

HOW TO
THINK
STRAIGHT
ABOUT
PSYCHOLOGY

Fourth Edition

Keith E. Stanovich

HOW TO
THINK STRAIGHT
ABOUT PSYCHOLOGY

Fourth Edition


Keith E. Stanovich

Ontario Institute for Studies in Education

To my parents, Betty and Mike Stanovich

Acquisitions Editor/Editor in Chief: Jill Lectka/Priscilla McGeehon
Design Manager/Text and Cover Designer: John D. Sparks
Electronic Production Manager: Alexandra Odulak
Manufacturing Manager: Hilda Koparanian
Electronic Page Makeup: Bookworks
Printer and Binder: R.R. Donnelley & Sons Company
Cover Printer: New England Book Components

How to Think Straight About Psychology, Fourth Edition
Copyright © 1996 by Keith E. Stanovich

HarperCollins® and ® are registered trademarks of HarperCollins Publishers Inc.

All rights reserved. Printed in the United States of America. No part of this book may be used or reproduced in any manner whatsoever without written permission, except in the case of brief quotations embodied in critical articles and reviews. For information address HarperCollins College Publishers, 10 East 53rd Street, New York, NY 10022.

Library of Congress Cataloging-in-Publication Data

Stanovich, Keith E., 1950-

How to think straight about psychology/Keith E. Stanovich.— 4th ed.
p. cm.

Includes bibliographical references and index.

ISBN 0-673-99439-2 (alk. paper)

1. Psychology—Research—Methodology. 2. Mass media—Psychological aspects. 3. Mass media—Objectivity. I Title.

BF76.5.S68 1996

150'.72—dc20

95-12238

CIP

Notes on the Fourth Edition

The fourth edition of *How to Think Straight About Psychology* has fewer structural revisions than the third edition because of the major chapter reorganization that occurred in the previous edition. The content and order of the chapters remain the same in the fourth edition. However, I have continued to update and revise the examples that are used. I have replaced some dated examples with more contemporary studies and/or issues. I have made a major effort to keep contemporary the citations that are relevant to the various concepts and experimental effects that are mentioned. As a result a total of 157 *new* citations appear in this edition, so that the reader continues to have up-to-date references on all of the examples and concepts.

Based on comments spontaneously sent to me by readers and on several comprehensive reviews commissioned by HarperCollins, I have moved certain sections. For example, the discussion of the Clever Hans case has been moved from Chapter 4 to Chapter 6, and the section on the anecdote war has been moved from Chapter 10 to Chapter 4. A discussion of the important issue of clinical versus actuarial prediction has been added to the chapter on probabilistic reasoning (Chapter 10). At the request of readers, I have bolstered the “Our Own Worst Enemies” section of Chapter 11. The goal of the book remains what it always was: to present a short introduction to critical thinking skills within the context of the subject matter of psychology.

Many of the individuals I have acknowledged in earlier editions continue to contribute ideas for the book. However, I must single out Richard West of James Madison University, who has been a most valuable continuing contributor to the book’s evolution. This time around, I received some extremely thorough reviews from HarperCollins readers: Angela M. Birkhead-Flight, University of Cincinnati; Ronald Gandelman, Rutgers University; Joseph E. Morrow, California State University at Sacramento; John F. Pfister, Dartmouth College; Toni G. Wegner, University of Virginia; Murray S. Work, California State University at Sacramento. Many of their suggestions were incorporated into this edition. Additional helpful comments were received from Ludy Benjamin, Texas A&M University; Stephen Louisell, Kalamazoo Community College; Douglas Mook, University of Virginia; Marjorie Semonick, University of Minnesota; David Share, University of Haifa; Linda Siegel, Ontario Institute for Studies in Education; Frank Smoll, University of Washington; Mike Stadler, University of Missouri; and Marty Wall, University of Toronto. My new acquisitions editor at HarperCollins, Jill Lectka, has provided guidance, enthusiasm, and support for the book.

As before, readers are encouraged to send me comments by corresponding with me at the following address: Keith E. Stanovich, Department of Applied Psychology, Ontario Institute for Studies in Education, 252 Bloor St. W., Toronto, Ontario, Canada M5S 1V6. E-mail: KStanovich@oise.on.ca

Keith E. Stanovich

Preface

There exists a body of knowledge that is unknown to most people. This information concerns human behavior and consciousness in their various forms. It can be used to explain, predict, and control human actions. Those who have access to this knowledge use it to gain an understanding of other human beings. They have a more complete and accurate conception of what determines the behavior and thoughts of other individuals than do those who do not have this knowledge.

Surprisingly enough, this unknown body of knowledge is the discipline of psychology.

What can I possibly mean when I say that the discipline of psychology is unknown? Surely, you may be thinking, this statement was not meant to be taken literally. Bookstores contain large sections full of titles dealing with psychology. Television and radio talk shows regularly feature psychological topics. Newspapers and magazines run psychology columns. Nevertheless, despite this attention, there is an important sense in which the field of psychology is unknown.

Despite much seeming media attention, the discipline of psychology remains for the most part veiled from the public. The transfer of “psychological” knowledge that is taking place via the media is largely an illusion. Few people are aware that the majority of the books they see in the “psychology” sections of many book stores are written by individuals with absolutely no standing in the psychological community. Few are aware that many of the people to whom the media apply the label “psychologist” would not be considered so by the American Psychological Association or the American Psychological Society. Few are aware that many of the most visible psychological “experts” have contributed no information to the fund of knowledge in the discipline of psychology.

The flurry of media attention paid to “psychological” topics has done more than simply present inaccurate information. It has also obscured the very real and growing knowledge base in the field of psychology. The general public is unsure about what is and is not psychology and is unable to independently evaluate claims about human behavior. Adding to the problem is the fact that many people have a vested interest in a public that is either without evaluative skills or that believes there is no way to evaluate psychological claims. The latter view, sometimes called the “anything goes” outlook, is one of the fallacies discussed in this book, and it is particularly costly to the public. Many pseudosciences are multi-million-dollar industries that depend on the lack of public awareness that claims about human behavior can be tested. The general public is also unaware that many of the claims made by these pseudosciences (for example, astrology, psychic surgery, speed reading, biorhythms, subliminal weight loss, and psychic detectives) have been tested and proved false. The existence of the pseudoscience industry, which is discussed in this book, increases the media’s tendency toward the sensationalistic reporting of science. This tendency is worse in psychology than in other sciences, and understanding the reasons why this is so is an important part

of learning how to think straight about psychology. This book, then, is directed not at potential researchers in psychology, but at a much larger group: the consumers of psychological information. The target audience is the beginning psychology student and the general reader who have encountered information on psychological issues in the general media and have wondered how to go about evaluating its validity.

This book is not a standard introductory psychology text. It does not outline a list of facts that psychological research has uncovered. Indeed, telling everyone to take an introductory psychology course at a university is probably not the ultimate solution to the inaccurate portrayal of psychology in the media. There are many laypeople with a legitimate interest in psychology who do not have the time, money, or access to a university to pursue formal study. More important, as a teacher of university-level psychology courses, I am forced to admit that my colleagues and I often fail to give our beginning students a true understanding of the science of psychology. The reason is that lower-level courses often do not teach the critical analytical skills that are the focus of this book. As instructors, we often become obsessed with “content”—with “covering material.” Every time we stray a little from the syllabus to discuss issues such as psychology in the media, we feel a little guilty and begin to worry that we may not “cover all the topics” before the end of the term.

Consider the average introductory psychology textbook. Many now contain between 600 and 800 multi-columned pages and reference literally hundreds of studies in the published literature. Of course, there is nothing wrong with such books containing so much material. It simply reflects the increasing knowledge base in psychology. There are, however, some unfortunate side effects. Instructors are often so busy trying to cram their students full of dozens of theories, facts, and experiments that they fail to deal with some of the fundamental questions and misconceptions that students bring with them to the study of psychology. The instructors (and the introductory textbook authors), rather than dealing directly with these misconceptions, often hope that if students are exposed to enough of the empirical *content* of psychology, they will simply *induce* the answers to their questions. In short, the instructors hope that students will recognize the implicit answers to these questions in the discussions of empirical research in several content areas. All too often this hope is frustrated. In a final review session—or in office hours at the end of the term—instructors are often shocked and discouraged by questions and comments that might have been expected on the first day of the course, but not after 14 weeks: “But psychology experiments aren’t real life; what can they tell us?”; “Psychology just can’t be a *real* science like chemistry can it?”; “But I heard a therapist on TV say the opposite of what our textbook said”; “I think this theory is stupid—my brother behaves just the opposite of what it says”; “Psychology is nothing more than common sense”; “Everyone knows what anxiety is—why bother defining it?”; “Psychology is just a matter of opinion, isn’t it?” For many students, such questions are *not* implicitly answered merely by a consideration of the content of psychology. In this book, I deal explicitly with the confusions that underlie questions and comments such as these.

Unfortunately, research supports the idea that the average introductory psychology course does very little to correct the many misconceptions about the discipline that are held by entering students (Best, 1982; McKeachie, 1960; Vaughan, 1977). One researcher stated, "I must conclude that the [introductory] course has little influence on their erroneous beliefs" (Vaughan, 1977, p. 140) and, further, drew the conclusion that "there is little evidence for a generally heightened skepticism, which might lead students to question statements about which they have received no additional information" (p. 140). Vaughan's latter conclusion touches on the basic purpose of this book. Psychology, probably more than any other science, requires critical thinking skills that enable students to separate the wheat from the chaff that accumulates around all sciences. These are the critical thinking skills that students will need to become independent evaluators of psychological information. Years after students have forgotten the *content* of an introductory psychology course, they will still use the fundamental principles covered in this book to evaluate psychological claims. Long after Erikson's stages of development have been forgotten, students will be using the "thinking tools" introduced in this text to evaluate new psychological information encountered in the media. Once acquired, these skills will serve as lifelong tools that will aid in the evaluation of knowledge claims. First, they provide the ability to conduct an initial gross assessment of plausibility. Second, these skills provide some criteria for assessing the reliability of "expert" opinion. Because the need to rely on expert opinion can never be eliminated in a complex society, the evaluation of an expert's credibility becomes essential to knowledge acquisition. Although these critical thinking skills can be applied to any discipline or body of knowledge, they are particularly important in the area of psychology because the field is so often misrepresented by the general media.

Many psychologists are pessimistic about any effort to stem the tide of misinformation about their discipline. While this pessimism is, unfortunately, often justified, this "consumer's guide" to psychology was motivated by the idea that psychologists must not let this problem become a self-fulfilling prophecy.

While I have welcomed the opportunity to prepare several editions of *How to Think Straight About Psychology*, it is unfortunately true that the reasons for the book's existence are just as applicable today as they were when I wrote the first edition. Media presentations of psychology are just as misleading as they ever were, and students in introductory psychology courses enter with as many misconceptions as they ever did.

Thus, the goals of all subsequent editions remain the same. They are shared by an increasing number of psychology instructors. Stanford University psychologist Roger Shepard (1983) echoed all the concerns that motivated the writing of the first edition of this text:

Although most undergraduate psychology students may not go on to scientific careers, one hopes that they acquire some facility for the critical evaluation of the incomplete, naive, confused, or exaggerated reports of social science "findings" to which they will continue to be exposed by the popular media . . . Widespread notions that human behavior and

mental phenomena can be adequately understood through unaided common sense or, worse, by reference to nonempirical pseudosciences, such as astrology, present us with a continuing challenge. (p. 855)

The goal of the book remains what it always was: to present a short introduction to the critical thinking skills that will help students to better understand the subject matter of psychology and to better understand events in the world in which they live.

ACKNOWLEDGMENTS

This book has benefited from the contributions of many people. Helpful suggestions were received from reviewers Christopher Bauer of the University of New Hampshire; Albert Heldt of Grand Rapids Junior College; George Howard of the University of Notre Dame; Michael O'Boyle of Iowa State University; Blaine Peden of the University of Wisconsin, Eau Claire; Paul Solomon of Williams College; and Carol Wade of the College of Marin. Richard F. West of James Madison University read the manuscript and contributed much to the development of the book. A humane scholar and a true friend, his intellectual and emotional support was much appreciated.

In addition to these individuals, several other scholars have provided valuable feedback on earlier editions. These include Wayne Bartz of American River College; Virginia Blankenship, University of Northern Arizona; Anne Cunningham of the University of Washington; William Graziano of Texas A&M University; Gordon Hammerle of Adrian College; Randy Hansen of Oakland University; George Heise of Indiana University; Bernie Koenig of Fanshawe College; P. A. Lamal, University of North Carolina, Charlotte; Edward Morris, University of Kansas; Dean Purcell of Oakland University; Michael Ross of the University of Waterloo; Frank Schieber of Oakland University; David Shantz of Oakland University; Norman Silverman of the University of Illinois, Chicago; Larry Vandervert of Spokane Falls Community College; Barbara Wanchisen, Baldwin-Wallace College. The insights from many discussions about teaching methodology with Ted Landau and Larry Lilliston of Oakland University, and Sam Rakover of the University of Haifa, were incorporated into the book.

Finally, I wish to thank Paula J. Stanovich for more than just the "emotional support" that is routinely alluded to in acknowledgments. Her concern for all human beings, particularly those less fortunate, is an inspiration to all those who know her. A view we both share is that every human being should have the opportunity to utilize their full potential. This book attests to the fact that I have had such an opportunity. Paula works to speed the day when this opportunity will be fully extended to all handicapped individuals.

Keith E. Stanovich

Contents

NOTES ON THE FOURTH EDITION ix
PREFACE xi

Chapter 1

PSYCHOLOGY IS ALIVE AND WELL (AND DOING FINE AMONG
THE SCIENCES) 1
The Freud Problem 1
The Diversity of Modern Psychology 2
 Implications of Diversity 3
Unity in Science 5
What, Then, Is Science? 8
 Systematic Empiricism 8
 Publicly Verifiable Knowledge: Replication and Peer Review 9
 Empirically Solvable Problems: Scientists Seek Testable Theories 11
 Psychology and Folk Wisdom: The Problem with “Common Sense” 12
Psychology as a Young Science 19

Chapter 2

FALSIFIABILITY: A DISCOURSE ON HOW TO FOIL LITTLE GREEN MEN
IN THE HEAD 21
Theories and the Falsifiability Criterion 22
 The Theory of Knocking Rhythms 23
 Freud and Falsifiability 24
 The Little Green Men 26
 Not All Confirmations Are Equal 27
 Falsifiability and Folk Wisdom 28
 The Freedom to Admit a Mistake 29
 Thoughts Are Cheap 31
Errors in Science: Getting Closer to the Truth 32

Chapter 3

OPERATIONISM AND ESSENTIALISM: “BUT, DOCTOR,
WHAT DOES IT REALLY MEAN?” 35
Why Scientists Are Not Essentialists 35

Essentialists Like to Argue About the Meaning of Words 36
Operationists Link Concepts to Observable Events 38
Scientific Concepts Evolve 39
Operational Definitions in Psychology 40
Operationism as a Humanizing Force 42
Essentialist Questions and the Misunderstanding of Psychology 43
Operationism and the Phrasing of Psychological Questions 45

Chapter 4

TESTIMONIALS AND CASE STUDY EVIDENCE: PLACEBO EFFECTS
AND THE AMAZING RANDI 49
Stages of Scientific Investigation 50
Why Testimonials Are Worthless: Placebo Effects 51
The “Vividness” Problem 54
The Overwhelming Impact of the Single Case 57
The Anecdote War 59
What to Do About the Vividness Problem 61
The Amazing Randi: Fighting Fire with Fire 62
Testimonials Open the Door to Pseudoscience 64

Chapter 5

CORRELATION AND CAUSATION: BIRTH CONTROL BY THE
TOASTER METHOD 69
Pearson and Tuberculosis 70
The Third-Variable Problem: Goldberger and Pellagra 70
Why Goldberger's Evidence Was Better 71
The Directionality Problem: Eye Movements and Reading 74
Selection Bias 75

Chapter 6

GETTING THINGS UNDER CONTROL: THE CASE OF CLEVER HANS 79
Snow and Cholera 80
Comparison, Control, and Manipulation 81
The Case of Clever Hans, the Wonder Horse 83
Clever Hans in the 1990s: An Unfolding Tragedy 84
Prying Variables Apart: Special Conditions 87
Intuitive Physics 88
Intuitive Psychology 89

Chapter 7

- “BUT IT’S NOT REAL LIFE!” :THE “ARTIFICIALITY” CRITICISM
AND PSYCHOLOGY 91
- The “Random-Sample” Confusion 92
- Theory-Driven Research Versus Direct Applications* 93
- Two Examples: Night Vision and Language Development* 96
- Applications of Psychological Theory 98
- The “College Sophomore” Problem* 101
- The Real-Life and College Sophomore Problems in Perspective* 104

Chapter 8

- AVOIDING THE EINSTEIN SYNDROME: THE IMPORTANCE OF
CONVERGING EVIDENCE 105
- The Connectivity Principle 106
- A Consumer’s Rule: Beware of Violations of Connectivity* 107
- The “Great-Leap” Model and the Gradual-Synthesis Model* 108
- Psychology Is a Gradual-Synthesis Science* 109
- Converging Evidence 110
- Progress Despite Flaws* 111
- Theory Evaluation* 111
- Converging Evidence in Psychology* 112
- Dyslexia: An Example of Convergence* 113
- Television Violence and Aggression: Convergence Again* 117
- Scientific Consensus 120
- Methods and the Convergence Principle* 121
- The Progression to More Powerful Methods* 124
- A Counsel Against Despair 125

Chapter 9

- THE MISGUIDED SEARCH FOR THE “MAGIC BULLET”:
MULTIPLE CAUSATION 127

Chapter 10

- THE ACHILLES’ HEEL OF HUMAN COGNITION:
PROBABILISTIC REASONING 133
- “Person-Who” Statistics 134
- Probabilistic Reasoning and the Misunderstanding of Psychology 135

Psychological Research on Probabilistic Reasoning 137
 Insufficient Use of Probabilistic Information 137
 Inverting Conditional Probabilities 140
 Failure to Use Sample Size Information 142
 The Tendency to Try to Explain Chance Events 143
 Explaining Chance: Illusory Correlation and the Illusion of Control 147
 Accepting Error in Order to Reduce Error: Clinical Versus Actuarial Prediction 149
Chance and Psychology 158
 Coincidence 158
 Personal Coincidences 161
 The Gambler's Fallacy 163
 The Conjunction Fallacy 166
 A Final Word About Statistics and Probability 169

Chapter 11

THE RODNEY DANGERFIELD OF THE SCIENCES 171
Psychology's "Image" Problem 172
 Psychology and Parapsychology 173
 The Self-Help Literature 175
 Recipe Knowledge 177
Psychology and the Media 178
Psychology and Other Disciplines 183
 Physicists and the Paranormal: Another Example 185
Our Own Worst Enemies 186
Isn't Everyone a Psychologist? Implicit Theories of Behavior 189
The Source of Resistance to Scientific Psychology 191
 Conflict of Interest 191
 Moral and Philosophical Objections to Psychology 195
The Final Word 196

REFERENCES 199
INDEX 219

PSYCHOLOGY IS ALIVE AND WELL (AND DOING FINE AMONG THE SCIENCES)

THE FREUD PROBLEM

Stop 100 people on the street and ask them to name a psychologist, either living or dead. Record the responses. Of course, Joyce Brothers and other “media psychologists” would certainly be named. If we leave out the media and pop psychologists, however, and consider only those who have made a recognized contribution to psychological knowledge, there would be no question about the outcome of this informal survey. Sigmund Freud would be the winner hands down. B. F. Skinner would probably finish a distant second. No other psychologist would get enough recognition to even bother about. Thus Freud, along with the pop psychology presented in the media, largely defines psychology in the public mind.

The notoriety of Freud has greatly affected the general public’s conceptions about the field of psychology and has contributed to many misunderstandings. For example, many introductory psychology students are surprised to learn that, if all the members of the American Psychological Association who were concerned with Freudian psychoanalysis were collected together, they would make up less than 10 percent of the membership. In another large organization of psychology, the American Psychological Society, they would make up considerably less than 5 percent.

Modern psychology is not obsessed (as are the media and some humanities disciplines) with the ideas of Sigmund Freud. Nor is it largely defined by them. Freud’s work is an extremely small part of the varied set of issues, data, and theories that are the concern of modern psychologists. This larger body of research and theory encompasses the work of four recent Nobel prize winners (David Hubel, Torsten Wiesel, Herbert Simon, and Roger Sperry) and a former director of the National Science Foundation (Richard Atkinson), all of whom are virtually unknown to the public.

The notoriety of Freud represents a significant obstacle to the public's understanding of psychology. It is bad enough that Freud's importance to modern psychology is vastly exaggerated. What makes the situation worse is that Freud's methods of investigation are completely unrepresentative of how modern psychologists conduct their inquiries (recall that Freud began his seminal work roughly a hundred years ago). The study of Freud's methods gives an utterly misleading impression of psychological research. For example, Freud did not make use of controlled experimentation, which, as we shall see in Chapter 6, is the most potent weapon in the modern psychologist's arsenal of methods. Freud thought that case studies could establish the truth or falsity of theories. We shall see in Chapter 4 why this idea is mistaken. Finally, a critical problem with Freud's work concerns the connection between theory and behavioral data. As we shall see in Chapter 2, for a theory to be considered scientific, the link between the theory and behavioral data must meet some minimal requirements. Freud's theories often do not meet these criteria. To make a long story short, Freud built an elaborate theory on a database (case studies and introspection) that was not substantial enough to support it. Freud concentrated on building complicated theoretical structures, but he did not, as modern psychologists do, ensure that they would rest on a database of reliable, replicable behavioral relationships. Many scholars who have attempted to trace the early history of psychology, including Howard Gardner (1985), have pointed to Freud's style of work as a significant impediment to the development of the discipline:

While many scholars were intrigued by Freud's intuitions, they felt that no scientific discipline could be constructed on the basis of clinical interviews and retrospectively constructed personal histories; moreover, they deeply resented the pretense of a field that did not leave itself susceptible to disconfirmation. (p. 15)

In this chapter, we shall attempt to deal with the Freud problem in two ways. First, when we illustrate the diversity of modern psychology, the rather minor position occupied by Freud will become clear. Second, we shall discuss what features are common to psychological investigations across a wide variety of domains. A passing knowledge of Freud's work has obscured from the general public what is the only unifying characteristic of modern psychology: the quest to understand behavior by using the methods of science.

THE DIVERSITY OF MODERN PSYCHOLOGY

There is, in fact, a great diversity of content and perspective in modern psychology. This diversity drastically reduces the coherence of psychology as a discipline. Henry Gleitman (1981), winner of the American Psychological Foundation's Distinguished Teaching Award, characterized psychology as "a loosely federated intellectual empire that stretches from the domains of the biological sciences on one border to those of the social sciences on the other" (p. 774). William Bevan (1982) captured the diversity of psychology quite explicitly by terming the field "a domain that encompasses the functioning of all organisms in all settings" (p. 1312).

Understanding that psychology is composed of an incredibly wide and diverse set of investigations is critical to an appreciation of the nature of the discipline. Simply presenting some of the concrete indications of this diversity will illustrate the point. The American Psychological Association (APA) has 48 different divisions, each representing either a particular area of research and study or a particular area of the practice of psychology. These 48 divisions are listed in Table 1.1. From the table, you can see the range of subjects studied by psychologists, the range of settings involved, and the different aspects of behavior studied. The other large organization of psychologists—the American Psychological Society—is just as diverse. Actually, Table 1.1 understates the diversity within psychology because it gives the impression that each division is a specific specialty area. In fact, each of the 48 divisions listed in the table is a broad area of study that contains a wide variety of subdivisions! In short, it is difficult to exaggerate the diversity of the topics that fall within the field of psychology.

Implications of Diversity

Students often come to the study of psychology hoping to learn the one grand psychological theory that unifies and explains all aspects of human behavior and consciousness. Such students are often disappointed, for they find not one grand theory, but many different theories, each covering a limited aspect of behavior. The diversity of psychology guarantees that the task of theoretical unification will be immensely difficult. Indeed, many psychologists would argue that such a unification is impossible. Others, however, are searching for greater unification within the field (Anderson, 1991; Gibson, 1994; Kimble, 1990, 1994; Newell, 1990). No matter what their position on the issue, all psychologists agree that theoretical unification will be extremely difficult and that such a unification will occur years in the future if it is to occur at all.

The lack of theoretical integration in psychology not only disappoints some students but also leads many others to denigrate the scientific progress that psychology has made. Such criticism often arises from the mistaken notion that all true sciences must have a grand, unifying theory. It is a mistaken notion because many other sciences also lack a unifying conceptualization. Harvard psychologist William Estes (1979) emphasized this point:

The situation in which the experimental psychologists find themselves is not novel, to be sure, nor peculiar to psychology. Physics during the early twentieth century subdivided even at the level of undergraduate teaching into separate disciplines. Thus I was introduced to that science through separate university courses in mechanics, heat, optics, acoustics, and electricity. Similarly, chemistry has branched out, evidently irreversibly, into inorganic, organic, physical, and biochemical specialties, among which there may be no more communication than among some of the current subdisciplines of psychology. In both cases, unity has reemerged only at the level of abstract mathematical theory. Medicine has similarly fragmented into specialties, but is like psychology in that there has been no appearance of a new unity. (pp. 661–662)

TABLE 1.1
DIVISIONS OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

1. General Psychology	28. Psychopharmacology
2. Teaching of Psychology	29. Psychotherapy
3. Experimental Psychology	30. Psychological Hypnosis
5. Evaluation, Measurement, and Statistics	31. State Psychological Association Affairs
6. Physiological and Comparative Psychology	32. Humanistic Psychology
7. Developmental Psychology	33. Mental Retardation and Developmental Disabilities
8. Personality and Social Psychology	34. Population and Environmental Psychology
9. Psychological Study of Social Issues	35. Psychology of Women
10. Psychology and the Arts	36. Psychology of Religion
12. Clinical Psychology	37. Child, Youth, and Family Services
13. Consulting Psychology	38. Health Psychology
14. Industrial and Organizational Psychology	39. Psychoanalysis
15. Educational Psychology	40. Clinical Neuropsychology
16. School Psychology	41. Psychology and Law
17. Counseling Psychology	42. Psychologists in Independent Practice
18. Psychologists in Public Service	43. Family Psychology
19. Military Psychology	44. Psychological Study of Lesbian and Gay Issues
20. Adult Development and Aging	45. Psychological Study of Ethnic Minority Issues
21. Applied Experimental and Engineering Psychology	46. Media Psychology
22. Rehabilitation Psychology	47. Exercise and Sport Psychology
23. Consumer Psychology	48. Peace Psychology
24. Theoretical and Philosophical Psychology	49. Group Psychology and Group Psychotherapy
25. Experimental Analysis of Behavior	50. Addictions
26. History of Psychology	
27. Community Psychology	

Note: There are no Divisions 4 or 11.

It is also important to understand that what a discipline considers within its province is in part historical accident. One contributing factor is the often arbitrary way that universities partition the range of human knowledge into “departments,” which may have administrative convenience but which should not be viewed as unchangeable categories. Indeed, William Bevan, a past president of the APA, said that the fragmentation within the discipline of psychology is so great that psychology departments exist only as an administrative convenience, so

members can get their mail from the same bank of mailboxes. In their sociological and historical analysis of American higher education, Christopher Jencks and David Riesman (1968) stated, "A discipline is at bottom nothing more than an administrative category. The various subdisciplines within biology or history or psychology, for example, have only the most limited intellectual relationship to one another, and the same is true in every other field" (p. 523).

Indeed, it is not difficult to imagine a university disbanding its psychology department and integrating its members into other departments (Gardner, 1985; Scott, 1991; Spence, 1987). Physiological psychologists could go into biology departments; many social psychologists could go into sociology departments and business schools; cognitive and perceptual psychologists could go into interdisciplinary departments of cognitive science (Gardner, 1985); organizational and industrial psychologists could go into business schools; clinical and counseling psychologists could go into departments of social work, human resources, and education; developmental psychologists might go to departments of education, cognitive science, or human resources; and so on. Few psychologists would notice any difference in the intellectual interchange with their new colleagues. Actually, many would experience greater camaraderie with their new colleagues than with the old ones in "psychology." Modern psychology, in terms of content, simply does not hang together as a coherent set of topics. One must look to a more general level to find anything that unifies the discipline.

Once we acknowledge the implications of the social and historical factors that determine the structure of disciplines, we can recognize that it is illogical to demand that all fields be unified. Indeed, it has been suggested that the term *psychological studies*, rather than *psychology*, would more accurately reflect the diversity of the discipline. The use of this new term would also make it less surprising to the student that the different areas within the discipline have been characterized by vastly different rates of scientific progress. Some have made impressive progress in the explanation and prediction of behavior, while others have progressed hardly at all. The term *psychology* does not convey this state of affairs. Instead, it implies a coherence of subject matter that is simply not characteristic of the discipline.

If we wish to find any unity in the subject of psychology, we must not look for connections among the topics that psychologists study. We must instead address the methods that psychologists use to advance knowledge. Here is the only place that we have any hope of finding common cause among psychologists. But here, in the domain of the methods psychologists use to advance knowledge, is where we also find some of the greatest misunderstandings of the discipline.

UNITY IN SCIENCE

Any coherence that the discipline of psychology does display stems from its quest to understand behavior by using the methods of science. Indeed, any claim to uniqueness that psychology has resides in its adherence to using the full range of scientific methods to understand behavior. Simply to say that psychology is "concerned with human behavior" does not distinguish it from other disciplines. Many other professional groups and disciplines—including economists, philosophers, novelists, the law, sociology, history, political science, anthropology, and lit-