

FOURTH EDITION



# PSYCHOLOGY

FROM INQUIRY TO UNDERSTANDING

 Pearson

LILIENFELD LYNN NAMY

# Psychology

From Inquiry to Understanding

**FOURTH EDITION**

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for an invaluable gift that I will always cherish:  
scientific thinking.*

—Scott Lilienfeld

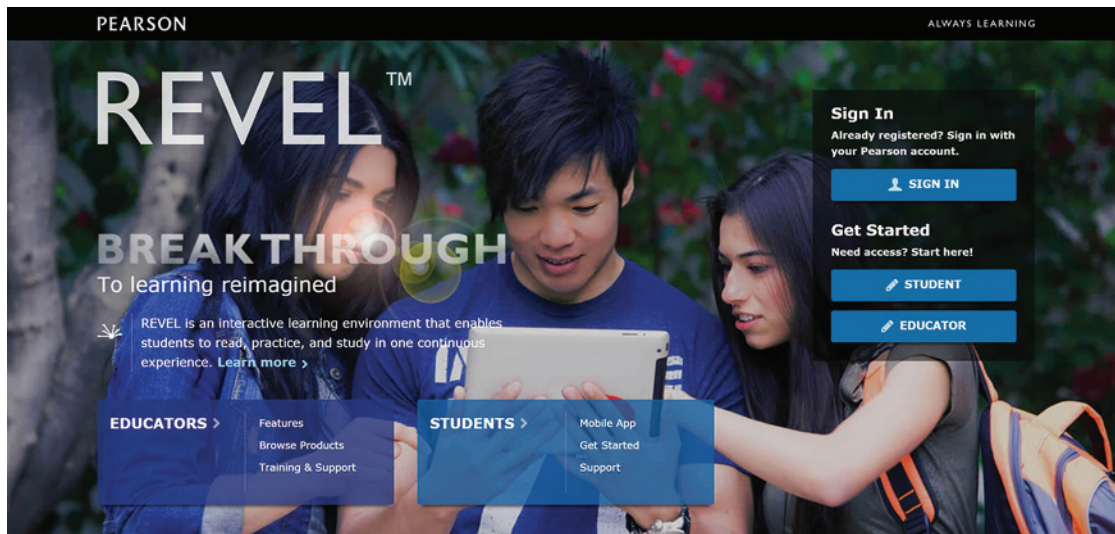
*To Fern Pritikin Lynn, my wife, my heart and  
my soul. And to my daughter, Jessica Barbara Lynn,  
the light of my life.*

—Steven Jay Lynn

*With profound appreciation for my NSF colleagues  
who expanded my horizons further than  
I ever could have imagined.*

—Laura L. Namy

# About Revel and the New Edition



“Why don’t we remember what happened to us as babies?” “Is human intelligence purely genetic?” “Can people actually become addicted to gambling or sex?” “Does everyone see colors the exact same way?” “Is the polygraph test really a ‘lie detector?’” “Should we trust most self-help books?”

Every day, our students are barraged with information—and misinformation—that shapes how they understand the world and their place in it. Whether it’s from social media, movies, self-help books, or advice from friends, our students encounter information and explanations—often many of which are inaccurate—about sex and romance, drug abuse, intelligence testing, parenting, mental illness, psychotherapy, and scores of other topics. Much of the time, the questions about these issues that most fascinate students are precisely those that psychologists routinely confront in their research, teaching, and practice. This is both a blessing and a curse—on the one hand, we as instructors have a natural “hook” because students find the topic inherently interesting. On the other hand we also face the challenge of coaxing students away from their intuitions, so that they can begin to think scientifically about evidence regarding mind, brain, and behavior.

As consumers of information, we all need help evaluating the bewildering variety of claims stemming from the vast world of popular psychology. This goal is especially critical in a world in which fake news is becoming increasingly challenging to

distinguish from real news. Without a framework for evaluating evidence, making sense of these often contradictory assertions can be a bewildering task for anyone. It’s no surprise that the untrained student can find claims regarding topics such as memory and mood-enhancing drugs, the overprescription of stimulants, the effectiveness of antidepressants, and the genetic bases of psychiatric disorders difficult to evaluate. Moreover, it is challenging for those who haven’t been taught to think scientifically to resist the allure of extraordinary psychological claims that lie on the fringes of scientific knowledge, such as extrasensory perception, subliminal persuasion, astrology, alien abductions, lie-detector testing, handwriting analysis, and ink-blot tests, among many others. Without a guide for distinguishing adequate from inadequate evidence, our students are left to their own devices when it comes to weighing the merits of these claims.

Our goal in this text, therefore, is to empower students to apply scientific thinking to the psychology of their everyday lives. By applying scientific thinking—thinking that helps protect us against our tendencies to make mistakes—we



can better evaluate claims about both laboratory research and daily life. In the end, we hope that students who have read our text will emerge with the critical thinking skills and open-minded skepticism needed to distinguish psychological misinformation from psychological information. The text is designed to encourage students to keep an open mind to new claims but to insist on and evaluate evidence informing these claims. Indeed, our overarching motto is that of space scientist James Oberg (sometimes referred to as “Oberg’s dictum”): *Keeping an open mind is a virtue, just so long as it is not so open that our brains fall out.*

## What’s New in This Edition?

*Psychology: From Inquiry to Understanding* continues to emphasize the importance of scientific-thinking skills. We are especially excited, in the fourth edition, to leverage Revel™, a multimedia instructional platform, to provide more interactive demonstrations, video examples, and self-tests. These activities engage student interest and provide regular opportunities for them to apply their knowledge to both real-world and research examples. We take seriously the compelling evidence that testing is an effective learning tool and have introduced interactive exercises that are low-stakes (i.e., ungraded) tests of their comprehension, with immediate feedback. Our intention in using this new interactive multimedia platform is to bring psychological phenomena to life and render concrete and accessible the types of evidence available to psychological scientists. We believe that Revel will create a sense of excitement and empowerment about the use of inquiry to foster understanding. To this end, we have updated the fourth edition to include not only new evidence and topic areas, but also new techniques for engaging student attention and facilitating learning.

From presenting chapter-opening videos produced by award-winning documentarians, to creating interactive demonstrations, to asking students to test their ability to distinguish supported from unsupported claims, this edition maintains the vision and tone students enjoyed in the previous editions. In addition, it introduces exciting interactive opportunities to apply their knowledge as they learn. We have also significantly updated the content by integrating new findings, highlighting fresh debates and challenges to psychology (e.g., the replicability crisis), and introducing new sections on emerging areas of research.

### GENERAL CHANGES

- New documentary-style, chapter-opening videos—in which subjects share their insights, daily experiences, or personal stories—will engage students and awaken an interest in them to learn more about the topics covered in each chapter.
- New “Challenge Your Assumptions Polls” allow students to compare their intuitions about psychological topics with those of their peers across institutions.
- Fully revised “Evaluating Claims” scenarios prompt students to use scientific-thinking skills to evaluate claims they are likely to encounter in various forms of media. This feature makes use of a fully interactive branching narrative in which readers navigate the scenario by making individual choices.
- New Fact vs. Fiction feature tests students’ ability to distinguish supported from unsupported claims in a low-stakes interactive assessment.
- More than 40 new in-chapter videos have been filmed or specially selected for this edition. These videos cover a variety of key topics in introductory psychology, from animating complex psychological concepts to demonstrating experiments to diagnosing and classifying disorders.

### NEW CONTENT AND UPDATED RESEARCH

- **Chapter 1 (Psychology and Scientific Thinking)** features new timely coverage of the replicability crisis as well as enhanced discussion of confirmation bias.
- **Chapter 2 (Research Methods)** provides broader discussion of the role of response styles in psychological assessment and enhanced guidance on evaluating claims on the Internet.
- **Chapter 3 (Biological Psychology)** includes new content regarding potential pitfalls in evaluating evidence from functional brain-imaging studies, as well as an introduction to epigenetics.
- **Chapter 4 (Sensation and Perception)** provides expanded coverage of inattentive blindness, the neuroscience of magic, and extrasensory perception. This chapter also provides greater coverage of multiple illusions, including afterimages, the moving spiral, and color constancy and “the dress.”
- **Chapter 5 (Consciousness)** features enhanced discussion of a variety of topics including synesthesia, the brain just prior to death, effects of LSD on the brain, and Hobson’s dream theory of protoconsciousness. The coverage of sleep has been significantly augmented to include expanded coverage of sleep disorders, sleep in nonhuman species, and the amount of sleep needed on a daily basis. Discussion of hallucinations, mystical experiences, and the effects of hallucinogenic drugs has also been expanded.
- **Chapter 6 (Learning)** includes new coverage of Little Albert, greater discussion of the role of classical conditioning in disgust reactions, and greater coverage of learning in unsupervised environments and of the role of mirror neurons in learning.
- **Chapter 7 (Memory)** includes new research on individual differences and context effects in false memories, memory and politics, overcoming memory biases, and the neural basis of spatial memory in Clark’s nutcracker. The chapter

offers enhanced coverage of interventions to potentially decrease the risk of dementia and memory loss that accompanies aging, as well as cross-cultural differences in early memories.

- **Chapter 8 (Thinking, Reasoning, and Language)** features enhanced coverage of behavioral economics and neuroeconomics, a description of distributed cognition, a new *Psychomythology* box on myths about sign language, and expanded coverage on learning to read.
- **Chapter 9 (Intelligence and IQ Testing)** provides new coverage of molecular genetic research on intelligence, the effects (or lack thereof) of brain-training programs on intelligence and working memory, the predictive validity of IQ tests, the effects of early intervention programs on IQ, sex differences in mental abilities, stereotype threat and IQ, emotional intelligence, and grit.
- **Chapter 10 (Human Development)** includes a discussion of epigenetics, new sections differentiating premature birth from low birth weight (including their causes and consequences), discussion of the research on early menarche, an updated *Psychomythology* box on apps designed to increase infant intelligence, expanded coverage of temperament and attachment, a new section on transgender development, and updated citations of current evidence on the developing brain.
- **Chapter 11 (Emotion and Motivation)** features new coverage of research on primary and secondary emotions, the facial feedback hypothesis, nonverbal behaviors and lie-detection methods, positive psychology, and self-esteem. The chapter also includes new discussion of bariatric surgery, binge eating and purging disorders, as well as enhanced coverage of intrinsic/extrinsic motivation, Maslow's hierarchy of needs, the glucostatic theory of hunger, sexual desire, and similarity and attraction.
- **Chapter 12 (Stress, Coping, and Health)** includes new coverage of posttraumatic growth, yoga, stress and social media, hookah smoking and electronic cigarettes, and apps for meditation. The chapter also features expanded coverage of PTSD, the tend-and-befriend response and oxytocin, optimism, coronary heart disease, controversies related to moderate drinking, and complementary and alternative medicine.
- **Chapter 13 (Social Psychology)** offers new coverage of the replicability crisis and its implications for social psychology, cultural differences in the fundamental attribution error, scientific controversies concerning the Milgram obedience and Zimbardo prison studies, viewpoint diversity, political polarization, "brainwashing," potential media influences on aggression, cyberaggression, psychological research on correcting misconceptions, stereotyping and outgroup-homogeneity, and implicit prejudice, and prejudice-reduction interventions.
- **Chapter 14 (Personality)** includes new coverage of molecular genetic research on personality, neuroscience research purportedly offering support for psychodynamic assertions, controversy regarding the efficacy of psychodynamic therapy, the ability to infer personality from social media, and cross-cultural research on the five-factor model of personality.
- **Chapter 15 (Psychological Disorders)** offers new coverage of the recent developments in diagnosis of mental disorders, including the development of the Research Domain Criteria (RDoC); discussion of inflammation as a potential trigger of depression and schizophrenia; genetics, the immune system and "overpruning" of synapses in schizophrenia; and the role of sleep disturbances in dissociation. Coverage has also been expanded on suicide, borderline personality disorder, and psychopathic personality.
- **Chapter 16 (Psychological and Biological Treatments)** includes new coverage related to meeting needs for psychological services, existential therapy, ecological momentary assessment, unified integrative psychotherapy protocols, and customized psychotherapeutic interventions. The chapter also features expanded coverage of Alcoholics Anonymous, nonspecific factors in psychotherapy, combining medication with psychotherapy, and transcranial stimulation.

## Content Highlights

### From Inquiry to Understanding: The Framework in Action

As instructors, we find that students new to psychology tend to learn best when information is presented within a clear, effective, and meaningful framework—one that encourages inquiry along the path to understanding. As part of our text's distinctive inquiry-to-understanding framework, our pedagogical features and assessment tools work to empower students to develop a more critical eye in understanding the psychological world and their place in it.

**THINKING SCIENTIFICALLY** In Chapter 1, we introduce readers to the **Six Principles of Scientific Thinking**, which comprise an integrated framework for the lifelong learning of psychology. Colored arrows indicate whenever the principles are referenced to reinforce these scientific thinking principles in readers' minds. In this way, readers come to understand these principles as key skills for evaluating claims in scientific research and in everyday life. These six principles, which we employ (a) throughout every chapter and (b) within our new Evaluating Claims feature to drive home their relevance and importance to the learning material, are:

**Ruling Out Rival Hypotheses**

Have important alternative explanations for the findings been excluded?

**Correlation vs. Causation**

Can we be sure that A causes B?

**Falsifiability**

Can the claim be disproved?

**Replicability**

Can the results be duplicated in other studies?

**Extraordinary Claims**

Is the evidence as strong as the claim?

**Occam's Razor**

Does a simpler explanation fit the data just as well?

**APPLICATIONS OF SCIENTIFIC THINKING** In keeping with the text's theme, the fully reconceived **Evaluating Claims** feature prompts students to use scientific thinking skills to evaluate claims they are likely to encounter in various forms of media. This interactive feature uses a unique branching narrative where user input dictates the flow of content.

A new feature for the fourth edition, **Fact vs. Fiction** invites students to test their ability to distinguish empirically supported versus unsupported claims. These self-tests are peppered throughout each chapter.

Throughout the text, **Psychomythology** boxes focus in depth on a widespread psychological misconception. In this way, students will come to recognize that their common-sense intuitions about the psychological world are not always correct and that scientific methods are needed to separate accurate from inaccurate claims. **Mysteries of Psychological Science** boxes tell the story of how psychological science has helped to shed light on a longstanding psychological mystery.

**ACTIVE LEARNING** Students learn best by doing, by applying their knowledge, and by engaging in interactive opportunities to test their understanding. We have developed a comprehensive array of active learning tools designed to test not only students' basic mastery but also their scientific reasoning skills. The Revel format provides a platform for active learning to occur outside (as well as inside) the classroom. We capitalize on these new avenues of instructional technology to deliver pedagogical tools and learning applications directly to the student.

**INTEGRATED CULTURAL CONTENT** Wherever relevant, we infuse the text with discussion of cultural factors that shape behavior, cultural variability in practice, and replications across cultural and ethnic groups. It is increasingly important in today's global society to highlight both generalizability of

psychological phenomena and cases that are culturally unique, and to adopt a broader perspective on how cultural context influences behavior and thought. A cultural perspective also allows students to better understand the potential boundary conditions on psychological findings.

## A Focus on Meaningful Pedagogy: Helping Students Succeed in Psychology

Our goal of applying scientific thinking to the psychology of everyday life is reflected in the text's pedagogical plan. The features in the text, the built-in quizzing, and the print and media supplements were designed to help students achieve a mastery of the subject and succeed in the course.

**Challenge Your Assumptions** polls, located at the start of every chapter, ask students what they believe they know about psychology, and instantaneously compare their responses with those of other students taking the course. These questions also serve to preview the key topics that will be discussed in each chapter. New documentary-style **Chapter-Opening Videos** help students connect emotionally to the material.

Each chapter is organized around **Numbered Learning Objectives**, which are listed at the start of each major section. (All instructor supplements are also keyed to these learning objectives.) The in-chapter assessment material is also organized around these objectives. Students' understanding of important terminology is enhanced with our on-page **Glossary**.

**Color-coded biological art and animations** orient students at both the micro and macro levels as they move throughout the text and forge connections among concepts. **Interactive photo captions** test students on their scientific-thinking skills and invite them to evaluate whether the photo is an accurate depiction of psychological phenomena.

Each chapter contains relevant and interesting **Fact vs. Fiction** self-tests designed to challenge students' ability to distinguish supported from unsupported claims. **Journal Writing Prompts** invite students to write short critical thinking–based responses to questions about the chapter content.

An **Experiment Simulations appendix** in Revel, correlated to each chapter, allows students to participate in online simulations of virtual, classic psychology experiments and research-based inventories, helping to reinforce what they are learning in class and in their book.

## Putting Scientific Thinking to the Test: Innovative and Integrated Supplements

**Psychology: From Inquiry to Understanding** is accompanied by a collection of teaching and learning supplements designed to reinforce the scientific thinking skills from the text. These supplements “put scientific thinking to the test” by reinforcing our framework for evaluating claims and assessing students' ability to think scientifically in a variety of psychological and real-world situations.

**NEW! Learning Games** Fun Activities to Help Students Master Concepts Learning Games, powered by mLevel, take studying to the next level with a series of fun, interactive games that drive learning. Enabling students to master Introductory Psychology concepts, Learning Games' powerful analytics allow you to track student performance and engagement in real time by course, activity, topic, and learning objective. Learning Games are available for study (and play!) via students' computer or mobile device. To purchase mLevel for Lilienfeld, Lynn & Namy's *Psychology: From Inquiry to Understanding 4e*, please visit [pearson0006.mlevel.com](http://pearson0006.mlevel.com)

**MyPsychlab** MyPsychLab is an online homework, tutorial, and assessment program that truly engages students in learning. It helps students better prepare for class, quizzes, and exams—resulting in better performance in the course—and provides educators with a dynamic set of tools for gauging individual and class progress. MyPsychLab comes from Pearson, your partner in providing the best digital learning experience.

**Learning Catalytics** Learning Catalytics is a “bring your own device” student engagement, assessment, and classroom intelligence system. It allows instructors to engage students in class with real-time diagnostics. Students can use any modern, web-enabled device (smartphone, tablet, or laptop) to access it.

**PRESENTATION AND TEACHING RESOURCES**  
The Instructor's Resource Center ([www.pearsonhighered.com/irc](http://www.pearsonhighered.com/irc)) provides information and the following downloadable supplements.

**Test Bank (ISBN 0134637593)** This test bank contains more than 3,000 multiple-choice, true/false, short-answer, and essay questions, each referenced to the relevant page in the textbook. All test items are mapped to the chapter learning objectives. An additional feature for the test bank is the

inclusion of rationales for the *conceptual and applied* multiple-choice questions. The rationales help instructors to evaluate the questions they are choosing for their tests and give instructors the option to use the rationales as an answer key for their students.

A Total Assessment Guide chapter overview makes creating tests easier by listing all of the test items in an easy-to-reference grid. All multiple-choice questions are categorized as factual, conceptual, or applied, and are correlated to each of the chapter's learning objectives.

**MyTest (ISBN 0134627628)** The fourth edition test bank is also available through Pearson MyTest ([www.pearsonmytest.com](http://www.pearsonmytest.com)), a powerful assessment-generation program that helps instructors easily create and print quizzes and exams. Instructors can write questions and tests online, allowing them flexibility and the ability to efficiently manage assessments at any time, anywhere.

**Instructor's Resource Manual (ISBN 0134637658)** The Instructor's Resource Manual is a comprehensive tool for class preparation and management, each chapter includes learning objectives, a chapter outline, lecture and discussion suggestions, “think about it” discussion questions, activities and demonstrations, and suggested video resources.

**Interactive Powerpoint Slides (ISBN 0134637690)** These slides draw students into the lecture and provide wonderful interactive activities, visuals, and videos. The slides are built around the text's learning objectives. Icons integrated throughout the slides indicate interactive exercises, simulations, videos, and activities that can be accessed directly from the slides if instructors want to use these resources in the classroom. Many of the textbook figures are presented in layers (like a set of transparency overlays) within the slides to allow instructors to step through more complex diagrams or processes.

**Standard Lecture Powerpoint Slides (ISBN 0134637674)** These ADA compliant PowerPoint slides provide an active format for presenting concepts from each chapter and feature relevant figures and tables from the text, and are designed to be compatible with assistive technology requirements.

**Art Powerpoint Slides (ISBN 0134637623)** These slides contain only the photos, figures, and line art from the textbook.

**Pearson Assessment Bank for the APA Guidelines for the Undergraduate Psychology Major 2.0** A unique bank of assessment items allows instructors to assess student progress against the American Psychological Association's (APA) Guidelines for the Undergraduate Psychology Major 2.0 (2013).

**APA Correlation Guide** This detailed correlation guide, which appears in the Instructor's Manual, shows how the learning outcomes in the text and the test bank questions correspond to the APA Learning Goals and Outcomes.

**Test Item File for Your Learning Management System** For instructors who only need the test item file, we offer the complete test item file in Blackboard, WebCT, and other LMS formats at [www.pearsonhighered.com/irc](http://www.pearsonhighered.com/irc).

## Final Word and Thanks

The author team has been passionate about our vision for the book and our commitment to helping engage students in the process of evaluating evidence. We have been honored and thrilled by the enthusiasm and support the book has received. Over the years since our first conception of this text, we have benefited from the input of literally hundreds of colleagues and students who have contributed in various ways to bringing it to fruition and continuing to improve its impact. We stand in awe of our fellow-instructors' love of the discipline and the enthusiasm and imagination they bring to the psychology classroom every day. We are incredibly grateful to them for joining us on this journey. We especially want to acknowledge Nancy Woolf's and Barry Beyerstein's contributions to earlier editions of the text.

In addition, the authors would like to extend our heartfelt gratitude and sincere thanks to a host of people who worked on or with the Pearson team. We consider ourselves remarkably fortunate to have had so much support for implementing our vision and priorities. To a person, they have been truly delightful, helpful, creative, energetic, wonderful collaborators and team members. Needless to say, this project was a monumental team effort, and every member of the team played an invaluable role in its inception. We owe special thanks to Erin Mitchell, Executive Editor, for her remarkable wisdom and insight, not to mention her supportive and encouraging

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Over the course of the first three editions, feedback from users of the text has been extraordinarily helpful in refining the content, and we welcome additional feedback on this edition. We invite you to share your experiences using the fourth edition by writing to Scott Lilienfeld at [slilien@emory.edu](mailto:slilien@emory.edu).

**OUR REVIEW PANEL** We are indebted to the members of our review panel from the third and previous editions who evaluated chapters and provided expert analysis on critical topic areas. Others served on an advisory council, participated in focus groups, conducted usability studies, ran class testing of chapters, and attended our faculty forums for the text. Their input proved invaluable to us, and we thank them for it.

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 Nicole Martin, *Kennesaw State University*  
 Robert Martinez, *University of the Incarnate Word*  
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 Dawn McBride, *Illinois State University*  
 Wanda McCarthy, *University of Cincinnati–Clermont College*  
 Tammy McClain, *West Liberty State College*  
 William McIntosh, *Georgia Southern University*  
 Michael McIntyre, *University of Winnipeg*  
 Ann McKim, *Goucher College*  
 Jessica McManus, *Kansas State University*  
 Barbara McMasters, *University of Cincinnati–Raymond Walters College*  
 Steven E. Meier, *University of Idaho*  
 Joe Melcher, *St. Cloud State University*  
 Richard Miller, *Western Kentucky University*  
 Robin Morgan, *Indiana University Southeast*  
 Jason Moses, *El Paso Community College*  
 Thomas J. Mount, *Yakima Valley Community College*  
 Morrie Mullins, *Xavier University*  
 Glenn Musgrove, *Broward Community College–Central*  
 Janie Nath, *Cerritos College*  
 Margaret Nauta, *Illinois State University*  
 Cindy Nordstrom, *Southern Illinois University–Edwardsville*  
 Larry Normansell, *Muskingum University*  
 Peggy Norwood, *Red Rocks Community College*  
 Mark O’DeKirk, *Meredith College*  
 Cynthia O’Dell, *Indiana University Northwest*  
 Kim O’Neil, *Carleton University*  
 Tony Obradovich, *Portland Community College*  
 Carlotta Ocampo, *Trinity College*  
 Michie Odle, *SUNY Cortland*  
 Elaine Olaoye, *Brookdale Community College*  
 David Osburn, *Arkansas Tech University*  
 Luz Ospina, *Brooklyn College*  
 Barbara Oswald, *Miami University*  
 Larry Pace, *Anderson University*  
 Tibor Palfai, *Syracuse University*  
 Jack Palmer, *University of Louisiana at Monroe*  
 Dominic Parrott, *Georgia State University*  
 David Payne, *Wallace Community College*  
 Terry F. Pettijohn, *Coastal Carolina University*  
 Brady J. Phelps, *South Dakota State University*

- Jacqueline Pickrell, *University of Washington*
- Julie Piercy, *Central Virginia Community College*
- Lloyd R. Pilkington, *Midlands Technical College*
- Alan Pope, *University of West Georgia*
- Frank Provenzano, *Greenville Technical College*
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- Reece Rahman, *University of Pittsburgh at Johnstown*
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- Meera Rastogi, *University of Cincinnati–Clermont College*
- Celia Reaves, *Monroe Community College*
- Dennis T. Regan, *Cornell University*
- Ann Renken, *University of Southern California*
- Tanya Renner, *Kapi'olani Community College*
- Amira Rezec, *Saddleback College*
- Kymberly Richard, *Northern Virginia Community College*
- Harvey Richman, *Columbus State University*
- Sheldon Rifkin, *Kennesaw State University*
- Michelle Rivera, *University of Maine*
- Jermaine Robertson, *Florida A&M University*
- Christopher Robinson, *University of Alabama–Birmingham*
- Wayne Robinson, *Monroe Community College*
- James Rodgers, *Hawkeye Community College*
- Scott Roesch, *San Diego State University*
- Wade C. Rowatt, *Baylor University*
- Claire Rubman, *Suffolk County Community College*
- Linda Ruehlman, *Arizona State University*
- John Ruscio, *The College of New Jersey*
- Melinda Russell-Stamp, *Northwest Missouri State University*
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- Nicholas Schwab, *University of Northern Iowa*
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- Eric Seemann, *University of Alabama–Huntsville*
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- Amy Shapiro, *University of Massachusetts, Dartmouth*
- Heidi Shaw, *Yakima Valley Community College*
- Wayne Shebilske, *Wright State University*
- Laura Sherrick, *Front Range Community College–Westminster*
- Elisabeth Sherwin, *University of Arkansas–Little Rock*
- Mark Sibicky, *Marietta College*
- Lawrence Siegel, *Palm Beach State College*
- Randy Simonson, *College of Southern Idaho*
- Royce Simpson, *Spring Hill College*
- Lisa Sinclair, *University of Winnipeg*
- Amy Skinner, *Gordon College*
- John Skowronski, *Northern Illinois University*
- Dale Smith, *Olivet Nazarene University*
- Vivian Smith, *Lakeland Community College*
- Valerie T. Smith, *Collin County Community College*
- Patrice Smith, *Carleton University*
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- Thomas W. Williams, *Western Kentucky University*
- Keith Williams, *Richard Stockton College of New Jersey*
- Kevin M.P. Woller, *Rogers State University*
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## Meet the Authors

**SCOTT O. LILIENFELD** received his BA in psychology from Cornell University in 1982 and his PhD in clinical psychology from the University of Minnesota in 1990. He completed his clinical internship at Western Psychiatric Institute and Clinic in Pittsburgh, Pennsylvania, from 1986 to 1987. He was Assistant Professor in the Department of Psychology at SUNY Albany from 1990 to 1994 and is now Samuel Candler Dobbs Professor of Psychology at Emory University and a Visiting Professor at the University of Melbourne in Australia. He is a Fellow of the Association of Psychological Science and was the recipient of the 1998 David Shakow Award from Division 12 (Clinical Psychology) of the American Psychological Association (APA) for Early Career Contributions to Clinical Psychology. More recently, he received the James McKeen Cattell Award from the Association for Psychological Science for outstanding career contributions to applied psychology and the Ernest Hilgard Award from APA Division 1 (General Psychology) for the integration of psychology across disciplines. Dr. Lilienfeld is president of the Society for a Science of Clinical Psychology within Division 12 and past president of the Society for the Scientific Study of Psychopathy. He is editor of *Clinical Psychological Science* and until recently was a regular columnist for *Scientific American Mind* magazine. He has authored or coauthored fourteen books and more than 350 journal articles and chapters. Dr. Lilienfeld has also been a participant in Emory University's "Great Teachers" lecturer series, a Distinguished Speaker for the Psi Chi Honor Society at the annual APA convention, and a keynote speaker at numerous national and international conventions.

**STEVEN JAY LYNN** received his BA in psychology from the University of Michigan and his PhD in clinical psychology from Indiana University. He completed an NIMH Postdoctoral Fellowship at Lafayette Clinic, Detroit, Michigan, in 1976 and is now Distinguished Professor of Psychology at Binghamton

University (SUNY), where he was the director of the Psychological Clinic and is currently the directory of the Laboratory of Consciousness and Cognition. (2007–2016). Dr. Lynn is a fellow of numerous professional organizations, including the American Psychological Association and the Association for Psychological Science, he is a diplomate in clinical and forensic psychology (ABPP), and he was the recipient of the Chancellor's Award of the State University of New York for Scholarship and Creative Activities. Dr. Lynn has authored or edited 22 books and more than 350 other publications and was named on a list of "Top Producers of Scholarly Publications in Clinical Psychology Ph.D. Programs" (2000–2004/Stewart, Wu, & Roberts, 2007, *Journal of Clinical Psychology*). Dr. Lynn is the founder and editor of *Psychology of Consciousness: Theory, Research, and Practice* (APA), and he has served on 11 other editorial boards, including the *Journal of Abnormal Psychology*. Dr. Lynn's research has been supported by the National Institute of Mental Health and the Ohio Department of Mental Health. His research has been featured in numerous media outlets, including the *New York Times*, *New Scientist Magazine*, *Discover Magazine*, *CBS Morning Show*, ABC's 20/20, Discovery Channel, and the Academy Award-winning documentary, *Capturing the Friedmans*.

**LAURA L. NAMY** received her BA in philosophy and psychology from Indiana University in 1993 and her PhD in cognitive psychology at Northwestern University in 1998. She is now Director of the Center for Mind, Brain, and Culture at Emory University where she is also Professor of Psychology and Core Faculty in Linguistics. She recently completed a three-year term at the National Science Foundation as a Program Director in the Behavioral and Cognitive Sciences Division. She is past editor-in-chief of the *Journal of Cognition and Development* and a Fellow of the American Psychological Association. Her research focuses on the origins and development of verbal and nonverbal symbol use in young children, sound symbolism in natural language, and the role of comparison in conceptual development.

## APA Correlation for Lilienfeld 4e

### The APA Guidelines for the Undergraduate Psychology Major, Version 2.0

APA Learning Outcomes and Objectives	Text Learning Objectives and Features
<b>Goal 1: Knowledge Base in Psychology</b>	
<b>Demonstrate fundamental knowledge and comprehension of major concepts, theoretical perspectives, historical trends, and empirical findings to discuss how psychological principles apply to behavioral problems.</b>	
<b>1.1 Describe key concepts, principles, and overarching themes in psychology.</b>	
1.1a Use basic psychological terminology, concepts, and theories in psychology to explain behavior and mental processes	<i>Learning Objectives:</i> 1.4a, 3.1a, 3.1b, 3.1c, 3.2a, 3.5a, 4.1a, 5.1b, 6.1a, 6.1b, 6.2b, 6.2c, 6.2d, 6.3a, 6.3b, 7.1b, 7.1c, 7.2b, 7.3a, 8.2a, 8.2b, 8.2c, 8.3d, 9.1a, 9.2a, 9.2b, 10.1a, 10.3a, 11.1a, 11.1b, 11.2a, 12.2a, 13.1a, 13.3a, 13.4a, 14.2a, 14.3a, 14.4a, 14.5a, 15.1a
1.1b Explain why psychology is a science with the primary objectives of describing, understanding, predicting, and controlling behavior and mental processes	<i>Learning Objectives:</i> 1.1b, 7.1a, 7.2a, 7.2c Chapter 13: Mysteries of Psychological Science: Why Are Yawns Contagious?
1.1c Interpret behavior and mental processes at an appropriate level of complexity	<i>Learning Objectives:</i> 3.4a, 3.4b, 4.6a, 8.3a, 9.3a, 9.3b, 14.2b
1.1d Recognize the power of the context in shaping conclusions about individual behavior	<i>Learning Objectives:</i> 4.6b
1.1e Identify fields other than psychology that address behavioral concerns	<i>Learning Objectives:</i> 6.1c, 6.2e, 8.3b, 8.4a, 8.4b, 9.2c, 9.2d, 10.1b, 12.4b, 12.5c

APA Learning Outcomes and Objectives	Text Learning Objectives and Features
<b>1.2 Develop a working knowledge of the content domains of psychology</b>	
1.2a Identify key characteristics of major content domains in psychology (e.g., cognition and learning, developmental, biological, and sociocultural)	<i>Learning Objectives: 5.2a, 6.1a, 6.1b, 6.2a, 6.2c, 6.2d, 7.1b, 8.1a, 8.1b, 10.2c, 10.4d</i>
1.2b Identify principle research methods and types of questions that emerge in specific content domains	<i>Learning Objectives: 4.1b</i>
1.2c Recognize major historical events, theoretical perspectives, and figures in psychology and their link to trends in contemporary research	<i>Learning Objectives: 1.4a, 1.4c, 5.2a, 5.3b, 9.2b, 11.3b, 11.4a, 12.2a, 14.2a, 14.2b, 14.3a, 14.3b, 14.4a, 14.4b, 14.5a, 14.5b, 14.6a, 14.6b, 14.6c, 16.2a, 16.2b, 16.4a</i>
1.2d Provide examples of unique contributions of content domain to the understanding of complex behavioral issues	<i>Learning Objectives: 1.4b, 1.4d, 3.3a, 3.5b</i>
1.2e Recognize content domains as having distinctive sociocultural origins and development	<i>Learning Objectives: 7.4a, 10.4e</i> Chapter 7: Mysteries of Psychological Science: Why Can't We Remember the First Few Years of Our Lives?
<b>1.3 Describe applications that employ discipline-based problem solving</b>	
1.3a Describe examples of relevant and practical applications of psychological principles to everyday life	<i>Learning Objectives: 1.4d, 3.1d, 4.5c, 4.6c, 5.1c, 6.1c, 6.2e, 7.2d, 7.3c, 7.5b, 8.3c, 9.2c, 10.2a, 10.2b, 12.1a, 12.3a, 12.4a, 12.5a, 12.5b, 16.3a, 16.3b, 16.3c</i> Chapter 3: Mysteries of Psychological Science: How Do We Recognize Faces? Chapter 12: Psychomythology: Are Almost All People Traumatized by Highly Adverse Events?
1.3b Summarize psychological factors that can influence the pursuit of a healthy lifestyle	<i>Learning Objectives: 4.5b, 5.1a, 5.4a, 7.3b, 10.2d, 11.4b, 12.5a, 12.5b</i> Chapter 16: Psychomythology: Are Self-Help Books Always Helpful?
1.3c Correctly identify antecedents and consequences of behavior and mental processes	<i>Learning Objectives: 5.3a, 6.2a, 11.5b, 12.2b</i>
1.3d Predict how individual differences influence beliefs, values, and interactions with others, including the potential for prejudicial and discriminatory behavior in oneself and others	<i>Learning Objectives: 9.4a, 9.4b, 10.4a, 10.4b, 10.4c, 13.5a, 13.5b</i> Chapter 9: Psychomythology: Do College Admissions Tests Predict Grades?
Major concepts are reinforced with learning tools: Writing Space, Experimental Simulations, MyPsychLab Video Series, Visual Brain, and instructor's teaching and assessment package. Text features such as Evaluating Claims and Fact Versus Fiction also reinforce learning objectives.	
<b>Goal 2: Scientific Inquiry and Critical Thinking</b>	
<b>Understand scientific reasoning and problem solving, including effective research methods.</b>	
<b>2.1 Use scientific reasoning to interpret behavior</b>	
2.1a Identify basic biological, psychological, and social components of behavioral explanations (e.g., inferences, observations, operational definitions, interpretations)	<i>Learning Objectives: 1.1a, 3.1a, 3.2b, 6.4a</i>
2.1b Use psychology concepts to explain personal experiences and recognize the potential for flaws in behavioral explanations based on simplistic, personal theories	<i>Learning Objectives: 1.3a, 16.5a, 16.5b</i> Chapter 3: Psychomythology: Are Some People Left-Brained and Others Right-Brained?
2.1c Use an appropriate level of complexity to interpret behavior and mental processes	<i>Learning Objectives: 1.2a, 3.2a, 4.6d, 9.1b, 10.1b, 11.1a, 11.3a, 11.4a, 12.1b, 12.3b, 12.4c, 13.4b, 14.1a</i> Chapter 4: Psychomythology: Psychic Healing of Chronic Pain
2.1d Ask relevant questions to gather more information about behavioral claims	<i>Learning Objectives: 1.3b, 4.6d, 5.2b, 5.3a, 11.2b, 13.1b, 13.4c, 16.5a, 16.5b</i> Chapter 4: Mysteries of Psychological Science: How Does Magic Work? Chapter 6: Mysteries of Psychological Science: Why Are We Superstitious? Chapter 10: Psychomythology: Creating "Superbabies" One App at a Time Chapter 16: Mysteries of Psychological Science: Why Can Ineffective Therapies Appear to be Helpful?
2.1e Describe common fallacies in thinking (e.g., confirmation bias, post hoc explanations, implying causation from correlation) that impair accurate conclusions and predictions	<i>Learning Objectives: 1.1a, 1.2a, 1.3a, 1.3b, 9.5b</i>
<b>2.2 Demonstrate psychology information literacy</b>	
2.2a Read and summarize general ideas and conclusions from psychological sources accurately	<i>Learning Objectives: 2.5a, 2.5b, 6.5a</i>
2.2b Describe what kinds of additional information beyond personal experience are acceptable in developing behavioral explanations (i.e., popular press reports vs. scientific findings)	<i>Learning Objectives: 1.1a, 2.5b, 9.5a</i>
2.2c Identify and navigate psychology databases and other legitimate sources of psychology information	<i>Learning Objectives: 1.2a</i> Chapter 7: Psychomythology: Smart Pills
2.2d Articulate criteria for identifying objective sources of psychology information	<i>Learning Objectives: 1.2b, 2.5b</i> Chapter 1: Mysteries of Psychological Science: Why Do We Perceive Patterns Even When They Don't Exist? Chapter 8: Psychomythology: Common Misconceptions About Sign Language

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APA Learning Outcomes and Objectives	Text Learning Objectives and Features
2.2e Interpret simple graphs and statistical findings	<i>Learning Objectives: 2.4a, 2.4b, 2.4c</i>
<b>2.3 Engage in innovative and integrative thinking and problem-solving</b>	
2.3a Recognize and describe well-defined problems	<i>Learning Objectives: 4.2a, 4.3a, 4.4a, 4.5a, 5.4b</i>
2.3b Apply simple problem-solving strategies to improve efficiency and effectiveness	
2.3c Describe the consequences of problem-solving attempts	
<b>2.4 Interpret, design, and conduct basic psychological research</b>	
2.4a Describe research methods used by psychologists, including their respective advantages and disadvantages	<i>Learning Objectives: 2.2a, 2.2b, 3.4a, 9.2a, 14.1a</i>
2.4b Discuss the value of experimental design (i.e., controlled comparisons) in justifying cause-effect relationships	<i>Learning Objectives: 2.2c</i>
2.4c Define and explain the purpose of key research concepts that characterize psychological research (e.g., hypothesis, operational definition)	<i>Learning Objectives: 1.3b</i> Chapter 2: Mysteries of Psychological Science: How Do Placebos Work?
2.4d Replicate or design and conduct simple scientific studies (e.g., correlational or two-factor) to confirm a hypothesis based on operational definitions	<i>Learning Objectives: 2.5a</i>
2.4e Explain why conclusions in psychological projects must be both reliable and valid	<i>Learning Objectives: 2.4b, 14.6b, 14.6c</i> Chapter 14: Psychomythology: How Accurate Is Criminal Profiling?
2.4f Explain why quantitative analysis is relevant for scientific problem solving	<i>Learning Objectives: 2.4b</i>
2.4g Describe the fundamental principles of research design	<i>Learning Objectives: 2.5a, 9.3a, 9.3b</i>
<b>2.5 Incorporate sociocultural factors in scientific inquiry</b>	
2.5a Relate examples of how a researcher's value system, sociocultural characteristics, and historical context influence the development of scientific inquiry on psychological questions	<i>Learning Objectives: 2.1a, 5.2a, 9.2b, 16.2a</i> Chapter 5: Psychomythology: Age Regression and Past Lives Chapter 6: Psychomythology: Are We What We Eat?
2.5b Analyze potential challenges related to sociocultural factors in a given research study	<i>Learning Objectives: 8.3b, 8.3c</i>
2.5c Describe how individual and sociocultural differences can influence the applicability/generalizability of research findings	<i>Learning Objectives: 7.4a, 7.5a, 7.5b,</i>
2.5d Identify under what conditions research findings can be appropriately generalized	<i>Learning Objectives: 2.5a</i>
Scientific inquiry is reinforced with learning tools: Writing Space, Experimental Simulations, MyPsychLab Video Series, Visual Brain, and instructor's teaching and assessment package. Text features such as Evaluating Claims and Fact Versus Fiction also reinforce learning objectives.	
<b>Goal 3: Ethical and Social Responsibility</b>	
<b>Develop ethically and socially responsible behaviors for professional and personal settings.</b>	
<b>3.1 Apply ethical standards to psychological science and practice</b>	
3.1a Describe key regulations in the APA Ethics Code for protection of human or nonhuman research participants	<i>Learning Objectives: 2.3a, 2.3b</i>
3.1b Identify obvious violations of ethical standards in psychological contexts	
3.1c Discuss relevant ethical issues that reflect principles in the APA Code of Ethics	<i>Learning Objectives: 2.3b, 7.5b</i>
3.1d Define the role of the institutional review board	<i>Learning Objectives: 2.3a</i>
<b>3.2 Promote values that build trust and enhance interpersonal relationships</b>	
3.2a Describe the need for positive personal values (e.g., integrity, benevolence, honesty, respect for human dignity) in building strong relationships with others	<i>Learning Objectives: 11.3a, 11.3b</i>
3.2b Treat others with civility	<i>Learning Objectives: 11.3b</i>
3.2c Explain how individual differences, social identity, and world view may influence beliefs, values, and interaction with others and vice versa	<i>Learning Objectives: 13.1a, 13.2a, 13.3b, 13.5a, 13.5b</i> Chapter 15: Psychomythology: The Insanity Defense: Controversies and Misconceptions
3.2d Maintain high standards for academic integrity, including honor code requirements	
<b>3.3 Adopt values that build community at local, national, and global levels</b>	
3.3a Identify human diversity in its many forms and the interpersonal challenges that often result from the diversity	<i>Learning Objectives: 8.3c, 9.2d, 13.5a, 13.5b</i> Chapter 15: Mysteries of Psychological Science: More Than a Pack Rat: Why Do People Hoard?
3.3b Recognize potential for prejudice and discrimination in oneself and others	<i>Learning Objectives: 9.2d, 15.1a, 15.1b, 15.1c</i>
3.3c Explain how psychology can promote civic, social, and global outcomes that benefit others	<i>Learning Objectives: 8.4a, 8.4b, 12.5a, 13.5b, 16.1a</i>

**APA Learning Outcomes and Objectives**

3.3d Describe psychology-related issues of global concern (e.g., poverty, health, migration, human rights, international conflict, sustainability)

**Text Learning Objectives and Features**

*Learning Objectives:* 9.2d, 9.4b, 10.3b, 10.3c, 11.4b, 11.4c, 11.4e, 12.4c, 12.5a, 12.5b, 15.3c, 15.4b  
Chapter 14: Mysteries of Psychological Science: Where Is the Environmental Influence on Personality?

3.3e Articulate psychology's role in developing, designing, and disseminating public policy

*Learning Objectives:* 8.3c, 9.2d, 13.3a, 13.3b, 13.5b

3.3f Accept the opportunity to serve others through civic engagement, including volunteer service

*Learning Objectives:* 9.2d, 15.1a, 15.1b, 15.1c

Ethics and social responsibility are reinforced with learning tools: Writing Space, Experimental Simulations, MyPsychLab Video Series, Visual Brain, and instructor's teaching and assessment package. Text features such as Evaluating Claims and Fact Versus Fiction also reinforce learning objectives.

**Goal 4: Communication**

**Demonstrate competence in written, oral, and interpersonal communication skills and be able to develop and present a scientific argument.**

**4.1 Demonstrate effective writing in multiple formats**

4.1a Express ideas in written formats that reflect basic psychological concepts and principles

4.1b Recognize writing content and format differ based on purpose (e.g., blogs, memos, journal articles) and audience

*Learning Objectives:* 2.5b

4.1c Use generally accepted grammar

4.1d Describe how writing using APA writing style is different from regular writing or writing in other conventions

*Learning Objectives:* 2.5b

4.1e Recognize and develop overall organization (e.g., beginning, development, ending) that fits the purpose

4.1f Interpret quantitative data displayed in statistics, graphs, and tables, including statistical symbols in research reports

*Learning Objectives:* 2.4a, 2.4b, 16.5a

4.1g Use expert feedback to revise writing of a single draft

*Learning Objectives:* 2.5a

**4.2 Exhibit effective presentation skills in multiple formats**

4.2a Construct plausible oral argument based on a psychological study

4.2b Deliver brief presentations within appropriate constraints (e.g., time limit, appropriate to audience)

4.2c Describe effective delivery characteristics of professional oral performance

4.2d Incorporate appropriate visual support

4.2e Pose questions about psychological content

*Learning Objectives:* 2.4c

Chapter 4: Mysteries of Psychological Science: How Does Magic Work?  
Chapter 5: Mysteries of Psychological Science: Why Do We Experience Déjà Vu?  
Chapter 11: Mysteries of Psychological Science: Why Do We Cry?

**4.3 Interact Effectively with Others**

4.3a Identify key message elements in communication through careful listening

*Learning Objectives:* 2.4c

4.3b Recognize that culture, values, and biases may produce misunderstandings in communication

4.3c Attend to language and nonverbal cues to interpret meaning

4.3d Ask questions to capture additional detail

Chapter 9: Mysteries of Psychological Science: Why Smart People Believe Strange Things

4.3e Respond appropriately to electronic communications

Communication goals are reinforced with learning tools: Writing Space, Experimental Simulations, MyPsychLab Video Series, Visual Brain, and instructor's teaching and assessment package. Text features such as Evaluating Claims and Fact Versus Fiction also reinforce learning objectives.

**Goal 5: Professional Development**

Apply psychology-specific content and skills, effective self-reflection, project management skills, teamwork skills and career preparation to support occupational planning and pursuit.

**5.1 Apply psychological content and skills to professional work**

5.1a Recognize the value and application of research and problem-solving skills in providing evidence beyond personal opinion to support proposed solutions

5.1b Identify a range of possible factors that influence beliefs and conclusions

*Learning Objectives:* 4.6c, 4.6d, 10.3c

5.1c Expect to deal with differing opinions and personalities in the college environment

*Learning Objectives:* 11.4e, 11.5a

5.1d Describe how psychology's content applies to business, healthcare, educational, and other workplace settings

*Learning Objectives:* 4.5c, 6.1c, 6.2e, 7.3c  
Chapter 7: Psychomythology: Smart Pills

5.1e Recognize and describe broad applications of information literacy skills obtained in the psychology major

(continued)

APA Learning Outcomes and Objectives	Text Learning Objectives and Features
5.1f Describe how ethical principles of psychology have relevance to non-psychology settings	
<b>5.2 Exhibit self-efficacy and self-regulation</b>	
5.2a Recognize the link between effort and achievement	
5.2b Accurately self-assess performance quality by adhering to external standards (e.g., rubric criteria, teacher expectations)	
5.2c Incorporate feedback from educators and mentors to change performance	
5.2d Describe self-regulation strategies (e.g., reflection, time management)	
<b>5.3 Refine project management skills</b>	
5.3a Follow instructions, including timely delivery, in response to project criteria	
5.3b Identify appropriate resources and constraints that may influence project completion	
5.3c Anticipate where potential problems can hinder successful project completion	<i>Learning Objectives: 12.1a, 12.2b</i>
5.3d Describe the processes and strategies necessary to develop a project to fulfill its intended purpose	
<b>5.4 Enhance teamwork capacity</b>	
5.4a Collaborate successfully on small group classroom assignments	
5.4b Recognize the potential for developing stronger solutions through shared problem-solving	Chapter 13: Psychomythology: Is Brainstorming in Groups a Good Way to Generate Ideas?
5.4c Articulate problems that develop when working with teams	<i>Learning Objectives: 13.2a, 13.2b</i>
5.4d Assess one's strengths and weaknesses in performance as a project team member	<i>Learning Objectives: 13.2b</i>
5.4e Describe strategies used by effective group leaders	
5.4f Describe the importance of working effectively in diverse environments	
<b>5.5 Develop meaningful professional direction for life after graduation</b>	
5.5a Describe the types of academic experiences and advanced course choices that will best shape career readiness	<i>Learning Objectives: 11.4a, 16.1b</i>
5.5b Articulate the skills sets desired by employers who hire people with psychology backgrounds	
5.5c Recognize the importance of having a mentor	
5.5d Describe how a curriculum vitae or resume is used to document the skills expected by employers	
5.5e Recognize how rapid social change influences behavior and affects one's value in the workplace	
Professional development goals are reinforced with learning tools: Writing Space, Experimental Simulations, MyPsychLab Video Series, Visual Brain, and instructor's teaching and assessment package. Text features such as Evaluating Claims and Fact Versus Fiction also reinforce learning objectives.	

## The Story of Revel—Why Revel?

### Watch WHY REVEL?



Revel is an immersive learning experience designed for the way today's students read, think, and learn. Revel uses interactives and assessments integrated within the narrative that enhance content as well as students' overall learning experiences.

The story of Revel is simple: When students are engaged in the course content, they learn more effectively and perform better.

When creating your course, you have many choices as to how to supplement your lectures and curriculum. So ask yourself these questions: How do I know if my students are reading their assigned materials? Do I want my students to have a better understanding of the concepts presented in this class through course materials and lectures? Do I want to see my students perform better throughout the course? If you answered "yes" to these questions, choose Revel.



## Narrative Tells the Story

With Revel, students are introduced to a new learning experience, one in which content, reading, and interactive learning become one.

We've talked to hundreds of instructors about their biggest challenges in teaching the Introduction to Psychology course. We've heard some consistent answers: students are not engaged; students come to class unprepared; students are unable to think critically. However, the most common answer is that students do not read, which leads directly to, and in fact magnifies, the other challenges that instructors identified—lack of student engagement, lack of student preparedness, and an inability to think critically. Our goal in developing Revel was to research why students aren't reading and to solve that problem first and foremost as a gateway to deeper learning.



## Research and Data

Research shows that for students, reducing the extraneous cognitive load – that is, the mental effort being used in the working memory – is key to learning and retention. When students read or study in order to process and retain information, the information must move from the working memory to the

long-term memory. Put simply, reducing extraneous cognitive load increases long-term memory.

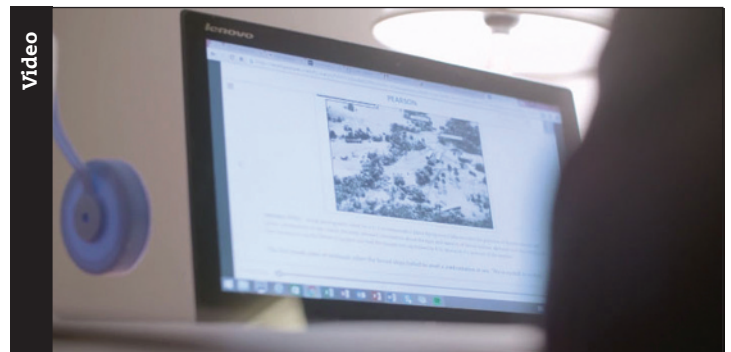
Our research also tells us that students do not see the benefits of reading their textbooks. Students perceive their instructor's dynamic lectures and class notes as their main source for learning and view their assigned text as simply a repetition of that classroom experience. In a student's mind, why would they read? What are the benefits?

We share the same goals: to give your students the motivation to read by adding value to their interaction with the course materials, and to make it easier for you to assign reading.

If that's important to you, choose Revel.

## The Story of Revel— The Solution

**Watch** THE REVEL SOLUTION



Revel is learning reimagined.

**Revel benefits your students.** Revel's dynamic content matches the way students learn today. Narrative is supported and enhanced by interactive content and as a result, reading becomes a pleasure rather than a chore. Revel also enables students to read and interact with course material on the devices they use, anywhere and any time. Responsive design allows students to access Revel on their tablets, desktop computers, or mobile devices with content displayed clearly in both portrait and landscape view.

**Revel benefits you.** Revel allows you to check your students' progress and understanding of core concepts through regular and consistent assessment. End-of-module and end-of-chapter quizzes in Revel allow students opportunities to check their understanding at regular intervals before moving on; their grades are reported to the instructor dashboard.

Revel also offers no-, low-, and high-stakes writing activities for students through the journal, shared-writing, and essay activities.

Revel lets you monitor class assignment completion as well as individual student achievement. Do you want to see points earned on quizzes, time on task, and whether a particular student's grade is improving? If so, choose Revel.

## Reading

Our extensive research with both students and instructors found that students who spend time completing their Revel reading assignments come to class better prepared to ask questions and participate in discussions. Revel's assignability and tracking tools help educators make sure students are completing their reading and understanding core concepts. Instructors using Revel can see how frequently students access their reading assignments and how well they understand what they read before they come to class.

Assessments allow instructors to gauge student comprehension frequently, provide timely feedback, and address learning gaps along the way. Stakes associated with assessment instruments can positively impact motivation, which can improve student participation and performance.



## Learning Design Theory

Over the course of several years, we have worked with more than 23,000 educators, students, and instructional design experts to develop Revel. All of Revel's key aspects—from features to content to performance dashboard reporting—were guided by interactions with our customers. Each Revel prototype has been tested with educators and students to make sure it facilitates the achievement of their course and individual goals. The result is a new approach to digital learning that gives educators and students precisely what they need to enhance learning and engagement.

**INTERACTIVES AND VIDEOS** Integrated interactive elements and brief videos allow students to engage with content and take an active role in learning. Revel's interactive learning tools have been designed to be completed quickly so students stay focused and on task.

**INTERACTIVITY SPACED ACROSS CONTENT** Instructional design research shows that active pauses—with interactive content interspersed within the text narrative—improves learning. Interactive content can often more clearly provide

information that is difficult to convey in static text. Revel integrates active pauses to let learners stop and process information using encoding and retrieval processes in the brain (Cheon, Crooks, & Chung, 2014).

**FAMILIAR LEARNING AND STUDY TOOLS** Highlighting, note taking, and a glossary personalize the learning experience. Instructors can add notes for students, too, including reminders or study tips.

## Data and Product Development

Instructional design research shows that taking a test on presented material promotes subsequent learning and retention of that material on a final test. When assessments are implemented appropriately and with specific, timely feedback, students are engaged in the retrieval process, and this act of retrieving solidifies the original learning. (McDaniel, Anderson, Derbish, & Morrisette, 2007; William 2007).

## The Story of Revel—Your Students

**Watch** REVEL AND YOUR STUDENTS



Today's students are busy. Many are not only taking a full class load, but are also working full-time, holding internships, raising families, and commuting to and from campus. As an instructor, you are competing for the limited time that students have outside of class. In addition, you are competing with other courses in which students juggle heavy workloads.

With Revel, students can be efficient with their time. Revel ensures that your course will become a priority, and it will motivate students to complete their reading prior to coming to class. You work hard to give your students a 21<sup>st</sup> century experience in class, one that incorporates multimedia and technology. With Revel, your students can have that same experience out of class on their own so that they can be better prepared, and ultimately, more successful, in your class.



## What Students Need

Students need to be motivated to read. Students also need the work they do outside of class to be a valuable use of their limited time. They need to believe that they are spending their time wisely. The interactive elements of Revel ensure that students are getting more than just a digital textbook experience; with Revel, they are “experiencing” the content in new and dynamic ways. Coupled with periodic assessment tools – as well as opportunities to write about what they have read and learned – Revel enhances student learning and retention.

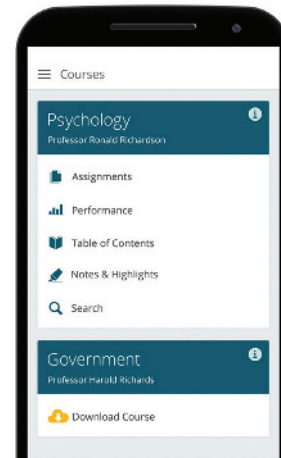


## Mobile APP

The new Revel mobile app lets students read, practice, and study—anywhere, anytime, on any device. Content is available both online and offline, and the app syncs work across all registered devices automatically, giving students greater flexibility to toggle between their phone, tablet, and laptop as they move through their day. The app also lets students customize assignment notifications to stay on top of all due dates. Available for download from the Apple iTunes App Store or Google Play for select Revel courses.

## OFFLINE ACCESS

Download course material to read, practice and study even when you're offline



## Accessibility

Learning doesn't stop when students walk out of class or step off campus; we designed the mobile app because learning happens where life happens — everywhere.

The Revel app lets students customize assignment notifications to stay on top of all due dates. With the Revel app, students can:

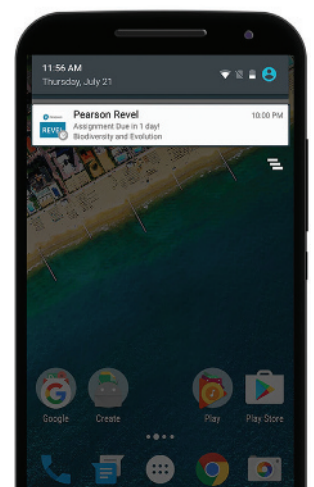
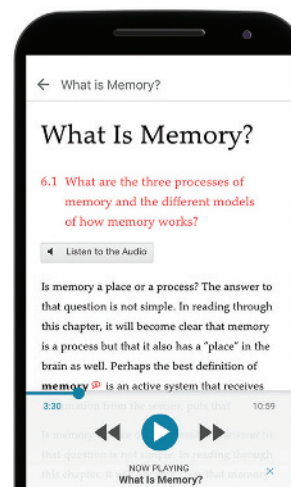
- access the assignment calendar;
- complete reading and quizzes;
- set customized due date reminders;
- check overall performance on their mobile device.

## AUDIO

Listen and learn as you go with full audio of your text (available for most courses)

## NOTIFICATIONS

Set your own notifications so you never miss a deadline again





## Support and Implementation—Getting Started with Revel

More than 5,000 Revel instructors are connecting and sharing ideas. They're energizing their classrooms and brainstorming teaching challenges via Pearson's growing network of faculty communities. The Revel community is an open, online space where members come together to collaborate and learn from each other. If you're currently teaching with Revel or considering Revel for use in your class, we invite you to join the Revel community.

Getting started with Revel is easy:

- **Identify the Problems You Want to Solve**

Do you want students to come to class more prepared, having read their assigned reading? Are your goals focused on improving student success in your course? Are you looking to increase student engagement? Are you interested in 'flipping your classroom' so that students learn basic course content outside of class, allowing for more active and applied in-class learning?

- **Keep it Simple**

The process of accessing and navigating these learning solutions needs to be simple and intuitive. Revel has built-in, frequent, low-stakes assessments for students to easily assess their understanding of the material, without getting sidetracked from their required reading assignment.

- **Track Learning Gains**

Educators who track and measure learning gains are able to make informed decisions about product implementations, course transformations, and redesigns. In addition, they can increase their ability to prove institutional effectiveness, meet accreditation standards, track quality-enhancement plans, and fulfill grant requirements.



## Course Creation, Set-Up, and Assignments

If you have used a Pearson digital product in the past like a MyLab, you can use your same Pearson account info to sign in to Revel.

If you do not have a Pearson account already, click **Educator** in the **Get Started** box, and click **I would like to request access**.

After sign in, you will arrive at Revel's course homepage. Select **Search for Materials** in the upper right-hand corner and enter the title, author, ISBN or keyword of the text you'll be using. When you find your text, click **Create Course**. Fill in your course information, and click **Save**.



The first time you log in to Revel as an instructor you will be prompted to "start creating assignments." Click **Get Started**.

You are now ready to:

- select content to choose textbook content, interactive media, and graded assignments;
- set due dates to make sure students know what Revel reading and assessments are due and when;
- publish assignments to push content and assignments to students.

**BUILDING AN ASSESSMENT PLAN** Revel includes various quiz types to use for both formative and summative assessments. To get started, simply assign each Revel module that you intend to cover in your course. Be sure to consider your assignment due dates. If your goal is for students to come to class more prepared, then be sure to make assignments due before those topics are covered in class.

Additionally, think about how you will measure success in this Revel course. What are the quantifiable goals you want to achieve? Pertinent metrics might include one or both of the following:

- an analysis of student engagement using Revel's built-in reporting features
- a comparison of in-class exam scores, final course grades, or retention rates with those of previous semesters.



## Dashboard and Analytics

Because students tend to skip optional assignments, it is critical that Revel contributes to the overall course grade. The recommendation of experienced educators is that Revel should represent at least 10-20% of the total course grade.

Remember that when you assign a chapter or section in Revel, you are assigning reading, interactives, videos, and assessments. All you need to do is pick the chapters and topics you want to cover, and then assign them to your students on the Revel assignment calendar. The Performance Dashboard allows you to export the student grades and provides total points earned for easy manual adjustments to external gradebooks.

Instructional design research suggests that certain habits of mind and dispositions are associated with critical thinking skills. Writing can be used as a tool to foster critical thinking. To get students to move toward adopting these habits and dispositions, *instruction and assessment should be appropriately complex, and focused on supporting, eliciting, and assessing skills such as evaluation, analysis, synthesis, collaboration, and critical reflection.* (Cope, Kalantzis, McCarthey, Vojak & Kline, 2011; Liu, Frankel, & Roohr, 2014).

**As a reminder, all Revel product information can be found on the Pearson Revel site.**

<https://www.pearsonhighered.com/Revel/>

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## BREAK THROUGH

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## LMS Integration

Pearson provides Blackboard Learn integration, giving institutions, instructors, and students easy access to Revel. Pearson's Revel integration delivers streamlined access to everything your students need for the course in the Blackboard Learn environment.

**SINGLE SIGN-ON** With a single sign-on, students are ready on their first day. From your Blackboard course, students have easy access to Revel's interactive blend of author's narrative, media, and assessment.

**GRADE SYNC** Flexible, on-demand grade synchronization capabilities allow you to control exactly which Revel grades should be transferred to the Blackboard Gradebook.

### BEFORE YOU GET STARTED

- Ask your campus Blackboard Administrator to enable Revel integration via Blackboard Partner Cloud.
- Read our Getting Started Guide for Blackboard Administrators at [www.pearsonhighered.com/Revel-bb-admin-guide](http://www.pearsonhighered.com/Revel-bb-admin-guide).
- Check with your Pearson representative to learn if your specific Revel course is available and to get a Pearson account if you need one.



## Summary

With Revel, Pearson authors have been able to reimagine the way students learn content, applying new and engaging learning and assessment strategies that were not possible in the past with a print textbook. If you want your students to read, retain what they have read, and understand concepts more fully, and develop and apply critical thinking skills, you have one choice.

Choose Revel.

PEARSON ALWAYS LEARNING

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## BREAKTHROUGH

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# Chapter 1

# Psychology and Scientific Thinking

## A Framework for Everyday Life



### Learning Objectives

- 1.1a** Explain why psychology is more than just common sense.
- 1.1b** Explain the importance of science as a set of safeguards against biases.
- 1.2a** Describe psychological pseudoscience and distinguish it from psychological science.
- 1.2b** Identify reasons we are drawn to pseudoscience.
- 1.3a** Identify the key features of scientific skepticism.
- 1.3b** Identify and explain the text's six principles of scientific thinking.
- 1.4a** Identify the major theoretical frameworks of psychology.
- 1.4b** Describe different types of psychologists and identify what each of them does.
- 1.4c** Describe two great debates that have shaped the field of psychology.
- 1.4d** Describe how psychological research affects our daily lives.

### Challenge Your Assumptions

Interactive

- Is psychology different from common sense?
- Should we trust most self-help books?
- Is psychology a science?
- Are claims that can't be proven wrong scientific?
- Are all clinical psychologists psychotherapists?

For many of you reading this text, this is your first psychology course. If you're like most people, much of what you've learned about psychology comes from watching television programs and movies, reading self-help books and popular magazines, surfing the Internet, using Facebook, Twitter, and other forms of social media, and talking to friends. In short, most of your psychology knowledge probably derives from the popular psychology industry: a sprawling network of everyday sources of information about human behavior.

Before reading on, try your hand at this little test of popular psychology knowledge.

### Test of Popular Psychology Knowledge

Interactive	1) Most people use only about 10 percent of their brain capacity.	True / False
	2) Newborn babies are virtually blind and deaf.	True / False
	3) Hypnosis enhances the accuracy of our memories.	True / False
	4) All people with dyslexia see words backward (like <i>tac</i> instead of <i>cat</i> ).	True / False
	5) In general, it's better to express anger than to hold it in.	True / False
	6) The lie-detector (polygraph) test is 90–95 percent accurate at detecting falsehoods.	True / False
	7) People tend to be romantically attracted to individuals who are opposite from them in personality and attitudes.	True / False
	8) The more people present at an emergency, the more likely it is that at least one of them will help.	True / False
	9) People with schizophrenia have more than one personality.	True / False
	10) All effective psychotherapies require clients to get to the root of their problems in childhood.	True / False

Beginning psychology students typically assume that they know the answers to most of the preceding 10 questions. That's hardly surprising because these assertions have become part of popular psychology lore. Yet most students are surprised to learn that *all* 10 of these statements are false! This exercise illustrates a take-home message we'll emphasize throughout this text: *Although common sense can be enormously useful for some purposes, it's sometimes completely wrong* (Chabris & Simons, 2010; Watts, 2014). This can be especially true for psychology, a field that strikes many of us as self-evident, or even obvious. In a sense, we're *all* psychologists because we deal with psychological phenomena like love, friendship, anger, stress, happiness, sleep, memory, and language in our daily lives (Lilienfeld et al., 2009). As we'll discover, everyday experiences can often be helpful in allowing us to navigate the psychological world, but they don't necessarily make us experts (Kahneman & Klein, 2009). Put a bit differently, familiarity with human nature doesn't equal understanding of human nature (Lilienfeld, 2012).

### Journal Prompt

Were you surprised by the results of this quiz? Where do you recall learning about the myths that you thought were true? Why do you think many of these myths persist despite scientific evidence to the contrary?

## 1.1: What Is Psychology? Science Versus Intuition

**1.1a** Explain why psychology is more than just common sense.

**1.1b** Explain the importance of science as a set of safeguards against biases.

William James (1842–1910), the Harvard psychologist often regarded as the founder of American psychology, once described psychology as a “nasty little subject.” As James noted, psychology is exceedingly difficult to study, and simple explanations of behavior are few and far between. If you enrolled in this course expecting cut-and-dried answers to psychological questions, such as why you become angry or fall in love, you're likely to come away disappointed. But if you enrolled in the hopes of acquiring more insight

**psychology**

the scientific study of the mind, brain, and behavior

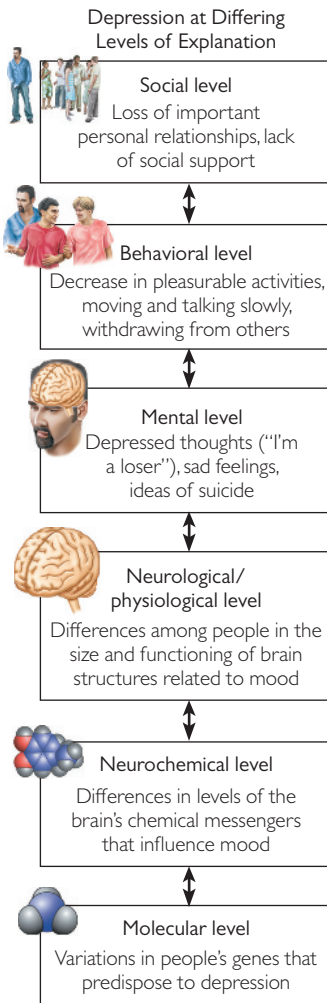
**levels of analysis**

rungs on a ladder of analysis, with lower levels tied most closely to biological influences and higher levels tied most closely to social influences

**Figure 1.1** Levels of Analysis in Depression.

We can view psychological phenomena, in this case the disorder of depression, at multiple levels of analysis, with lower levels being more biological and higher levels being more social. Each level provides unique information and offers a distinctive view of the phenomenon at hand.

**SOURCE:** Based on a figure from Ilardi, Rand, & Karwoski, 2007.



into the hows and whys of human behavior, stay tuned, because a host of delightful surprises are in store. While reading this text, prepare to find many of your preconceptions about psychology challenged. Also be prepared to encounter new ways of thinking about the causes of your everyday thoughts, feelings, and actions, and to apply your newfound skills to evaluating psychological claims in daily life. If we've done our job as authors, you'll emerge from this text equipped with tools to more thoughtfully evaluate assertions from the Internet, movies, television shows, news sources, and social media. In short, you'll become a better consumer of psychological knowledge.

## Psychology and Levels of Analysis

The first question often posed in introductory psychology texts could hardly seem more straightforward: "What is psychology?" Although psychologists disagree about many things, they agree on one thing: Psychology is remarkably challenging to define (Henriques, 2004; Lilienfeld, 2004). In part, that's because psychology is a vast discipline, encompassing the study of perceptions, emotions, thoughts, and observable behaviors from an enormous array of perspectives. For the purposes of this text, we'll simply refer to **psychology** as the scientific study of the mind, brain, and behavior.

Psychology is a discipline that spans multiple **levels of analysis**. We can think of levels of analysis as rungs on a ladder, with the lower rungs tied most closely to biological influences and the higher rungs tied most closely to social and cultural influences (Ilardi & Feldman, 2001; Kendler, 2005; Schwartz et al., 2016). The levels of analysis examined in psychology stretch all the way from what psychologists call "neurons to neighborhoods." That is, they span molecules to brain structures on the lower rungs to thoughts, feelings, and emotions and to social and cultural influences on the higher rungs, with many levels in between (Cacioppo et al., 2000; Satel & Lilienfeld, 2013) (see Figure 1.1). The lower rungs are more closely tied to what we traditionally call "the brain"; the higher rungs to what we traditionally call "the mind." But as we'll see, "brain" and "mind" are just different ways of describing the same material "stuff" at different levels of analysis: What we call the "mind" is really just the brain in action. Although research psychologists often differ in which rungs they choose to investigate, they're united by a commitment to understanding the causes of human and animal behavior using the best available tools of science.

We'll cover all of these levels of analysis in the coming chapters. When doing so, we'll keep one crucial guideline in mind: *To fully understand psychology, we must consider multiple levels of analysis.* That's because each level tells us something different, and we gain new knowledge from each perspective. Think of viewing a major city from the vantage point of a tall hotel's glass elevator (Watson, Clark, & Harkness, 1994). As you ascend, you'll obtain different glimpses of the city. At the lower elevations, you'll acquire a better grasp of the details of the city's roads, bridges, and buildings, whereas at the higher elevations, you'll acquire a deeper perspective of how the roads, bridges, and buildings fit together and interact. Each elevation tells you something new and interesting. The same is true when ascending the ladder of levels of analysis in psychology.

It's easy to fall into the trap of assuming that only one level of analysis is the "right" or "best" one. Some psychologists believe that biological factors—like the actions of the brain and its billions of neurons (nerve cells)—are sufficient for understanding the major causes of behavior. Others believe that social factors—like parenting practices, peer influences, and culture—are sufficient for understanding the major causes of behavior (Meehl, 1972). In this text, we'll steer clear of these two extremes, because both biological and social factors are essential for a complete understanding of psychology (Kendler, 2005; Schwartz et al., 2016).

## What Makes Psychology Distinctive—and Fascinating

Another key theme of this text is that we can approach psychological questions scientifically, and in much the same way as we can approach questions in biology, chemistry, and physics. Yet in some ways, psychology is distinctive from other sciences, if not unique. A host of challenges make the study of mind, brain, and behavior especially complex; yet it's precisely these challenges that also make psychology fascinating because they contribute

to scientific mysteries that psychologists have yet to solve. Here, we'll touch briefly on five especially intriguing challenges that we'll be revisiting throughout the text.

First, human behavior is exceedingly difficult to predict, in part because almost all actions are **multiply determined**, that is, produced by many factors. That's why we need to be skeptical of *single-variable explanations* of behavior, which are widespread in popular psychology. Although it's tempting to explain complex human behaviors, such as violence, in terms of a single causal factor like poverty, personality traits, bad upbringing, or genes, such behaviors are almost surely the result of the interplay of an enormous array of factors (Stern, 2002).

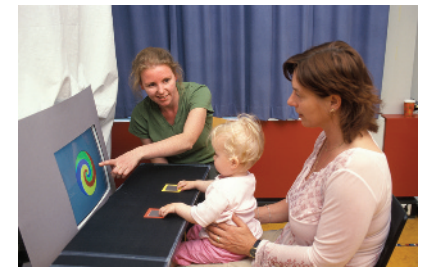
Second, psychological influences are rarely independent of each other, making it difficult to pin down which cause or causes are operating. Imagine yourself as a scientist attempting to explain why some women develop **anorexia nervosa**, a severe eating disorder. You could start by identifying several factors that might contribute to anorexia nervosa, such as anxiety-proneness, compulsive exercise, perfectionism, excessive concern with body image, and exposure to television programs that feature thin models. Let's say that you want to focus on just one of these potential influences, such as perfectionism. Here's the catch: Women who are perfectionists also tend to be anxious, to exercise a lot, to be overly concerned with their body image, to watch television programs that feature thin models, and so on (Egan et al., 2013). The fact that all of these factors tend to be interrelated makes it tricky to pinpoint which one actually contributes to anorexia nervosa. The odds are high that they each play at least some role.

Third, people differ from each other in thinking, emotion, personality, and behavior. These **individual differences** help to explain why each person responds in different ways to the same objective situation, such as an insulting comment from a boss (Harkness & Lilienfeld, 1997). In this respect, psychology is far more complicated than chemistry, because people—unlike most carbon atoms—aren't identical. Entire fields of psychology, such as the study of intelligence, interests, personality, and mental illness, focus on individual differences (Cooper, 2015; Lubinski, 2000). Individual differences make psychology challenging because they make it difficult to come up with explanations of behavior that apply to everyone. At the same time, they make psychology endlessly fascinating, because people we might assume we understand well often surprise, or even shock, us in their reactions to life events.

Fourth, people often influence each other, making it difficult to pin down precisely what causes what (Wachtel, 1973). For example, if you're an extraverted person, you're likely to make the people around you more outgoing. In turn, their outgoing behavior may "feed back" to make you even more extraverted, and so on. This is an example of what Stanford researcher Albert Bandura (1973), who is the most-cited living psychologist, called *reciprocal determinism*—the fact that we mutually influence each other's behavior. Reciprocal determinism can make it enormously challenging to isolate the causes of human behavior (Wardell & Read, 2013).

Fifth, people's behavior is often shaped in powerful ways by culture. Cultural differences, like individual differences, place limits on the generalizations that psychologists can draw about human nature (Henrich, Heine, & Norenzayan, 2010; Morris, Chiu, & Lui, 2015). To take one example, Richard Nisbett and his colleagues found that European-American and Chinese participants often attend to strikingly different things in pictures (Chua, Boland, & Nisbett, 2005). In one case, the researchers showed people a photograph of a tiger walking on rocks next to a river. Using eye-tracking technology, which allows researchers to determine where people are moving their eyes, they found that European Americans tend to look mostly at the tiger, whereas Chinese tend to look mostly at the plants and rocks surrounding it. This finding dovetails with evidence that European Americans tend to focus on central details, whereas Asian Americans tend to focus on peripheral or incidental details (Nisbett, 2003; Nisbett et al., 2001).

All five of these challenges are worth bearing in mind as we move onto later chapters. The good news is that psychologists have made substantial progress toward addressing all of them. As we'll discover, a deeper and richer appreciation of these challenges helps us to better predict—and in some cases understand—behavior.



Psychology may not be one of the traditional hard sciences like chemistry, but many of its fundamental questions are even more difficult to answer.

### multiply determined

caused by many factors

### anorexia nervosa

psychiatric condition marked by extreme weight loss and the perception that one is overweight even when one is massively underweight

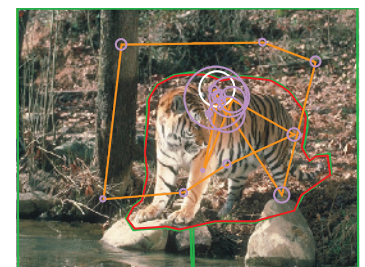
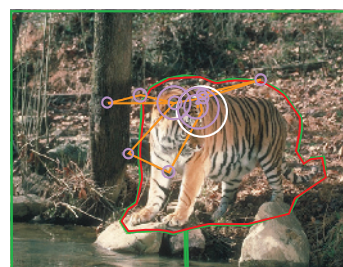
### individual differences

variations among people in their thinking, emotion, personality, and behavior

In the museum of everyday life, causation isn't a one-way street. In conversations, one person influences a second person, who in turn influences the first person, who in turn influences the second person, and so on. This principle, called *reciprocal determinism*, makes it challenging to pinpoint the causes of behavior.



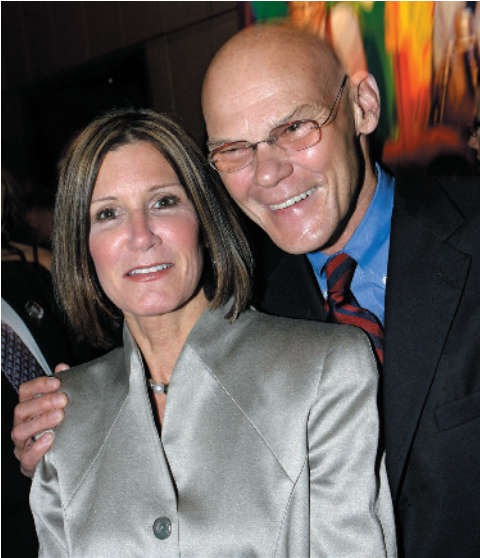
In a study by Chua, Boland, and Nisbett (2005), European Americans tend to focus more on the central details of photographs, like the tiger itself (*left*), whereas Asian Americans tend to focus more on the peripheral details, like the rocks and leaves surrounding the tiger (*right*).





## Do Opposites Attract?

Interactive



Marriages like that of Mary Matalin, a prominent conservative political strategist, and James Carville, a prominent liberal political strategist, are rare. Despite the commonsense belief that opposites attract, psychological research shows that people are generally drawn to others who are similar to them in beliefs and values.

## naïve realism

belief that we see the world precisely as it is

## Figure 1.2 Naïve Realism Can Fool Us.

Even though our perceptions are often accurate, we can't always trust them to provide us with an error-free picture of the world. In this case, take a look at *Shepard's tables*, courtesy of psychologist Roger Shepard (1990). Believe it or not, the tops of these tables are identical in size: One can be directly superimposed on top of the other (get out a ruler if you don't believe us!).



## Why We Can't Always Trust Our Common Sense

To understand the causes of our behavior and that of others, most of us rely on our common sense—that is, our gut intuitions about how the social world works. Many popular books, such as Malcolm Gladwell's blockbuster bestseller *Blink* (2005), reinforce this view, implying that we should often, if not usually, trust our common sense. Yet, as we've already discovered, our intuitive understanding of ourselves and the world is frequently mistaken (Cacioppo, 2004; Chabris & Simons, 2010; Van Hecke, 2007).

As the quiz at the start of this chapter showed us, our commonsensical understanding of psychology is sometimes not merely incorrect but entirely backward. For example, although many people believe the old adage "There's safety in numbers," psychological research actually shows that the more people present at an emergency, the *less* likely at least one of them will help (Darley & Latané, 1968a; Fischer et al., 2011; Latané & Nida, 1981).

Let's consider another illustration of why we can't always trust our common sense. Read the following well-known proverbs, most of which deal with human behavior, and ask yourself whether you agree with them:

- |   |   |
|---|---|
| 1. Birds of a feather flock together.   | 6. Opposites attract.                   |
| 2. Absence makes the heart grow fonder. | 7. Out of sight, out of mind.           |
| 3. Better safe than sorry.              | 8. Nothing ventured, nothing gained.    |
| 4. Two heads are better than one.       | 9. Too many cooks spoil the broth.      |
| 5. Actions speak louder than words.     | 10. The pen is mightier than the sword. |

To most of us, these proverbs all ring true. Yet in fact, each proverb contradicts the proverb across from it. So our common sense can lead us to believe two things that can't both be true simultaneously—or at least that are largely at odds with each other. Strangely enough, in most cases, we never notice the contradictions until other people, like the authors of an introductory psychology textbook, point them out to us. This example reminds us of why scientific psychology doesn't rely exclusively on intuition, speculation, or common sense.

**NAÏVE REALISM: IS SEEING BELIEVING?** We trust our common sense in part because we're prone to **naïve realism** (Lilienfeld, Lohr, & Olatunji, 2008; Ross & Ward, 1996). We assume that "seeing is believing" and trust our intuitive perceptions of the world and ourselves. In daily life, naïve realism generally serves us well. If we're driving down a one-lane road and see a tractor trailer barreling toward us at 85 miles per hour, it's a good idea to get out of the way. Much of the time, we *should* trust our perceptions, or at least pay pretty close attention to them.

Yet appearances can sometimes be deceiving. The earth *seems* flat. The sun *seems* to revolve around the earth (see Figure 1.2 for another example of deceptive appearances). Yet in both cases, our intuitions are wrong.

Similarly, naïve realism can trip us up when it comes to evaluating ourselves and others. Our common sense assures us that people who don't share our political views are biased but that we're objective. Yet psychological research demonstrates

that just about all of us tend to evaluate political issues in a biased fashion (Pronin, Gilovich, & Ross, 2004). So our tendencies toward naive realism can lead us to draw incorrect conclusions about human nature. In many cases, “believing is seeing” rather than the reverse: Our beliefs shape our perceptions of the world, often in ways we don’t realize (Gilovich, 1991; Gilovich & Ross, 2016).

**WHEN OUR COMMON SENSE IS RIGHT.** That’s not to say that our common sense is always wrong. Our intuition comes in handy in many situations and sometimes guides us to the truth (Gigerenzer, 2007; Gladwell, 2005; Myers, 2002). For example, our snap (five-second) judgments about whether someone we’ve just watched on video is trustworthy or untrustworthy tend to be right more often than we’d expect by chance (Fowler, Lilienfeld, & Patrick, 2009). Common sense can also be a helpful guide for generating hypotheses that scientists can later test in rigorous investigations (Redding, 1998). Moreover, some everyday psychological notions are indeed correct. For example, most people believe that happy employees tend to be more productive on the job compared with unhappy employees, and research shows that they’re right (Kluger & Tikochinsky, 2001).

But to think scientifically, we must learn when—and when not—to accept our common-sense conclusions. Doing so will help us to become more informed consumers of popular psychology and ideally, to make better real-world decisions. One major goal of this text is to provide you with a framework of scientific thinking tools for doing so. This thinking framework can help you to better evaluate psychological claims, not just in your courses, but in everyday life.

## Psychology as a Science

A few years ago, one of our academic colleagues was advising a psychology major about his career plans. Out of curiosity, he asked the student, “So why did you decide to go into psychology?” The student responded, “Well, I took a lot of science courses and realized I didn’t like science, so I picked psychology instead.”

We’re going to try to persuade you that the student was mistaken—not about selecting a psychology major, that is, but about psychology not being a science. A central theme of this text is that modern psychology, or at least a hefty chunk of it, is scientific. But what does the word *science* really mean, anyway?

We might assume that *science* is just a word for all of that complicated stuff people learn in their biology, chemistry, and physics classes. But in reality, science isn’t a body of knowledge. It’s a systematic *approach* to evidence (Bunge, 1998; Chalmers, 2013). Specifically, science consists of a set of attitudes and skills designed to prevent us from fooling ourselves and fooling others. Science begins with *empiricism*, the premise that knowledge should initially be acquired through observation. Yet such observation is only a rough starting point for obtaining psychological knowledge. As the phenomenon of naive realism reminds us, observation isn’t sufficient by itself, because our senses can fool us. Science refines our initial observations, subjecting them to stringent tests to determine whether they are accurate. The observations that stand up to rigorous scrutiny are retained; those that don’t are revised or discarded.

Survey data show that a large percentage, and perhaps even a majority, of the general public doubts that psychology is scientific (Janda et al., 1998; Ferguson, 2015; Lilienfeld, 2012). Some of this skepticism probably reflects the fact that few psychologists who appear on the news or other popular media outlets are scientists. So it’s not entirely surprising that in a poll of the American public, only 30 percent agreed that “psychology attempts to understand the way people behave through scientific research”; in contrast, 52 percent believed that “psychology attempts to understand the way people behave by talking to them and asking them why they do what they do” (Penn & Schoen and Berland

### Naïve Realism

Interactive



Here’s another case in which our naive realism can trick us. Take a look at these two upside-down photos. They look quite similar, if not identical. See next page for “flipped” versions.

## Naïve Realism

Interactive



Now you can see a noticeable difference between these two images.

**scientific theory**

explanation for a large number of findings in the natural world

**hypothesis**

testable prediction derived from a scientific theory

Some creationists have argued that evolution is “just a theory.” Cobb County, Georgia, briefly required high school biology textbooks to carry this sticker (Pinker, 2002).

This textbook contains material on evolution. Evolution is a theory, not a fact, regarding the origin of living things. This material should be approached with an open mind, studied carefully, and critically considered.

Approved by  
Cobb County Board of Education  
Thursday, March 28, 2002

Associates, 2008, p. 29). In fact, scientific psychologists almost always rely on systematic research methods, of which talking to people is only one component, and often not the most important. Another reason why many people question psychology’s scientific status is that psychology is intimately familiar to all of us; memory, learning, love, sleep and dreams, personality, and the like are part and parcel of everyday lives. Because these psychological phenomena are so recognizable to us, we may assume that we understand them (Lilienfeld, 2012). Indeed, children and adults alike tend to regard psychology as simpler and more self-evident than physics, chemistry, and biology (Keil, Lockhart, & Schlegel, 2010), which probably helps to explain why these other fields are often called the “hard” sciences. Yet as we’ll see in later chapters, there are many ways in which psychology is even “harder” than physics, because behavior—especially human behavior—is often far more challenging to predict (Cesario, 2014; Meehl, 1978).

**WHAT IS A SCIENTIFIC THEORY?** Few terms in science have generated more confusion than the deceptively simple word *theory*. Some of this confusion has contributed to serious misunderstandings about how science, including psychological science, works. We’ll first examine what a scientific theory is and then address two misconceptions about what a scientific theory *isn’t*.

A **scientific theory** is an explanation for a large number of findings in the natural world, including the psychological world. A scientific theory offers an account that ties multiple observations together into one pretty package.

Still, good scientific theories should do more than account for existing data. They should generate predictions regarding new data we haven’t yet observed. For a theory to be scientific, it must lead to novel predictions that researchers can test. Scientists call a testable prediction a **hypothesis**. In other words, theories are general explanations, whereas hypotheses are specific predictions derived from those explanations (Bolles, 1962; Meehl, 1967). Based on their tests of hypotheses, scientists can provisionally accept the theory that generated these hypotheses, reject this theory outright, or revise it (Proctor & Capaldi, 2006). Now, let’s consider two common misconceptions about what a theory is.

**Misconception 1:** *A theory explains one specific event.* The first misunderstanding is that a theory is a specific explanation for an event. The popular media get this distinction wrong much of the time. We often hear television reporters say something like, “The most likely theory for the robbery at the downtown bank is that it was committed by two former bank employees who dressed up as armed guards.” But this isn’t a “theory” of the robbery. For one thing, it attempts to explain only one event rather than a variety of diverse observations. It also doesn’t generate testable predictions.

**Misconception 2:** *A theory is just an educated guess.* A second myth is that a scientific theory is merely a guess about how the world works. People often dismiss a theoretical explanation on these grounds, arguing that it’s “just a theory.” (McComas, 1996).

In fact, *all* general scientific explanations about how the world works are theories. A few theories are extremely well supported by multiple lines of evidence. For example, the Big Bang theory, which proposes that the universe began in a gigantic explosion about 14 billion years ago, helps scientists to explain a diverse array of observations. They include the findings that (1) galaxies are rushing away from each other at remarkable speeds; (2) the universe exhibits a uniform background radiation strongly suggestive of the remnants of a tremendous explosion; and (3) powerful telescopes reveal that the oldest galaxies originated about 14 billion years ago, right around the time predicted by the Big Bang theory. Like all scientific theories, the Big Bang theory can never be “proven” because it’s remotely conceivable that an even better explanation might come along one day. Nevertheless, because this theory is consistent with many differing lines of evidence, the overwhelming majority of scientists accept it as a good explanation.

## Identify Theories and Hypotheses

Interactive	1) Sarah's motivation for cheating was fear of failure. a. Theory b. Hypothesis
	2) Darwin's evolutionary model explains the changes in species over time. a. Theory b. Hypothesis
	3) The universe began in a gigantic explosion about 14 billion years ago. a. Theory b. Hypothesis
	4) Our motivation to help a stranger in need is influenced by the number of people present. a. Theory b. Hypothesis
	5) Crime rates in Nashville increase as the temperature rises. a. Theory b. Hypothesis
	1) b, 2) a, 3) a, 4) b, 5) b.

## Fact vs. Fiction

Interactive	Academic psychologists are more skeptical of many weakly supported claims, such as extrasensory perception, than are their colleagues in more traditional sciences, such as physics and chemistry. (See bottom of page for answer.)
	<input type="radio"/> Fact <input type="radio"/> Fiction

Darwinian evolution, the Big Bang, and other well-established theories aren't merely guesses about how the world works, because they've been substantiated over and over again by independent investigators. In contrast, many other scientific theories are only moderately well supported, and still others are questionable or entirely discredited. Not all theories are created equal.

So when we hear that a scientific explanation is "just a theory," we should remember that theories aren't merely guesses. Some theories have survived repeated efforts to refute them and are well-established models of how the world works (Kitcher, 2009).

### SCIENCE AS A SAFEGUARD AGAINST BIAS: PROTECTING US FROM OURSELVES.

Some people assume that scientists are objective and free of biases. Yet all scientists, including psychological scientists, are human and have their biases, too (Greenwald, 2012; Mahoney & DeMonbreun, 1977). The best scientists, though, strive to become aware of their biases and to find ways to compensate for them. In particular, the best scientists realize that they *want* their pet theories to turn out to be correct. After all, they've typically

*Answer:* Fact. Compared with physicists, chemists, and biologists, psychologists are considerably less likely to believe that extrasensory perception is an established scientific phenomenon (Wagner & Monnet, 1979). That may be because psychologists are more aware than most other scientists of how biases can affect the interpretation of ambiguous data.