervening variables (Kendler, 1952).

### ***The Radical Behaviorism of B. F. Skinner***

Burrhus Frederick Skinner (1904–1990) questioned whether theories of learning were necessary in view of what appeared to be fruitless theoretical tests (Skinner, 1950). He argued instead for a purely empirical description of behavior, eschewing any hypothetical or intervening non observable variable in his description of behavior, a position that he had established in his first major publication (Skinner, 1938). His manipulation of the contingency between an operant (emitted) behavior and a reinforcer constituted his program of research, carried out in the operant-conditioning chamber more popularly known as a "Skinner Box." With rats and later pigeons as his experimental subjects, Skinner measured cumulative responses over elapsed time as a function of reinforcement schedules (Ferster & Skinner, 1957). Intervening variables, such as drive or motivation, were defined operationally in terms of number of hours of deprivation or percent of free-feeding body weight. The reports of experiments by Skinner and his followers, with few animals but a large number of responses, met with rejection from editors whose definition of an experiment required a research design comparing experimental and control groups with a statistical test of the significance of the difference between them. The result was the establishment of the *Journal for the Experimental Analysis of Behavior* in 1958 (Krantz, 1972). Skinner's approach to behavior extended to the development and use of language (Skinner, 1957) and to the technology of teaching (Skinner, 1968).

## **The Rise of Cognitive Psychology: Mentalism Revisited**

The experiments engendered by the debates among the different approaches to learning and behavior continued to dominate the literature of experimental psychology at mid-century. However, the traditional methods and research topics of the psychological laboratory also flourished; although the era of the schools had ended, they left a legacy of influence on the research conducted within psychology. Introspection as a source of psychological data lost its primacy with the end of structuralism; introspective reports resumed their more limited role in assessing the quality and/or intensity of sensory experience in psychophysical experiments.

Articles reporting on experiments on perception, stimulated in part by gestalt psychology's emphasis upon perceptual organization, continued to appear in psychological journals, together with studies of the higher mental processes of thinking and problem solving (e.g., Wertheimer, 1959). Functional psychology, more of an attitude than a systematic position, characterized American psychology generally and fostered experiments on serial list and paired associate learning and the interference theory of forgetting, continuing the research tradition emanating from the laboratories of Ebbinghaus and G. E. Müller (McGeoch, 1942). Although research on higher mental processes in animals had not been entirely neglected (Dewsbury, 2000), behaviorism left a legacy of animal research that focused on stimulus-response interpretations of the results of maze learning studies, classical conditioning experiments, and, increasingly, of behavior in operant-conditioning chambers. Psychology redefined itself from the science of mind to the science of behavior. References to mind or mental processes were found only infrequently in textbooks and journals.

The molecular, elemental, and mechanistic analyses of behaviorism, emphasizing peripheral sensory-motor relations, were not limited to research on learning. Child psychology, for example, was strongly influenced by studies of the conditioned reflex (e.g., Mateer, 1918) and Watson's admitted premature claim that, given a dozen healthy infants, he could make of them anything he chose (J. B. Watson, 1924). Emphasis on the study of sensory-motor and nervous-system development in young children led to an emphasis on developmental norms that were postulated to follow relatively fixed maturational principles (e.g., Gesell & Ilg, 1946). These principles and norms were challenged by research that combined behavioral and maturational approaches in examining motor development in children (e.g., McGraw, 1935; 1943). In the decades of the 1950s

and 1960s, the language and models that stimulated psychological research began to change. Explanations of behavior derived from experiments on maze learning and classical and operant-conditioning research came under attack from those studying more complex behavior patterns (e.g., Harlow, 1953). Rote learning of serial lists and verbal paired associates were acknowledged to represent only a limited domain of human learning (Melton, 1956). Information theory, developed during World War II as a tool for measuring the capacity of humans as processors and transmitters of information, provided a new measure of human performance and implied capacities for making judgments and choices (Attneave, 1959). Information theory offered fresh interpretations of choice reactiontime experiments (e.g., Hick, 1952) and the limits of human attention and immediate memory (Miller, 1956). Discussions of human capacities to reduce, transmit, or create information renewed interest in cognitive capacities of decision making and problem solving that suggested analogies to the recently developed technology of the computer.

Interest in cognitive development revitalized child psychology in moving from a focus on sensory-motor development to a focus on thinking, the formation of concepts, and the child's understanding of the world. The theories of Jean Piaget (1896–1980) that describe the development of language and cognition in childhood had appeared in the 1920s and 1930s in Europe (e.g., Piaget, 1929) but had an impact in the United States only decades later (Flavell, 1963). Experimental research that explored cognitive and social development in children came to dominate the field of *developmental* psychology, no longer simply *child* psychology but soon to cover the life span. This shift in emphasis in the study of human development paralleled changes in research on adults and on animals. Psychologists appeared to be less self-consciously concerned with the status of psychology as a science and more concerned with the kind of science psychology was to be. The behavioral view of a largely passive organism whose mechanical behavior was governed by environmental events became an increasingly less satisfactory model. Calls for a humanistic, rather than a mechanistic, science of psychology (Giorgi, 1970; Maslow, 1966) called for a view of human beings as actively engaged with the environment, thinking and deciding rather than simply responding to external events. The results of Pavlovian conditioning experiments began to be interpreted in terms of cognitive events (e.g., Rescorla, 1966) and signaled the increasing willingness to consider the role of mental processes that determined behavior in both humans and animals. The journals *Cognitive Psychology* (1970) and *Memory and Cognition* (1973) were founded to provide an



outlet to the burgeoning research in human memory that was less characteristic of traditional associationistic theories (Warren, 1921; Robinson, 1932/1964) and more influenced by analogies to computers and conceptions of information processing. Topics of the older mentalistic psychology, such as attention, concept formation, and thinking, became more prominent in psychological research. The term *mind*, banished from the psychological lexicon in the heyday of behavioral theories, began to reappear in textbooks and, more significantly, in developing theories of human and animal cognitive capacities. The magnitude of the shift in research agendas and theoretical constructs suggested that psychology had undergone a revolutionary change, while others regarded the shift as part of the normal historical development of the discipline (Leahey, 1992). Nevertheless, these developments in scientific psychology represent the continuing vitality of the discipline as psychologists address traditional problems of mind and behavior in forging the science of psychology. These efforts inform the content of the volumes and chapters that follow and properly belong to contemporary psychology.

## CHAPTER 2

### **PSYCHOLOGY AS A PROFESSION**

There was a profession of psychology long before there was a science of psychology and even before the term “psychologist” came into public use. In early nineteenth-century America (as in centuries before throughout the world), there were practitioners who counselled people about their marriages, advised individuals about possible careers, aided parents in the rearing of their children, advised companies about employee selection, and offered to cure a host of psychological illnesses through myriad treatments. These practitioners worked under various labels, including phrenologist, characterologist, spiritualist, graphologist, mental healer, physiognomist, mind reader, and psychologist. To “get your head examined” was big business in nineteenth-century America. Phrenologists, often using a system marketed by brothers Lorenzo and Orson Fowler, measured skull shapes. Phrenology clinics worked with businesses for employee selection, with schools for hiring of teachers, with lawyers for evaluating clients, and with individuals for vocational counseling and advice on marital partners. Thus, there were individuals practicing in most of the venues in

which psychologists practice today and offering many of the services that are provided today by clinical, counseling, school, and industrial-organizational psychologists. However, whether such individuals were “psychologists,” and whether they represented a “profession” at that point, are different matters.

### **WHAT DEFINES A PROFESSION?**

Originally, there were three professions: law, medicine, and the clergy. These fields of endeavour were distinct from “trades” in that they required highly specialized areas of education, created their own languages—generally not understood by the populace at large—and developed their own sets of practices, ethics, and so forth. As opposed to science, which traditionally published its newfound knowledge, professions kept their knowledge to themselves. For example, the priests of the Mayans knew by their sophisticated astronomy when the eclipses of the sun and moon would be and used their predictive powers to ensure that citizens paid their appropriate taxes.

In time the word *profession* was not used exclusively for the three original fields but for any career requiring higher education, although today one can hear the terms “profession” and “job” as nearly interchangeable. However, the hallmarks of a profession are still commonly understood to be specialized education, exchange of information (e.g., through journals, books, seminars), accepted standards of practice, and governmental certification and/or licensing.

How psychologists achieved the status of professional is discussed in this chapter, as we explore historical developments, organizational efforts, educational criteria, relations with other professions, and brief histories of its major subspecialties. More detailed histories of the specialties can be found in the relevant chapters in the volume. Also, the role of organizations of the profession is presented in the last chapter of the book.

### **PIONEERING APPLICATIONS OF PSYCHOLOGICAL SCIENCE**

When the science of psychology began in America in the last quarter of the nineteenth century, academicians found themselves in competition with practitioners for the label of “psychologist.” The academics sought to draw boundaries between their discipline and the many pseudo psychologies.

The new psychological scientists “used their battles with spiritualists [and phrenologists and others] to legitimize psychology as a science and create a new role for themselves as guardians of the scientific worldview” (Coon, 1992, p.

143). Although American psychologists of the late nineteenth century may have been housed within the academy, they were not bent on a pure science that excluded practical problems. Applications to real-world issues emerged in the earliest days of the new laboratories. Not surprisingly, the first applications were in the field of education. By 1892, the year in which he founded the American Psychological Association (APA), Clark University president G. Stanley Hall (1844–1924) was the recognized leader of the child study movement in America, a national movement that was directed at educational reform. Hall and his colleagues at Clark organized a research effort using schoolteachers, parents, and college educators (including psychologists) to collect data on children, largely through the use of questionnaires, that would lead to a total understanding of the child. With this understanding, teachers could be better trained, school curricula could be better designed, and education could be better suited to individual student needs. Clark University served as a clearinghouse for these studies, accumulating data from more than 190 different questionnaires. Various universities with child study interests (such as Clark, Stanford University, and the Universities of Illinois and Nebraska) held summer programs for schoolteachers, administrators, and educators in normal colleges (i.e., colleges in which teachers were trained) to dispense the new knowledge of the child and to describe the implications of this knowledge for teacher training and school reform (Davidson & Benjamin, 1987).

Although the questionnaires were the principal research tools of child study, various mental tests were also employed. The mental tests were an outgrowth of the anthropometric tests developed by Francis Galton (1822–1911) in England in the 1880s and imported to America by James McKeen Cattell (1860–1944). Cattell actually coined the term “mental test” in an 1890 article in which he described a proposed program of research based on sensory, motor, and cognitive measures (Cattell, 1890; Sokal, 1982b). A few years later he was confident enough in the validity of the measures to suggest that they had value in school settings as “a useful indication of the progress, condition, and aptitudes of the pupil” and further, that these “tests might serve as a means of training and education” (Cattell, 1893, p. 257). By 1895, several American psychology laboratories had adopted a similar mode of testing and were using the tests as diagnostic instruments, principally of intellectual functioning.

This was the start of a measurement of individual differences that would define American psychology, particularly applied psychology, throughout the twentieth

century. Another of the pioneers in applied psychology was a University of Pennsylvania professor, Lightner Witmer (1867–1956), who in 1896 opened the first psychology clinic in America, and perhaps in the world. In March of that year, a local schoolteacher brought a 14-year-old boy to see Witmer. The boy had difficulties with spelling, and the teacher reasoned that if psychology was the science of mind, then it ought to be able to solve such problems. Witmer dealt with the boy's problem successfully. By the summer, Witmer was seeing similar cases at the university, which led to the opening of his clinic (Baker, 1988). So enthused was he with this applied success that he gave an address at the annual meeting of the American Psychological Association that December in which he spoke about using psychology to solve learning difficulties in schoolchildren. He urged his colleagues to use their science to “throw light upon the problems that confront humanity” (Witmer, 1897, p. 116). The clinic grew slowly at first, with Witmer handling much of the caseload himself, mostly schoolchildren presenting with learning and/or behavioral problems. In 1907, he began editing and publishing a new journal, *The Psychological Clinic*, in which he described the cases and the diagnostic and treatment methods used. In the first issue of that journal, Witmer outlined a program of graduate training in a field he designated as “clinical psychology” (Witmer, 1907). Based on the work in his clinic and his promotional efforts on behalf of applying psychology to the remediation of learning and behavioral problems, Witmer has generally been acknowledged as the founder of clinical psychology and school psychology in America (McReynolds, 1997). In addition to schools and clinics, the new psychology also quickly found its way into the world of business. In the fall of 1895, Harlow Gale (1862–1945), a psychology instructor at the University of Minnesota, began his research on the psychology of advertising. He sent a brief questionnaire to approximately 200 businesses in the Minneapolis–St. Paul area asking them about their advertising practices. He wrote, “It is our aim to find the mental processes which go on in the minds of the customers from the time they see an advertisement until they have purchased the article advertised” (Gale, 1900, p. 39). Gale discovered that the business community may not have been as interested in psychology as he was in their field; only about 20 businesses returned his questionnaire, a return rate of 10%. In the next 5 years, however, a theoretical debate among advertisers about the nature of consumer motivation led the advertising community to make contact with psychology, initially with Walter Dill Scott (1869–1955), who published books on the psychology of advertising in 1903 and 1908. With his work, the field of industrial psychology was born

(Benjamin, in press). By 1915, many psychologists were employed full-time in the business field in advertising, sales, and personnel work.

Thus, whereas many of the early academic psychologists appeared content to remain in their laboratories where they used their new scientific techniques to answer age-old questions of mind, others were lured beyond the ivy-covered walls, motivated by a need for money or a curiosity about problems in the world outside of the academy or by a need to demonstrate the value of the new science of psychology through application. It was the work of those pioneers that marked the beginning of the new profession of psychology, a profession that was to be grounded in science.

### **THE BEGINNINGS OF THE NEW PROFESSION OF PSYCHOLOGY**

It is doubtful that psychologists at the end of the nineteenth century envisioned anything like the profession of psychology that would exist in the 1930s much less the profession of today. Yet the earliest of American psychologists, such as William James (1842–1910), G. Stanley Hall, and James McKeen Cattell, clearly recognized the potential contributions of psychology through applied research. It, perhaps, was only a small step to move from applied research to establish a role for psychologists as consultants employed outside the university.

The beginning of the twentieth century in America was marked by great social upheaval. American cities were growing rapidly and with them the factories that were the home of the new urban labor. Immigrants came to America in even greater numbers, seeking a better life. Child labor laws and compulsory school attendance laws were passed in tandem to prevent abuses of children in the workplace but also to provide an education needed for an urban workforce and to impart the values of American society important to the melting pot of fully acculturated citizens. There were movements for a national reform in education and for the right to vote for women. As manufacturing capacity exceeded demand, businesses looked beyond their regions to a national consumer base. Advertising became more important to create those broader markets. The types of jobs available expanded considerably as America moved from a largely agrarian/rural society to a factory/urban one; consequently, people sought more information about jobs leading to a new focus—arguably a more scientific one—on adjustment.

The changes in America at the turn of the century virtually clamoured for an applied social science to solve the problems of the new society. And, there were

psychologists both inside and outside of university settings who were ready to tackle those problems. We will next examine some of the early practical applications of psychology in business, in counseling, in education, and in clinical settings.

### **The Business Psychologist**

At the beginning of the twentieth century, American business was changing America as well as being changed by the evolution of American society. With the “formation of large industrial empires came new management problems and a growing problem with efficiency” (Napoli, 1981, p. 28). As efficiency became the watchword of new American business, psychologists would take up the challenges of increasing productivity, improving personnel selection, providing job analyses, and improving worker morale. Business psychology—later to be called industrial psychology in the 1920s, and then industrial-organizational (I-O) psychology in the 1960s—can be said to have originated with Gale’s advertising study in 1895. But Gale did not pursue that work. Instead, the first sustained program in business psychology was that of Walter Dill Scott, who published many articles on the psychology of advertising in *Mahin’s Magazine*, a leading journal in the advertising field. Scott also wrote about his advertising work in other magazines, such as *Atlantic Monthly*, *Business World*, *Advertising World*, and *The Woman’s Herald*, thus making business psychology known to a broad audience of potential employers and consumers. Scott promoted the psychology of suggestion, arguing that successful advertising suggested a course of action, that is, buying the product. He wrote, “Man has been called the reasoning animal but he could with greater truthfulness be called the creature of suggestion. He is reasonable, but he is to a greater extent suggestible” (Scott, 1903, p. 59). In applying suggestion to advertising, Scott advocated two techniques: the direct command (e.g., “Use Peterson’s Tooth Powder”) and the return coupon. Both techniques were thought to stimulate compulsive obedience.

In the subsequent theoretical debates in the advertising community on the nature of consumer behavior, other approaches displaced Scott’s views (see Kuna, 1976, 1979), but his work gave psychology considerable visibility in the world of business and paved the way for many psychologists who would follow in advertising such as Harry Hollingworth, Daniel Starch, and John B. Watson.

Although business psychology can be said to have begun in the field of advertising, it quickly branched into other prominent areas. When increased emphasis on efficiency led to the “scientific management” of Frederick Winslow

Taylor (1911), psychologists entered that arena as well. Efficiency meant not only better management and more effective advertising but also better training of workers, improved employee selection procedures, better ways to control employee performance, and better understanding of human actions in work. Prominent in these areas was Harvard psychologist Hugo Munsterberg (1863–1916), who argued in his book, *Psychology and Industrial Efficiency* (1913), that the key to workplace efficiency was matching job and worker and that successful matches generated satisfied employees, quality work, and high productivity. Munsterberg promoted psychology as the science of human efficiency, noting that psychology had the tools to create the perfect match by determining the mental traits required for any job and the mental traits of workers. That his ideas were well received by a broad public is evidenced by the fact that his book was for a time on the national list of best-sellers.

Psychologists began to develop mental tests to evaluate workers and jobs (ship captains, trolley car operators, saleswomen), work that was to prove especially important when they were asked to oversee the selection program for the United States armed forces during World War I. Business psychology had begun in the universities, but its practice soon moved to business settings as psychologists found fulltime employment, particularly as personnel officers involved with selection, job analysis, and training. Such opportunities expanded considerably after World War I, establishing the psychologist as a key player in the world of business.

### **The Counseling Psychologist**

As noted earlier, with the proliferation of types of jobs around the turn of the twentieth century, people had more occupational choices than ever before. Vocational counseling, which had been a part of the business of nineteenth-century phrenologists, became even more important. The most influential figure in the vocational guidance movement of the early twentieth century was not a psychologist but an individual trained in engineering and law, Frank Parsons (1854–1908). He wrote his most important work in the waning days of his life, a book published after he died, entitled *Choosing a Vocation* (1909). Parsons's formula for successful guidance involved: (a) a clear understanding of the individual's talents, limitations, and interests, (b) knowledge about diverse jobs including what was required for success in those jobs, and (c) matching those two kinds of information for the best vocational guidance.

There were clear ties between Parsons's approach and the matching between jobs and people that was the focus of psychologists in personnel work in businesses. Parsons, as part of the progressive movement of the times, emphasized the reduction of human inefficiency—as reflected in the high turnover of workers—through the application of a careful program of career planning. Vocational guidance became a mantra of progressive reformers and soon found its way into the American mainstream with the formation of the National Vocational Guidance Association in 1913.

Quickly, the vocational guidance counselor was integrated into elementary and secondary schools across America, beginning a strong association between guidance and education. It also made its way into industry through personnel selection. Psychologists found the issues of person and career matching amenable to the new applied science of psychology and worked to develop reliable and valid measures of individual traits and abilities for use in guidance and selection.

Guidance counseling became even more prominent in schools after the passage of the National Vocational Education Act in 1917. Following the First World War, vocational guidance centers (or “clinics,” as they were sometimes called) were established as well at colleges and universities. For example, Witmer founded a separate vocational guidance clinic at the University of Pennsylvania in 1920 that was headed by one of his doctoral graduates, Morris Viteles (1898–1996), who would later distinguish himself as an industrial psychologist. In all of these vocational guidance centers and clinics, the key component of the arsenal of the guidance specialists was mental tests, including interest tests that were developed in the 1920s, and a growing number of aptitude and ability tests that were used not only in guidance but also for selection. This vocational role, both in personnel work and in guidance, remained relatively stable until after the Second World War. (See the chapters by Koppes and Baker in this volume.)

### **The School Psychologist**

We have already noted that the origins of school psychology lie in the psychological clinic of Lightner Witmer. Thomas Fagan (1992) has written that: School psychology was one of many child-saving services originating in the period of 1890 to 1920. . . . [I]t originated in response to compulsory schooling, which provided the stage for development of separate special educational programs for atypical children. School psychology emerged in the middle of the child study movement. (p. 241) The child study work of Hall focused attention on a broad spectrum of child behavior and education. Many of Hall's master's



and doctoral students at Clark University worked in what could be described as school psychology, including three particularly influential pioneers: Henry Herbert Goddard (1866–1957), Lewis Terman (1877–1956), and Arnold Gesell (1880–1961). Goddard was employed at the New Jersey Training School for Feeble-minded Girls and Boys in Vineland when he began his research on mental retardation, searching for better tools for intellectual assessment and for methods of effective education and training of mentally handicapped children.

Goddard was frustrated in his work at Vineland using the measurement tools he had learned at Clark University and from Cattell's work. Whereas those tools seemed appropriate for assessment of children of normal intelligence, they were not useful for the children at Vineland. In a 1908 trip to Europe, Goddard learned of a new approach to intelligence testing developed by French psychologist Alfred Binet (1857–1911). Goddard translated the test for English language use, tested it on samples of public school children as well as the students at the Vineland Training School, and published his version of the test in 1909. Its popularity as an instrument of intellectual assessment spread rapidly, culminating in the version published by Terman in 1916 that became known as the Stanford-Binet Intelligence Test. Goddard's role in school psychology, and more broadly in educational reform, cannot be overstated. He sought to apply the science of psychology to the questions then facing public schools, particularly regarding the educability of children labelled subnormal in intelligence. Through his research efforts, his training workshops for teachers, and the prominence of his ideas in American education, Goddard was instrumental in promoting special education opportunities in American schools (even though many of those efforts went beyond what he would have endorsed). More important for psychology, he established a place for psychologists in the schools as diagnosticians of mental capacity, a role that was often synonymous with the label of school psychologist in the twentieth century (Zenderland, 1998). Terman, like Goddard, also focused on intellectual assessment. Although Terman conducted some research on mentally handicapped children (including some work published with Goddard using subjects at Vineland), his work with children came to be more focused on gifted students, and he is arguably best known (beyond the Stanford-Binet) for the longitudinal studies of children identified as gifted, the "genius studies," that began in California in 1921. His revision of the Binet test was better psychometrically than Goddard's across all intellectual levels but especially so in the higher ranges. Terman, like Goddard, enhanced the role of psychologist as assessor of intellectual functioning and as designer of curricula for special-needs

children, particularly gifted children. Gesell was the first person in the United States to hold the title of “school psychologist,” according to Fagan (1992). He was hired by the Connecticut State Board of Education in 1915 to evaluate schoolchildren and make recommendations for those who needed special treatment. Gesell’s duties in the beginning of his work were research oriented, but he later came to be consumed by a caseload of 502 schoolchildren (and his duties were similar to those of contemporary school psychologists). The significance of Gesell’s appointment was that the title “school psychologist” was associated “with services to exceptional children, especially the mentally deficient, and it associated the functions of that title as primarily diagnostic testing for placement decisions in the newly created programs for the handicapped” (Fagan, 1987, p. 406).

Although Gesell is perhaps the most prominent of the early school psychologists, he was not the only person performing those duties by 1915. Already schools were employing teachers in intellectual assessment roles as well as curriculum design for special children. Norma Estelle Cutts (1892–1988) played such a role as early as 1914 in the New Haven, Connecticut, schools after working with Goddard for a year at Vineland (Fagan, 1989). She was one of many individuals whom Goddard influenced to become school psychologists, most of them women who already had teaching experience.

### **The Clinical Psychologist**

At the beginning of the twentieth century, psychopathology was the domain of psychiatry and, to a lesser extent, neurology. Psychiatry, arguably the oldest of the medical specialties (excluding surgery), originated with the superintendents of mental asylums at the end of the eighteenth century. After a half century of asylum management, the superintendents formed an organization entitled the Association of Medical Superintendents of American Institutions for the Insane in 1844 and in the same year began publication of their journal, *The American Journal of Insanity*. The organization’s name was later changed to the American Medico-Psychological Association in 1892 and in 1921 to the American Psychiatric Association; the journal name was changed as well in 1921 to the *American Journal of Psychiatry* (Grob, 1994). The abnormal mind was of interest to some, perhaps many, of the early psychologists, but the domains of diagnosis and treatment seemed clearly within the boundaries of medicine, and few psychologists saw any need to venture there. That would soon change.

Origins of any field are rarely, if ever, unequivocal—and so it is with clinical psychology. We have already discussed the contributions of Lightner Witmer with respect to school and clinical psychology. Not only did he establish the first psychology clinic in 1896, but as early as 1897 he had described a training program for psychologists to work in a field that he had named “clinical psychology,” a field that would draw from the knowledge base in medicine, education, and psychology (particularly child psychology). An expanded description of this field and a rationale for its further development appeared in the inaugural issue of his journal, *The Psychological Clinic* (Witmer, 1907), a journal that largely published reports of the cases seen in Witmer’s clinic.

Witmer was clearly interested in the difficulties that children exhibited in the classroom and believed that psychological science could offer solutions to behavioral problems of perception, learning, motivation, and emotion. He championed the need for accurate diagnosis based on psychological and medical tests (the latter were performed by associated physicians). Slowly others began to share his vision, and, by 1914, there were psychology clinics at 19 universities.

Witmer’s focus was on children (and chiefly on problems that impeded learning). Others soon broadened the scope of clinical psychology. But, the duties of these early clinical psychologists remained focused on diagnosis and recommendations for treatment, with limited roles in actual treatment until after World War II. *Psychotherapy*, a book published in 1909 by Hugo Munsterberg, represents an early psychology-based contribution to the clinical intervention literature. It was a non-Freudian textbook grounded in a theory of psychophysical parallelism, which argued that all psychical processes had a parallel brain process. His volume argued for the scientific study of the processes of psychotherapy and viewed psychotherapy as a clinical endeavour separate from “psychiatry.” Other influences came from physicians cognizant of the potential contributions of psychology. Morton Prince (1854–1929) was a neurologist interested in the problems of psychopathology and one who recognized the importance of psychology in the study and treatment of psychological disorders. His most famous book, *The Dissociation of a Personality* (1908), was a lengthy and insightful description of a case of multiple personality. His contributions to clinical psychology were considerable and include his founding of the *Journal of Abnormal Psychology* in 1906, which published the early work on experimental psychopathology, and his establishment of the Psychological Clinic at Harvard

University in 1926, which he housed in the Department of Philosophy (where psychology was located) rather than in Harvard's medical school.

Another physician, William Healy (1869–1963), headed the Juvenile Psychopathic Institute, which opened in Chicago in 1909. Healy had studied with William James and had also been influenced by the work of Goddard at Vineland. His institute was to be both a research facility, investigating the causes of juvenile delinquency, and a treatment facility. He hired psychologist Grace Fernald (1879–1950) to work with him, and when she left, he replaced her with another psychologist, Augusta Bronner (1881–1966), whom he would later marry. Both Fernald and Bronner used the title “clinical psychologist” and played important roles in research, diagnosis, and treatment. Other juvenile courts and corrections facilities began to hire psychologists for similar roles (Levine & Levine, 1992).

Other stimulants to the development of clinical psychology before World War I included the work on mental assessment by Goddard and other advances in mental testing; the five addresses given by Sigmund Freud (1856–1939) at Clark University in 1909 that fostered considerable interest in psychoanalysis in America but more broadly in the nature of causation in mental illness; the mental hygiene movement begun around 1908 by former mental patient Clifford Beers (1876–1943) and psychiatrist Adolf Meyer (1866–1950), a movement that sought to understand the early causes of mental illness and how conditions might be changed (in families and society) to minimize psychological problems; and the popularity of the Emmanuel Movement begun by a Wundt doctoral student, Elwood Worcester (1862–1940), in his Boston church, a movement that spread across the United States emphasizing the alliance of medicine and psychology in treating mental disorders, a movement credited with the emergence of psychotherapy in America (Caplan, 1998).

All of these forces brought psychology into greater contact with issues of mental pathology and afforded new jobs for psychologists, largely as mental testers. As the demand for these diagnostic services grew, clinical psychologists petitioned the APA in 1915 for a certification program for qualified psychologists in consulting roles, a measure that was seen to protect the public and to preserve the jobs of consulting psychologists. When the APA declined to provide such certification, several psychologists, including J. E. Wallace Wallin (1876–1969) and Leta S. Hollingworth (1886–1939), formed in 1917 a new, short-lived organization entitled the American Association of Clinical Psychologists

(AACP), arguably the first association of professional psychologists. The membership totalled only about 45 psychologists in its first year, some in university settings, some in applied jobs. The association was a clear statement of another of psychology's applied specialists coming of age: the clinical psychologist.

## **WORLD WAR I AND THE GROWTH OF PSYCHOLOGICAL PRACTICE**

The foundations for the modern practice of psychology were well in place before the beginning of the First World War. Psychologists could be found working in schools, businesses, hospitals, and social and clinical service agencies. The number of such individuals was still relatively small, particularly in comparison to their colleagues in colleges and universities.

Two world wars would dramatically reverse that ratio. The first would promote the rapid development of the practice specialties; the second would open the floodgates for psychological practice, including psychologists as independent practitioners of psychotherapy. It can be argued that American psychologists were unprepared for World War I. On April 6, 1917, two days after America's entry into the war, much of the leadership of American psychology—at least those located on the East Coast—were attending the annual meeting of E. B. Titchener's "experimentalists" at Harvard University (see Boring, 1938, 1967). In attendance was Robert M. Yerkes (1876–1956), who was the current president of the APA. Yerkes chaired a discussion about psychology's role in the war that led to an emergency meeting of the APA Council called for the end of April. At that meeting, Yerkes established a dozen committees that were charged with pursuing various roles for psychologists within the war effort. Only two of those really materialized. One involved a testing program of nearly two million military recruits, headed by Yerkes, that developed group intelligence tests, namely the Army Alpha and Army Beta. The second program was headed by Walter Dill Scott, who used his experience in developing job selection tests to assess the job skills of more than three million military personnel, a task accomplished by his staff's development of more than 100 separate selection instruments in a little more than 12 months. After the war, Scott was awarded the Distinguished Service Medal by the U.S. Army for this monumentally successful program. He was the only psychologist to be so honored in World War I (Napoli, 1981).

The exact number of American psychologists who participated in the war is not known, but the figure is likely between 250 and 300, counting those who served

as consultants as well as those in uniform. Toward the end of the war, some were stationed at the 40 U.S. Army hospitals, where their assignments brought them into direct contact with issues of psychopathology. One example was Harry Hollingworth (1880–1956), a faculty member on leave from Barnard College who, as a captain in the army, was working at the army hospital in Plattsburgh, New York, examining approximately 1,200 soldiers suffering from “shell shock” and other psychological disorders. Based on those experiences, Hollingworth wrote a book entitled *The Psychology of Functional Neuroses* (1920). Although Hollingworth was not led into clinical psychology by his wartime experiences, other psychologists were.

All of the activities of psychologists during the war are far beyond the scope of this chapter. What is important to emphasize, though, is that the war efforts by psychologists had important implications for the public and for the discipline of psychology. The work of psychologists, especially in selection, was seen by the government and the public as a program of considerable success. Such favorable press brought many consulting opportunities to psychologists after the war, and psychologists were quick to take advantage of such applied opportunities. For example, Scott founded The Scott Company, a consulting firm of psychologists based in Pittsburgh, to do contract work for businesses and government agencies. Further, the war work convinced psychologists of the value of their science, that is, that they had something significant to offer in the public sector that was grounded in fact, not myth. This newly gained disciplinary awareness for psychologists, the public’s perception of the value of psychology as demonstrated by success in the war work, the growing economic prosperity of America in the 1920s, and the rapid social changes in American society after the war were all factors that led to the further development of the profession of psychology.

### **THE 1920s: THE DECADE OF POPULAR PSYCHOLOGY**

American historians have written of the public euphoria in the United States that followed World War I. American forces had helped to win the war in Europe. There was general economic prosperity, and a growing belief in the American dream that anything was possible, with hard work. Writing for the American public in 1925, psychologist John B. Watson (1878–1958) promoted this nurturistic optimism: Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I’ll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant-chief and, yes, even beggar-man and thief, regardless of his

talents, penchants, tendencies, abilities, vocations, and race of his ancestors. (Watson, 1925, p. 82)

Americans seemed delirious with the potential for psychology to improve their lives. The first popular psychology magazines (four of them) began publication in the decade. Countless self-help books were published, and newspapers carried daily columns of psychological advice. Touting the value of psychology for the public, journalist Albert Wiggam (1928) wrote:

Men and women never needed psychology so much as they need it to-day. . . . You cannot achieve these things [effectiveness and happiness] in the fullest measure without the new knowledge of your own mind and personality that the psychologists have given us.

Public demand for psychological services grew rapidly, and consequently, many individuals, with little or no training in psychology, offered their services to the public as psychologists.

Consulting psychologists were especially concerned about such pseudo-practitioners and petitioned the APA to create a certification program to identify psychologists qualified to consult with the public. Initially, the APA balked at the idea but relented in 1924, when it established such a program. Four years later, after fewer than 30 psychologists had received certification, the program was abandoned (Sokal, 1982b).

There was no mechanism for enforcement of such a program, and the public seemed incapable of making distinctions between qualified psychologists and unqualified ones, or at least was uninterested in doing so. Nevertheless, psychology of all kinds prospered—and the professional opportunities in business, school, clinical, and counseling psychology grew at a rapid rate.

## **STRUGGLES FOR PROFESSIONAL IDENTITY**

As early as 1915, consulting psychologists had petitioned the APA to recognize the growth of applied psychology by committing some program time at the annual meeting for discussion of professional issues. But APA leadership had balked, citing the APA's sole stated objective as an organization that existed for the advancement of psychology as a science.

When the American Association of Clinical Psychologists (AACP) had been founded in 1917, there was concern within the APA that the group would lead to a rupture in organized psychology. In negotiations between the two groups, the

AACP agreed to dissolve in 1919 and reorganize as the Clinical Section of the APA. The Clinical Section identified three goals: “promoting better working relationships within clinical and within allied fields, developing professional standards for practitioners, and encouraging research and publication on topics in clinical psychology” (Napoli, 1981, p. 26).

Two years later, in 1921, the APA created a second section on consulting psychology, and the short-lived certification program would stem from the efforts of this group. The consulting/ clinical psychologists recommended two additional APA sections, one on educational psychology and the other on industrial psychology, but those two requests were denied. As the professional opportunities for psychologists grew and as problems in professional practice occurred, these psychologists made additional requests of the APA. They called on the APA to develop a code of professional ethics. They sought help in protecting the label “psychologist.” They called for changes in graduate training that included additional applied psychology experiences, including internships (which had begun as early as 1908 but were still uncommon, see Routh, 2000). And, they asked that psychology departments hire more faculty who had significant practical experience.

Except for some minimal gestures toward the applied group, the APA largely ignored those requests that were important for the professionalization of psychology, reminding the group of its mantra that the APA was a scientific association. Throughout the 1920s, more than a dozen applied psychology groups were formed, most of them state associations.

The largest of those was the New York State Association of Consulting Psychologists, which had begun in 1921. By 1930, it was clear to the professional psychologists that the APA was not going to support their efforts. In that year New York University psychologist Douglas Fryer led a reorganization of the New York group, renamed it the Association of Consulting Psychologists (ACP), and extended its geographical boundaries for membership to include the entire United States. The ACP, thus, became the first “national” association for professional psychologists. In 1933, the ACP published its code of professional ethics, the first such document for psychologists. And, in 1937, it began publication of the *Journal of Consulting Psychology*, arguably the first professional psychology journal.

ACP struggled to establish itself as the national association for professional psychologists; however, it was dominated by New York psychologists. In 1935,



a plan was initiated to broaden the ACP membership by creating a federation of societies. All the existing state associations were invited to join as well as the Clinical Section of the APA. Eventually the federation plan was abandoned, and it was decided to create a wholly new organization, the American Association for Applied Psychology (AAAP), which began in 1938. The ACP and the Clinical Section of the APA both disbanded and became part of AAAP. The ACP journal was continued by the AAAP—as its official organ.

The AAAP began with four sections: clinical, consulting, educational, and industrial psychology. Fryer served as the first president of AAAP and was followed in later years by such important applied psychologists as Walter Van Dyke Bingham (1880–1952) and Carl Rogers (1902–1987). The AAAP’s success was manifested largely through its sections in which psychologists with similar needs could work together on issues of common concern. Each section wrote its own by-laws, elected its own officers, created its own committees, and planned its own program at the annual meeting of the AAAP.

Even though most of the AAAP members retained their memberships in the older APA, many identified more strongly with the new organization than with APA because AAAP provided the professional identity, the collegial relations, and the professional assistance that APA had been unwilling to offer. (Benjamin, 1997, p. 728) Although the AAAP was quite successful in serving the needs of professional psychologists, the organization lasted only slightly more than seven years. Its demise had nothing to do with the service it was providing for the growing profession of psychology. With the United States at war in 1942, there was federal government pressure on the various psychological organizations to come together with one voice for the national good. Negotiations among several groups (including the Society for the Psychological Study of Social Issues, or SPSSI, and the Psychometric Society) but principally steered by the two heavyweights, the APA and the AAAP, led to the establishment of a “new” American Psychological Association.

The new APA began with 18 charter divisions, a model borrowed from the sectional structure of the AAAP; a new journal that was intended to be a journal of “professional psychology,” the *American Psychologist* (Benjamin, 1996); and a new central office in Washington, D.C. (Capshe, 1999).

The new APA also had a new statement of objectives which read: “to advance psychology as a science, as a profession, and as a means of promoting human welfare” (Wolfe, 1946/1997, p. 721). The “professional” goal had come, of

course, from the AAAP, and the “human welfare” goal from the SPSSI. The APA looked and sounded like a new kind of organization, one that had finally acknowledged the presence of the profession of psychology. However, professional psychologists would soon learn that they had little real support (or power) within the new association. It would be almost 30 years before that situation changed in any dramatic way.

## **POSTWAR GROWTH OF THE PRACTICE OF PSYCHOLOGY**

Whereas American psychologists were caught napping by the First World War, they did not repeat that mistake for the second one. Both the APA and the AAAP had committees in place by 1939 to plan for psychology’s role should the United States enter the war. As noted earlier, in the first war psychologists worked largely in two areas: examination of recruits and personnel selection. However, in the Second World War, the involvement of psychologists was substantially more diverse—and it included recruitment, selection, training, equipment design, propaganda, surveying attitudes in the United States and abroad, examining and testing prisoners of war, morale studies, intelligence work, and personality studies, including an analysis of Adolf Hitler (Capshew, 1999; Hoffman, 1992). The verdict on psychologists’ performance in the war was an incredibly favorable one. The legacy of that performance was a growth in scientific and professional opportunities for psychologists that was unprecedented in psychology’s history. The profession benefited particularly, and no group benefited more than clinical psychology.

### **Clinical Psychology**

Early in the war, the federal government began planning to meet the mental health needs of returning veterans, which were judged to be substantial. Perhaps the government hoped to avoid the hard feelings among veterans that occurred as a result of their poor treatment following the First World War, ill feeling that had led to a massive march on Washington, D.C. It was evident in 1942 that psychiatrists were too few in number to provide the necessary clinical services, so the federal government mandated that the United States Public Health Service (USPHS) and the Veterans Administration (VA) significantly expand the pool of mental health professionals. That translated into increasing the availability of clinical psychologists.

The USPHS and VA worked with the new APA to expand doctoral training programs in clinical psychology and to identify programs of acceptable quality. The latter goal led to the formation of the APA's accreditation program for clinical psychology programs in 1946 and for counseling psychology programs in 1952. The former goal initiated a series of meetings with department heads of doctoral psychology programs who had extant clinical psychology programs or were interested in developing such programs. The USPHS promised funding to university graduate programs to support clinical psychology students, and the VA promised funding for practica and internship training (Moore, 1992). Because the GI bill had been altered to include benefits for graduate study, money was also available from that program to support doctoral training for veterans, and many chose to pursue advanced study in psychology, with much of that interest directed toward clinical psychology.

Although an accreditation process was already in place within the APA as of 1946, there was no agreed-upon model for clinical training. Discussions of such models dated to the 1890s with a proposal from Witmer, which was followed by subsequent curriculum and training proposals by APA's Clinical Section in 1918–1919 in a series of articles in the *Journal of Applied Psychology*, by the ACP, and by the AAAP. As a leader in the AAAP, clinical psychologist David Shakow (1901–1981) was the key figure in drafting a model curriculum for clinical training. He developed a proposal for the AAAP in 1941 that shaped all subsequent discussions, leading to the report of the Committee on Training in Clinical Psychology (CTCP), an APA committee founded in 1946 with Shakow as chair and funded by the VA and the USPHS.

The committee's formidable charge was to (a) formulate a recommended program for training in clinical psychology, (b) formulate standards for institutions giving training in clinical psychology, including both universities and internship and other practice facilities; (c) study and visit institutions giving instruction in clinical psychology and make a detailed report on each institution. (Baker & Benjamin, 2000, p. 244) Shakow and his committee published their report in 1947 (American Psychological Association, 1947). Two years later it became the framework for the most famous report in the history of professional training in psychology, the "Boulder Report." That report was the result of the joint work of 73 individuals from psychology and related fields who came together in Boulder, Colorado, for two weeks in the summer of 1949 to produce a model of clinical training in psychology that became known as the "Boulder

model” or “scientist practitioner model” (Raimy, 1950). The architects of this model argued that it was both possible and desirable to train clinical psychologists as competent practitioners and scientists, a view that continues to be debated today. Not only was there a new formal model for clinical training, but there was a new model for the clinical psychologist as practitioner (one that involved training as a psychotherapist, a role for psychologists that was strongly supported by the federal government). Clinical psychologists would break from their tradition in psychometrics to focus on the delivery of psychotherapy. In 1948, the federal government established the National Institute of Mental Health, which gave further impetus to both the training in and practice of clinical psychology (VandenBos, Cummings, & DeLeon, 1992). The turf disputes with psychiatry had been minor skirmishes before the war, but bigger battles were about to break out as psychologists began to be true competitors of psychiatrists.

As the numbers of psychologists who worked as practitioners grew, the pressures for certification, licensing, and even insurance reimbursement for clients again surfaced within the profession. Connecticut was the first state to enact a psychologist certification law in 1945. Over the next 30 years, professional psychologists worked state by state to get state legislatures to pass laws creating psychology licensing boards. These efforts were largely the responsibility of state psychological associations, although by 1970 the APA began providing some coordination and consultation. In the mid-1950s, the Board of Professional Affairs was created by the APA, with the mission to establish standards for professional practice, foster the application of psychological knowledge, and maintain satisfactory relations with other professions (American Psychological Association, 1957).

The struggles for equality were not only in the legislatures but also with insurance companies and employers. Employer paid health insurance had emerged as an employee benefit during World War II. During the 1950s and 1960s, labor unions sought to achieve such coverage and expand it (and to include psychotherapy services). After years of urging by practitioners, the APA created an Ad Hoc Committee on Insurance and Related Social Developments in 1963 to meet with insurance industry officials in order to get psychologists included in reimbursement plans (and for such reimbursement to be at parity with that of psychiatrists). Leonard Small, Rogers Wright, Milton Theaman, and Nicholas Cummings were central in this undertaking. The committee also created model “freedom-of-choice” legislation, which individual state psychological

associations could try to get adopted in their state (Cummings, 1979). Legislative language was such that if an insurance company reimbursed a psychiatrist for a particular service, it must also provide such reimbursement when the same service is provided by a qualified licensed psychologist. Later, professional psychologists would use the courts as well in their struggle for equality. It took, for example, a lawsuit filed by the APA against the American Psychoanalytic Institute to establish the right of psychologists to be trained in psychoanalytic centers controlled by the institute (DeAngelis, 1989). The APA Practice Directorate, which was formed in the early 1990s by combining the Office of Professional Practice and the Office of Professional Affairs, evaluates cases and develops selected ones that further the independent practice of psychology. The directorate's efforts are partly funded by a yearly special assessment to all members who engage in practice activities. Divisions of the APA in which at least 50% of its members contribute to the assessment are identified as "practice Divisions." Efforts outside of the APA also contributed to the development of standards of excellence for practitioners. The American Board of Examiners in Professional Psychology (ABEPP) was created in 1947 "to award diplomas for advanced competency in the field" (Riess, 1992, p. 769). Later the term "Examiners" was omitted, and at least five separate specialty boards exist today under the aegis of the parent organization.

Following the conference in Boulder, several other conferences were held to establish training guidelines for a clinical as well as for other professional subspecialties (see Cohen, 1992), but the 1973 "Vail Conference" (also in Colorado) gave credence to the burgeoning programs offering doctor of psychology (PsyD) degrees from universities as well as from freestanding schools (Korman, 1974). The history of the establishment of professional schools and the PsyD degree has been well documented by Peterson (1992) and Stricker and Cummings (1992). As of June 2001, there were 53 such schools accredited by the APA. Professional schools now graduate over 50% of all clinical students.

### **Counseling Psychology**

As a profession, counseling psychology changed considerably following the war. Vocational guidance remained a duty, but that work would soon shift primarily to guidance counselors within secondary schools. And, the selection duties that had occupied many in vocational guidance became more exclusively the property of industrial psychologists. In place of these activities, "psychotherapy" came to counseling psychology, initially through the writings and teachings of Carl

Rogers, who trained many counseling psychologists after the war in “non-directive” counseling and therapy techniques.

The 1950s proved to be a decade of crisis for counseling psychologists. It was a crisis of identity, or at least role confusion. Counseling psychologists who previously garnered most of their identity as vocational counselors had been called on in increasing numbers to provide a range of services to military veterans both in hospital settings and community service centers. Rehabilitation took on a broader meaning, and in addition to vocational planning, counselors were working on general issues of adjustment with service personnel seeking to integrate into the general society. Likewise, the role of student personnel workers in higher education began to focus more broadly on student adjustment. Changes for the counseling profession in the 1950s were evidenced by several clear markers. “Counseling psychology” became the appellation of choice at the North-western Conference of 1951, a meeting specifically organized to explore changes in the field and to make plans for the future. Out of that conference came several initiatives that affected Division 17, the APA, and the VA.

In 1952, Division 17 changed its name from “Counseling and Guidance” to “Counseling Psychology.” The Veterans Administration established two new psychological job descriptions: Counseling Psychologist (Vocational) and Counseling Psychologist. In that same year, the APA began accrediting doctoral programs in counseling psychology, partly in response to a doctoral training curriculum recommended by a Division 17 committee (APA, 1952). The final identifying component of a profession was added in 1954 with the establishment of a new publication, the *Journal of Counseling Psychology*. It might seem that counseling psychology had arrived as a profession. Such professionals had an organizational home, a journal, doctoral training programs, and jobs. There were, however, continued difficulties in defining the field that led to a Division 17 Committee on Definition report in 1956 (American Psychological Association, 1956) and a “crisis” report on counseling psychology as a profession, written in 1960.

This latter report was initiated by the APA’s Education and Training (E&T) Board, which appointed a three-person committee to prepare a report on the status of counseling psychology as a professional specialty (Berg, Pepinsky, & Shoben, 1980). The leadership of Division 17 was not pleased with the unilateral actions of the E&T Board. When the E&T report appeared, the division commissioned its own three-person committee, which drafted a much more optimistic report on

the status of counseling psychology arguing that the profession was thriving, even if graduate programs were not. This 1961 report found that, The rate of growth of counseling psychology has been normal despite limited financial support for the development of graduate programs and the support of graduate students. . . . The social demand for well prepared counseling psychologists is great and continues to increase. The Division of Counseling Psychology has a deep professional obligation to meet this social need. (Tyler, Tiedeman, & Wrenn, 1980, p. 124)

Part of the dissatisfaction within counseling psychology was caused by its comparison with clinical psychology, a profession that was growing at a fantastic rate. By that yardstick, any field would have looked to be in trouble. There was concern from many in counseling that the field should clearly distinguish itself from clinical psychology, whereas others suggested merging the training of the two fields while maintaining differences in the nature of practice.

Traditional work in vocational guidance had been modified by the experiences of counseling psychologists in the VA and student personnel work in higher education. What emerged was a new specialty area that had as its focus the adjustment of the individual to the demands of everyday life, whether those demands were vocational, educational, or interpersonal. The emphasis on developmental processes of average individuals facing day-to-day life was seen as a clear contrast to the emphasis on psychopathology that was the bread and butter of the clinical psychologist.

### **Industrial Psychology**

Other practice specialties also benefited from psychologists' record of accomplishment during the war. Historian Donald Napoli (1981) wrote this about the postwar growth of industrial psychology:

The military had given psychologists a chance to prove the effectiveness of selection, classification, and aptitude testing, and psychologists met the challenge successfully. Civilian employers also offered new opportunities, which grew largely from the labor shortage produced by wartime mobilization. Business managers, beset by high rates of absenteeism and job turnover, took unprecedented interest in hiring the right worker and keeping him contented on the job. Management turned to psychologists . . . and the amount of psychological testing quickly increased. Surveys show that in 1939 only 14% of businesses were using such tests; in 1947 the proportion rose to 50%, and in 1952, 75%. (p. 138)

Another area of substantial development for the industrial psychologist that grew out of the wartime work was the field of human factors or engineering psychology. The military, in particular, continued to employ psychologists in its research on human-machine interactions, but businesses as well began to employ psychologists to design irons, telephones, arc welders, vending machines, chemical refineries, and the like. Human factors remained an important part of industrial psychology into the 1960s but gradually separated, a transition begun in the late 1950s when APA's Division 21 (Engineering Psychology) and the Human Factors Society were founded. It was replaced by psychologists interested in applying social psychological theories to the problems of organizations, leading to the growth of the "O" half of the I-O psychologist. Prior to the war, most industrial psychologists served as consultants to businesses, thus working part-time as professionals. After the war, however, that pattern changed dramatically. Businesses offered full-time employment opportunities, and consequently graduate programs began to train the I-O practitioners to fill those jobs.

### **School Psychology**

Unlike the other three practice specialties, the Second World War had much less impact on the practice of school psychology. Such practice has always been more circumscribed, as the label would imply. Furthermore, whereas the doctoral degree has been assumed to be the minimal level of training necessary for professional practice in the other three specialties, historically most school psychologists have practiced with a master's degree or specialty credential. Further, in the first half of the twentieth century, school psychologists came from many different educational backgrounds, sometimes with little training in psychology.

Fagan (1990) has divided the history of school psychology into "Hybrid years" (1890-1969) and "Thoroughbred years" (1970 to present). The Hybrid years describe a period when school psychology was "a blend of many kinds of educational and psychological practitioners loosely mobilized around a dominant role of psychoeducational assessment for special class placement" (p. 913). That role still exists in the Thoroughbred years, but the practitioner is more narrowly defined as a school psychologist, typically someone who has a master's or doctoral degree in school psychology from a nationally accredited program.

The first master's degree training program for school psychologists was initiated at New York University in 1928 and the first doctoral training program at the



University of Illinois in 1953. The APA did not begin accrediting doctoral programs in school psychology until 1971, and only accredits at the doctoral level. Master's degree programs are accredited by the National Association of School Psychologists (NASP), an organization founded in 1969.

Like the other practice specialties, there have been significant post-war changes for school psychologists as they, too, have struggled to find their identity as a profession (see the report of the Thayer Conference, Cutts, 1955). Still, the Thoroughbred years have been ones of tremendous growth in training and practice for the field. Psychological services in the schools have increased dramatically since the 1970s, in part stimulated by America's baby boom, but also by federal legislation on education, particularly laws on special education such as the landmark Public Law 94-142, enacted in 1974, which mandated education for all children regardless of handicap.

### **A "PROFESSIONAL" JOURNAL WITHIN APA**

When the new APA was formed in 1946, a new "professional" journal was established, the *American Psychologist*. Initially, many articles on professional training and professional job opportunities were published in the *AP*. After 10 years, the *AP* was serving a broader association wide role, and the statement about "the professional journal" of psychology was quietly removed in 1957.

It would be 12 more years before practitioners got back a "professional" journal from the APA. In 1966, Donald K. Freedheim was asked by George W. Albee, who was then president of the Division of Clinical Psychology (12), to edit the newsletter of the division, which was a mimeographed publication. A magazine-like format, with a new logo, was developed. The format lent itself to having pictures, which enhanced the readability of the publication, but also helped to identify authors at conventions. With this new professional looking publication, the editor invited contributions from members of other service divisions (e.g., school, industrial, counseling), as they were facing similar issues of standards of practice, training, and licensing that were of concern to the clinical members. Submissions from across the spectrum of professional fields in psychology grew, and there were clearly important issues that all the specialties shared.

The APA had a fine stable of scientific journals at the time but no publication that was appropriate for the sorts of material important to the practicing community—policy issues, case histories, training and internship opportunities, and so forth. It was apparent that a truly professional practice-oriented journal

was needed. The APA had just received a large grant from the National Science Foundation to develop new, innovative publications on an experimental basis. “The Clinical Psychologist” was about to be transformed into an “experimental publication” called *Professional Psychology*, with an editorial board made up of members from across subspecialty fields. The inaugural issue, fall 1969, contained “The Clinical Psychologist,” and the cover of the journal retained the logo that had been developed for the newsletter. By the second issue of the quarterly, “The Clinical Psychologist” was pulled out to be published separately.

The transition from newsletter to journal was not always smooth. “The Clinical Psychologist” had carried book reviews, but none of the APA journals did. All APA-published reviews were in *Contemporary Psychology*. The *PP* editor believed it important to retain reviews for both the convenience of the readership and the clear fact that few practice type publications would be reviewed in *CP*. After much discussion, the review section was allowed in the new journal, a major exception by the APA Publications and Communications Board (P&C Board). A similar, though less crucial, matter came up regarding authors’ pictures, which had seldom appeared in APA journals, except in the *American Psychologist*. Not only were pictures maintained in *Professional Psychology*, but they started appearing in other APA journals as well, beginning with *Contemporary Psychology*. Another conflict emerged over the size of the publication, as the APA Journals Office wanted it to be in the standard 7-by-10-inch format then instituted for all other APA journals (except the *American Psychologist*, which was larger). The newsletter had been in a 6-by-9-inch format, and the *PP* editor believed that its successor should retain its distinct (and convenient) size, in part to distinguish it from the scientific journals. With the editor threatening to withdraw from the publication, the smaller format prevailed—at least for the seven-year term of the editor. After a year of being in experimental status, and submissions growing monthly, the quarterly was made an “official” APA publication—and the editor allowed to serve on the Council of Editors.

In 1983, the title of the journal expanded to *Professional Psychology: Research and Practice*. *PP* is currently published six times a year. During the editorial term of Patrick H. DeLeon (1995–2000), with Gary R. Vanden Bos serving as the managing editor, *Professional Psychology* made an even greater effort to address the interests of the practice community. After conducting three reader surveys during the first year (one of which involved an innovative nationwide telephone conference call hook up involving over 50 subscribers), *PP* readers made crystal

clear that they wanted articles that “provide practical advice and concrete suggestions that could be implemented in everyday practice settings, rather than merely placing the new findings within the context of the existing published literature (and then commenting upon needed future research)” (DeLeon & Vanden Bos, 2000, p. 595). *PP*’s coverage included managed care, prescription privileges for psychologists, telehealth care, expanding roles for psychologists within the public policy (including legislative and administrative) arena, and behavioral health-service delivery within primary care. Each of these issues has become of major concern to the profession and to the nation’s overall health-delivery system during the past decade. The readership numbers (individual and institutional) steadily increased to approximately 8,000, making *Professional Psychology* the second most popular subscribed to APA journal. In retrospect, the concerted effort to promulgate APA Practice Directorate efforts and relevant federal public health initiatives (e.g., those of the U.S. Surgeon General), although perhaps highly unusual for an APA journal, have had an impact in educating the field regarding the changes evolving within their practice environments. Also, efforts to engage women and ethnic minorities in the editorial process (and thereby enrich the breadth of coverage) were particularly successful. The overall percentage of ethnic minority members in the APA at the time was 5.38%; in sharp contrast, in 1999 three of the five *Professional Psychology* associate editors were female, and two associate editors were members of ethnic minorities. Further, 34.7% of the editorial board were female and 14.7% were ethnic minorities. This was a significantly higher percentage of both categories of members than almost any other APA journal.

## **ELECTRONIC PUBLISHING INITIATIVES**

In January 1995, the APA Web site was available to its members and the public. The total “hits” in the first three months was 22,474—a figure that today (in 2001) is reached every 30 minutes. Usage increased in every quarter of 1995, reaching 413,207 hits in the fourth quarter of that year; quarterly hits in 2001 ran at 90 million. It is interesting to note that many people from a vast array of fields turn to the APA for information on how to reference electronic documents. The APA has a special “style page” on electronic citations. A million people access this specialized page on a relatively narrow topic every year. Non psychologist (and nonstudent) use of the APA Web site remains strong. Almost 35% (or some four million annual users) of the APA Web site are *not* psychologists or students studying psychology.

In 1997, APA president-elect Martin Seligman proposed the establishment of an electronic journal called *Treatment*, to be published jointly with the American Psychiatric Association. For political reasons the “other APA” withdrew from the venture because of fear that psychologists might claim that reading the co-published journal would qualify them for prescribing medication. The American Psychological Association then decided to embark on the e-journal alone, which is now titled *Prevention and Treatment*. By the summer of 2001, under Seligman’s editorship, the journal had 20,000 regular readers, with each article being “hit” an average of 35,000 times within the first year of release. Publications from the Practice Directorate, the e-journal, Web-based communications, videotapes, and over 70 new books each year constitute communications from the APA that are directed toward the practicing professional psychologist.

## **COMMUNITY INVOLVEMENT**

During the 1990s, the APA became increasingly involved in several highly visible community activities that contributed to society’s appreciation of the role of psychological services. In 1991, during the Gulf War, the APA joined with the American Red Cross in forming a network of psychologists to provide mental health services to families of members of the armed services. Since then the network has been activated following natural disasters, airline crashes, and terrorist attacks in Oklahoma City (1996) and in New York City and Washington, D.C., in September 2001. In another effort, the Practice Directorate forged a partnership with Music Television (MTV) to develop a youth anti-violence initiative titled “Warning Signs,” to help the nation’s youth in identifying early signs of violent behavior and to emphasize the need to get help should they see any of them (Peterson & Newman, 2000). The campaign officially kicked off with a youth forum held in Los Angeles on April 22, 1999. The 30-minute documentary, coproduced by MTV and the APA, was the highest rated prosocial special in MTV’s history, with 3.9 million youth watching the film. In that year, there were over 600 follow-up psychologist-led “Community Youth Forums on Violence” held across the nation, with more than 58,000 youths attending. In March 2000, the Practice Directorate launched “Warning Signs for Parents” as a logical follow-up; by the end of the year, nearly 150,000 copies of the accompanying publication had been distributed.

