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In this chapter, I shall first give a short description of psychology as an empirical science as it appears at the beginning of the twenty-first century. Then, I shall discuss how a study of the history of psychology can contribute to our understanding of present-day psychology. Further, I shall account for the way (I believe) psychology as an empirical science originated. Finally, before I present the plan for the book, I shall discuss reasons why empirical psychology over time has undergone changes. In this discussion, I shall be particularly concerned with the problem of assessing progress in psychology as an empirical science.

A Short Characterization of Present-Day Psychology

Here at the beginning of the twenty-first century, psychology as an empirical science has grown into a broad, diversified field of study. We can gain an impression of its breadth by noting that it borders on the biological sciences on the one hand and the social sciences on the other.

Psychology is a theoretical as well as an applied science, and also a profession incorporating a number of specialties. In a wide variety of areas it has produced knowledge useful for the solution of theoretical problems as well as problems of practical and social

life. However, so far, psychology has hardly produced comprehensive theories or scientifically acceptable principles of a general nature. Thus, the discipline appears highly fragmented.

The Present Approach to the Study of the History of Psychology

The attempt to establish psychology as an empirical science raised several questions that were not easily answered and that soon became controversial. Questions such as what is the relationship between mind and brain, between human and animal behavior, and between genetic endowment and environmental influence (nature and nurture) emerged at the inception of the discipline and have remained controversial to this day. At an early stage, disagreement arose about whether we should conceive of psychology as the study of mental experiences or the study of behavior. In what sense should we regard as mental experiences various types of nonconscious processes, such as the subconscious and the unconscious? How do society and culture influence human thinking and behavior? This last question emerged later in psychology's history and is of central importance for the advancement of psychology as an empirical science.

When controversial questions such as these have been satisfactorily answered, psychology will be considerably advanced. I believe a critical, historical examination of them can contribute to their conceptual clarification. For this reason, I give the study of its history a central place in the general study of psychology. Ernst Mayr (1982, p. 16), who called my attention to the prominent role played by the historical examination of long-standing controversies in a field of science, stated the point in his history of evolutionary biology as follows:

Even today's controversies have a root that usually goes far back in time. It is precisely the historical study of such controversies that often contributes materially to a conceptual clarification and thus makes the ultimate solution possible.

By clarifying the available concepts and creating new ones, scientists make their thinking and communication more efficient. As James Conant (1947/1951) and Mayr (1982) have argued, the best way to understand a science is to study how its main concepts are used. I agree with them on this point, and in this book I shall undertake a detailed examination of how some of the most influential psychological researchers have used their main concepts, including careful descriptions of their research.

My concentration on the scientific concepts does not suggest that I believe the invention of new techniques is not significant. Progress often comes with new techniques, but I believe that if new techniques do not result in new or improved concepts, their introduction does not represent important scientific progress.

How Did Empirical Psychology Originate?

A book on the history of psychology written by Harvard professor Edwin Boring in 1929 greatly influenced the ideas psychologists have had of the history of their discipline. To

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get an overview of the problems related to the question of how psychology originated, let us take Boring's book as our starting point.

Edwin Boring's Book on the History of Psychology

Boring (1929/1950) represented the origin of psychology as the convergence of two lines drawn through the scientific and intellectual history of the West: One through philosophy and the other through physiology. In his view, the lines converged in the study of perception started by German researchers around 1850 and eventually met in the psychological studies of Wilhelm Wundt. According to Boring, Wundt was the founder of experimental psychology, and, slightly altering Boring's account, several historians have dated the beginning of scientific psychology to Wundt's establishment of the world's first experimental psychological laboratory in Leipzig in 1879. According to Boring, we can regard experimental psychology as having been founded by Wundt in 1879 and as having spread first throughout Germany and subsequently to other European nations and to the United States. Boring's account of the origin of German experimental psychology, published fifty years after the establishment of the Leipzig laboratory, was comprehensive, yet at the same time outstanding in its simplicity. It remained unchallenged for nearly half a century.

To Boring, scientific psychology primarily meant experimental psychology, and his book was entitled *A History of Experimental Psychology* (1929/1950). Actually, it dealt with all areas regarded as belonging to scientific psychology during Boring's time. British comparative animal psychology, based on field studies, was included with the (doubtful) justification that animal psychology belongs to the laboratory; studies of individual differences and personality psychology were included because they are based on testing, and testing could be seen as a type of experimental psychology. Even stranger was the rationale for including clinical psychology: It might, said Boring in his foreword, become experimental.

History as University Politics

Boring had been appointed professor at Harvard a few years prior to writing his history. During the time he was working on the book, considerable controversy raged over the nature of psychology, both at Harvard and at other US universities. Behaviorism was about to become one of the dominant schools, and psychoanalysis was gaining ground in psychology and psychiatry. Boring himself represented the 1800s view of psychology, psychology as the study of consciousness; in his own empirical research he carried on the German tradition in experimental psychology. His teacher, Edward Titchener, to whom Boring's book was dedicated, was also a representative of this tradition.

Boring had additional goals. By highlighting German experimental psychology, he could, as John O'Donnell (1979) notes, claim that psychology first had to develop as an empirical theoretical discipline before it could become an applied discipline. Further, by claiming that Wundt had liberated psychology from philosophy, Boring could advocate his view of psychology as an independent discipline, a view the Harvard philosophers

did not share. His book, therefore, had obvious university–political aims, as Mitchell Ash (1983) noted in a survey of the US study of the history of psychology.

Boring's account of the origin of psychology gave a useful perspective on the field. However, as later historians have shown, several of the questions he dealt with could be answered differently. The following three questions need a more careful consideration: How is psychology related to philosophy?; How is it related to other natural science disciplines?; and Where did it originate?

Philosophy and Scientific Empirical Psychology

In Western civilization, several problems of a psychological nature have been subjected to systematic examination, first by the Greek philosophers of antiquity, and then by the philosophers of the seventeenth, eighteenth, and nineteenth centuries. The latter debated, among other things, the relationship between body and mind, feelings and reason, sensation and perception, and perception and learning based upon associations, as well as remembering, innate and learned abilities, and the relationship between reflex-like (automatic) and voluntary movement. At the beginning of the 1800s, philosophers also focused on the problem of unconscious processes and studied psychological processes, and several works on psychology were written. Only occasionally, however, did philosophers' interest in psychology result in empirical investigations.

As early as the 1700s, there were thinkers interested in expanding science to include psychology. Towards the latter part of that century, Immanuel Kant (1724–1804) discussed in detail the question of whether psychology could be converted into a discipline similar to physics. Like most psychologists of the 1700s and 1800s, Kant understood a psychological study to be an investigation of mental processes. He concluded that a study of consciousness could not be similar to a study of physics because, among other reasons, mental processes could not be the subject of an experimental inquiry based on quantification and mathematics.

Kant's successor to the professorship in Königsberg, Johann Friedrich Herbart (1776–1841), was more open to the idea of a scientific psychology, although he agreed with Kant that psychology could not be converted into an experimental science. Herbart held that consciousness contains entities in fixed dynamic relationships to one another, and these relationships *could* be expressed mathematically. Consequently, mental processes could be subjected to mathematical treatment, and in this respect the study of psychology could be regarded as scientific. Herbart presented his thoughts about psychology in two widely read books, *Lehrbuch der Psychologie* (*Textbook of Psychology*) in 1816 and *Psychologie als Wissenschaft* (*Psychology as a Science*) in 1824–1825.

Some years after the publication of Herbart's book on psychology as a science, the French philosopher Auguste Comte (1798–1857) discussed the historical development of science in the Western world. Comte became the main representative of a broad intellectual movement known as positivism. I shall return to Comte in Chapter 2, but for now we can note that he rejected the idea that the introspective study of mental processes could be developed into an empirical science. On this point, he was opposed

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by John Stuart Mill (1806–1873), who argued that it is possible to undertake an experimental, scientific study of consciousness. Mill even claimed that by using experimental methods, the British philosophers of the empiricist tradition had arrived at scientific laws stating how associations between ideas were formed. In an influential work, *A System of Logic*, published in 1843, he further proposed that the psychological study of consciousness could be widened to include the study of human character, or what we today call personality.

Apart from Mill, none of the more influential philosophers in the first half of the 1800s wholeheartedly supported the idea of turning psychology into an empirical science. I think we can therefore conclude that the time was not yet ripe for an empirical scientific psychology.

During the latter half of the 1800s, however, the intellectual climate became more favorable to the idea. An increasing number of philosophers were then attracted to the notion that psychological problems could be investigated by empirical methods. Positivism arose as a strong movement within Western thinking, and a central belief in positivist thinking was that empirical scientific research could be expanded to include problems of philosophy.

Boring insisted that the establishment of Wundt's laboratory in 1879 was an expression of a new and more favorable attitude to the idea of developing psychology as an empirical science. However, more dubious was his claim that empirical psychology had thereby become independent of philosophy. Fifty years later, as we have seen, it was still important to champion this belief, and in fact the question of how empirical psychology is related to philosophy persisted to the end of the 1900s. In 1979, at the centenary of the establishment of the Leipzig laboratory in 1879, one of the most prominent methodologists of the day, Sigmund Koch, raised it again. Let us look at his view of empirical psychology.

Sigmund Koch's View of the History of Psychology

As the director of a large-scale project sponsored by the American Psychological Association and the National Science Foundation, and carried out in the 1950s and early 1960s, Sigmund Koch (1959–1963) held a central position in the discussion of methodological and historical problems in psychology. In this project, ninety leading psychologists of the time wrote reports describing their research and evaluating progress in their particular fields. Their detailed and thorough reports were published in six comprehensive volumes. As Daniel Robinson (1998) and Michael Wertheimer (1998) have noted, the project shed considerable light on the history of psychology as well as on present-day psychology. After examining the reports, Koch concluded that the concepts used by the theorists lacked clarity and precision, and that none of the theories discussed were acceptable.

Koch was particularly critical of the comprehensive theories from the first half of the 1900s, such as psychoanalysis, Gestalt psychology, and various versions of behaviorism. Unlike many earlier critics, he had soft spots for none of the theories, and he revealed

fundamental weaknesses in all of them. Although he was far from alone, he probably contributed considerably to the maturing of psychology as a science by installing a more critical attitude to psychological work. After 1960, few attempts were made to construct comprehensive psychological theories for the rest of the century. The attitude seems to have been that psychology was not yet ripe for this task. Thus, we can see Koch's project of the mid-1960s as a manifestation of an important change in psychologists' attitude to their discipline.

Twenty-two years after Koch had finished his first large project, he and David Leary (Koch and Leary, 1985) edited a new collection of essays assessing contemporary psychology. For this collection, Koch (1985a,b) wrote an essay and an afterword in which he evaluated progress up to about 1980. As before, he was highly critical of the belief that psychology had made progress as a scientific, empirical endeavor. However, he felt psychology was ready to make some progress.

According to Koch (1985b), there were several reasons psychology had not progressed as an empirical science. One was a disdain for nonexperimental methods, and another was the idea that the experimental method is applicable only to certain areas of the field. The introduction of the experimental method had, therefore, not significantly advanced psychology as an empirical science. Nor had attempts at introducing the methods of the natural sciences resulted in a definite break with philosophy. In contrast to Boring, who wanted to show that empirical psychology should be considered independent of philosophy, Koch (1985b, p. 944) insisted that psychology had never been separated from it:

Our problems, concepts, terminology, questions have grown out of the history of philosophy; and any position, theory, model, procedural decision, research strategy, or lawlike statement that we assert presupposes philosophical commitments.

According to Koch, empirical psychology was not founded by the establishment of Wundt's laboratory in 1879. Nor could it be said to have been established at any other point during the 1800s or 1900s. I believe Koch was right, but in discussing the relationship between psychology and philosophy, he overlooked the fact that since the Renaissance, philosophy and conceptions of science had been intertwined. Thus, for example, Descartes contributed to the new directions in empirical science at the same time as he worked out his own philosophy, and we can see the philosophies of Hume, Kant, and other influential thinkers as responses to progress in natural science. Moreover, Koch overlooked that in the mid-1800s a change had taken place in philosophy, making it more open to the idea that philosophical problems might be investigated by the methods of empirical science.

Koch was right, however, in pointing out that in the universities the separation of psychology from philosophy was a far slower process than Boring suggests. Actually, in German and most other European universities, the study of psychology formed part of philosophy until the mid-1900s. On the other hand, prominent pioneers in German experimental psychology, such as Hermann Ebbinghaus and Georg Elias Müller,

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attempted to develop psychology independently of philosophy. Although many of the pioneer US psychologists had a close tie to philosophy, empirical psychology there was treated as a discipline independent of philosophy earlier than in Europe. Several early US psychologists were appointed professors of psychology without responsibility for the development of philosophy.

Expansion in Natural Science

In his account, I feel Koch gave too little weight to the effect of nineteenth-century progress in natural science that made the idea of empirical psychology more acceptable. Development in physiology was rapidly accelerating, and from 1860 on, surprising findings were being made about the functions of the brain. This stimulated interest in the empirical exploration of psychological problems, to which we shall return in Chapter 2. However, other important events also took place in natural science. In 1859, Charles Darwin presented documentation to convince a majority of biologists that biological evolution had occurred. This provided a new approach to the study of human nature, which led to a comparable psychological study of animals as well as to a study of heredity. Further, progress in neurology and psychiatry threw light on important psychological problems, and a clinical psychology emerged in France and Austria that originated in these advances. So much was new in the study of psychology in the latter half of the 1800s that I believe we may call it a new era in the field. Particularly new was the use of the procedures of natural science. In contrast to Koch, I believe these procedures have led to more or less continuous progress from the mid-1800s to the present, and I shall trace this progress through the history of psychology.

The idea of scientific psychology was not new with Wundt, and several researchers before him had undertaken experimental work on psychological problems. Moreover, Wundt had not consistently – and perhaps never – held that the study of psychology should be carried out independently of philosophy. As we will see in Chapter 3, it is an oversimplification to regard him as the founder of experimental psychology. I think Koch made an important correction of Boring's account of the role played by Wundt.

Where Did Psychology Originate?

We saw above that Boring described German experimental psychology as having one root in philosophy and one in physiology. This gave an adequate picture. But when he went on to describe the development of empirical scientific psychology as a branching out of German experimental psychology to European countries as well as to the United States, the picture became seriously distorted. When we examine matters more carefully, we see the differences in the types of problems studied by the early researchers, and how slight the influence of one country on another often was. Psychology in Great Britain, France, Austria, Russia, and the United States was widely different from German experimental psychology. Thus, scientific psychology was not the coherent discipline we meet in Boring's book, and Wundt played a far different role than that Boring ascribed to him.

We gain a better perspective on the origin and further development of empirical psychology by recognizing that it originated in several countries at almost the same time. The early psychologists had a common background of ideas; they believed in the importance of science and in the possibility of expanding it to include the study of psychology. However, they had different research interests, were linked to different research traditions, and on the whole worked independently of each other. These cultural and research differences led to substantial differences in their conceptions of psychology.

The Emergence of Scientific Psychology

Next I present a survey of the approaches to scientific psychology adopted in different countries and – to the extent that it is possible – describe them in chronological order.

Germany came first. Here, the study of sensory physiology and perception flourished about 1860, headed by Hermann von Helmholtz. In an extensive work published in 1874, Wundt described a number of problems that could be studied from the point of view of psychology as well as physiology, and he suggested that *physiological psychology* should be instituted as a study in the natural sciences. As we have already seen, he established the first laboratory in the world for experimental work in psychology some years later, in 1879. Conceiving of psychology as the study of consciousness, he extended the study of perception to include the study of attention and feeling. Some years later Ebbinghaus laid the foundation for an experimental study of verbal learning and memory.

In *Great Britain*, scientific psychology emerged in a completely different manner. There, the major inspiration was the theory of evolution, which gave an entirely new perspective to the study of the nature of human beings and laid the foundation for a comparative study of psychology. In 1872, Darwin published his highly influential studies on the expression of emotions and, in 1877, his notes taken thirty-seven years earlier on the development of his eldest son from birth to early childhood. These notes were an important contribution to modern infant and child psychology. They inspired Darwin's friend, the British-German physiologist William Preyer, who in 1882 published an influential book on developmental psychology based on extensive and careful studies of one of his sons. Moreover, inspired by the theory of evolution, Darwin's cousin Francis Galton laid the foundation for the psychological study of heredity. Galton constructed tests for measuring individual differences, thereby initiating the psychological study of individual differences and personality.

The development of psychology in *Russia* was entirely different again. Russian psychology was based on a view of the nervous system as the integration of different types of reflexes. As early as the beginning of the 1860s, this view had been elaborated by the Russian physiologist Ivan Setchenov, but not until the turn of the century did it form the basis for empirical investigations carried out by Ivan Pavlov and Vladimir Bekhterev. The Russians hoped to create what they believed to be an objective psychology, a psychology based on observations of an objective nature. This was a form of behaviorism.

In *France*, psychology emerged in the 1880s and 1890s as part of the neurological and psychiatric research that was then flourishing there. This was a clinical psychology,

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oriented towards practical life. Apart from pathological conditions, the early French psychologists took an interest in all forms of unusual mental conditions, and the study of hypnosis was a key interest of theirs. Two prominent names in early French psychology are Pierre Janet and Alfred Binet.

In *Austria*, inspired by the development of neurology and psychiatry, as well as by French clinical psychology, Sigmund Freud promoted a psychodynamic psychology. This psychology began not in consciousness but in ideas Freud claimed were unconscious. Psychoanalysis therefore conflicted with German experimental psychology and also with French clinical psychology. More or less independently of Freud, two other neurologists, Alfred Adler in Austria and Carl Jung in Switzerland, developed other versions of clinical and personality psychology. These were influenced by an entirely different philosophical tradition than the one that had inspired German experimental psychology.

These were the developments in Europe. But what of the United States? It seems to have been widely accepted that psychology was developed in the United States almost as early as in Europe. This conclusion needs some qualifications.

As we shall see in Chapter 11, early US psychologists produced a number of ideas that later influenced empirical psychology, and the American William James (1890) gave psychology a new and modern direction in an extensive, critical textbook. Only four years after Wundt established his laboratory in Leipzig, the first psychological laboratory was founded in the United States, and, as Ernest Hilgard (1987) notes in his *Psychology in America*, forty-two others had been set up by 1900. These performed studies in comparative animal psychology and child development.

Yet I believe an examination of the empirical research of the early US psychologists reveals that it was lacking in originality and in support from its neighboring disciplines: Physiology, evolutionary biology, neurology, and psychiatry. The experimental work is with few exceptions an elaboration of ideas of the early German experimentalists, and hardly any US study has comparable originality and quality. The same seems to be true for comparative animal psychology. The studies performed are mainly elaborations of work carried out in Great Britain, and the studies in child psychology in the early years are based on British and German ideas. Thus, while we may easily be led to believe that psychology in the United States developed in a similar way to that of the European countries, we must qualify the point.

When empirical psychology was being developed in Europe, the United States had just begun to build its scientific institutions. Its scientists and science administrators looked to Europe for models, and ideas were to a large extent imported from Europe, including German experimental psychology, British comparative psychology, and to some extent French clinical psychology. As a result, though it was lacking in originality, empirical psychology in the United States acquired a far broader foundation than it had in any of the European countries. But not until the 1920s and 1930s did it begin to flower.

All the research traditions I have listed above are incorporated in the modern, empirical study of psychology. While the diverse empirical research traditions originated in Europe, the organization of them into one field of study seems mainly to have been

the achievement of the American psychologists, who in the 1920s also added to the field the study of social psychology. Further, they developed the study of personality into a quantitative pursuit and helped broaden the definition of psychology to include behavior.

As we shall see in the chapters to follow, not until several decades had passed was psychology organized into a coherent study. This is understandable when we consider that a number of highly different empirical research traditions had to be integrated into it, requiring far more than taking over the procedures worked out in the various research traditions. The ideas underlying the traditions were complex, and it took time to understand more concretely their implications for psychological theory.

Why Is Psychology Changing?

Historians have found a number of reasons why empirical psychology has changed from its inception at the latter half of the 1800s to the present. One is the changes taking place in the society in which psychology is studied and practiced.

For example, like all other scientific enterprises, psychology depends upon society's interest in recruiting students and obtaining salaries, laboratories, and financial support for research. As we shall see in Chapter 6, in Great Britain in the 1800s, many researchers financed their studies by private means, and in the United States, many larger research projects were financed through funds established by wealthy people. Today that support comes from universities and scientific institutions. However, these are not the only sources of funding. National governments, for example, are a significant source of funding.

As another example, from its early years, particularly in the United States but also in Europe, one of psychology's aims was to contribute to the planning of society and particularly to assist people in adjusting better to social life. As society changes, its need for the help of psychology also changes.

Finally, as Thomas Leahey (2004) said, "scientists are human beings socialized within a given culture." We can often see that in particular periods, despite individual differences, members of a society concentrate on specific values and views of ethics, religion, science, and so on. This is naturally true of psychologists too. Even if it is sometimes difficult to identify the influence of society and culture on psychologists' conceptions of their subject, this is what historians must try to do. For instance, many scholars have claimed that people in the United States place greater emphasis on individuality and have a more optimistic view of life than, say, Europeans. This applies equally to American psychologists. General historical accounts of the history of psychology should, therefore, include attempts at describing the relationship between society and culture on the one hand and psychology on the other. Leahey has pointed out many interesting relationships of this nature.

We have already seen that psychology is also influenced by progress in other natural science disciplines, primarily physiology, neurology, evolutionary biology, and genetics.