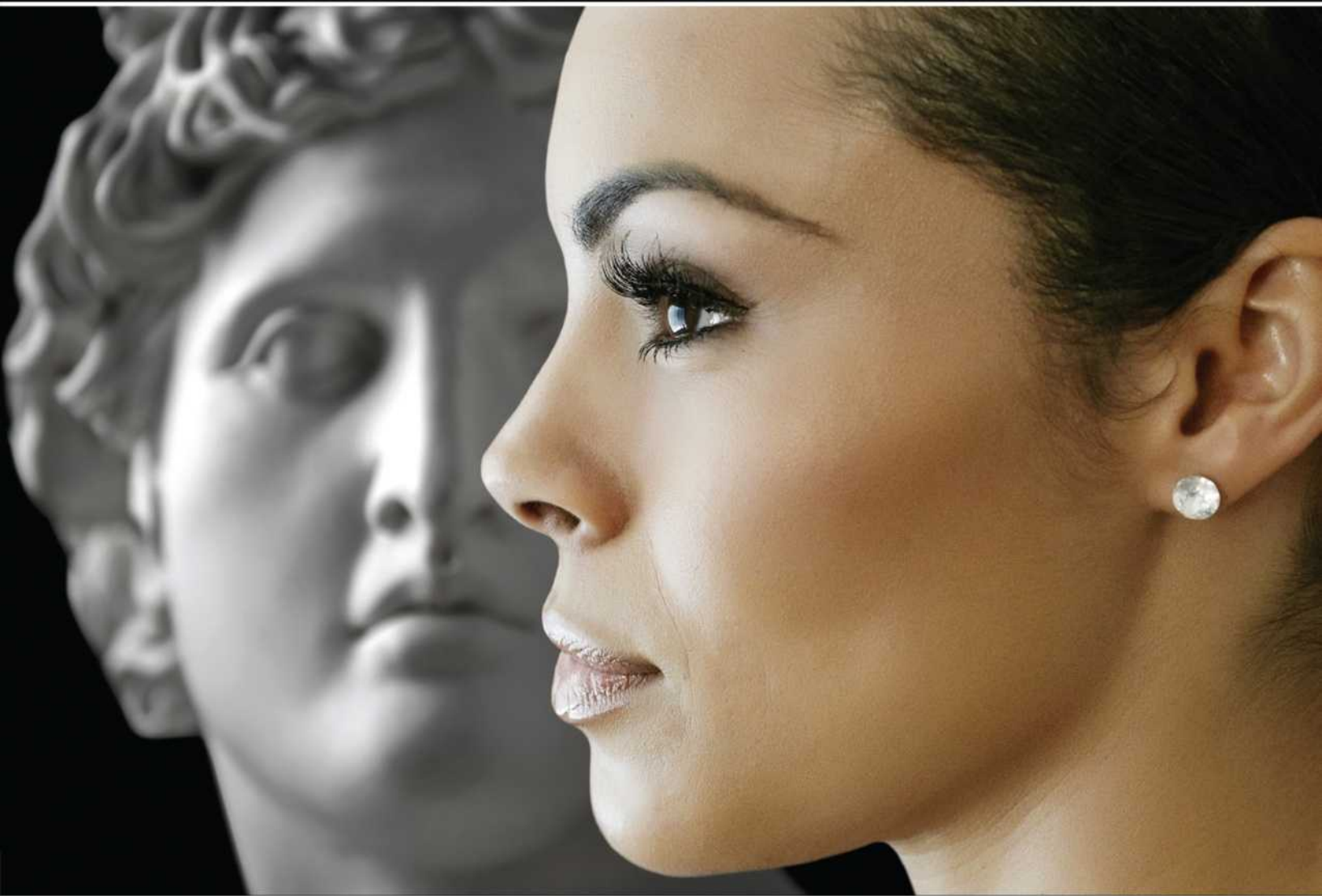


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# An Introduction to the History of Psychology



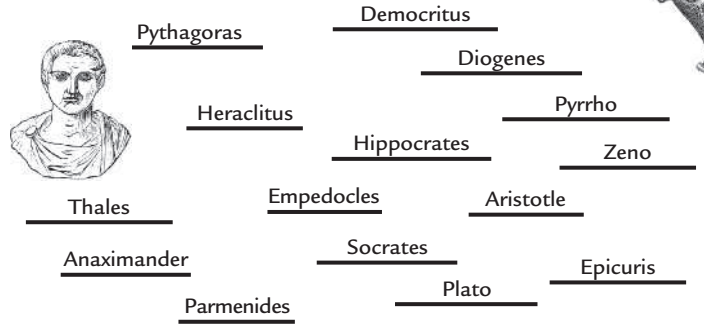
Tracy B. Henley

# Timeline of Significant Individuals and Events in the History of Psychology

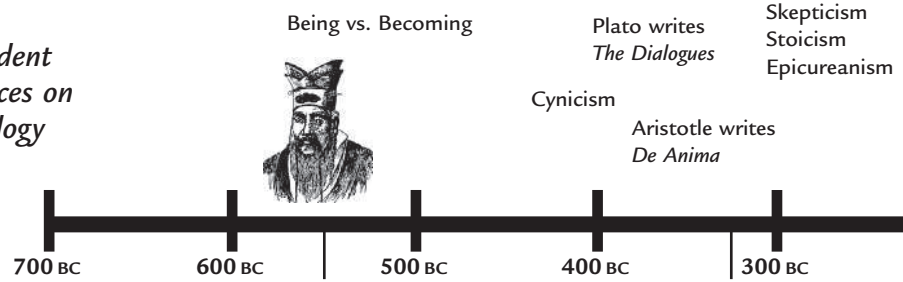
ca. 700 BC–2024 AD



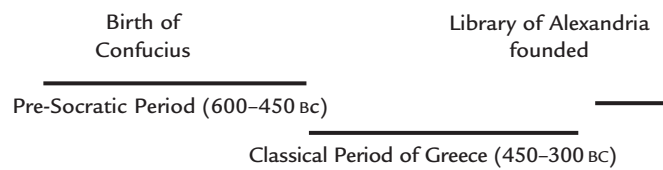
## Individuals Significant to Psychology



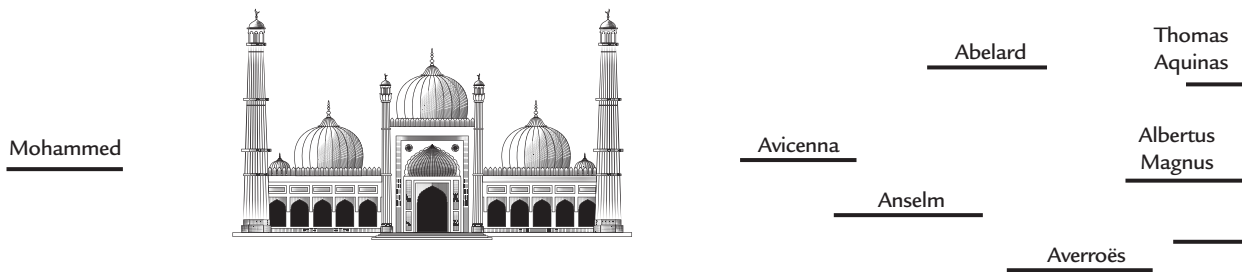
## Antecedent Influences on Psychology



## Historical Epochs and Events



## Individuals Significant to Psychology

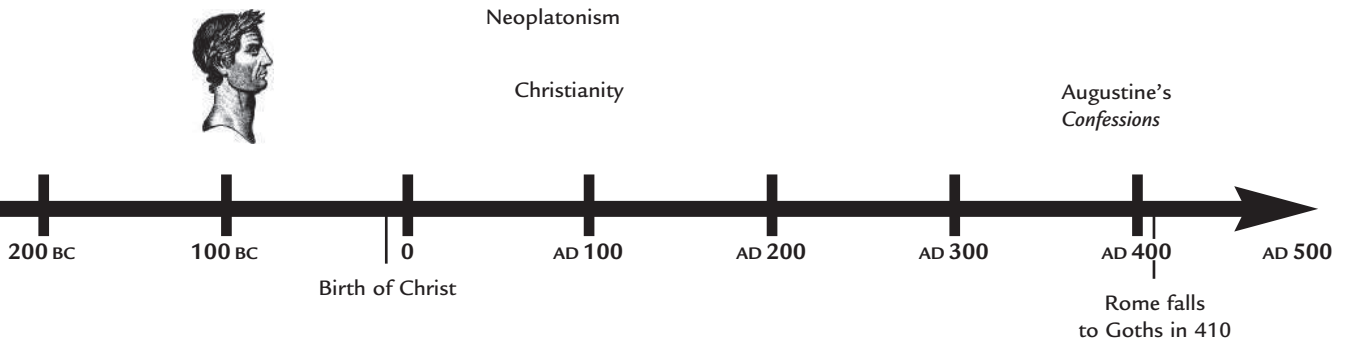
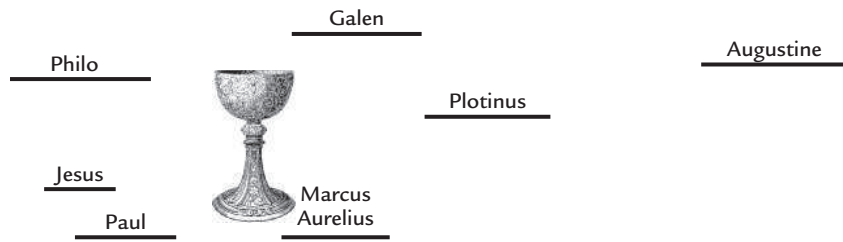


## Antecedent Influences on Psychology



## Historical Epochs and Events





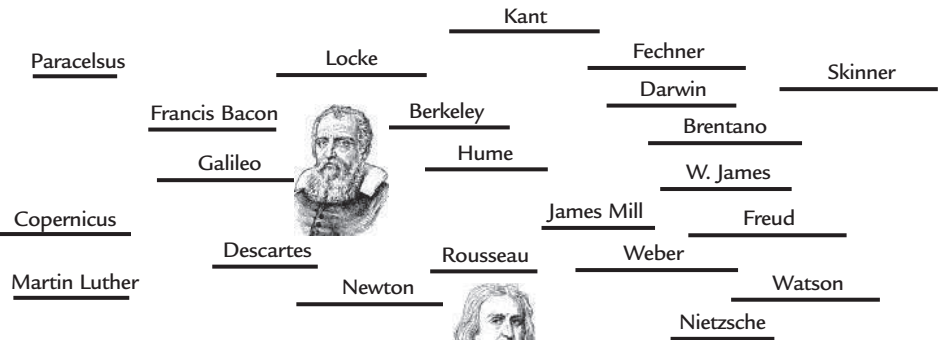
Hellenistic Period (300–100 BC)

Greco-Roman Period (100 BC–AD 400)

Dark Ages (400–1000)

William of Occam

Roger Bacon



Publication of *Malleus Maleficarum* (1487)

Modern science  
Empiricism  
Sensationalism  
Positivism

Wundt establishes the first laboratory for psychology (1879)

Modern psychology begins

1300



1400

Columbus reaches Americas in 1492

Reformation begins (1517)

1600

American Revolution (1776)

1800

Lunar landing (1969)



Bubonic Plague (1347–1350)

Renaissance (1450–1600)

Spanish Inquisition (1480–1808)

See back cover for expanded timeline from 1840 to 2024.

Hergenhahn's

# An Introduction to the History of Psychology

Ninth Edition

Tracy B. Henley



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Library of Congress Control Number: 2023911873

ISBN: 978-0-357-79771-6

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Printed in the United States of America  
Print Number: 01      Print Year: 2024

“The great use of a life is to spend it for something  
that outlasts it.”

—William James





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# Preface

The world has changed in myriad ways since Bud Hergenhahn first published *An Introduction to the History of Psychology* in 1986. Just since the previous eighth edition, there has been both a life-altering global pandemic and a significant shift in our understanding of matters concerning social diversity and inclusion. Indeed, perhaps more so than at any point in my own academic career, these extramural changes have impacted the way that the sciences and the social sciences have been practiced within academia and have been perceived outside of academia.

As will be apparent to users of the previous edition, one of the most substantive updates to the ninth edition is our discussion of the impact of such changes right at the start of the first chapter. Two other big changes will also be evident from the outset—that each chapter now begins with reader-orienting learning outcomes, and, once again establishing the book as the most student-friendly in the market, the entire volume is now in color!

Indeed, the Hergenhahn book has always been about innovation. It was the first history of psychology text to include a comprehensive set of images, as well as chapters that featured summaries, study questions, suggested readings, bold-faced terms, and other elements that we now consider basic pedagogy. Still, the matter that both the publisher and I have grappled with in each of the last couple of revisions is balancing new changes with holding constant the elements that have kept the book as a market leader for some 40 years.

Given that, instructors (and students) should rest assured that the book's reader-engaging tone and its inclusion of fun and interesting biographical tidbits remains. Likewise, Hergenhahn wisely let many of the greatest thinkers in Western Civilization speak for themselves by using extended quotations, another powerful and popular device that students appreciate and that we keep as a defining feature. Additionally, the book continues to proudly present a truly comprehensive overview of the history of psychology—providing both significant depth and breadth within a chronological narrative.

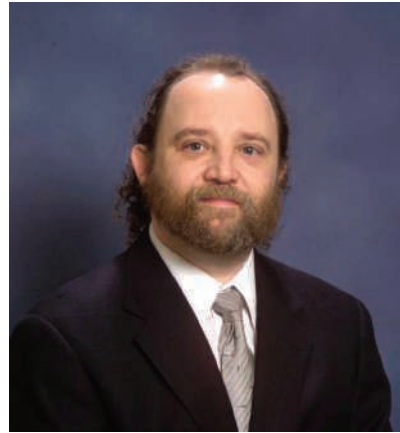
As for that narrative, and as was the case with the previous two revisions, each chapter was vigorously edited with the goal of reducing the length by a few pages. That said—and keeping true to the title—the general substance, organization, and flow has purposefully been left unchanged. Finally, a substantial number of (about 80) new references were cited, reflecting the ongoing commitment to keeping this work among the most scholarly available. Beyond that, some other specific changes made for this edition include the following:

- **Chapter 1:** Much of the chapter was entirely rewritten. Historiography is covered in much greater detail. Discussions of diversity, inclusion, as well as how these and related topics potentially impact the history of psychology now begin the book.
- **Chapter 2:** Anaximenes was added to the coverage of the Pre-Socrates, and the material on the Pythagoreans was expanded.
- **Chapter 3:** Hypatia was included, and the coverage of Maimonides was expanded.
- **Chapter 4:** The material on Queen Christina and Descartes was further developed.
- **Chapter 5:** The language regarding various populations was revised.
- **Chapter 6:** Pascal was added, as was more information about Eleanor Gibson.
- **Chapter 7:** The section on Nietzsche was expanded.
- **Chapter 8:** There is now more discussion of women as early contributors to philosophy and science. Modest expansions were made to several figures such as Swammerdam and Whytt.
- **Chapter 9:** The material on Titchener and his students was further developed. A new section on early U.S. universities was added.
- **Chapter 10:** The language surrounding special needs individuals was revised. The coverage of Lamarck was expanded, and the contributions of Cronbach are now mentioned.
- **Chapter 11:** Several new figures in early U.S. psychology were introduced, including more women and persons of color. The coverage of Pierce was expanded.
- **Chapter 12:** Various contributions to Russian psychology were better detailed.
- **Chapter 13:** Several small changes were made to the coverage of Skinner.
- **Chapters 14 and 15:** Material concerning both the Gestaltists and early conceptions of mental illness was tightened and streamlined.
- **Chapter 16:** Freud's thinking about religion was considered in more detail.
- **Chapter 17:** Coverage of Heidegger and both Böhlers was modestly expanded.
- **Chapter 18:** The material on evolutionary psychology was expanded and enriched.
- **Chapter 19:** The transition to contemporary psychology was recontextualized; several new images were added.
- **Chapter 20:** Parts of the chapter were reorganized for flow, and contemporary controversies such as reliance on WEIRD participants and concerns with replication were introduced.

Respectfully,  
Tracy B. Henley

# About the Author

Tracy Branson Henley was born in East Tennessee. He began his college work studying philosophy at Ole Miss, and finished with a PhD in psychology at the University of Tennessee. Although he has had many data-based publications (and been part of numerous Federal grants) in cognitive psychology, his real passion has always been the history of philosophy and psychology. Tracy spent the first half of his academic career (1990–2003) at Mississippi State University, then moved in 2003 to Texas A & M – Commerce where he remains today. At A & M – Commerce, Tracy has served as Department Head and in other administrative roles. Beyond psychology, Tracy is known for his cooking and his “home brew” variations of many classic board and card games. His wife Lani is also an academic, and his son Robert aspires to be the world’s next great screen writer.



Tracy Branson Henley

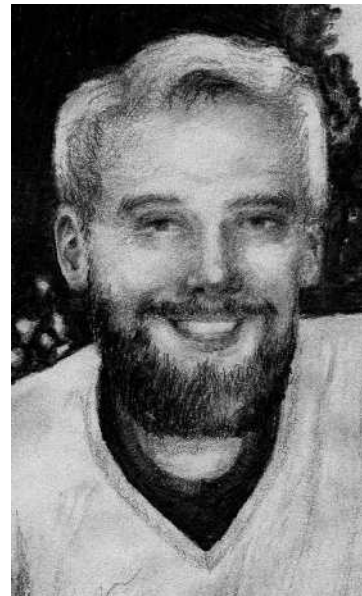
# About the Original Author

**Baldwin Ross “Bud” Hergenhahn (1934–2007)** lived a colorful life that many students might be surprised by. He was not just an impressive scholar (who preferred writing longhand to using a computer) but also a soldier (in the Korean war), an outdoorsman (who as a graduate student lived for a while in a tepee), a family man (with seven children), a man who enjoyed sports and games (and was a good golfer), and above all a person who was a fiercely independent freethinker.

Bud was born in Chicago in 1934. He served in the military and worked as a forest ranger at Mount Saint Helens before starting college. His undergraduate degree was completed at Western Washington University and his graduate training at the University of Arizona. He completed his dissertation in experimental psychology in 1966 and began his academic career at Hamline University in Minnesota immediately thereafter.

Psychology was always one of his principal passions, and he owned no books that were unrelated to the topic. That said, his specific focus shifted over time. Initially, Bud was a hard-nosed experimentalist with a behavioral approach to learning and child development. During the 1970s, he acquired a deeply held interest in the personality theories of the American humanists. And eventually, he sought to master the philosophical foundations and historical roots of psychology.

Bud retired from Hamline in 1992, after 26 years of service and earning a reputation for being a real “character” on campus. Through his classroom teaching and his scholarly works, he directly influenced many students who would go on



B. R. Hergenhahn

to careers in psychology. After Hamline, Bud relocated to Las Vegas to enjoy the good life, although he continued to revise his successful textbooks, including his works on learning and personality (both co-authored with Matthew Olson).

*In memory,*  
Tracy B. Henley, Rockwall, Texas  
Matthew H. Olson, Santa Fe, New Mexico



# 1

## Introduction

### Chapter Learning Outcomes

After studying this chapter, you should be able to:

1. Explain the differences between presentism and historicism.
2. Explain the differences between the great person and the zeitgeist approach.
3. Determine what makes something a science, and discuss if psychology is a science.
4. Analyze the differences between the traditional model of science with the alternatives offered by both Popper and Kuhn.
5. List and explain several of the different accounts proposed for the relationship between mind and body.
6. List and explain the different types of determinism.
7. Discuss the relationship between nature and nurture.

The primary purpose of this book is to explore the origins of the theories and methods that underpin modern academic psychology. As we examine the relevant history we will see that most of the concerns of today's psychologists are indeed manifestations of themes that have been under consideration for hundreds or, in some cases, thousands of years. So, where do we begin?

*Psychology* means the study of the *psyche*, one of the terms the Ancient Greeks had for *mind*, and arguably such study is at least as old as the human species (Henley, 2020). Ancient peoples, for example, surely studied one another to determine who was reliable and trustworthy, and archaeological evidence suggests that they attempted to account for dreams, mental illness, and emotions (Henley, Rossano, & Kardas, 2020). Was this then the start of psychology? Although this certainly was *doing* psychology, do these initial ideas and practices actually connect with or inform the sorts of psychology taught at your university today?

With that additional constraint in mind, perhaps we should say that psychology commences with the first systematic explanations of human cognitive experience, such as those proposed by the early Greeks. Plato and Aristotle, for example, created elaborate theories that attempted to account for such processes as memory, perception, and learning. Many academic disciplines taught in modern universities trace their roots to the Ancient Greeks, so is this then the best point at which to say that psychology also started?

Alternatively, perhaps those Greek ideas (as well as the Roman and medieval ones that followed) were just the philosophical backdrop to psychology, which itself

came into existence only when it emerged as a university-based science in Germany late in the nineteenth century. Although we will discuss it more substantively a bit later in the chapter, it is perhaps worth acknowledging here at the outset that academic, scientific psychology is a Western invention. As such, any detailed history of the discipline will necessarily be a Eurocentric one.

Historian Daniel Lord Smail makes a compelling case that across subjects our deeper history is often neglected in favor of starting where sources are more readily available (Shyrock & Smail, 2011; Smail, 2008). As we have alluded to already, psychology certainly has a fascinating prehistory that is increasingly being included as a part of **cognitive archaeology** (Coolidge & Wynn, 2016; Henley & Rossano, 2022; Wynn & Coolidge, 2022), the interdisciplinary consideration of archaeological data from perspectives such as psychology. Still, and although we will explore briefly what came before, this book's coverage of the history of psychology starts in earnest with the Ancient Greeks.

In part this decision is a function of the fact that the data of history is often fragile and easily lost to us, limiting what we can say with certainty about the more distant past. As such, the pre-Socratic Greeks are simply where we first have enough material to properly begin our story. Additionally, early Greek explanations of human behavior and thought processes are also the ones that Western philosophers and psychologists have been reacting to ever since. That is, to fully appreciate Wilhelm Wundt's establishing the first program in academic psychology at Leipzig University in 1879 requires an understanding of its philosophical foundations. It is also the case that to just start

our account with later German scientific psychology would limit our consideration of the aspects of psychology—such as clinical and school psychology—that have roots beyond the university-based community.

## Considerations in Writing a History of Psychology

**Historiography** is the study of the proper way to write history. The topic is complex, and there are no final answers to many of the questions it raises. In this section, we consider a few basic matters of historiography that must be addressed when writing any history.

Among these issues is that historical data differs at least in degree, if not in kind, from the types of scientific and clinical data that contemporary psychology most often uses. As already stated, historical data can be fragile—becoming lost or destroyed. The Italian academic Umberto Eco's (1932–2016) novel *The Name of the Rose* illustrates this delightfully by considering the fate of the last copy of Aristotle's work on comedy—a book we know actually existed, but that is now lost to us—in the context of a medieval-era detective story.

Additionally, all data requires certain knowledge to be correctly understood. As a simple example, consider seeing a classic car pass by on the interstate. Perhaps that is all you can claim to see—a classic car. But some folks with knowledge of older cars may rightly recognize the car as a Studebaker. Likely it would require an expert or an enthusiast to recognize even more specifically that the model was a 1960 Lark. Of course, we would like to have the full knowledge of such experts if we were studying the history of classic cars. The point is that to understand the significance and contemporary relevance of the arguments made by Ancient Greeks, or even nineteenth-century Germans, you will need to have some knowledge of history.

Similarly, historical data comes to us from individuals who were writing from a perspective—sometimes literally and always psychologically. The various accounts of the important medieval battle of Agincourt (in 1415) are often cited as an example. Although several detailed contemporary records exist, some crafted by eyewitnesses and others by writers chronicling the events as experienced by the combatants, they all differ from one another. Notably, the versions penned by those supporting the victorious English differ in key ways from those written by folks on the side of the defeated French. If we assume that each author is attempting to give us an accurate account of the battle, then the differences in these narratives makes clear that each is limited by perspective—that is, their situational understanding, sources, allegiance, and so on.

To be clear, these issues are not unique to distantly historical data. Psychologists (e.g., Thorne & Watson, 1999) have fretted that the date of death for Rosalie Rayner (the colleague of John Watson in the context of

“Little Albert”; see Chapter 12) is reported differently in official sources—a minor matter, but still one where a modern era fact is lost to us. Likewise, as you probably know from your own statistics classes, without knowledge of various analytical techniques, you may not be able to make sense of scientific data—even to say if it is significant or not.

### Presentism and Historicism

Typically, in determining what to include in a history of anything, one traces those people, ideas, and events that led to what is important now. This book, too, uses the strategy of looking at the way psychology is understood today and then attempts to show how it came to be that way. Stocking (1965) calls such an approach to history **presentism**, as contrasted with what he calls **historicism**—the study of the past for its own sake, without attempting to relate the past and present (see also Butterfield, 1931). Copleston (2001) describes historicism as it applies to philosophy:

If one wishes to understand the philosophy of a given epoch, one has to make the attempt to understand the mentality and presuppositions of the men who lived in that epoch, irrespective of whether one shares that mentality and those presuppositions or not. (p. 11)

Alternatively, presentism attempts to understand the past in terms of contemporary knowledge and standards—which is a practical goal for any textbook. As Lovett (2006) observes, no matter how much historicism is emphasized, presentism cannot be completely avoided:

To try to understand what historical events were like for those who participated in those events is reasonable and desirable, but to conduct historical research—from the selection of projects to the evaluation of sources to the interpretation of findings—without any regard for present knowledge is counterproductive. . . . If we ever hope to know where progress has happened and where it has not happened, even if we only want to observe change, some level of presentism is necessary; without the present, the very concept of “history” would be meaningless. (p. 33)

Letting established contemporary psychology be a guide for deciding what individuals, ideas, and events to include in a history of psychology presumptively also serves to limit the personal biases of the author. That is, it provides a set of suggestions and constraints for determining what content should be covered. Most textbook writers in the modern era work hard to present the material in as accurate a fashion as possible, although an author's own knowledge, expertise, cultural perspective, and personal interests cannot help but color that presentation.

### Diversity and Inclusion

It has already been noted that the history of psychology will be a Eurocentric account. This means that the narrative

will be one that is more about the activities of Europeans than peoples native to the Americas, Asia, or sub-Saharan Africa, and (at least initially) more about the activities of men than women. In a recent study of the five leading undergraduate history texts (this title included), Cramblet Alvarez and colleagues (2020) found that less than 2 percent of the persons covered were of color, and less than 10 percent were women. Historians of psychology are increasingly self-aware of this dilemma and often make a point of including diverse voices from women, people of color, and non-Western traditions wherever appropriate.

As our story progresses over time, these issues of inclusion will abate somewhat. For example, the early twentieth century would see an increasing acceptance of women in higher education and science and, in turn, psychology (e.g., Johnston & Johnson, 2017; Scarborough & Furumoto, 1987). Likewise, contemporary scholars have done great work in documenting the contributions of various cultural and ethnic groups. As one illustration, the history of psychology in Spain is often traced from Juan Luis Vives and Juan Harte in the 1500s to the more modern efforts of José Luis Pinillos Díaz (1919–2013). There are also works looking at how these efforts then intersect with the history of psychology in Latin America (Osso, Salas, & Scholten, 2021). Other works consider important contemporary Hispanic and Latin American contributors to psychology in the United States, such as John Garcia (1917–2012) and Martha Bernal (1931–2001).

This is not to say that psychology has not had to acknowledge the issues caused by its Eurocentric history. Perhaps the best example of this comes from Robert Val Guthrie's (1930–2005) excellent work *Even the Rat Was White*. First published in 1976, with a revised edition in 2004 (see also Volume 56 of the *Journal for the History of the Behavioral Sciences* for a series of related articles), it documents the neglect and marginalization of African American contributions to psychology.

**Juxtaposing Past and Present.** As present concerns evolve, so to do our sensibilities. For example, in the next section, we will contrast two organizational approaches: the great person approach and the zeitgeist approach. The great person approach was initially called the *great man theory*—a phrase that today we would find needlessly sexist and insensitive. But should we be concerned that past historians used such a phrase 75 or 175 years ago?

We certainly will see cases where what was judged (then or now) to be misconduct occurred among some of the most important and significant persons in psychology's history. To name but a few, Aristotle (Chapter 2) accepted the institution of slavery, James Mark Baldwin (Chapter 11) was arrested in a brothel, some of Sir Cyril Burt's (Chapter 10) work would be considered fraudulent, James McKeen Cattell (Chapter 11) experimented with drugs, Sir Francis Galton (Chapter 10) proposed eugenic ideas, G. Stanley Hall (Chapter 11) was knowingly deceitful on many occasions, Martin Heidegger (Chapter 17) was a member of the

Nazi party, Edward Titchener (Chapter 9) was perceived as a male chauvinist, John Watson (Chapter 12) had affairs with his students, and Robert Yerkes (Chapter 10) held views we would certainly find racist today. These issues, however, cannot obviate their contributions from our discipline's history, as that would be presentism running amok (see Sweet, 2022).

Drawing on just the last few examples, it is Titchener who brings Wundt's ideas to the United States, it is Watson who provides the theoretical basis for the school of behaviorism, and it is Yerkes' efforts in World War I that modernized our measurement of intelligence. There is no way to accurately describe the advent of U.S. psychology without acknowledging these contributions. Arguably, covering such controversial individuals actually affords us an opportunity to explore the sensibilities of the past and to consider when, how, and why such sensibilities have changed over time.

The British novelist L. P. Hartley (1895–1972) famously wrote that the “past is a foreign country” (see also Lowenthal, 1985). In that vein, consider this analogy: Most people find it enjoyable to be cosmopolitan in the sense that they like trying new cuisines, as well as being exposed to diverse artistic and musical styles. Being cosmopolitan is seen as laudable in that it provides us with an opportunity to develop an appreciation of other cultures beyond our own. Similarly, then, the study of history provides us with an opportunity to be *chronopolitan* (Cwerner, 2000)—that is, to examine the diverse cultures that have preceded us and to be exposed to a range of ideas and practices different than those we embrace in the here and now. Some of these ideas and practices—such as the unequal status of women or the practice of slavery—we will find noxious, but only through the study of history can we understand the origins as well as the evolution of our modern views.

Even when we let contemporary psychology inform content, there remains the question of how much detail to include for any topic or person. Seldom, if ever, is a single individual solely responsible for an idea or a concept. Rather, it is a *catena* (from the Latin, for “chain”) of individuals who are influenced by other individuals, who in turn were influenced by other individuals, and so on. A history of almost anything then can be viewed as an unending stream of connections and interrelated events. The “great” individuals are typically those who synthesize existing nebulous ideas into a clear, forceful viewpoint.

The usual (and practical) solution is to omit large amounts of information, thus making the history selective. As has already been discussed, the topics covered tend to align with the major areas of psychology taught and practiced today. Likewise, only those individuals who did the most to develop or popularize a topic are covered. For example, Charles Darwin is generally the name most associated with evolutionary theory when, in fact, evolutionary theory had existed in one form or another for thousands of years. Darwin documented and reported evidence supporting evolutionary theory in a way that made the



The Reading Room/Alamy Stock Photo

June Etta Downey

theory's validity hard to ignore. Thus, although Darwin was not the first to formulate evolutionary theory, he did much to substantiate and popularize it, and we, therefore, associate it with his name. The same is true for Freud and the notion of unconscious motivation.

Even with over 400 pages of core content, this book too generally focuses on just those individuals who either did the *most* to develop an idea or, for whatever reason, have become closely associated with an idea. Regrettably, this approach does not do justice to many important individuals who deservedly could be mentioned in some detail, and it assuredly often reinforces the marginalization of contributions by women and non-Europeans.

As just one example, consider **June Etta Downey (1875–1932)**. Born to a distinguished family in Laramie, Wyoming, Downey is seldom found in undergraduate history texts, although she was a “star” student of both Titchener at Cornell University as well as the American functionalist James Rowland Angell (Chapter 11) at the University of Chicago. After completing her doctorate, she would become the first woman to head a department of philosophy and psychology at a state university—her undergraduate alma mater, the University of Wyoming. Indeed, in the few books where she is mentioned, it is in the context of being a student of Titchener or Angell (e.g., Thorne & Henley, 2005). Downey's primary interests included handedness, handwriting, psychology in relation to literature and the arts, and personality—most of which are topics that receive almost no coverage, not because they are uninteresting, but because other topics are viewed as more important. For more on the impressive Professor Downey, see Hogan and Broudy, (2000).

## The Choice of Approach

Once the material to be included in a history of psychology has been chosen, the matter of organization remains.

Most academic histories, including this one, adopt a chronological approach. Although that establishes a sensible progression, we will see that some topics, such as the mind-body problem or the question of nature versus nurture, will recur.

Another question of organization concerns how much to emphasize the influence of such nonpsychological matters as developments in other sciences, political climate, technological advancement, and socioeconomic conditions. Together, these and other factors create a **zeitgeist**, or “spirit of the times,” which many scholars consider vital to the full understanding of any historical development. For example, Ogburn and Thomas (1922) documented numerous discoveries that were independently made by two people at essentially the same time—a phenomenon we will also see in psychology—which suggests that “the time was right” for such a discovery.

Instead of focusing on the zeitgeist, the prevailing alternative is to take the **great person approach** by emphasizing the works of individuals such as Plato, Aristotle, Descartes, Darwin, Wundt, and Freud. Ralph Waldo Emerson (1841/1981) embraced the great person approach to history, saying that history “resolves itself very easily into the biography of a few stout and earnest persons” (p. 138).

Yet another possibility is the **historical development approach**, showing how various individuals or events contributed to changes in an idea or concept through the years. For example, one could focus on how the idea of mental illness has evolved throughout history.

In his approach to the history of psychology, our discipline's most noted chronicler, E. G. Boring (1886–1968; the president of the American Psychological Association in 1928), stressed the importance of the zeitgeist. For Boring, ideas do not occur in a vacuum. A new idea, to be accepted or even considered, must be compatible with existing ideas. In other words, a new idea will be tolerated only if it arises within an environment that can assimilate it. An idea or viewpoint that arises before people are prepared for it will not be understood well enough to be critically evaluated. The important point here (and that we will revisit later in the chapter) is that validity is not the only criterion by which ideas are judged; psychological and sociological factors are at least as important. New ideas are always judged within the context of existing ideas. If new ideas are close enough to existing ideas, they will at least be understood; whether they are accepted, rejected, or ignored is another matter.

The approach taken in this book is eclectic. That is, this book will show that sometimes the spirit of the times clearly produces great individuals and that sometimes great individuals shape the spirit of their times. At other historical moments, we will see how both great individuals and the general climate of the times evolve to change the meaning of an idea or a concept. In other words, the **eclectic approach** entails using whatever method seems best able to illuminate an aspect of the history of psychology.

## Why Study the History of Psychology?

Ideas are seldom, if ever, born full-blown. Rather, they typically develop over an elongated period of time. Seeing ideas in their historical perspective allows us to more fully appreciate the subject matter of modern psychology. However, viewing the questions and concerns currently dealt with in psychology as manifestations of centuries-old problems is sometimes vexing, but also humbling. After all, if psychology's problems have been worked on for centuries, should they not be solved by now? Conversely, knowing that our current studies have been shared and contributed to by some of the greatest minds in human history is exciting.

### To Gain a Richer Understanding

George Santayana, a friend and colleague of America's most famous psychologist, William James (1842–1910), once quipped, “Those who cannot remember the past are condemned to repeat it.” A student with a historical awareness knows where modern psychology's subject matter came from and why it is important. Just as we gain a greater understanding of a person's current behavior by learning more about that person's past experiences, so do we gain a greater understanding of current psychology by studying its historical origins. Boring (1950) made this point nicely:

The experimental psychologist . . . needs historical sophistication within his own sphere of expertness. Without such knowledge he sees the present in distorted perspective, he mistakes old facts and old views for new, and he remains unable to evaluate the significance of new movements and methods. In this matter I can hardly state my faith too strongly. A psychological sophistication that contains no component of historical orientation seems to me to be no sophistication at all. (p. ix)

**The Development of Ideas.** The history of science offers several examples of an idea taking hold only after being rediscovered long after it had originally been proposed. This fact fits nicely into the zeitgeist interpretation of history, suggesting that some conditions are better suited for the acceptance of an idea than others. The notions of evolution, unconscious motivation, and conditioned responses had been proposed and re-proposed several times before they were offered in an atmosphere that allowed their critical evaluation. Even Copernicus's “revolutionary” heliocentric theory had been entertained by the Greeks many centuries before he proposed it. A final example is that of lateralization of brain function. Many believe that the idea that the two cerebral hemispheres function in radically different ways is a contemporary one. However, over 130 years ago, Brown-Séquard's article “Have We Two Brains or One?” (1890) was one of many written on the topic. In fact, important scientific ideas can be rejected

more than once before they are finally appreciated. The noted philosopher of science Paul Feyerabend (1987) said,

The history of science is full of theories which were pronounced dead, then resurrected, then pronounced dead again only to celebrate another triumphant comeback. It makes sense to preserve faulty points of view for possible future use. The history of ideas, methods, and prejudices is an important part of the ongoing practice of science and this practice can change direction in surprising ways. (p. 33)

**The Demise of Ideas.** While studying the history of psychology, one is also struck by the realization that a viewpoint often does not always fade away because it is incorrect; rather, some viewpoints disappear simply because they become unpopular. What is fashionable in psychology varies with the zeitgeist. For example, when psychology first emerged as a science, the emphasis was on “pure” science—that is, on the gaining of knowledge without any concern for its usefulness. Later, when Darwin's theory became popular, psychology shifted its attention to processes that were related to survival or adaptation. Today, one major emphasis in psychology is on cognitive processes, and that emphasis is due, in part, to advances in computer technology.

The illustrious personality theorist Gordon W. Allport (1897–1967; president of the American Psychological Association in 1939) spoke of such fashions in psychology:

Our profession progresses in fits and starts, largely under the spur of fashion. . . . We never seem to solve our problems or exhaust our concepts; we only grow tired of them. . . .

Fashions have their amusing and their serious sides. We can smile at the way bearded problems receive tonsorial transformation. . . . Modern ethnology excites us, and we are not troubled by the recollection that a century ago John Stuart Mill staked down the term to designate the new science of human character. . . . Reinforcement appeals to us but not the age-long debate over hedonism. . . . We avoid the body-mind problem but are in fashion when we talk about “brain models.” Old wine, we find, tastes better from new bottles.

The serious side of the matter enters when we and our students forget that the wine is indeed old. Picking up a recent number of the *Journal of Abnormal and Social Psychology*, I discover that . . . 90 percent of their references [are] to publications of the past ten years. . . . Is it any wonder that our graduate students reading our journals conclude that literature more than a decade old has no merit and can be safely disregarded? At a recent doctoral examination the candidate was asked what his thesis . . . had to do with the body-mind problem. He confessed that he had never heard of the problem. An undergraduate said that all he knew about Thomas Hobbes was that he sank with the *Leviathan* when it hit an iceberg in 1912. (1964, pp. 149–151)

With such examples of how research topics move in and out of vogue in science, we see again that “factuality” is not the only variable determining whether to embrace or abandon an idea. As zeitgeists change, so too does what appears to be fashionable in science, and psychology is not immune to this process.

## Psychology and Science

How a history of psychology is written will be influenced by whether psychology can be considered a science. At various times in history, influential individuals (such as Galileo and Kant) have claimed that psychology could never be a science because of its concern with subjective experience. Many natural scientists still believe this, and some psychologists would not argue with them. To answer the question of whether psychology is a science, however, we must first define science.

### What is Science?

**Science** came into existence as a way of answering questions by examining nature directly rather than by depending on religious dogma, past authorities, folk theories, or even just logical analysis. From science's inception, its ultimate authority has been **empirical observation** (that is, the direct observation of nature), but there is more to science than simply observing nature. To be useful, observations must be organized or categorized in some way, and the ways in which they are similar to or different from other observations must be noted. After noting similarities and differences among observations, many scientists take the additional step of attempting to explain what they have observed. Science, then, is often characterized as having two major components: (1) empirical observation and (2) theory. According to the influential behavioral psychologist Clark Hull (1943; see Chapter 13), these two aspects of science can be seen in the earliest efforts of humans to understand their world:

Men are ever engaged in the dual activity of making observations and then seeking explanations of the resulting revelations. All normal men in all times have observed the rising and setting of the sun and the several phases of the moon. The more thoughtful among them have then proceeded to ask the question, “Why? Why does the moon wax and wane? Why does the sun rise and set, and where does it go when it sets?” Here we have the two essential elements of modern science: The making of observations constitutes the empirical or factual component, and the systematic attempt to explain these facts constitutes the theoretical component. As science has developed, specialization, or division of labor, has occurred; some men have devoted their time mainly to the making of observations, while a smaller number have occupied themselves with the problems of explanation. (p. 1)

### A Combination of Rationalism and Empiricism.

As we will see in Chapters 5 and 6, in the modern era there are two major approaches to understanding where our knowledge comes from: **rationalism** and **empiricism**. The rationalist believes that knowledge of certain propositions can best be determined by carefully applying the rules of logic. The empiricist maintains that the source of knowledge is always based on sensory observation. Contemporary science draws on both positions.

The rational aspect of science prevents it from simply collecting an endless array of independent empirical facts. For scientists to somehow make sense out of what they observe, theories are formulated. As such, a **scientific theory** has two main functions: (1) It organizes empirical observations and (2) it acts as a guide for future observations. The latter function of a scientific theory generates **confirmable propositions**. In other words, a theory suggests propositions that can be tested experimentally. If the propositions generated by a theory are confirmed through experimentation, the theory gains strength; if the propositions are not confirmed by experimentation, the theory loses strength. If the theory generates too many erroneous propositions, it must be either revised or abandoned. Thus, scientific theories must be testable. That is, they must generate hypotheses that can be validated or invalidated empirically. In science, then, the direct observation of nature is important, but such observation is often guided by theory.

**The Search for Laws.** Another feature of science is that it seeks to discover lawful relationships. A **scientific law** can be defined as a consistently observed relationship between two or more classes of empirical events. For example, when *X* occurs, *Y* also tends to occur. By stressing lawfulness, science is proclaiming an interest in the general case rather than the particular case. Traditionally, science is not interested in private or unique events but in general laws that can be publicly observed and verified. To reiterate, a scientific law is general and, because it describes a relationship between empirical events, it is amenable to **public observation**. The concept of public observation is a vitally important aspect of science. All scientific claims must be verifiable by any interested person. In science, there is no secret knowledge available only to select authorities.

There are two general classes of scientific laws. One class is **correlational laws**, which describe how events vary together in some systematic way. For example, exercise tends to correlate positively with health. With such information, only prediction is possible. That is, if we knew a person's level of exercise, we could predict their health, and vice versa. A more powerful class of laws are **causal laws**, which specify how events are causally related. For example, if we knew the causes of a disease, we could predict *and* control that disease—as preventing the causes of a disease

would prevent the disease from occurring. Thus, correlational laws allow prediction, but causal laws allow prediction and control. For this reason, causal laws are more powerful than correlational laws and thus are generally considered far more desirable.

A major goal of science then is to discover the causes of natural phenomena. Specifying the causes of natural events, however, is highly complex and usually requires substantial experimental research. It cannot just be assumed, for example, that contiguity proves causation. If rain follows a rain dance, it does not establish that the dance necessarily caused the rain. Also complicating matters is the fact that most events seldom, if ever, have a single cause; rather, they have multiple causes. Questions such as what caused World War I and what causes schizophrenia are not amenable to one simple answer. Even seemingly mundane questions such as why did Xander quit his job or why did Maria marry Tomas are, in reality, enormously complex. In the history of philosophy and science, the concept of causation has been one of the most perplexing of matters (see, for example, Clatterbaugh, 1999, and Meehl, 1978).

**The Assumption of Determinism.** Because a main goal of science is to discover lawful relationships, science assumes that what is being investigated is lawful. For example, the chemist assumes that chemical reactions are lawful, and the physicist assumes that the physical world is lawful. The assumption that what is being studied can be understood in terms of causal laws is called **determinism**. Taylor (1967) defined *determinism* as the philosophical doctrine that “states that for everything that ever happens there are conditions such that, given them, nothing else could happen” (p. 359). The determinist, then, assumes that everything that occurs is a function of a finite number of causes and that, if all these causes were known, an event could be predicted with complete accuracy. Fortunately, knowing *all* causes of an event is often not necessary for us to develop some understanding, but as more causes are known, predictions can become more accurate. For example, meteorologists would agree that the weather is a function of a finite number of variables such as sunspots, high-altitude jet streams, barometric pressure, and the like; yet weather forecasts are always probabilistic because many of these variables change constantly, and the relationship between all of them is not yet fully understood. The *assumption* underlying meteorology (weather prediction), however, is deterministic; as all sciences assume determinism.

### Revisions in the Traditional View of Science

The traditional view is that science involves empirical observation, theory formulation, theory testing, theory revision, prediction, control, the search for lawful relationships, and the assumption of determinism. Some prominent philosophers of science, however, take issue with at least some

aspects of this traditional view of science. Among them are Karl Popper and Thomas Kuhn.

**Karl Popper.** Born in Vienna, **Karl Popper (1902–1994)** began attending university classes at age 16 and eventually earned a degree under the psychologist Karl Bühler (see Chapter 17). Although his original interests were in psychology, Popper would become famous as a philosopher of science. Specifically, Popper came to disagree with the traditional description of science in two fundamental ways. First, he disagreed that scientific activity starts with empirical observation. According to Popper, the classic view of science implies that scientists wander around making observations and then attempt to explain what they have observed. Popper (1963/2002a) showed the problem with such a view:

Twenty-five years ago I tried to bring home [this] point to a group of physics students in Vienna by beginning a lecture with the following instructions: “Take pencil and paper: carefully observe, and write down what you have observed!” They asked, of course, *what* I wanted them to observe. Clearly the instruction, “Observe!” is absurd. . . . Observation is always selective. It needs a chosen object, a definite task, an interest, a point of view, a problem. (p. 61)

So, for Popper, scientific activity starts with a problem, and the problem determines what observations scientists will make. The next step is to propose solutions to the problem (conjectures) and then attempt to find fault with the proposed solutions (refutations). Popper saw the scientific method as involving three stages then: problems, theories (proposed solutions), and criticism.

According to Popper, the demarcation criterion that distinguishes a scientific theory from a nonscientific idea is the **principle of falsifiability**. A scientific theory must



Karl Popper

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be refutable. Contrary to what many believe, if every conceivable observation can be made to agree with a theory, the theory is weak, not strong. Popper spent a great deal of time criticizing the theories of Freud and Adler for exactly this reason. Because their theories are vague, no matter what happens, verification can likely be claimed. Popper contrasted such theories with those of Einstein, who predicts precisely what should or should not happen if his theory is correct. Thus, Einstein's theory, unlike the theories of Freud and Adler, was refutable and, therefore, robustly scientific.

In addition to vagueness, another major problem with many psychological theories (such as Freud's and Adler's) is that they engage more in **postdiction** (explaining phenomena after they have already occurred) than in prediction. According to Popper, for a theory to be scientific, it must make **risky predictions**—predictions that run a real chance of being incorrect. Theories that cannot make risky predictions, or that merely explain phenomena *after* they have already occurred, are not scientific.

For Popper, then, it is a theory's incorrect predictions, rather than its correct ones, that cause scientific progress. This idea is nicely captured by Marx and Goodson (1976):

In real scientific life theories typically contribute not by being right but by *being wrong*. In other words, scientific advance in theory as well as experiments tends to be built upon the successive corrections of many errors, both small and large. Thus the popular notion that a theory must be right to be useful is incorrect. (p. 249)

Popperian science is an unending search for better and better solutions to problems or explanations of phenomena. For Popper, *all* scientific theories will eventually be found to be false and will be replaced by more adequate theories; it is just a matter of time. For this reason, the highest status that a scientific theory can attain, according to Popper, is *not yet disconfirmed*. Brett (1912–1921/1965) made this point effectively:

We tend to think of science as a “body of knowledge” which began to be accumulated when men hit upon “scientific method.” This is a superstition. It is more in keeping with the history of thought to describe science as the myths about the world which have not yet been found to be wrong. (p. 37)

Does this mean Popper believed that nonscientific theories (including those of Freud and Adler) are useless? Absolutely not! He said,

Historically speaking all—or very nearly all—scientific theories originate from myths, and . . . a myth may contain important anticipations of scientific theories. . . . I thus [believe] that if a theory is found to be nonscientific, or “metaphysical” . . . it is not thereby found to be unimportant, or insignificant, or “meaningless,” or “nonsensical.” (1963/2002a, p. 50)

Popper used falsification as a demarcation between a scientific and a nonscientific theory but not between a

useful and useless idea. Many theories in psychology fail Popper's test of falsifiability either because they are stated in such general terms that they are confirmed by almost any observation, or because they engage in postdiction rather than prediction. Such theories lack scientific rigor but are still often found to be useful.

**Thomas Kuhn.** Until recently, it was widely assumed that the scientific method guaranteed objectivity and that science produced information in a steady, progressive way. It was believed that the world consists of knowable “truths” and that following scientific procedures allowed science to systematically approximate those truths. In other words, scientific activity was guided by the **correspondence theory of truth**, “the notion that the goal, when evaluating scientific laws or theories, is to determine whether or not they correspond to an external, mind-independent world” (Kuhn, 2000a, p. 95).

**Thomas Kuhn (1922–1996)** changed that conception of science by showing science to be a highly subjective enterprise. Born in Cincinnati, Ohio, Kuhn would earn an undergraduate as well as his doctoral degree in physics from Harvard. His primary interest, however, was in the history of physics and the history of science more generally. It was out of this interest in history that Kuhn developed his philosophy of science.

According to Kuhn, in the physical sciences, one viewpoint is commonly shared by most members of that science. In physics or chemistry, for example, most researchers share a common set of assumptions or beliefs about their subject matter. Kuhn refers to such a widely accepted viewpoint as a **paradigm**. Kuhn defines the term *paradigm* as “the entire constellation of beliefs, values, techniques, and so on shared by the members of a given [scientific] community” (1996, p. 175). For those scientists accepting a given paradigm, it becomes *the* way of looking at and analyzing the subject matter of their science. Once a paradigm is accepted, the activities of those accepting it become a matter of exploring the implications of that paradigm. Kuhn referred to such activities as **normal science**. Normal science becomes what Kuhn called a “mopping-up” operation for a paradigm.



Thomas Kuhn

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That is, while following a paradigm, scientists explore in-depth precisely the problems defined by the paradigm and utilize precisely the methods suggested by the paradigm while investigating those problems.

Kuhn likened this normal science to a form of **puzzle solving**. For example, the problems of normal science have an assured solution, and there are “rules that limit both the nature of acceptable solutions and the steps by which they are to be obtained” (Kuhn, 1996, p. 38). For Kuhn, normal science then does not involve much creativity: “Perhaps the most striking feature of . . . normal research problems . . . is how little they aim to produce major novelties, conceptual or phenomenal” (1996, p. 35). Although a paradigm restricts the range of phenomena scientists examine, it does guarantee that certain phenomena are studied thoroughly. According to Kuhn,

By focusing attention upon a small range of relatively esoteric problems, the paradigm forces scientists to investigate some part of nature in a detail and depth that would otherwise be unimaginable. . . . During the period when the paradigm is successful, the profession will have solved problems that its members could scarcely have imagined and would never have undertaken without commitment to the paradigm. And at least part of that achievement always proves to be permanent. (1996, pp. 24–25)

That is the positive side of having research guided by a paradigm, but there is also a negative side. Specifically, paradigms blind scientists to other phenomena and perhaps better explanations for what they are studying. As Kuhn notes:

Mopping-up operations are what engage most scientists throughout their careers. They constitute what I am here calling normal science. Closely examined, whether historically or in the contemporary laboratory, that enterprise seems an attempt to force nature into the preformed and relatively inflexible box that the paradigm supplied. No part of the aim of normal science is to call forth new sorts of phenomena; indeed, those that will not fit the box are often not seen at all. Nor do scientists normally aim to invent new theories, and they are often intolerant of those invented by others. Instead, normal scientific research is directed to the articulation of those phenomena and theories that the paradigm already supplies. (Kuhn, 1996, p. 24)

A paradigm, then, determines what constitutes a research problem *and* how the solution to that problem is sought. In other words, a paradigm guides all of the researcher’s activities, both theoretical and methodological. More important, however, is that researchers become psychologically invested in their paradigm—they define their careers by the work they do within the paradigm. It becomes part of their lives and is therefore very difficult to give up.

**How Sciences Change.** How do scientific paradigms change? According to Kuhn, not very easily. First, there

must be persistent observations that the currently accepted paradigm cannot effectively explain; these are called **anomalies**. Usually, a single scientist or a small group of scientists will eventually propose an alternative understanding that will both account for the main phenomena that the prevailing paradigm accounts for, but will also explain the anomalies. Kuhn indicated that there is typically great resistance to this new, alternative, paradigm and that converts to it are won over very slowly. In time, however, the new paradigm wins out and displaces the old one. According to Kuhn, this describes what happened when Einstein challenged the Newtonian conception of the universe. Now, the Einsteinian paradigm is generating its own normal science and will continue to do so until it is overthrown by another paradigm.

Kuhn portrayed science as a method of inquiry that combines the objective scientific method and the psychological makeup of the scientist. Science progresses, according to Kuhn, because scientists are forced to change their belief systems; and belief systems are very difficult to change, whether for a group of scientists or for anyone else.

**The Stages of Scientific Development.** According to Kuhn, the development of a paradigm that comes to dominate a science occurs over a long period of time. Prior to the initial development of a paradigm, a science typically goes through a **preparadigmatic stage**, during which a number of competing viewpoints exist. During this period, which Kuhn referred to as *prescientific*, a discipline is characterized by a number of rival camps or schools, a situation contrary to unification and that results in, essentially, random fact gathering. Such circumstances continue to exist until one school succeeds in defeating its competitors and becomes *the* paradigm. At this point, the discipline becomes a science, and a period of normal science begins. The normal science generated by the paradigm continues until it encounters an anomaly and is displaced by a new paradigm that can account for the anomaly, which in turn will generate its own normal science.

In sum, Kuhn saw sciences as passing through three distinct stages: the preparadigmatic stage, during which rival camps or schools compete for control of the field; the **paradigmatic stage**, during which the puzzle-solving activity of normal science occurs; and the **revolutionary stage**, during which an existing paradigm is being displaced by another paradigm.

**Paradigms and Psychology.** How then does all this connect with psychology? One certainly *could* fit the history of psychology into Kuhnian terms. For example, one could suggest that American psychology’s first school, functionalism (Chapter 11), was displaced by Watson’s behaviorism (Chapter 12), which following a cognitive revolution (Chapter 19) was in turn itself displaced. Although that can be a useful heuristic for looking at psychology in the twentieth century, it is not clear that it is the most accurate account.