



Introduction to
Psychology^{11e}

James W. Kalat

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Psychology ^{11e}

James W. Kalat

North Carolina State University



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Jo Ellen Kalat

To my grandchildren: Max and Ann Stapel-Kalat, Ophelia and Liam Floyd

about the author

JAMES W. KALAT (rhymes with ballot) is Professor Emeritus at North Carolina State University, where he taught Introduction to Psychology and Biological Psychology for 35 years. Born in 1946, he received an AB degree summa cum laude from Duke University in 1968 and a PhD in psychology in 1971 from the University of Pennsylvania, under the supervision of Paul Rozin. He is also the author of *Biological Psychology*, 12th edition (Boston, MA: Cengage, 2016), and coauthor with Michelle N. Shiota of *Emotion*, 2nd edition (Belmont, CA: Wadsworth, 2012). In addition to textbooks, he has written journal articles on taste-aversion learning, the teaching of psychology, and other topics. A remarried widower, he has three children, two stepsons, and four grandchildren. When not working on something related to psychology, his hobby is bird-watching.



brief contents

- 1** What Is Psychology? 1
- 2** Scientific Methods in Psychology 25
- 3** Biological Psychology 55
- 4** Sensation and Perception 99
- 5** Development 143
- 6** Learning 181
- 7** Memory 213
- 8** Cognition and Language 249
- 9** Intelligence 287
- 10** Consciousness 311
- 11** Motivated Behaviors 343
- 12** Emotions, Stress, and Health 377
- 13** Social Psychology 411
- 14** Personality 449
- 15** Abnormal Psychology: Disorders and Treatment 481



1 What Is Psychology? 1

Module 1.1 Psychologists' Goals 3

- General Points about Psychology 3
- Major Philosophical Issues in Psychology 4
- What Psychologists Do 6
- Should You Major in Psychology? 11

IN CLOSING: Types of Psychologists 13

- Summary 13
- Key Terms 13
- Review Questions 14

Module 1.2 Psychology Then and Now 15

- The Early Era 15
- The Rise of Behaviorism 19
- From Freud to Modern Clinical Psychology 20
- Recent Trends 20

IN CLOSING: Psychology through the Years 22

- Summary 22
- Key Terms 22
- Review Questions 23



2 Scientific Methods in Psychology 25

Module 2.1 Evaluating Evidence and Thinking Critically 27

- Psychological Science 27
- Gathering Evidence 27
- Evaluating Scientific Theories 28

IN CLOSING: Scientific Thinking in Psychology 33

- Summary 33
- Key Terms 33
- Answers to Other Questions in the Module 33
- Review Questions 33
- Thought Question 33

Module 2.2 Conducting Psychological Research 34

- General Research Principles 34
- Observational Research Designs 36
- Experiments 41

what's the evidence? 44

- Evaluating the Results 45
- Ethical Considerations in Research 47

IN CLOSING: Psychological Research 49

- Summary 49
- Key Terms 50
- Review Questions 50
- Appendix to Chapter 2: Statistical Calculations 52
- Measures of Variation 52
- Correlation Coefficients 54
- Key Terms 54

3 Biological Psychology 55

Module 3.1 Neurons and Behavior 57

Nervous System Cells 57

The Action Potential 58

Synapses 60

what's the evidence? 61

Neurotransmitters and Behavior 63

IN CLOSING: Neurons, Synapses, and Behavior 64

Summary 64

Key Terms 64

Review Questions 65

Module 3.2 Drugs and Their Effects 66

Stimulants 66

Hallucinogens 67

Depressants 68

Narcotics 68

Marijuana 69

IN CLOSING: Drugs and Synapses 72

Summary 72

Key Terms 72

Review Questions 72

Module 3.3 Brain and Behavior 73

The Cerebral Cortex 74

The Two Hemispheres and Their Connections 78

Measuring Brain Activity 80

Subcortical Areas 81

Experience and Brain Plasticity 83

Social Neuroscience 84

The Binding Problem 84

IN CLOSING: Brain and Experience 85

Summary 86

Key Terms 86

Review Questions 87

Module 3.4 Genetics and Evolutionary Psychology 88

Genetic Principles 88

How Genes Influence Behavior 93

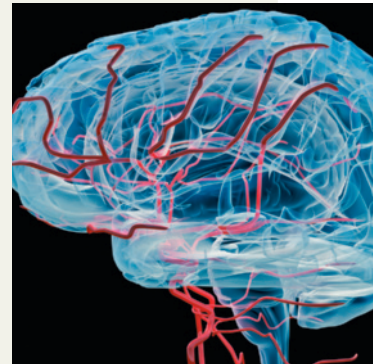
Evolutionary Psychology 94

IN CLOSING: Genes and Experience 97

Summary 97

Key Terms 97

Review Questions 97



4 Sensation and Perception 99

Module 4.1 Vision 101

Detecting Light 101

Color Vision 106

IN CLOSING: Vision as an Active Process 110

Summary 110

Key Terms 110

Answers to Other Questions in the Module 110

Review Questions 111

Module 4.2 The Nonvisual Senses 112

Hearing 112

The Vestibular Sense 115

The Cutaneous Senses 116

The Chemical Senses 119

Synesthesia 122

IN CLOSING: Sensory Systems 123

Summary 123

Key Terms 124

Review Questions 124

Module 4.3 Interpreting Sensory Information 125

Perceiving Minimal Stimuli 125

Perceiving and Recognizing Patterns 128

what's the evidence? 128

Similarities between Vision and Hearing 132

Perceiving Movement and Depth 133

Optical Illusions 136

IN CLOSING: Making Sense of Sensory Information 139

Summary 139

Key Terms 139

Answers to Other Questions in the Module 140

Review Questions 140



5 Development 143



Module 5.1 Cognitive Development in Infancy and Childhood 145

- Research Designs for Studying Development 145
- The Fetus and the Newborn 148
- Infancy 148
- Jean Piaget's View of Cognitive Development 152
- Piaget's Sensorimotor Stage 152
- what's the evidence?** 152
- Piaget's Preoperational Stage 155
- what's the evidence?** 155
- Piaget's Stages of Concrete Operations and Formal Operations 159
- How Grown Up Are We? 160

IN CLOSING: Understanding Children 161

- Summary 161
- Key Terms 162
- Review Questions 162

Module 5.2 Social and Emotional Development 163

- Erikson's Description of Human Development 163
- Infancy and Childhood 164

- Social Development in Childhood and Adolescence 165
- Adulthood 167
- Old Age 168
- The Psychology of Facing Death 168

IN CLOSING: Social and Emotional Issues through the Life Span 169

- Summary 169
- Key Terms 170
- Review Questions 170
- Gender Influences 171

Module 5.3 Diversity: Gender, Culture, and Family 171

- Gender Influences 171
- Cultural and Ethnic Influences 174
- The Family 176

IN CLOSING: Many Ways of Life 179

- Summary 179
- Key Terms 179
- Review Questions 180

6 Learning 181



Module 6.1 Classical Conditioning 183

- The Behaviorist View in Relation to Learning 183
- Pavlov and Classical Conditioning 184
- Drug Tolerance as an Example of Classical Conditioning 188
- Explanations of Classical Conditioning 190

IN CLOSING: Classical Conditioning Is More than Drooling Dogs 192

- Summary 192
- Key Terms 192
- Review Questions 192

Module 6.2 Operant Conditioning 194

- Thorndike and Operant Conditioning 194
- Reinforcement and Punishment 196
- Additional Phenomena of Operant Conditioning 199
- B. F. Skinner and the Shaping of Responses 199
- Applications of Operant Conditioning 202

IN CLOSING: Operant Conditioning and Human Behavior 203

- Summary 203
- Key Terms 204
- Review Questions 204

Module 6.3 Variations of Learning 205

- Conditioned Taste Aversions 205
- what's the evidence?** 205
- Birdsong Learning 207
- Social Learning 208

IN CLOSING: All Learning Is Not the Same 211

- Summary 211
- Key Terms 211
- Review Questions 211

7 Memory 213

Module 7.1 Types of Memory 215

- Ebbinghaus's Pioneering Studies of Memory 215
- Methods of Testing Memory 216
- Application: Suspect Lineups as Recognition Memory 218
- Children as Eyewitnesses 219
- The Information-Processing View of Memory 220
- Working Memory 223

IN CLOSING: Varieties of Memory 224

- Summary 224
- Key Terms 224
- Answer to Other Question in the Module 224
- Review Questions 225

Module 7.2 Encoding, Storage, and Retrieval 226

- Encoding 226
- How to Organize Your Studying 230
- Mnemonic Devices 231

- Storage 232
- Retrieval 233

IN CLOSING: Improving Your Memory 236

- Summary 236
- Key Terms 236
- Answers to Other Questions in the Module 236
- Review Questions 237

Module 7.3 Forgetting 238

- Retrieval and Interference 238
- A Controversy: "Recovered Memories" or "False Memories"? 239
- what's the evidence? 240
- Amnesia 242

IN CLOSING: Memory Loss and Distortion 246

- Summary 246
- Key Terms 247
- Review Questions 247



8 Cognition and Language 249

Module 8.1 Attention and Categorization 251

- Research in Cognitive Psychology 251
- what's the evidence? 251
- Attention 252
- Attention Deficit Disorder 256
- Categorizing 257

IN CLOSING: Thinking about Attention and Concepts 260

- Summary 260
- Key Terms 261
- Answers to Other Questions in the Module 261
- Review Questions 261

Module 8.2 Solving Problems and Making Decisions 262

- Two Types of Thinking and Problem Solving 263
- Other Common Errors in Human Cognition 265
- Expertise 268

IN CLOSING: Successful and Unsuccessful Problem Solving 271

- Summary 271
- Key Terms 272
- Answers to Other Questions in the Module 272
- Review Questions 273

Module 8.3 Language 274

- Nonhuman Precursors to Language 274
- Human Specializations for Learning Language 276
- Language Development 277
- Understanding Language 279
- Reading 281

IN CLOSING: Language and Humanity 284

- Summary 284
- Key Terms 285
- Review Questions 285



9 Intelligence 287



Module 9.1 Intelligence and Intelligence Tests 289

- Defining Intelligence 289
- IQ Tests 292
- Individual Differences in IQ Scores 294

IN CLOSING: Measuring Something We Don't Fully Understand 297

- Summary 297
- Key Terms 298
- Answers to Other Question in the Module 298
- Review Questions 298

Module 9.2 Evaluation of Intelligence Tests 299

- The Standardization of IQ Tests 299
- Evaluation of Tests 302
- Are IQ Tests Biased? 304

what's the evidence? 306

IN CLOSING: Consequences of Testing 307

- Summary 308
- Key Terms 308
- Review Questions 308

10 Consciousness 311



Module 10.1 Conscious and Unconscious Processes 313

- Measuring Consciousness 313
- Brain Activity, Conscious or Unconscious 314
- Can We Use Brain Measurements to Infer Consciousness? 316

Consciousness and Action 317

what's the evidence? 317

What Is the Purpose of Consciousness? 319

IN CLOSING: Research on Consciousness 319

- Summary 319
- Key Terms 320
- Review Questions 320

Module 10.2 Sleep and Dreams 321

- Circadian Rhythms 321
- Why We Sleep 325
- Stages of Sleep 326
- Abnormalities of Sleep 328
- Dreams 330

IN CLOSING: The Mysteries of Sleep and Dreams 333

- Summary 333
- Key Terms 333
- Review Questions 333

Module 10.3 Hypnosis 335

- Ways of Inducing Hypnosis 335
- The Uses and Limitations of Hypnosis 336

what's the evidence? 338

what's the evidence? 338

- Is Hypnosis an Altered State of Consciousness? 339
- Other States of Consciousness 340

IN CLOSING: What Hypnosis Is and Isn't 341

- Summary 341
- Key Terms 341
- Review Questions 341

11 Motivated Behaviors 343

Module 11.1 Work Motivation 345

Views of Motivation 345

Conflicting Motivations 346

Goals and Deadlines 347

what's the evidence? 348

Job Design and Job Satisfaction 350

IN CLOSING: Work and Ambition 353

Summary 353

Key Terms 354

Review Questions 354

Module 11.2 Hunger Motivation 356

The Physiology of Hunger and Satiety 356

Social and Cultural Influences on Eating 359

Eating Too Much or Too Little 360

IN CLOSING: The Complexities of Hunger 363

Summary 363

Key Terms 363

Review Questions 363

Module 11.3 Sexual Motivation 365

What Do People Do and How Often? 365

Sexual Development and Identity 369

Sexual Orientation 371

what's the evidence? 374

IN CLOSING: The Biology and Sociology of Sex 375

Summary 375

Key Terms 375

Review Questions 375



12 Emotions, Stress, and Health 377

Module 12.1 The Nature of Emotion 379

Measuring Emotions 379

Emotion, Arousal, and Action 381

what's the evidence? 382

Do We Have a Few "Basic" Emotions? 384

Usefulness of Emotions 389

Emotional Intelligence 390

IN CLOSING: Research on Emotions 392

Summary 392

Key Terms 392

Answers to Other Questions in the Module 392

Review Questions 393

Module 12.2 A Survey of Emotions 394

Fear and Anxiety 394

Anger and Related Emotions 396

Happiness, Joy, and Positive Psychology 396

Sadness 400

Other Emotions 400

IN CLOSING: Emotions and the Richness of Life 401

Summary 401

Key Terms 401

Review Questions 401

Module 12.3 Stress, Health, and Coping 402

Stress 402

How Stress Affects Health 404

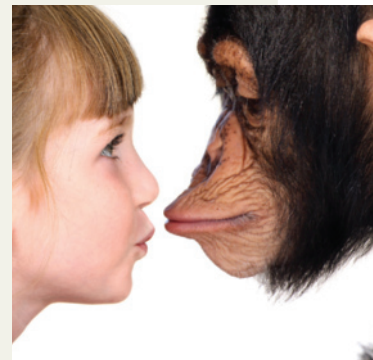
Coping with Stress 405

IN CLOSING: Health Is Mental as Well as Medical 409

Summary 409

Key Terms 409

Review Questions 409



13 Social Psychology 411



Module 13.1 Prosocial and Antisocial Behavior 413

- Morality: Logical or Emotional? 413
- Altruistic Behavior 414
- Accepting or Denying Responsibility toward Others 415
- Violent and Aggressive Behavior 416

IN CLOSING: Is Cooperative Behavior Logical? 419

- Summary 419
- Key Terms 419
- Review Questions 419

Module 13.2 Social Perception and Cognition 421

- First Impressions 421
- Stereotypes and Prejudices 422
- Attribution 424

IN CLOSING: How Social Perceptions Affect Behavior 427

- Summary 427
- Key Terms 428
- Review Questions 428

Module 13.3 Attitudes and Persuasion 429

- Attitudes and Behavior 429
- Mechanisms of Attitude Change and Persuasion 431

IN CLOSING: Persuasion and Manipulation 435

- Summary 435
- Key Terms 436
- Review Questions 436

Module 13.4 Interpersonal Attraction 437

- Establishing Relationships 437
- Marriage and Long-Term Commitments 439

IN CLOSING: Choosing Your Partners Carefully 440

- Summary 441
- Key Terms 441
- Review Questions 441

Module 13.5 Interpersonal Influence 442

- Conformity 442
- Obedience to Authority 444
- what's the evidence? 444
- Group Decision Making 447

IN CLOSING: Fix the Situation, Not Human Nature 448

- Summary 448
- Key Terms 448
- Review Questions 448

14 Personality 449



Module 14.1 Personality Theories 451

- Sigmund Freud and the Psychodynamic Approach 451
- Carl Jung and the Collective Unconscious 456
- Alfred Adler and Individual Psychology 457
- The Learning Approach 458
- Humanistic Psychology 458

IN CLOSING: In Search of Human Nature 460

- Summary 460
- Key Terms 461
- Review Questions 461

Module 14.2 Personality Traits 463

- Personality Traits and States 463
- The Search for Broad Personality Traits 463
- The Big Five Model of Personality 465
- The Origins of Personality 466

IN CLOSING: The Challenges of Classifying Personality 469

- Summary 470
- Key Terms 470
- Review Questions 470

Module 14.3 Personality Assessment 471

Standardized Personality Tests 472

An Objective Personality Test: The Minnesota Multiphasic Personality Inventory 472

The NEO PI-R 473

The Myers-Briggs Type Indicator 473

Projective Techniques 474

Implicit Personality Tests 475

Uses and Misuses of Personality Tests 476

Personality Tests in Action: Criminal Profiling 476

what's the evidence? 477

IN CLOSING: Possibilities and Limits of Personality Tests 478

Summary 479

Key Terms 479

Review Questions 479

15 Abnormal Psychology: Disorders and Treatment 481

Module 15.1 An Overview of Abnormal Behavior 483

Defining Abnormal Behavior 483

DSM and the Categorical Approach to Psychological Disorders 485

IN CLOSING: Is Anyone Normal? 487

Summary 488

Key Terms 488

Review Questions 488

Module 15.2 Anxiety Disorders and Obsessive-Compulsive Disorder 489

Disorders with Excessive Anxiety 489

Phobia 490

what's the evidence? 491

Obsessive-Compulsive Disorder 494

IN CLOSING: Emotions and Avoidance 495

Summary 495

Key Terms 496

Review Questions 496

Module 15.3 Substance-Related Disorders 497

Substance Dependence (Addiction) 497

Alcoholism 498

what's the evidence? 499

Opiate Dependence 501

IN CLOSING: Substances, the Individual, and Society 501

Summary 502

Key Terms 502

Review Questions 502

Module 15.4 Mood Disorders, Schizophrenia, and Autism 503

Depression 503

Bipolar Disorder 507

Schizophrenia 508

Autistic Spectrum Disorder 512

IN CLOSING: Disabling Psychological Disorders 513

Summary 513

Key Terms 513

Review Questions 514

Module 15.5 Treatment of Mental Illness 515

Overview of Psychotherapy 515

Types of Psychotherapy 516

How Effective Is Psychotherapy? 519

Comparing Therapies 520

The Future of Psychotherapy and Prospects for Prevention 521

Social Issues Related to Mental Illness 521

IN CLOSING: The Science and Politics of Mental Illness 523

Summary 523

Key Terms 524

Review Questions 524

Epilogue 525

References 527

Name Index 575

Subject Index/Glossary 589



Some years ago, I was on a plane that had to turn around shortly after takeoff because one of its two engines had failed. When we were told to get into crash position, the first thing I thought was, “I don’t want to die yet! I was looking forward to writing the next edition of my textbook!” True story.

I remember taking my first course in psychology as a freshman at Duke University in 1965. Frequently, I would describe the fascinating facts I had just learned to my roommate, friends, relatives, or anyone else who would listen. I haven’t changed much since then. When I read about new research or think of a new example to illustrate some point, I want to tell my wife, children, and colleagues. Psychology is fun. Although I retired from teaching after 35 years at North Carolina State University, I still volunteer to “pinch hit” when any of my colleagues are ill or out of town. I wake up in the morning and think, “Wow! I get to teach about optical illusions today!” or “Great! Today’s topic is emotions!” Do professors in other fields enjoy teaching so much? Does someone in the French department wake up thinking how exciting it will be to teach about adverbs today? I doubt it.

Ideally, a course or textbook in psychology should accomplish two goals. The first is to instill a love of learning so that our graduates will continue to update their education. Even if students permanently remembered everything they learned—and of course they won’t—their understanding would gradually go out of date unless they continue to learn about new developments. I hope that some of our students occasionally read *Scientific American Mind* or similar publications. The second goal is to teach students the skills of evaluating evidence and questioning assertions, so that when they do read about some new research, they will ask the right questions before drawing a conclusion. That skill can carry over to fields other than psychology.

Throughout this text, I have tried to model the habit of critical thinking or evaluating the evidence, particularly in the **What’s the Evidence?** features that describe research studies in some detail. I have pointed out the limitations of the evidence and the possibilities for alternative interpretations. The goal is to help students ask their own questions, distinguish between good and weak evidence, and ultimately, appreciate the excitement of psychological inquiry.

Approaches, Features, and Student Aids

Many years ago, I read an educational psychology textbook that said children with learning disabilities and attention problems learn best from specific, concrete examples. I remember thinking, “Wait a minute. I do, too! Don’t we *all* learn best from specific, concrete examples?” For this reason, science classes use laboratories to let students see for themselves. Few introductory psychology classes offer laboratories, but we can nevertheless encourage students to try procedures that require little or no equipment. At various points, the text describes simple **Try It Yourself** exercises, such as negative afterimages, binocular rivalry, encoding specificity, and the Stroop effect. Additional activities are available as **Online Try It Yourself** activities on MindTap. Students who try these activities will understand and remember the concepts far better than if they merely read about them.

Cognitive psychology researchers find that we learn more if we alternate between reading and testing than if we spend the same amount of time reading. The **Concept Checks** pose questions that attentive readers should be able to answer. Students who answer correctly can feel encouraged. Those who miss a question should use the feedback to reread the relevant passages.

Each chapter of this text is divided into two to five modules, each with its own summary. Modules provide flexibility for instructors who wish to take sections in a different order—for example, operant conditioning before classical conditioning—or who wish to omit a section. Modular format also breaks up the reading assignments so that students read one or two modules for each class. Key terms are listed at the end of each module. At the end of the text, a combined Subject Index and Glossary defines key terms and provides page references.

Education was long a traditional field in which the procedures hardly changed since the invention of chalk. Today, however, educators use the power of new technologies, and this text offers several important technological enhancements. The digital MindTap for *Introduction to Psychology* includes online Try It Yourself exercises as well as an integrated eBook, videos with assessment, mastery training, validated essay assignments, quizzes, and an online glossary.

What's New in the Eleventh Edition?

Anyone familiar with previous editions will notice two changes in the format: A list of learning objectives starts each module, and a few multiple-choice review questions end each module.

This edition has more than 600 new references, including more than 500 from 2012 or later. Nearly every topic in the book has at least a minor revision or update. The three modules of Chapter 2 were combined into two, and the first module of Chapter 10 was substantially reorganized. A few new topics were added, including social neuroscience, individual differences in taste and smell, and how to take notes in class. Many topics were substantially revised, including replicability, epigenetics, and autism. Many of the figures are new or revised. Here are a few of my favorite new studies:

- Hearing loss in old age occurs not only in the ears, but also in the brain. A decrease of inhibitory synapses makes it harder to attend to one voice among many, and the auditory cortex may deteriorate from insufficient input, such as when someone delays getting hearing aids. (Chapter 4)
- The “collectivist attitude” typical of Asian cultures is stronger in some parts of China than others, and correlates strongly with a history of rice farming. Unlike wheat farming, rice farming requires extensive cooperation among neighboring farmers. (Chapter 5)
- In contrast to the previous view that expertise results from 10,000 hours of practice, new research clearly demonstrates important individual differences. Some chess players reach expert levels after only 3,000 hours of practice, whereas others fail to achieve expertise after 25,000 hours. (Chapter 8)
- The brain mechanisms for self-initiated (“spontaneous”) movements differ from those for stimulus-elicited movements, and self-initiated movements almost always have a slow, gradual onset. That finding is critical for interpreting Libet’s study reporting that brain activity for a muscle movement starts before a conscious decision to move. The problem is that a conscious decision for a spontaneous movement, like the movement itself, is gradual and hard to pinpoint in time. (Chapter 10)
- People at an all-you-can-eat buffet tend to eat until they think they got their money’s worth. People given a half-off coupon to a pizza buffet ate less than others did, on average. (Chapter 11)
- People with anorexia nervosa seldom experienced depression or any other psychological

troubles prior to becoming anorexic, and treating them for depression is generally ineffective in relieving anorexia. A new study starts with the assumption that the decreased eating is the original problem, and that the increased activity characteristic of anorexia is an unconscious attempt for temperature control. (Chapter 11)

- Sex hormones influence the differentiation of several brain areas, but the chemical mechanisms differ from one brain area to another. Therefore, it is common for a person to be more masculinized or more feminized in one brain area than another, just as someone can be behaviorally more male-typical in some ways and more female-typical in others. (Chapter 11)
- A woman with damage to her amygdala previously seemed unable to experience fear or anxiety. A new study shows that she feels intense anxiety in response to breathing concentrated carbon dioxide. The amygdala damage doesn’t prevent fear; it just blocks processing cognitive information relating to fear. (Chapter 12)
- More recent birth cohorts report greater life satisfaction than older birth cohorts, at all ages. (Chapter 12)
- Love doesn’t always fade over time. Many older couples continue to experience passionate love. (Chapter 13)

Teaching and Learning Supplements

You’re familiar with those television advertisements that offer something, usually for \$19.95, and then say, “But wait, there’s more!” Same here. In addition to the text, the publisher offers many supplements:

MindTap

MindTap for *Introduction to Psychology*, 11th edition, creates a unique learning path that fosters increased comprehension and efficiency. It engages students and empowers them to produce their best work—consistently. In MindTap, course material is seamlessly integrated with videos, activities, apps, and more.

In MindTap instructors can:

- control the content. Instructors select what students see and when they see it.
- create a unique learning path. In MindTap, the *Introduction to Psychology* text is enhanced with multimedia and activities to encourage and motivate learning and retention, moving students up the learning taxonomy. Materials can be used

as-is or modified to match exactly with an instructor's syllabus.

- integrate their own content. Instructors can modify the MindTap Reader using their own documents or pulling from sources like RSS feeds, YouTube videos, websites, Google Docs, and more.
- follow student progress. Powerful analytics and reports provide a snapshot of class progress, time students spend logging into the course, and completion to help instructors assess level of engagement and identify problem areas.

Test Bank, powered by Cognition Instant Access.

Written by the author himself, the test bank for *Introduction to Psychology* consists entirely of new or reworded items, with an emphasis on clarity. Nearly all items are worded in the form of a question, and none of them include an “all of the above” or “none of the above” choice. The test bank also includes a special file of items that cut across chapters, intended for inclusion on a comprehensive final exam. That bank is also available in Cognition electronic format.

Online Instructor's Resource Manual is both thorough and creative. It includes suggestions for class demonstrations and lecture material, organized by chapter to allow instructors to easily identify resources to enhance lectures and facilitate learning.

Online PowerPoint® Lecture slide decks are designed to facilitate instructors' use of PowerPoint® in lectures. Slides are provided for each chapter, and contain main concepts, with figures, graphics, and tables to visually illustrate main points from the text. The notes section of the slide provides guidelines and text references to support lecture preparation. Slides have been designed to be easily modifiable for instructors to customize with their own materials.

Acknowledgments

To begin the job of writing a textbook, a potential author needs self-confidence bordering on arrogance and, to complete it, the humility to accept criticism of favorite ideas and carefully written prose. A great many people provided helpful suggestions that made this a far better text than it would have been without them.

My acquisitions editor, Clayton Austin, has been very helpful and supportive throughout the preparation of this edition. I have been delighted to work with Michelle Newhart, my developmental editor, who provided helpful, intelligent advice on everything from the big picture to the details. I thank them for their tireless help.

I greatly appreciate the detailed work of the copy editor, Heather McElwain. Jill Traut and Samen Iqbal did a marvelous job of supervising the production, a complicated task with a book such as this. Vernon Boes, the art director, and Jeanne Calabrese, who designed the cover and interior, had the patience and artistic judgment to counterbalance this very nonartistic author. Andrew Ginsberg planned and executed the marketing strategies. The photo and text researchers at Lumina Datamatics skillfully researched and managed the permissions requests. To each of these, my thanks and congratulations.

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Many reviewers provided helpful and insightful comments. Each edition builds on contributions from reviewers of previous editions. I would like to thank the following reviewers who contributed their insight to one or more editions:

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James W. Kalat

Welcome to introductory psychology! I hope you will enjoy reading this text as much as I enjoyed writing it. I have tried to make this book as interesting and as easy to study as possible.

Features of This Text

Modular Format

Each chapter is divided into two or more modules so that you can study a limited section at a time. Each chapter begins with a table of contents and a list of learning objectives. At the end of each module is a summary of important points, a list of key terms, and a few multiple-choice questions. Although the multiple-choice questions are listed at the end, you may find it a good strategy to try answering them before you read the module. Trying the questions at the start will prime you to pay attention to those topics. Do not assume that the summary points and the review questions include everything you should learn! They are only a sampling.

Key Terms

When an important term first appears in the text, it is highlighted in **boldface** and defined in *italics*. All the boldface terms are listed alphabetically at the end of each module. They appear again with definitions in the combined Subject Index and Glossary at the end of the book. You might want to find the Subject Index and Glossary right now and familiarize yourself with it.

I sometimes meet students who think they have mastered the course because they have memorized the definitions. The title of the course is “psychology,” not “vocabulary.” You do need to understand the defined words, but don’t memorize the definitions word for word. It would be better to try to think of examples of each term. Better yet, when appropriate, think of evidence for or against the concept that the term represents.

Questions to Check Your Understanding

People remember material better if they alternate between reading and testing than if they spend the whole time reading. (We’ll consider that point again in the chapter on memory.) At various points in this

text are Concept Checks, questions that ask you to use or apply the information you just read. Try to answer each of them before reading the answer. If your answer is correct, you can feel encouraged. If it is incorrect, you should reread the section. In MindTap, Mastery Training is an adaptive tool that allows you to practice concepts over time. As you practice, questions adjust to focus on the items where you need the most review. Reminders help you optimize studying by reviewing at times when it will be most beneficial.

Try It Yourself Activities

The text includes many items marked “Try It Yourself.” Most of these can be done quickly with little or no equipment. Online Try It Yourself activities are also available on MindTap. These are like the Try It Yourself activities in the text, except that they include sounds and motion. The description of a psychological principle will be easier to understand and remember after you have experienced it yourself.

“What’s the Evidence?” Features

With the exception of the introductory chapter, every chapter includes a section titled “What’s the Evidence?” These features highlight research studies in more detail, specifying the hypothesis (idea being tested), research methods, results, and interpretation. In some cases, the discussion also mentions the limitations of the study. These sections provide examples of how to evaluate evidence.

MindTap

MindTap for *Introduction to Psychology* creates a unique learning path that fosters increased comprehension and efficiency. It engages students and empowers them to produce their best work—consistently. In MindTap, course material is seamlessly integrated with videos, activities, apps, and more.

- MindTap delivers real-world relevance with activities and assignments designed to help students build critical thinking and analytical skills that can be applied to other courses and to their professional lives.
- MindTap serves as a single destination for all course materials, so students stay organized and efficient, and have the necessary tools to master the content.

- MindTap shows students where they stand at all times—both individually and compared to the highest performers in class. This information helps to motivate and empower performance.

Indexes and Reference List

A section at the back of the book lists the references cited in the text in case you want to check something for more details. The combined Subject Index and Glossary defines key terms and indicates where in the book to find more information. The name index provides the same information for all names mentioned in the text.

Answers to Some Frequently Asked Questions

Do you have any useful suggestions for improving study habits? Whenever students ask me why they did badly on the last test, I ask, “When did you read the assignments?” The typical answer is that they read everything the night before the test. If you want to learn the subject matter well, read the assigned material before the lecture, review it again after the lecture, and quickly go over it again a few days later. Then reread the textbook assignments and your lecture notes before a test. Memory researchers have established that you will understand and remember something better by studying it several times spread out over days than by studying the same amount of time all at once. Also, of course, the more total time you spend studying, the better.

When you study, don’t just read the text but stop and think about it. The more actively you use the material, the better you will remember it. One way to improve your studying is to read by the SPAR method: **S**urvey, **P**rocess meaningfully, **A**sk questions, **R**eview.

Survey: Know what to expect so that you can focus on the main points. When you start a module, first look over the learning objectives. It also helps if you turn to the end and read the summary and try to answer the review questions.

Process meaningfully: Read the chapter carefully, stopping to think from time to time. Tell your roommate something you learned. Think about how you might apply a concept to a real-life situation. Pause when you come to the Concept Checks and try to answer them. Do the Try It Yourself exercises. Try to monitor how well you understand the text and adjust your reading accordingly. Good readers read quickly through easy, familiar content but slowly through difficult material.

Ask questions: When you finish the chapter, try to anticipate what questions your instructor would

ask on a test. What questions would you ask, if you were the professor? Write out the questions, think about them, and hold them for later.

Review: Pause for at least an hour, preferably a day or two. Now return to your questions and try to answer them. Check your answers against the text. Reinforcing your memory a day or two after you first read the chapter will help you retain the material longer and deepen your understanding. If you study the same material several times at lengthy intervals, you increase your chance of remembering it long after the course is over.

What do those parentheses mean, as in “(Ferguson, 2013)”? Am I supposed to remember the names and dates? Psychologists generally cite references in the text in parentheses rather than in footnotes. “(Ferguson, 2013)” refers to an article written by Ferguson, published in 2013. All the references cited in the text are listed in alphabetical order (by the author’s last name) in the References section at the back of the book. You will also notice a few citations that include two dates separated by a slash, such as “(Wundt, 1862/1961).” This means that Wundt’s document was originally published in 1862 and was republished in 1961. No, you should not memorize the parenthetical source citations. They are provided so interested readers can look up the source of a statement and check for further information. The names that *are* worth remembering, such as B. F. Skinner, Jean Piaget, and Sigmund Freud, are emphasized in the discussion itself.

Can you help me read and understand graphs? You will encounter four kinds of graphs in this text: pie graphs, bar graphs, line graphs, and scatter plots. Let’s look at each kind.

A *pie graph* shows the components of a whole.

Figure 1 shows the proportion of psychologists who work in various settings. It shows that many are self-employed, almost as many work in colleges and other educational institutions, and a slightly smaller number work in hospitals and other health care institutions.

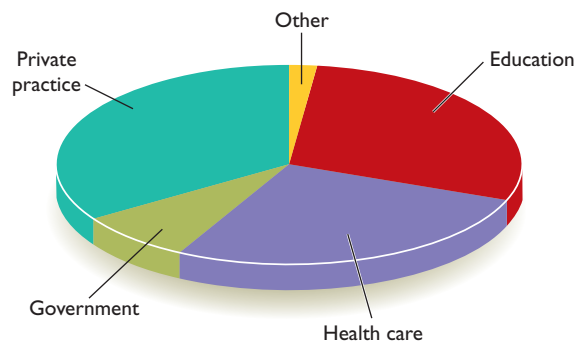


Figure 1

Bar graphs show measurements for two or more groups. Figure 2 shows how much unpleasantness three groups of women reported while they were waiting for a painful shock. The unpleasantness was least if a woman could hold her husband's hand while waiting, intermediate if she held a stranger's hand, and most if she was by herself.

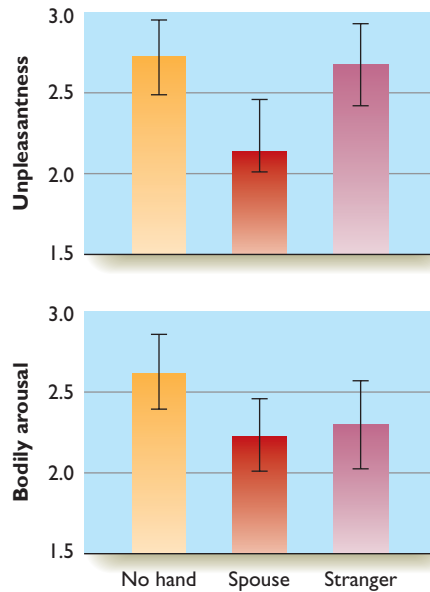


Figure 2

Line graphs show how one variable relates to another variable. Figure 3 shows measurements of conscientiousness in people from age 10 to 80. The upward slope of the line indicates that older people tend to be more conscientious than younger people, on average.

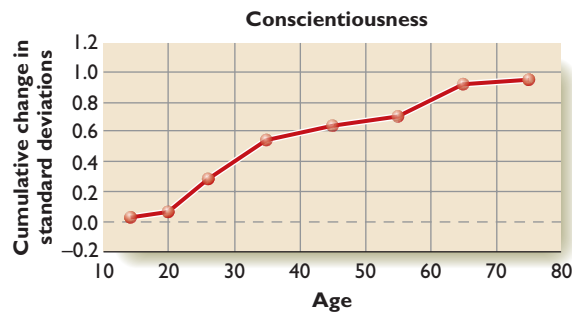


Figure 3

Scatter plots are similar to line graphs, with this difference: A line graph shows averages, whereas a scatter plot shows individual data points. By looking at a scatter plot, we can see how much variation occurs among individuals.

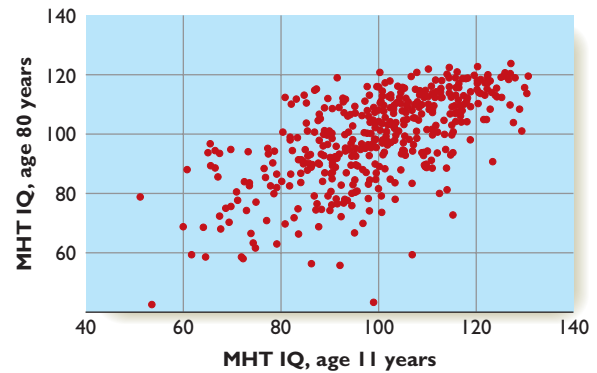


Figure 4

To prepare a scatter plot, we make two observations about each individual. In Figure 4, each person is represented by one point. If you take that point and scan down to the *x*-axis, you find that person's score on an IQ test at age 11. If you then scan across to the *y*-axis, you find that person's score on a similar test at age 80. You can see about how consistent most people's scores are over a lifetime.

We may have to take multiple-choice tests on this material. How can I do better on those tests?

1. Read each choice carefully. Do not choose the first answer that looks correct; first make sure that the other answers are wrong. If two answers fit with what you know, decide which of the two is better.
2. If you don't know the correct answer, make an educated guess. An answer that includes absolute words such as "always" or "never" is probably wrong. Also eliminate any answer that includes unfamiliar terms. If you have never heard of something, it is probably not the right answer. Remember, every test question is about something presented either in lecture or in the text.

3. After you finish, don't be afraid to go back and reconsider your answers. Students have been telling each other for decades that "you should stick with your first answer," but research says that most people who change their answers improve their scores. When you examine a question a second time, you sometimes discover that you misunderstood it the first time.

Last Words Before We Start . . .

Most of all, I hope you enjoy the text. I have tried to include the liveliest examples I can find. The goal is not just to teach you some facts but also to teach you a love of learning so that you will continue to read more and educate yourself about psychology long after your course is over.

James W. Kalat

1

What Is Psychology?



Jaume Llorens/Getty Images

MODULE 1.1 Psychologists' Goals

General Points about Psychology
Major Philosophical Issues in Psychology
What Psychologists Do
Should You Major in Psychology?
In Closing: Types of Psychologists

MODULE 1.2 Psychology Then and Now

The Early Era
The Rise of Behaviorism
From Freud to Modern Clinical Psychology
Recent Trends
In Closing: Psychology through the Years



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Even when the people we trust seem very confident of their opinions, we should examine their evidence or reasoning.

If you are like most students, you start off assuming that nearly everything you read in your textbooks and everything your professors tell you must be true. What if it isn't? Suppose impostors have replaced your college's faculty.

They pretend to know what they are talking about and they all vouch for one another's competence, but in fact, they are all unqualified. They managed to find textbooks that support their prejudices, but those textbooks are full of false information, too. If so, how would you know?

While we are entertaining such skeptical thoughts, why limit ourselves to colleges? When you read books and magazines or listen to political commentators, how do you know who has the right answers?

No one has the right answers all of the time. One professor starts his first day of class by saying, "At least 10 percent of what I tell you will be wrong. But I don't know which 10 percent it is." Sometimes even the best and most conscientious individuals discover to their embarrassment that a confident opinion was wrong. I don't mean to imply that you should disregard everything you read or hear. But you should expect people to tell you the reasons for their conclusions, so that you can decide which ones to follow with high confidence and which to treat as little better than a guess.

You have just encountered the theme of this book: Evaluate the evidence. You will hear all sorts of claims concerning psychology, as well as medicine, politics, religion, and other fields. Some are valid, some are wrong, some are hard to evaluate for sure, many are valid under certain conditions, and some are too vague to be either right or wrong. When you finish this book, you will be in a better position to examine evidence and decide which claims to take seriously.

module 1.1

Psychologists' Goals



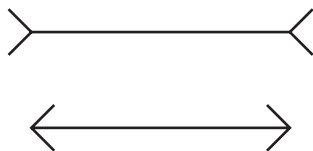
After studying this module, you should be able to:

- Discuss three major philosophical issues important to psychology.
- Distinguish psychology from psychiatry and psychoanalysis.
- Give examples of specializations in psychology, for both research and practice.

Your history text probably doesn't spend much time discussing what the term *history* means, and I doubt that a course on English literature spends the first day defining literature. Psychology is different because so many people have misconceptions about this field. I remember a student who asked when we would get to the kind of psychology he could "use on" people. Another young man bluntly asked me (in my office, not publicly) whether I could teach him tricks to seduce his girlfriend. I told him that (1) psychologists don't try to trick people into doing something against their better judgment, (2) if I did know tricks like that, ethically I couldn't tell him about them, and (3) if I knew powerful tricks to control behavior *and* I had no ethics, I would probably use those powers for my own profit instead of teaching introduction to psychology!

The term *psychology* derives from the Greek roots *psyche*, meaning "soul" or "mind," and *logos*, meaning "word." Psychology is literally the study of the mind or soul, and people defined it that way until the early 1900s. Around 1920, psychologists became disenchanted with the idea of studying the mind. First, research deals with what we observe, and mind is unobservable. Second, talking about "the mind" implies it is a thing or object. Mental activity is a process. It is not like the river but like the flow of the river; not like the automobile but like the movement of the automobile. Beginning in the early 1900s, psychologists defined their field as the study of behavior.

Certainly the study of behavior is important, but is behavior the only thing we care about? When you look at this optical illusion and say that the horizontal part of the top line looks longer than that of the bottom line (although really they are the same length), we wonder why the line *looks* longer, not just why you *said* it looks longer. So as a compromise, let's define **psychology** as *the systematic study of behavior and experience*. The word *experience* lets us discuss your perceptions without implying that a mind exists independently of your body.



When most people think of psychologists, they think of clinical psychologists—those who try to help worried, depressed, or otherwise troubled people. Clinical psychology is only one part of psychology. Psychology also includes research on sensation and perception, learning and memory, hunger and thirst, sleep, attention, child development, and more. Perhaps you expect that a course in psychology will teach you to "analyze" people and decipher hidden aspects of their personality. It will not. You will learn to understand many aspects of behavior, but you will gain no dazzling powers. Ideally, you will become more

skeptical of those who claim to analyze people's personality from small samples of their behavior.

General Points about Psychology

Let's start with three of the most general statements about psychology. Each of these will arise repeatedly throughout this text.

"It Depends"

Hardly anything is true about the behavior of all people all the time. Almost every aspect of behavior depends on age. Infants differ from children, who differ from young adults, who differ from older adults. Behavior also varies with people's genetics, health, past experiences, and whether they are currently awake or asleep. In some ways, behavior differs between males and females or from one culture to another. Some aspects depend on the time of day, the temperature of the room, or how recently someone ate. How someone answers a question depends on the exact wording of the question, the wording of the previous question, and who is asking the questions.

If psychology regards "it depends" as a general truth, you may infer that psychology really doesn't know anything. On the contrary, "it depends" is a serious point. The key is to know *what* it depends on. The further you pursue your studies of psychology, the more you will become attuned to the wealth of subtle influences that people easily overlook. Here is an example: Decades ago, two psychology laboratories were conducting similar studies on human learning but reporting contradictory results. Both researchers were experienced and highly respected, they thought they were following the same procedures, and they did not understand why their results differed. Eventually, one of them traveled to the other's university to watch the other in action. Almost immediately, he noticed a key difference in procedure: the chairs in which the participants sat! His colleague at the other university had obtained chairs from a retired dentist. So the research participants were sitting in *dentist's* chairs, during an era when dental procedures were often painful. The participants were sitting there in a state of heightened anxiety, which altered their behavior (Kimble, 1967).

Progress Depends on Good Measurement

Nobel Prize-winning biologist Sydney Brenner was quoted as saying, “Progress in science depends on new techniques, new discoveries, and new ideas, probably in that order” (McElheny, 2004, p. 71). In any field, from astronomy to zoology, new discoveries and ideas depend on good measurements. Psychologists’ understanding has advanced fastest on topics such as sensory processes, learning, and memory, which researchers can measure fairly accurately. Research progress has been slower in such areas as emotion and personality, where we struggle to find clear definitions and accurate measurements. As you proceed through this text, you will note occasional issues such as, “How well do IQ scores really measure intelligence?” or “Are people as happy as they say they are?” Areas of psychology with less certain measurement have less definite conclusions and slower progress.

Confidence in the Conclusions Should Depend on the Strength of the Evidence

Is it all right for young children to spend many hours a day watching television? How much is too much? Is it sometimes all right to spank a child? What should be the limits, if any, on teenagers playing violent video games? To what extent do the behavioral differences between men and women reflect biological influences? You probably have opinions on these questions, and so do many psychologists. However, in many cases, the evidence is not nearly as strong as the confident opinions imply (Ferguson, 2013). It is important to distinguish between opinions based on strong evidence and those based on less. When this text describes research studies in some detail, the reason is to give you an idea of how strong the research evidence is (or isn’t) behind some conclusion.

Major Philosophical Issues in Psychology

Psychology began in the late 1800s as an attempt to apply scientific methods to certain questions of the philosophy of mind. Three of the most profound philosophical questions related to psychology are free will versus determinism, the mind–brain problem, and the nature–nurture issue.

Free Will versus Determinism

The scientific approach to anything, including psychology, assumes that we live in a universe of cause and effect. If things “just happen” for no reason at



Rick Doyle / CORBIS

Behavior is guided by external forces, such as waves, and by forces within the individual. According to the determinist view, even those internal forces follow physical laws.

all, then we have no hope of discovering scientific principles. That is, scientists assume **determinism**, *the idea that everything that happens has a cause, or determinant, that someone could observe or measure*. This view is an assumption, not a certainty, but the success of scientific research attests to its value.

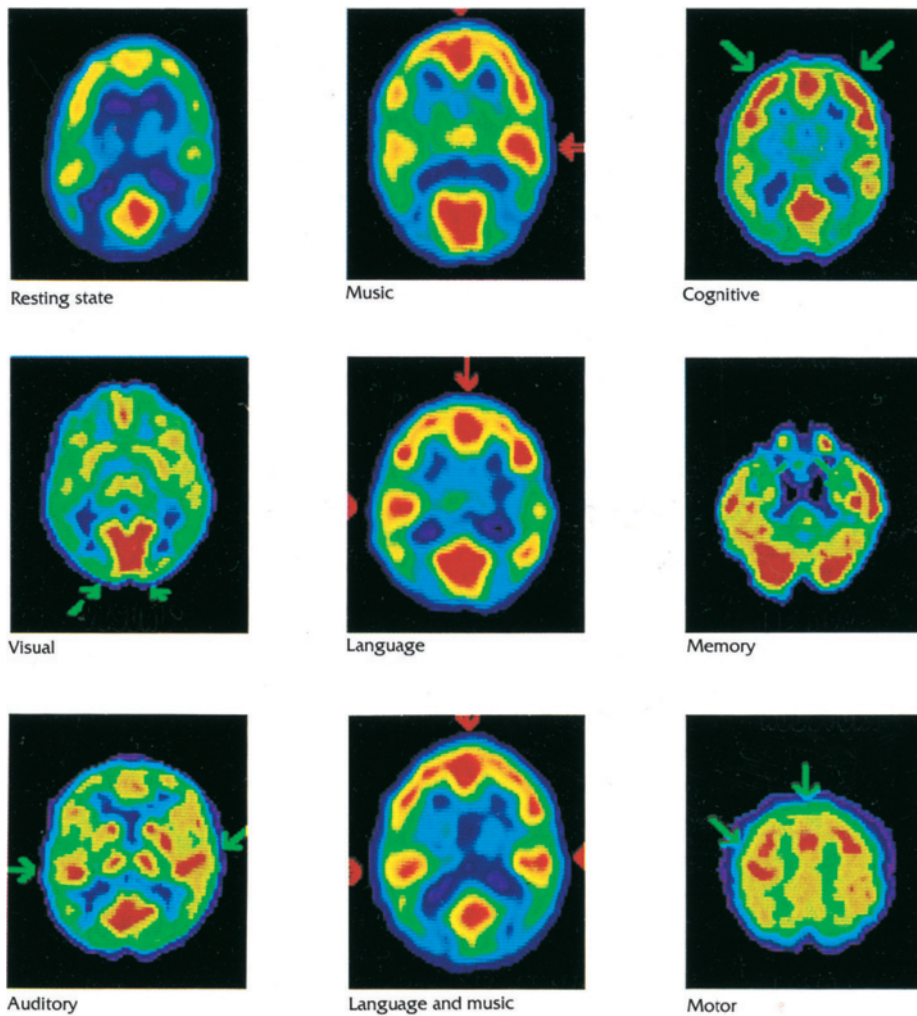
Does it apply to human behavior? We are, after all, part of the physical world. According to the determinist assumption, everything we do has causes. This view seems to conflict with the impression all of us have that “I make the decisions about my actions. Sometimes, when I am making a decision, like what to eat for lunch or which sweater to buy, I am in doubt right up to the last second. The decision could have gone either way.” *The belief that behavior is caused by a person’s independent decisions* is known as **free will**. Do you think your behavior is predictable? How about other people’s behavior? Questionnaires show that most people think their own behavior is less predictable than other people’s. That is, you think you have free will, but other people, not so much (Pronin & Kugler, 2010).

Some psychologists maintain that free will is an illusion (Wegner, 2002): What you call a conscious intention is more a prediction than a cause of your behavior. When you have the experience of deciding to move a finger, the behavior has already started to happen, controlled unconsciously. We shall explore the evidence for this idea later, in Chapter 10.

Other psychologists and philosophers reply that you do make decisions, in the sense that something within you initiates the action (Baumeister, 2008). When a ball bounces down a hill, its motion depends on the shape of the hill. When you run down a hill, you could change direction if you saw a car coming toward you, or a snake lying in your path. The ball could not.

Nevertheless, the “you” that makes your decisions is itself a product of your heredity and the events of your life. (You did not create yourself.) In a sense, yes, you have a will, an ability to make choices (Dennett, 2003). But your will is the product of your heredity and experiences. It did not emerge from nothing. Whether you do or do not have free will depends on what you mean by “free.”

The test of determinism is ultimately empirical: If everything you do has a cause, your behavior should be predictable. Behavior is clearly predictable in some cases, such as reflexes. However, ordinarily psychologists’ predictions are more like predicting the weather. The predictions are nearly accurate most of the time, but they cannot be accurate in every detail, simply because so many small influences are operating.



◀ **Figure 1.1** These PET scans show the brain activity of normal people during different activities. Red indicates the highest activity, followed by yellow, green, and blue. Arrows indicate the most active areas.

Courtesy of Michael E. Phelps and John C. Mazziotta, University of California, Los Angeles, School of Medicine

Researchers admit one point: Although determinism makes sense theoretically and leads to good research, it doesn't work well as a philosophy of life. One study provides a good illustration of this point: Psychologists asked people to read one of two passages. Some read an argument for determinism, and others read a paper on an irrelevant topic. The participants were then put in a situation in which it would be easy to cheat to gain a personal advantage. A higher percentage of those who had read the determinism essay cheated (Vohs & Schooler, 2008). Apparently, they felt less sense of personal responsibility.

The Mind–Brain Problem

Given that we live in a universe of matter and energy, what, if anything, is the mind? And why does consciousness exist? The *philosophical question of how experience relates to the brain* is the **mind–brain problem** (or mind–body problem). One view, called **dualism**, holds that *the mind is separate from the brain but somehow controls the brain and therefore the rest of the body*. However, dualism contradicts the law of conservation of matter and energy, one of the cornerstones of physics. According to that principle, the only way to influence any matter or energy, including the matter and energy that compose your body, is to act on it with other matter or energy. If the mind isn't composed of matter or energy, it cannot *do* anything. For that reason, nearly all brain researchers and philosophers favor **monism**, *the view that conscious experience is inseparable from the physical brain*. That is, mental activity is brain activity. So far as we can tell, consciousness cannot exist without brain activity, and presumably it is also true that certain kinds of brain activity cannot exist without consciousness. The

mind–brain problem inspires much research, some of which we shall consider in Chapter 3 on the brain and Chapter 10 on consciousness.

The photos in ▲ **Figure 1.1** show brain activity while a person participated in nine tasks, as measured by a technique called positron-emission tomography (PET). Red indicates the highest degree of brain activity, followed by yellow, green, and blue. As you can see, the various tasks increased activity in different brain areas, although all areas showed some activity at all times (Phelps & Mazziotta, 1985). You might ask: Did the brain activity cause the thoughts, or did the thoughts cause the brain activity? Most brain researchers reply, “Neither,” because brain activity and mental activity are the same thing.

Even if we accept this position, we are still far from understanding the mind–brain relationship. What type of brain activity is associated with consciousness? Why does conscious experience exist at all? Could a brain get along without consciousness? Research studies are not about to put philosophers out of business, but results do constrain the philosophical answers that we can seriously consider.



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Lawrence Manning/Corbis

Why do different children develop different interests? They had different hereditary tendencies, but they also had different experiences. Separating the roles of nature and nurture is difficult.

The Nature–Nurture Issue

Why do most little boys spend more time than little girls with toy guns and trucks and less time with dolls? Is it because of biological differences or because parents rear their sons and daughters differently?

Alcohol abuse is common in some cultures and rare in others. Are these differences entirely a matter of social custom, or do genes influence alcohol use also?

Certain psychological disorders are more common in large cities than in small towns and in the countryside. Does life in crowded cities cause psychological disorders? Or do people develop such disorders because of a genetic predisposition and then move to big cities in search of jobs, housing, and welfare services?

Each of these questions relates to the **nature–nurture issue** (or heredity–environment issue): *How do differences in behavior relate to differences in heredity and environment?* The nature–nurture issue shows up in various ways throughout psychology, and it seldom has a simple answer.



1. What is meant by determinism?
2. What type of evidence supports monism?

Answers

1. Determinism is the assumption that everything that happens has a cause.
 2. Every type of mental activity is associated with some type of measurable brain activity. Also, as discussed in Chapter 3, any type of brain damage leads to a deficit in some aspect of behavior or experience.

What Psychologists Do

We have considered some major philosophical issues related to psychology in general. However, most psychologists deal with smaller, more manageable questions. They work in many occupational settings, as shown in ▼ **Figure 1.2**. The most common settings are colleges and universities, private practice, hospitals and mental health clinics, and government agencies.

Service Providers to Individuals

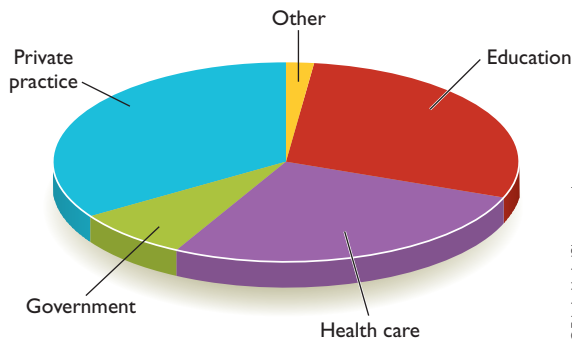
It is important to distinguish between several types of mental health professionals. Some of the main kinds of service providers for people with psychological troubles are clinical psychologists, psychiatrists, social workers, and counseling psychologists.

Clinical Psychology

Clinical psychologists have an advanced degree in psychology (master's degree, doctor of philosophy [PhD], or doctor of psychology [PsyD]), with a specialty in understanding and helping people with psychological problems. Those problem range from depression, anxiety, and substance abuse to marriage conflicts, difficulties making decisions, or even the feeling that “I should be getting more out of life.” Clinical psychologists try, in one way or another, to understand why a person is having problems and then help that person overcome the difficulties. Some clinical psychologists are college professors and researchers, but most are full-time practitioners. A little over half of all new PhDs are for specialists in clinical psychology or other health-related fields.

Psychiatry

Psychiatry is a branch of medicine that deals with emotional disturbances. To become psychiatrists, students first earn a medical doctor (MD) degree and then take an additional four years of residency training in psychiatry. Because psychiatrists are medical doctors, they can prescribe drugs, such as antidepressants, whereas most psychologists cannot. In the United States, a few states now permit psychologists with a couple years of additional training to prescribe drugs.



▲ **Figure 1.2** Psychologists work in a variety of settings. (Based on data from U.S. Department of Labor, 2008)

More psychiatrists than clinical psychologists work in mental hospitals, and psychiatrists more often treat clients with severe disorders.

Does psychiatrists' ability to prescribe drugs give them an advantage over psychologists in places where psychologists cannot prescribe them? Not always. Drugs can be useful, but relying heavily on them can be a mistake. Whereas a typical visit to a clinical psychologist includes an extensive discussion of the client's troubles, many visits to a psychiatrist focus mainly on checking the effectiveness of a drug and evaluating its side effects. A survey found that over the years, fewer and fewer psychiatrists have been providing talk therapy (Mojtabai & Olfson, 2008).

Other Mental Health Professionals

Several other kinds of professionals also provide help and counsel. **Psychoanalysts** are *therapy providers who rely heavily on the theories and methods pioneered by the early 20th-century Viennese physician Sigmund Freud and later modified by others*. Freud and his followers attempted to infer the hidden, unconscious, symbolic meaning behind people's words and actions, and psychoanalysts today continue that effort.

There is some dispute about who may rightly call themselves psychoanalysts. Some people apply the term to anyone who attempts to uncover unconscious thoughts and feelings. Others apply the term only to graduates of an institute of psychoanalysis, a program that lasts four years or more. These institutes admit mostly people who are already either psychiatrists or clinical psychologists. Thus, people completing psychoanalytic training will be at least in their mid 30s.

A **clinical social worker** is similar to a clinical psychologist but with different training. In most cases, a clinical social worker has a master's degree in social work with a specialization in psychological problems. Many health maintenance organizations (HMOs) steer most of their clients with psychological problems toward clinical social workers instead of psychologists or psychiatrists because the social workers, with less formal education, charge less per hour.

Table 1.1 Mental Health Professionals

Type of Therapist	Education
<i>clinical psychologist</i>	PhD with clinical emphasis or PsyD plus internship. Ordinarily, 5+ years after undergraduate degree.
<i>psychiatrist</i>	MD plus psychiatric residency. Total of 8 years after undergraduate degree.
<i>psychoanalyst</i>	Psychiatry or clinical psychology plus 4 or more years in a psychoanalytic institute. Many others who rely on Freudian methods also call themselves psychoanalysts.
<i>psychiatric nurse</i>	From 2-year (AA) degree to master's degree plus supervised experience.
<i>clinical social worker</i>	Master's degree plus 2 years of supervised experience.
<i>counseling psychologist</i>	PhD, PsyD, or EdD plus supervised experience in counseling.
<i>forensic psychologist</i>	Doctorate, ordinarily in clinical psychology or counseling psychology, plus additional training in legal issues.

Some psychiatric nurses (nurses with additional training in psychiatry) provide similar services.

Counseling psychologists help people with educational, vocational, marriage, health-related, and other decisions. A counseling psychologist has a doctorate degree (PhD, PsyD, or EdD) with supervised experience in counseling. Whereas a clinical psychologist deals mainly with anxiety, depression, and other emotional distress, a counseling psychologist deals mostly with life decisions and family or career readjustments. Counseling psychologists work in educational institutions, mental health centers, rehabilitation agencies, businesses, and private practice.

You may also have heard of **forensic psychologists**, who provide advice and consultation to police, lawyers, and courts. Forensic psychologists are clinical or counseling psychologists who have additional training in legal issues. They advise on such decisions as whether a defendant is mentally competent to stand trial or whether someone eligible for parole is dangerous (Otto & Heilbrun, 2002). Several popular films and television series have depicted forensic psychologists helping police investigators develop a psychological profile of a serial killer. That may sound like an exciting, glamorous profession, but few psychologists engage in such activities (and the accuracy of their profiles is uncertain, as discussed in Chapter 14). Most criminal profilers today have training and experience in law enforcement, not psychology.

■ **Table 1.1** compares various types of mental health professionals.



3. How does the education of a clinical psychologist differ from that of a psychiatrist?

Answer

3. A clinical psychologist earns an advanced degree in psychology, generally a PhD or PsyD, that focuses more on research. A psychiatrist earns an MD, like other medical doctors.

Service Providers to Organizations

Psychologists also work in business, industry, and school systems, doing work you might not recognize as psychology. The job prospects in these fields have been good, and you might find these fields interesting.

Industrial/Organizational Psychology

The psychological study of people at work is known as **industrial/organizational (I/O) psychology**. This field deals with such issues as hiring the right person for a job, training people for jobs, developing work teams, determining salaries and bonuses, providing feedback to workers about their performance, planning an organizational structure, and organizing the workplace so that workers will be productive and satisfied. I/O psychologists attend to both the individual workers and the organization, including the impact of economic conditions and government regulations.

Here's an example of a concern for industrial/organizational psychologists (Campion & Thayer, 1989): A company that manufactures complex electronic equipment needed to publish reference and repair manuals for its products. The engineers who designed the devices did not want to spend their time writing the manuals, and none of them were skilled writers anyway. So the company hired a technical writer to prepare the manuals. After a year, she received an unsatisfactory performance rating because the manuals she wrote contained too many technical errors. She countered that, when she asked various engineers in the company to check her manuals or to explain technical details to her, they were always too busy. She found her job complicated and frustrating. Her office was badly lit, noisy, and overheated, and her chair was uncomfortable. Whenever she mentioned these problems, she was told that she "complained too much."

In a situation such as this, an industrial/organizational psychologist helps the company evaluate its options. One solution would be to fire her and hire an expert on electrical engineering who



Firefly Productions/CORBIS

Human factors specialists help redesign machines to make them easier and safer to use. This field uses principles of both engineering and psychology.

is also an outstanding writer who tolerates a badly lit, noisy, overheated, uncomfortable office. However, if the company cannot find or afford such a person, then it needs to improve the working conditions and provide the current employee with more training and help.

Human Factors

Learning to operate our increasingly complex machinery is one of the struggles of modern life. Sometimes, the consequences are serious. Imagine an airplane pilot who intends to lower the landing gear and instead raises the wing flaps. Or a worker in a nuclear power plant who fails to notice a warning signal. A type of psychologist known as a **human factors specialist** (or **ergonomist**) *attempts to facilitate the operation of machinery so that ordinary people can use it efficiently and safely*. Human factors specialists first worked in military settings, where complex technologies sometimes require soldiers to spot nearly invisible targets, understand speech through deafening noise, track objects in three dimensions, and make life-or-death decisions in a split second. The military turned to psychologists to redesign the tasks to fit the skills that their personnel could master.

Human factors specialists soon applied their expertise to the design of everyday devices, such as cameras, computers, microwave ovens, and cell phones. The field combines features of psychology, engineering, and computer science. It is a growing field with many jobs available.

Military Psychologists

Military psychologists are *specialists who provide services to the military* in many ways. Some are similar to industrial/organizational psychologists, conducting intellectual and personality tests to identify people suitable for certain jobs within the military, and then helping to train people for those jobs. Other military psychologists consult with the leadership about strategies, including the challenges of dealing with allies or enemies from a different culture. Still others provide clinical and counseling services to soldiers dealing with highly stressful experiences. Few experiences in life are more stressful than military combat.



Infants and young children will try to eat almost anything that tastes okay. As they grow older, they begin to avoid foods for reasons other than taste.

Also, some psychologists conduct research on such topics as how best to deal with battlefield stress, sleep deprivation, and other difficulties. Matthews (2014) has argued that military psychologists will become increasingly important, as future conflicts pertain more to influencing people than attacking them.

School Psychology

Many if not most children have school problems at one time or another. Some children have trouble sitting still or paying attention. Others get into trouble for misbehavior. Some have problems with reading or other academic skills. Others master their schoolwork quickly and become bored. They too need special attention.

School psychologists are *specialists in the psychological condition of students*, usually in kindergarten through the 12th grade. School psychologists identify children's educational needs, devise a plan to meet those needs, and then either implement the plan themselves or advise teachers how to implement it.

School psychology can be taught in a psychology department, a branch of an education department, or a department of educational psychology. In some countries, it is possible to practice school psychology with only a bachelor's degree. In the United States, the minimum education requirement for a school psychologist is usually a master's degree, but a doctorate may become necessary in the future. Most school psychologists work for a school system, but some work for mental health clinics, guidance centers, and other institutions.

Psychologists in Teaching and Research

Many psychologists, especially those who are not clinical psychologists, teach and conduct research in colleges and universities. To some extent, different kinds of psychologists study different topics. For example, developmental psychologists observe children, and biological psychologists examine the effects of brain damage. However, different kinds of psychologists also sometimes study the same questions, approaching them in different ways. To illustrate,

let's consider one example: how we select what to eat. Different kinds of psychologists offer different explanations.

Developmental Psychology

Developmental psychologists *study how behavior changes with age*, "from womb to tomb." For example, they might examine language development from age 2 to 4 or memory from age 60 to 80, both describing the changes and trying to explain them.

With regard to food selection, some taste preferences are present from birth. Newborns prefer sweet tastes and avoid bitter and sour substances. However, they appear indifferent to salty tastes, as if they could not yet taste salts (Beauchamp, Cowart, Mennella, & Marsh, 1994). Toddlers will try to eat almost anything they can fit into their mouths, unless it tastes sour or bitter. For that reason, parents need to keep dangerous substances like furniture polish out of toddlers' reach. Older children become increasingly selective about the foods they accept, but up to age 7 or 8, usually the only reason children give for refusing something is that they think it would taste bad (Rozin, Fallon, & Augustoni-Ziskind, 1986). As they grow older, they cite more complex reasons for rejecting foods, such as health concerns.

Learning and Motivation

The research field of **learning and motivation** *studies how behavior depends on the outcomes of past behaviors and current motivations*. How often we engage in any particular behavior depends on the results of that behavior in the past.

We learn our food choices largely by learning what *not* to eat. For example, if you eat something and then feel sick, you form an aversion to the taste of that food, especially if it was unfamiliar. It doesn't matter whether you consciously think the food made you ill. If you eat something at an amusement park and then go on a wild ride and get sick, you may dislike that food, even though you know the ride was at fault.

Cognitive Psychology

Cognition means *thought and knowledge*. A **cognitive psychologist** *studies those processes*. (The root *cogn-* also shows up in the word *recognize*, which literally means "to know again.") Typically, cognitive psychologists focus on how people make decisions, solve problems, and convert their thoughts into language. These psychologists study both the best and the worst of human cognition (expert decision making and why people make costly errors).

Cognitive psychologists seldom study anything related to food selection, but cognitions about