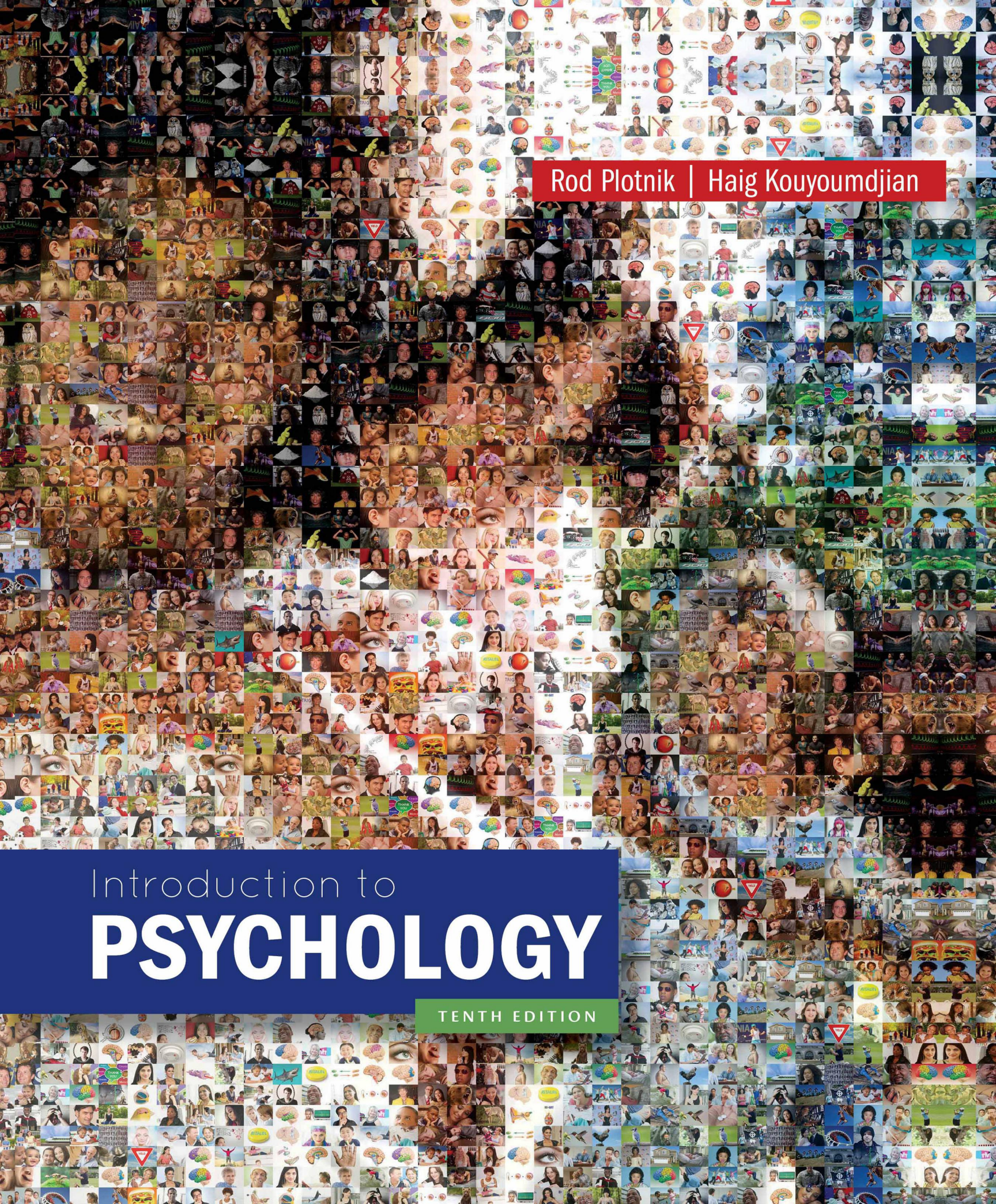

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# Introduction to PSYCHOLOGY

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Rod Plotnik and Haig Kouyoumdjian

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# To All Students Everywhere

We begin each revision with great enthusiasm, which usually begins to fade at the halfway point. The one sure way we have to revive our motivation is to read the many uplifting students' comments that we have received. To show you what we mean, we've included a sample of their wonderful comments, for which we are eternally grateful. (If you too would like to comment on the text, please fill out and send in the form on the last page of this text.)

The psychology book was amazing. I do not know how and where to begin, because I just loved it so much.
—**Natosha**,
Saint Dominic Academy

I really liked how easy the book was to comprehend. The examples help make the definitions easy to memorize.
—**Natalie**,
Onondaga Community College

The diagrams were easy to understand. Good pictures and real-life examples people can *relate* to. Best psychology book I've read.
—**Sarah**, Rochester Community College

Since I consider myself a visual learner, I benefited a lot from the pictures, drawings, and graphs included throughout the book. Also the "chunking" made the material fun to learn.
—**Roxanne**, Wharton County Junior College

How visual it is. The many pictures helped me to remember the text better. The simple writing style, but still academic, was helpful to make it interesting. I am really glad that we read this book. It made my course!
—**Julia**, Norwalk Community College

I enjoyed so much the photos, the text, the stories, the whole layout of the book—I truly learned just from reading and remembered things because of the way they were used in the book, like next to a picture or highlighted!
—**Richelle**, Western Iowa Tech Community College

I was astonished at how gripping this textbook was. I actually looked forward to the reading. I really enjoyed the real-life situations that were incorporated into each module. I have decided to keep this book and do more reading than what was required during class.
—**Amanda**,
Lanier Technical College

Your book made learning all the material really easy & very interesting. The way you explained everything made sense & kept me intrigued & wanting to learn more. No joke.
—**Avani**, Henry Ford Community College

The summary tests!! I couldn't have passed psychology with out those tests!! THANK YOU!! I'll keep this book forever!!
—**Shannon**, Griffith University

I truly enjoyed the "little stories." They help me understand what we were studying. Please continue on with the Cultural Diversity sections!
—**Pharik**, Platt College

This is one of the best textbooks I've read and enjoyed; you did a great job organizing and writing material in such a friendly way. I plan on keeping this book as I enjoyed it so much.
—**Janet**, Ivy Tech Community College

The newspaper articles at the end of each chapter were so interesting, I wanted to read every single one. Thank you for putting together such a visual book and making everything seem so much more interesting.
—**Tracy**, Wayne Community College

# About the Cover

Our cover was created by Picture Mosaic using more than 180 photographs and 30 illustrations from our text. The cover underscores the book's visual learning philosophy and reflects our modular "parts are as great as the sum" approach. All of these small images come together to create a whole picture.

Each page throughout our 25 modules is a complete "part," meaning that each page is individually formatted to cover specific content from beginning to end. We create this format by "chunking" information on each page into small units. Also, we integrate the text on each page with interesting visuals so students have meaningful visual cues to help them learn and remember content. The "parts" of all of the pages within the modules come together to provide the learner with the whole picture.



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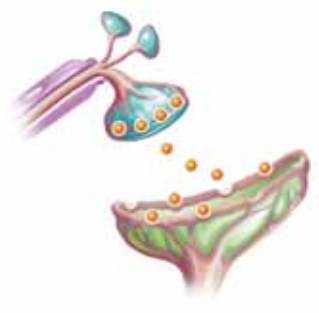





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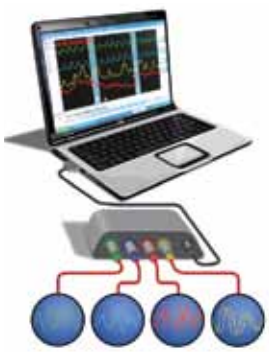

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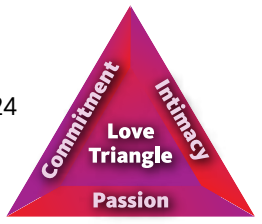

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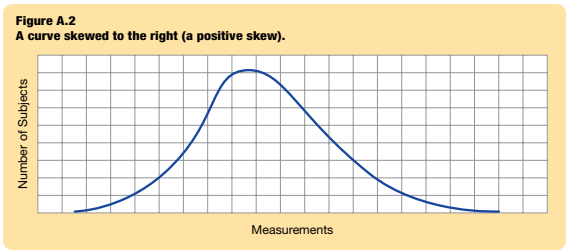
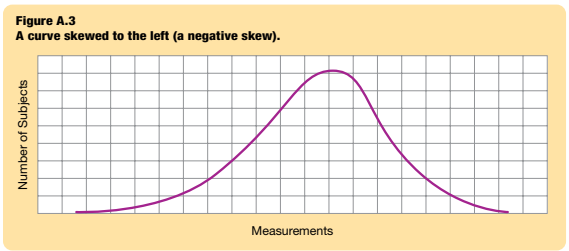




# To the Instructor: Changes & Features

## What Are the Major Content Changes?

During the past decade, new findings in the related areas of biology, genetics, and cognitive neuroscience have had a great impact on the field of psychology. Because such findings help psychologists better understand and explain behavior, we included many new and exciting discoveries not only from the field of psychology but also from the related fields of biology, genetics, and cognitive neuroscience.

In updating the 10th edition, we added nearly 750 new references, all from recent years!

Here is a sample of some of the major content changes in the 10th edition:

### Module 1: Discovering Psychology

- Revised discussion of autism
- New coverage of sociocultural approach
- New coverage of biopsychosocial approach
- New coverage of neuroscience
- Updated discussion on test anxiety and passive perfectionism
- New discussion on behavioral approach to test anxiety
- New coverage of positive psychology
- Updated coverage of autism prevalence in South Korea
- Updated Cultural Diversity: Early Discrimination feature
- Updated research regarding employment opportunities for psychologists
- New discussion about test taking and recalling information
- New Critical Thinking: Learning through Visuals feature, discussing visual learning and the book's modular format

### Module 2: Psychology & Science

- Completely revised organization of module, including coverage of descriptive research, correlational research, and experimental research as overarching research method types
- Thoroughly updated introduction to the six-step scientific method and descriptive research, including detailed discussion of steps, "armchair psychology," new illustrations, and advantages, and disadvantages of the descriptive research method
- New research example of survey, involving reported versus observed hand washing after use of public bathroom
- New discussion of and illustrations for naturalistic observation and its advantages and disadvantages
- New discussion and explanation of "personal beliefs" and "self-fulfilling prophecy" as disadvantages of the case study method, as well as a revised discussion of the advantages
- Updated Cultural Diversity: Use of Placebos feature with research related to medical uses of placebos, a study linking placebo relief consistent with medical relief in IBS patients, and garlic as a cure for H1N1 in China
- New discussion of correlation between kindergarten test scores and adulthood earnings as disadvantage of the correlational research method, with new illustrations
- New discussion of "population" and "sample" in discussion of how to choose participants in an experiment
- New illustrations created for the experimental research section

### Module 3: Brain's Building Blocks

- Revised introduction, including updated research about Alzheimer's disease, its diagnosis, possible genetic factors, and proposed medical treatments accompanied by a new illustration and real-world example about dementia in Alzheimer's patients
- New in-depth coverage and integration of neuroscience
- Revised organization and coverage of the development and structure of the brain in Overview: Human Brain discussion, including new research about the function of glial cells, new research about the complexity of neurons and the neural network, new coverage of neurogenesis, and updated example, figure, and imagery about Alzheimer's effects on the neural activity of the brain
- New coverage and figure about the synapse in Neurons: Structure & Function discussion, including a close-up look at and description of the bulb, dendrites, and neurotransmitters
- New discussion about transplanting limbs, including the example of 54-year-old Karl Merk who received a double arm transplant from a donor
- New research on how damage to the central nervous system effects neurons, resulting in conditions like multiple sclerosis and Alzheimer's disease
- Updated coverage, organization, section titles, and figures in Neurons: Communication section, including revised figures and illustrations, new descriptions of well-known neurotransmitters and their purposes, and new discussion of neuropeptides with endorphins as an example of brain-born painkillers
- Updated Cultural Diversity: Plants & Drugs feature, including new imagery, as well as a new cultural and contemporary discussion of salvia, the popularity of its use, and its effect on the behavior of celebrity Miley Cyrus
- Updated discussion of Parkinson's disease and actor Michael J. Fox's continuing struggle with the condition
- New research about and revised discussion of stem cells, including the use of embryonic human stem cells in treatment of a patient with spinal cord injury and the up and coming engineering of induced pluripotent stem cells (iPSCs)
- Updated research on deep brain stimulation (DBS) in the treatment of patients with Parkinson's disease and coverage of newer, more effective DBS systems

### Module 4: Incredible Nervous System

- New Introduction about Stu Bryant, who suffers from frontotemporal disease, including a description of his symptoms and diagnosis along with an introduction to cognitive neuroscience and discussion of how genes affect behavior
- Updated research about the genome, including new information on the number of genes found on the 23 pairs of human chromosomes, and new research about Tibetans as a recent example of human evolution in Genes & Evolution section
- Updated discussion of brain scans in Cognitive Neuroscience section, including revised MRI example, new headings for and organization of discussion, new discussion of magneto-encephalography (MEG) scan, and new discussion of and imagery for electroencephalograph (EEG), with updated Concept Review and Summary Test
- Updated discussion of the brain in Brain: Structures and Functions section, including references to new introductory example about Stu Bryant and damage to the frontal and temporal lobes
- New research example about amygdala and effect of genetic disease deterioration on experience of fear and recognition of fear in others' facial expressions
- Updated Research Focus: Sex Differences in the Brain? feature, with new conclusion discussion regarding recent research in sex differences in the brain
- New Cultural Diversity: Cultural Neuroscience feature, including introduction to the field, research methods involved in cultural neuroscience, and three diverse examples featuring studies including brain activity

differences between cultures in relation to behaviors, emotions, and thoughts with new accompanying illustration
- New Critical Thinking: Consciousness during Coma feature, including a compare-and-contrast discussion of two well-publicized cases of people in comas, Terri Schiavo and Jean-Dominique Bauby, whose conditions caused them to have different states of consciousness and mental ability along with a revised set of critical thinking questions, and new transcranial magnetic stimulation (TMS) and electroencephalograph (EEG) discussion and illustration

## Module 5: Sensation

- Updated Introduction to sensation module, including revised discussion of Terry Byland, whose retina were damaged but can now see with help of a microchip and special glasses, and a new visual discussion identifying the five senses
- New discussions about visual accommodation and blind spots in the retitled Vision section, along with updated imagery throughout and updated research related to color blindness
- Retitled Audition section with revised use of key terms, like *frequency, hammer, anvil, stirrup, eardrum,* and *pinna,* and imagery, like an updated ear diagram, as well as new research about the likelihood of hearing loss in college students
- New Vestibular & Kinesthetic Senses section, including the key terms *vestibular sense* and *semicircular canals,* and a new Kinesthetic Sense discussion with updated inclusion in the Concept Review and Summary Test
- Updated Chemical Senses section, including new research about brain cells in mice and response to types of taste, new research about human sensitivity to bitterness and link to evolution, updated research on supertasters, updated olfactory cell diagram, and new research in functions of olfaction, including five real-world examples of how smells affect things like our emotions, choices for reproduction, and everyday purchases
- Updated Touch section, including revised discussion of sensory receptors and new inclusion of and research about the Merkel cell, which is sensitive to gentle, localized touch, along with updated inclusion in the Concept Review and Summary Test
- Updated Cultural Diversity: Disgust feature, including new research about how disgust can influence public hygiene behaviors and updated imagery
- Updated Research Focus: Mind over Body? feature, including new research about placebo response tracked in the brain using neuroscience
- New research example of how being in love can affect one's experience of pain and updated research in acupuncture discussion in the Pain section
- Updated Application: Artificial Senses feature, including new real-world example of Erik Weihenmayer and his ability to "see" with his tongue using an electrode-heavy tool called the BrainPort, along with new research about the prevalence of cochlear implants and their use in children and adults
- Updated Critical Thinking: What Would It Be Like Never to Feel Pain? feature, including revised description of Ashlyn Blocker's continued struggle with congenital insensitivity to pain with anhidrosis (CIPA)

## Module 6: Perception

- Updated Introduction to module, including new imagery and revised examples
- Updated and retitled Thresholds section, including revised discussion of absolute threshold with examples of absolute thresholds for the human eye, ear, tongue, nose, and skin as well as a revised discussion of subliminal stimuli with new historical example of subliminal messaging in advertising
- Updated imagery in Sensation Versus Perception section
- Completely revised and retitled Perceptual Organization section, including new compare-and-contrast discussion of top-down and bottom-up processing with contextual examples, and a revised discussion of Gestalt psychology and updated Concept Review and Summary Test
- Updated imagery throughout Perceptual Constancy section
- New visual examples for linear perspective, relative size, light and shadow, atmospheric perspective, texture gradient, and motion parallax depth cues in Depth Perception discussion
- Updated Cultural Diversity: Influence on Perceptions feature, including new imagery
- Revised Research Focus: Unconscious Perceptions feature, including new discussion of research study involving unconscious imagery and visual perception and updated imagery
- Updated Concept Review and Summary Test, including new imagery and review questions
- Updated and retitled Strange Perceptions section, including new moon illusion and Ames room illusion imagery, new location for ESP: Extrasensory Perception discussion, and new strange perceptions problems discussion with description of prosopagnosia with real-world examples of the condition
- Updated imagery throughout Application: Creating Perceptions feature
- Updated Critical Thinking: Taste Shapes? Hear Colors? Smell Sounds? feature

## Module 7: Sleep & Dreams

- Updated Introduction, including new imagery, revised discussion of rapid eye movement, and new discussion about REM behavior disorder and sleepwalking
- Revised Continuum of Consciousness section, including updated research about distracted driving, misconceptions about daydreaming, and new imagery
- Retitled and updated Rhythms of Consciousness section, including new research example about mice and circadian rhythms involving light exposure and weight gain along with updated imagery
- Retitled and updated Stages of Sleep section with new imagery, revised illustrations, and an updated discussion of the four stages of sleep
- Revised Research Focus: Circadian Preference feature, including new research about changes to sleep patterns across the lifespan along with new imagery
- New research about sleeping and old age, new discussion on theories about why we sleep, and research study involving rats, sleep deprivation, and consciousness
- Updated Cultural Diversity: Incidence of SAD feature, including updated information about treatment for seasonal affective disorder
- Retitled and updated Theories of Dream Interpretation section, including new definitions and descriptions of manifest content and latent content in the discussion about Freud's theory of dream interpretation, and new imagery
- Updated Application: Sleep Problems Treatments feature, including new research about cognitive-behavioral therapy and drug therapy as treatments for insomnia, updated research on narcolepsy, and suggested treatment for those who experience nightmares
- Revised Critical Thinking: Texting: How Distracting Can It Be? feature, including updated discussion regarding state and national laws about texting while driving accompanied by new information on a study discussing the frequency of near-crashes due to texting

## Module 8: Hypnosis & Drugs

- Slight reorganization of drug discussions in module, including a new outline with drugs covered under their comprehensive type: stimulants, depressants, hallucinogens, and opiates
- New research in the Hypnosis section, including discussion of a case study in which eye movements support altered state theory of hypnosis imagery
- New Research Focus: Meditation & School Stress feature that discusses transcendental meditation (TM) and how it can be used to reduce school stress, including data from a recent study involving minority college students and their experience of stress with and without use of TM

- Updated Drugs: Overview section, including new research about drug abuse and cost in the United States, a revised definition of psychoactive drugs, a new discussion of physiological and psychological dependency, a revised discussion of the effect of drug addiction and dependency on dopamine levels, new research on the prevalence of drug use in young adults, and updated imagery and illustrations
- Updated Stimulants section, including new research about cocaine use in the United States, with the real-world example of Whitney Houston, whose cocaine use contributed to her death, research about long-term drug abuse and decision-making abilities, and a completely revised nicotine discussion with new research on cigarette smoking, smoking-related deaths, and the dangers of smoking on one's own and other's bodies
- Updated and newly titled Depressants section, including new definition of depressant, new real-world example of Amy Winehouse who died of alcohol poisoning, updated research on genetic risk factors for alcoholism, and new discussion about barbiturates and tranquilizers, their effects and uses, along with new imagery
- New research on alcohol abuse prevalence in the United States in the Cultural Diversity: Alcoholism Rates feature
- Revised Concept Review and Summary Test to include new concepts like transcendental meditation, physiological dependence, barbiturates, and tranquilizers
- New research on study involving the use of MDMA for patients who have developed treatment-resistant posttraumatic stress disorder (PTSD) conducted by the U.S. government in the designer drugs discussion
- A part of the Hallucinogens section, the updated marijuana discussion includes new research about illicit marijuana use, uses for medical marijuana, public interest in marijuana legalization, and a revised definition of marijuana
- Revised opiates discussion, including new definition of narcotics, revised discussion of heroin use and popularity, new research on the prevalence of heroin in drug abuse-related deaths, and new imagery
- Updated Application: Treatment for Drug Abuse feature, including new research about the prevalence of alcohol abuse and the percentage of the population that seeks treatment, the use of vaccines as treatment for substance addiction, and new imagery
- Updated Critical Thinking: Brain-Boosting Drugs: Myth or Fact? feature, including new research about caffeine consumption and its use in the U.S. military

### Module 9: Classical Conditioning

- Updated Procedure: Classical Conditioning section to include definition of acquisition as a learning process involved in classical conditioning
- New Cultural Diversity: Conditioning Racial Prejudice feature, including discussions relating classical conditioning and racial prejudice, a classic 1930s research study example involving preschool children, white dolls, and black dolls, how people become prejudiced through conditioning, and how to uncondition racial prejudice through extinction with new imagery
- Updated imagery throughout module
- Updated Summary Test to include new content and imagery about new Cultural Diversity feature

### Module 10: Operant & Cognitive Approaches

- Updated Operant Conditioning section, including new definition of Skinner box with new illustrations and imagery
- Updated Reinforcers section, including new definition of reinforcer with updated imagery and examples
- Revised Cognitive Learning section with new definition of latent learning, new discussion about the "aha!" moment or flash of insight experience, including four main characteristics of this experience based on research studies, along with new imagery
- Updated Research Focus: Viewing Aggression feature, including new research example about reality television shows, relational aggression, and viewer behavior
- Updated Application: Behavior Modification feature, including new use of term *intellectual impairment*, new research about the cost of treatments for those with autism, new example of contingency management as a behavior modification treatment for autism as well as a variety of conditions with examples of HIV-positive patients who took medication and people who ate more healthfully because of this form of behavior modification, as well as an updated discussion of spanking and what research says about its effectiveness
- Updated Critical Thinking: How Do You Train a Killer Whale? feature, highlighting the danger involved in this work, along with new imagery
- Updated Concept Review and Summary Test, incorporating new key terms, key concepts, and imagery

### Module 11: Types of Memory

- Updated Introduction, including revised key terms, definitions, and explanations for memory, information-processing model, storage, and retrieval and new imagery
- Newly titled Three Stages of Memory section, which discusses sensory memory, short-term memory, long-term memory, memory processes, iconic memory, and echoic memory with new imagery
- Revised discussion of short-term memory and working memory as separate concepts in the Short-Term Memory: Working section, including updated imagery and new definitions
- New key terms *explicit memory* and *implicit memory* introduced in the Long-Term Memory: Storing section, including new imagery
- New Research Focus: Strengthening Episodic Memories feature, including study about memory-enhancing hormones and new discussion of memories of amnesia patients with case study of Claire Robertson, who has amnesia and uses a camera to "memorize" her daily activities
- Updated Repressed Memories section, including updated research about repressed memories and sexual abuse and a new example of therapy bringing about false traumatic memories
- Revised Cultural Diversity: Oral Versus Written feature, including a whole new section on the oral tradition and the importance of griots to community, history, and cultural identity in Africa
- Updated Application: Unusual Memories feature, including new research on the consistency of flashbulb memories associated with 9/11 attacks and new imagery
- Revised Concept Review and Summary Test, including new imagery, key terms, and key concepts

### Module 12: Remembering & Forgetting

- New imagery throughout the module
- New research example about early memories and listening to music while in the womb in the forgetting curves section
- Revised discussion about interference, a new discussion about and definition of decay, revised discussion about and definition of retrieval cues, and new research example about tip-of-the-tongue phenomenon in the reasons for forgetting section
- New discussion about the complexities associated with identifying the biological bases of memory
- New Cultural Diversity: Differences in Episodic Memory feature discussing the differences in Euro-Americans and Asians in encoding episodic memories, including synopses of three studies and new imagery
- Revised title for the Research Focus feature, now Recalling Sexual History
- Updated Application: Eyewitness Testimony feature, including revised data about wrongful convictions based on DNA evidence, a new discussion of the accuracy of eyewitness testimonies in an accident involving two trains, multiple fatalities, and millions of dollars in damages, and a new discussion of the misinformation effect, with new imagery throughout
- Updated Critical Thinking: Can Bad Memories Be Erased? feature, including new research about bad memories and how it might be possible to add to, alter, or erase them

- Updated Concept Review and Summary Test, including revised imagery and new key terms

### Module 13: Intelligence

- New Introduction section, including updates to information about Halle Berry and new inclusion of John Grisham, Mark Zuckerberg, and Jeremy Lin as examples of various types of intelligence, with new imagery
- Revised discussions of general intelligence theory (or *g*-factor theory), multiple intelligence theory, and triarchic theory in the Defining Intelligence section, along with updated research examples and imagery
- In the Measuring Intelligence section, new research example about brain size and intelligence (IQ scores), new discussion of the Stanford-Binet Intelligence Scale, and new examples of Quentin Tarantino and Laura Shields in the discussion of whether IQ is the same as intelligence, with updated imagery
- Revised Distribution & Use of IQ Scores section, including new introduction featuring *Glee* actress Lauren Potter, retitling of sections, new discussion of intellectual disability and replacement of term *mental retardation* throughout, and revised discussion of giftedness with updated imagery and figures
- Updated Nature-Nurture Question section, including new introductory examples of Lang Lang and Sufiah Yusof as child prodigies in music and mathematics respectively, new discussion of the interaction between nature and nurture, new discussion of heritability of intelligence, all-new discussion of neuroscience and intelligence in a study involving impoverished children and brain activity, and a new research study involving adopted children, with new imagery and illustrations
- Updated Application: Intervention Programs feature, including updated research, definitions, and imagery
- Updated Concept Review and Summary Test, incorporating new key concepts and people, new imagery

### Module 14: Thought & Language

- Revised introduction, including updated imagery and introduction of the key term *cognition*
- Updated Solving Problems section, including new real-world examples of world chess champion Vladimir Kramnik and his match with computer Deep Fritz as well as a discussion about advertising created by lottery companies and the availability heuristic, new discussion of and real-world example for key term *representative heuristic,* new key term *mental set* and updated imagery throughout
- Revised Thinking Creatively section, including updated introductory information about music and fashion mogul Shawn Carter, new definition of *creativity,* and new discussion about convergent and divergent thinking and learned creativity with new imagery throughout
- New section titled Reasoning & Decision Making, including definitions of and discussions about deductive reasoning, inductive reasoning, confirmation bias, theory of linguistic relativity, and decision making, including how it relates to gambling, emotions, thoughts, and words, with new imagery throughout
- Revised Language: Basic Rules section, including updated introduction, new research about bilingualism in infants, with updated imagery and illustrations
- Revised Acquiring Language section, including updated research and discussion about language acquisition in infants with new research for each of the four stages, including discussion of receptive and productive vocabularies as well as a new study about smart baby DVD programs and environmental factors in language acquisition, with new imagery throughout
- Updated Research Focus: Dyslexia feature, including revised definition of dyslexia, new real-world example of Benjamin Bolger, and updated research and imagery throughout
- Updated Cultural Diversity: Influences on Thinking feature, with revised titles and a new illustration
- Updated Application: Do Animals Have Language? feature, including descriptions of four studies involving researchers, gorillas and chimpanzees with descriptions of primates Koko, Washoe, Nim, Kanzee, and Panzee and related research
- Updated Concept Review and Summary Test with new imagery and new key concepts and terms included
- Revised Critical Thinking article titled Does Music Improve Language Skills in Children?, and new imagery

### Module 15: Motivation

- New example of Shaquille O'Neal as example of achievement in Introduction, including brief synopsis of his athletic, musical, academic, and acting careers
- Revised Theories of Motivation section, including retitled and updated sections Instinct Approach and Maslow's Hierarchy of Needs, new sections Arousal Theory and Arousal Approach, revised Reward/Pleasure Center Approach section, and new discussions of self-determination theory, the Yerkes-Dodson law, and sensation seekers, with updated imagery and illustrations throughout
- Revised Hunger section, including newly titled Obesity section with discussions of body mass index (BMI) and research related to prevalence and causes of obesity in the United States, revised Biological Hunger Factors and Psychological Hunger Factors sections, including cross-cultural research about eating habits and dangerous dieting tactics, and updated imagery throughout
- Updated Sexual Behavior section, including revised discussion of and research about the activity of the hypothalamus in males and females, new discussion about gender dysphoria with examples of Chaz/Chastity Bono juxtaposed against landmark example of John/Joan, and updated research about sexual orientation in the United States, updated discussion on male-female sex differences, including new research study involving testosterone levels in Filipino men with and without children and the study's relationship with evolutionary theory, updated research on prevalence of homosexuality in men with several older biological brothers, and updated research on the prevalence and progression of AIDS virus worldwide with updated imagery and illustrations throughout
- Updated Cultural Diversity: Genital Cutting feature, including updated research about anti-genital cutting activist Soraya Mire, with updated imagery
- Updated Concept Review and Summary Test to include new key concepts and terms with updated imagery and illustrations
- Revised Achievement section, including revised introduction about social needs and Shaquille O'Neal, new discussion on the need for achievement and entrepreneurship, updated discussion of Intel Science Talent Search and winner Nithin Tumma in discussion of cognitive influences of achievement with updated imagery
- New Application: Dieting & Eating Disorders feature, including updated discussion of Oprah Winfrey as example of difficulties with dieting, updated diet program/lifestyle discussion including examples of visualizing food as a diet program and food addiction as a lifestyle issue, new eating disorders discussion with prevalence and examples of anorexia nervosa, bulimia nervosa, and binge eating disorder, with new imagery throughout
- New Critical Thinking: Using Money to Motivate Kids to Learn feature about experiment with multiple conditions conducted with children to determine the effectiveness of monetary reward and academic performance with new imagery and questions

### Module 16: Emotion

- Updated Peripheral Theories section, including revised section titles and new discussion of the Cannon-Bard theory, with new imagery throughout
- Updated Affective Neuroscience Approach section, including new landmark research study of SM and how the absence of an amygdala affects experiences of fear

- Revised Universal Facial Expressions section, including updated research about cross-cultural and genetic evidence for universal facial expressions and new discussion about criticisms of universal expressions given new research about recognition of certain expressions in young children
- Updated Happiness section, including new discussion about happiness across the lifespan, with updated imagery throughout
- Revised Cultural Diversity: Emotions across Cultures feature, including new research about outward expression of happiness and its varying perception in American and Asian cultures as well research showing that the vocalizations of negative emotion, but not positive emotions are universally recognized, with updated imagery throughout
- Updated Concept Review and Summary Test, including new key terms and imagery
- Updated Research Focus: Emotional Intelligence feature, including updated research and imagery
- Revised Application: Lie Detection feature, including new research about the accuracy and inaccuracy of lie detector tests, their use in law enforcement, and other physiological and observation-based methods that may provide more insight into lying, with updated imagery throughout

### Module 17: Infancy & Childhood

- Revised Introduction section, including new subtitles, updated discussion about the lasting social deficits of a damaging orphanage environment on Romanian children, and a new definition for human development
- Revised and retitled Prenatal Development section, including new example of Yo-Yo Ma as a musical prodigy and the genetic and environmental factors affecting his talents, new discussion of epigenetics, new research on prevalence of drug abuse during pregnancy and its effect on prenatal development, with new teratogen examples of prescription painkillers and pesticides, and new discussion of partial fetal alcohol syndrome, as well as new imagery throughout
- Updated Sensory & Motor Development section, including new definition of sensory development, new titles, with new imagery and illustrations throughout
- Revised Emotional Development section, including new imagery and illustrations throughout
- Revised Cognitive Development section, including revised discussion of Piaget's theory of cognitive development and its criticisms as well as new imagery and illustrations throughout
- Revised Social Development section, including a new introductory example for Bandura's social cognitive theory and new closing research on the relationship between adverse life experiences and mental health later in life
- Newly titled Gender Development section, including discussions of gender identity and roles, social role theory, cognitive developmental theory, gender schemas, and gender traits and research on male and female differences, with new imagery throughout
- Newly titled Infancy & Childhood Review section, including discussion of sensory and motor development, emotional development, cognitive development, social development, and gender development between ages 1 month and 3 years, with new imagery and illustrations throughout
- Revised Cultural Diversity: Gender Roles feature, including new imagery throughout
- Revised Application: Child Abuse feature, including updated research on child abuse and neglect and its long-lasting effects on the psychological and neurological development of children, with new imagery throughout
- Revised Critical Thinking: Who Matters More—Parents or Peers? feature, including new imagery
- Updated Concept Review and Summary Test, including updated key terms and imagery

### Module 18: Adolescence & Adulthood

- Revised Introduction, including updated case study example of Charlie Sheen, with new imagery throughout
- Revised section titles to reflect organization of module by topic, including Physical Development: Puberty, Cognitive & Emotional Development, Morality & Parenting, Personality & Social Development, Adolescence Review, and Adulthood & Aging
- Updated Physical Development: Puberty section, including new key terms *primary sexual characteristics* and *secondary sexual characteristics,* new research on environmental effects on age of menarche, updated research on trends in sexual activity and contraceptive use of teenagers, with updated imagery throughout
- New discussion of neurological gap in adolescents and updated imagery and illustrations in Cognitive & Emotional Development section
- Updated Morality & Parenting section, including completely revised discussions of authoritarian, authoritative, and permissive parenting styles as well as the parenting style's effect on the child's self-esteem, self-confidence, and achievement, with new imagery throughout
- Updated Personality & Social Development section, including new discussion of emerging adulthood and new imagery throughout
- Updated Adolescence Review section, including new discussion of Erikson's psychosocial stages of development and new imagery and illustrations throughout
- Revised Gender Roles, Love & Relationships section, including updated research on gender roles in the home and workplace for working men and women, and new research on brain scans and love, cohabitation, and socioeconomic factors in marriage and divorce, with updated imagery and illustrations throughout
- Updated Research Focus: Happy Marriages feature, including new research on successful relationships and key factors, including friendship, intimacy, constructive criticism, and shared meaning, with discussions of how to accomplish each
- Updated Cultural Diversity: Preferences for Partners feature, including new discussion of American men and women's preferences for partners and lifestyle, with updated imagery and illustrations
- Updated Adulthood & Aging section, including new research on life expectancy and population, changes in cognitive speed, brain resiliency, memory, and emotion in adulthood as well as a new discussion of death and dying and Kubler-Ross's five stages of coping, with new imagery throughout
- Updated Application: Suicide feature, including new research on suicide prevalence in the United States, the most common suicide methods, and the suicide rate in young adults and older adults as well as a new discussion on suicide prevention and identifying risk factors
- Updated Critical Thinking: Are Teens Too Young to Drive? feature, including function of executive branch of brain and common driving mistakes made by teenagers as well as research on new programs for driver's licensure involving phased driving privileges, with updated imagery
- Updated Concept Review and Summary Test, including new terminology and imagery

### Module 19: Freudian & Humanistic Theories

- Revised Introduction, including new example of Greg Mathis, who went from gang member to court judge and host of an award-winning television show, with updated imagery
- Updated Divisions of the Mind section, including new imagery and research regarding defense mechanisms and denial
- Updated Developmental Stages section, including updated illustrations and new imagery
- Revised Freud's Followers & Critics section, including updated research on Freud's theory of personality and early childhood experiences with future behavior, personality, emotions, as well as how those experiences can affect genes recognized using neuroscience, with updated imagery and illustrations
- Updated Humanistic Theories section, including new introduction about Greg Mathis, new example of Yani Tseng, who knew since childhood that

she wanted to become "the world's best golfer" and is ranked No. 1 in the Women's World Golf Rankings, new positive regard example of how pet owners often live longer lives, updated information about Carrie Underwood as an example of self-actualization, and new discussion of positive psychology, with updated illustrations and imagery throughout
- Updated Concept Review and Summary Test, including updated imagery and illustrations
- Revised Research Focus: Shyness section, including definition for social cognitive theory and updated imagery

### Module 20: Social Cognitive & Trait Theories

- Updated Social Cognitive Theory section, including new discussions about social cognitive theory and reciprocal determinism as well as new longitudinal research involving the children from the classic delay of gratification marshmallow study over a 40-year period, with updated imagery throughout
- Revised Trait Theory section, including a new discussion of policewomen and how their interpersonal skills are an advantage in violent situations, a new section on the Big Five personality traits and how the sizes of different regions of the brain may be associated with the Big Five, a new introduction about the behavior of infamous football coach and child molester Jerry Sandusky, whose conflicting actions provide a strong person versus situation example, updated research on heritability, and an all-new discussion on the environmental influences of shared and nonshared environments on personality development, including cultural influences, as well as updated imagery throughout
- Updated Cultural Diversity: Suicide Bombers feature, including new revised content about martyrdom, hatred, and suicide bombers, with updated imagery
- Updated Review: Four Theories of Personality section, including revised discussion of social cognitive theory with discussion of reciprocal determinism
- New Critical Thinking: More Employers Use Personality Tests in Hiring Process feature, including new discussion of industrial/organizational psychology and how the Myers-Briggs test and Minnesota Multiphasic Personality Inventory can be used in the workplace, with updated imagery
- Revised Concept Review and Summary Test, including updated questions and imagery

### Module 21: Health, Stress, & Coping

- Updated Introduction section, including new discussions of stressors and coping, new research on Americans with panic disorder, and updated imagery throughout
- Revised Appraisal of Stress section, including new example of appraisals, updated section title, and updated imagery and illustrations throughout
- Updated Stress Responses section with updated section title, new discussion of tend and befriend, new discussions about the relationship between chronic illness and stress, and a new discussion of health psychology, with new imagery
- Revised Stressful Experiences section, including discussion of daily uplifts and overall functioning, updated discussion of significant causes of stress for most Americans, new real-world example of Lady Gaga and her experience with frustration, new research about violence and development of posttraumatic stress disorder (PTSD), with updated imagery and illustrations throughout
- Updated Personality & Health section, including revised information about Shaun White, updated information on the health differences of optimists and pessimists, new subsection on Bandura's self-efficacy theory, including four sources of information and student-friendly examples, updated information on negative health effects of Type D behavior, with updated imagery throughout
- Revised Coping with Stress section, including updated section title, new discussion of using problem- and emotion-focused coping and their facilitation of each other
- Revised Concept Review and Summary Test, including new key terms and updated imagery and illustrations
- New Positive Psychology section, including its definition, background, and research findings on altruism, writing exercises, and promotion of positive traits and their effect on physical and emotional health, and new imagery
- New Critical Thinking: The Positive Benefits of Social Support feature about the small town of Roseto, Pennsylvania, and the benefits of its strong social support network, how continuing research of a 40-year-old study can yield important findings, and how the Internet can provide social support, with new critical thinking questions and imagery

### Module 22: Assessment & Psychological Disorders I

- Revised module title, from Assessment & Anxiety Disorders to Assessment & Psychological Disorders I
- New module-opening vignette with key term *anxiety disorder* and real-world example of Howie Mandel, comedian and actor afflicted with severe anxiety since childhood, including new imagery
- Updated Factors in Mental Disorders section, including new figure about cognitive-emotional-behavioral and environmental factors of mental disorders, with updated imagery throughout
- Revised Diagnosing Mental Disorders section, including updated history and overview of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM), new section on the upcoming DSM 5, including examples of new diagnoses, an in-depth discussion of categorical versus dimensional assessments, a discussion of Howie Mandel in relation to obsessive-compulsive disorder and Axis I of the DSM, updated discussion of the frequency of mental disorders, and new imagery and illustrations throughout
- Revised Anxiety Disorders discussion, including updated research on panic disorder, updated discussion of specific phobias, expanded discussion of obsessive-compulsive disorder (OCD) using Howie Mandel's experiences as examples, revised discussion of treatment for posttraumatic stress disorder (PTSD), and updated imagery throughout
- Revised Somatoform Disorders section, including new real-world examples of mass hysteria among female high school students in New York, Vietnam, and Mexico, and updated imagery throughout
- Updated Summary Test, including revised section titles, imagery, illustrations, and key concepts
- Revised Cultural Diversity: Asian Anxiety Disorder feature, including updated research on taijin kyofusho and its occurrence in the Japanese population, with updated imagery
- Revised Application: Treating Phobias feature, including new real-world example of a woman who has a phobia of flying, with detailed descriptions of cognitive-behavioral therapy and exposure therapy as treatments for her phobia, with new imagery throughout
- Updated Concept Review and Summary Test, including new key terms and imagery

### Module 23: Psychological Disorders II

- Revised Mood Disorders section, including updated discussion of bipolar disorder, its prevalence, real-world example of Catherine Zeta-Jones who has bipolar disorder, new research on genetic factors in bipolar disorder, new research on the effectiveness of antidepressants, and an updated biomedical treatment section, including discussions of electroconvulsive therapy (ECT), transcranial magnetic stimulation (TMS), and deep brain stimulation (DBS) with research on their prevalence and effectiveness, with updated imagery throughout
- Updated Personality Disorders section, including new example of Gary Ridgway, the Green River (Serial) Killer, revised list of five types of personality disorders proposed to be included in the DSM 5, a new discussion of how self-harm often becomes a part of borderline personality disorder, some causes of borderline personality disorder, and updated imagery throughout

- Revised Schizophrenia section, including the new key terms *delusion* and *flat affect,* new research on genetic markers for the condition, updated discussion of how infections may contribute to schizophrenia, new discussion of the association between brain chemistry and schizophrenia symptoms, a new discussion of how researchers are working to identify biomarkers for earlier diagnosis of the condition, and a new discussion of cognitive-behavioral therapy as treatment for schizophrenia, with updated imagery throughout
- Updated Dissociative Identity Disorder section, including new research on its prevalence and how researchers can capture personality transitions in the brain
- Updated Cultural Diversity: Interpreting Symptoms feature, including new descriptions of windigo and hikkomori as culture-specific disorders and how depression may be more prevalent in women due to biological and psychosocial factors with updated imagery
- Updated Research Focus: Exercise Versus Drugs feature, including research on how regular exercise can affect depression, with updated imagery
- Updated Application: Dealing with Mild Depression feature, including new updated imagery throughout
- Updated Critical Thinking: What Is a Psychopath? feature, including coverage of the different types of psychopaths
- Updated Concept Review and Summary Test, including new key terms and imagery

### Module 24: Therapies

- Updated research on mental illness in the homeless population in the Historical Background section, with new imagery
- Revised Questions about Psychotherapy section, including the new key concept biomedical therapy and new research on the effectiveness of psychotherapy, with updated illustrations
- Revised Psychoanalysis section, including new title and updated research on the effectiveness of long-term psychoanalysis therapy on various mental disorders, with new imagery
- Revised Client-Centered Therapy section, including new discussion of the humanistic approach
- Revised Cognitive Therapy discussion, including updated illustrations and a new title
- Updated Behavior Therapy section, including new case story about a woman with phobia of flying and the use of in vivo exposure (exposure therapy) with new imagery and illustrations
- Revised Cognitive-Behavior Therapy section, including updated titles
- New section titled Common Factors and Therapy Settings, including a discussion about common factors among different therapies, new discussion of various types of group therapy, including family therapy and couple therapy, and a revised discussion of telemental health with discussion of therapy research on the prevalence of severe forms of depression in college students with apps for use on smartphones
- Revised Research Focus: EMDR feature, including new research on studies involving EMDR therapy and reducing traumatic memories in those suffering from posttraumatic stress disorder (PTSD) and updated research discussing how EMDR allows relaxation and subdues symptoms, and new discussion of the various organizations naming EMDR as an effective treatment for PTSD, with updated imagery
- Updated Cultural Diversity: Different Healer feature, including updated imagery
- New Biomedical Therapies section, including definition of the new key concept biomedical therapy, with introduction of new concepts and discussions about antidepressant drugs, antianxiety drugs, mood-stabilizer drugs, and antipsychotic drugs, with new imagery
- Updated Application: Cognitive-Behavioral Techniques, with updated imagery
- Revised Critical Thinking: Virtual Reality Can Be More than Fun & Games feature, including updated research and information about current virtual reality technology

### Module 25: Social Cognition & Behavior

- New module title Social Cognition & Behavior (formerly Social Psychology)
- New Introduction section, including a discussion of a social experiment involving award-winning violinist Joshua Bell playing in a subway and a discussion of behavior in groups focusing on the hazing rituals of the "Marching 100" band from Florida A&M University (FAMU) and how it demonstrates group dynamics, with new imagery throughout
- Updated Perceiving Others section, including revised discussion about Joshua Bell, his attire in the subway performances versus music hall performances, and how appearance affects person perception, updated research examples of how physical attractiveness affects perceptions and relationships, new research on how monogamy affects looking at other attractive people, revised discussion of how cultural values and social approval contribute to stereotypes, new example of Olympian Sarah Robles as a 275-pound, 5'10" top-ranked weightlifter who hopes to change the perception of larger women in the United States, a new discussion about Jeremy Lin, the only Asian-American and Harvard grad playing in the NBA, new key concept and discussion about social cognition, with updated imagery throughout
- Updated Attributions section, including revised discussion about the glass ceiling and the number of female versus male chairpersons in the list of Fortune 500 companies, with real-world discussion about Marissa Mayer as the youngest woman to become CEO of a Fortune 500 company and believed to be the first to become CEO while pregnant
- Updated Attitudes section, including discussion of when politicians should use the central route for persuasion, with updated imagery throughout
- Updated Cultural Diversity: National Attitudes & Behaviors feature, including revised research about Egyptian women in the workforce and universities as well as their literacy, with updated imagery
- Revised Social & Group Influences section, including updated introduction about conformity and hazing using FAMU's "Marching 100" band and the death of drum major Robert Champion as an example of conformity, and updated statistics about the frequency of hazing within student organizations and athletic teams and compliance of individuals in group situations, new real-world examples of Abu Ghraib and government-sanctioned massacres in Syria and Libya as reflections of Milgram's historical obedience experiment, revised discussion of Wesley Autrey, everyday hero who protected a man who had fallen onto the subway tracks with his own body, new key concept of heroism as a form of altruism, and new real-world examples of deindividuation among Black Friday shoppers as well as how physical symbols, like clothing and gangs, help gang, fraternity, and sorority members identify with their group and feel less accountable when engaging in irrational behavior, with updated imagery throughout
- Revised Social Neuroscience section, including new research on mirror neurons and how they affect our observations, and interpretations of those in our ethnic in- and outgroups, with updated imagery
- Revised Aggression section, including updated research on adolescents and how playing violent video games can lead to either hostility or improved skills, depending on the child's personality traits, new research on sexual harassment and aggression in the United States, including statistics about the incidence of rape in men and women with new key term and definition for rape
- Updated Critical Thinking: Why the Debate over Teen Vaccination? feature, including new data on the prevalence of the HPV vaccination in teen girls as well as the recommendation to administer it to boys, with new imagery.

Now that you've read about some of the changes in the 10th edition, we'll discuss the major features of the text. ●

# Distinctive Learning Approach

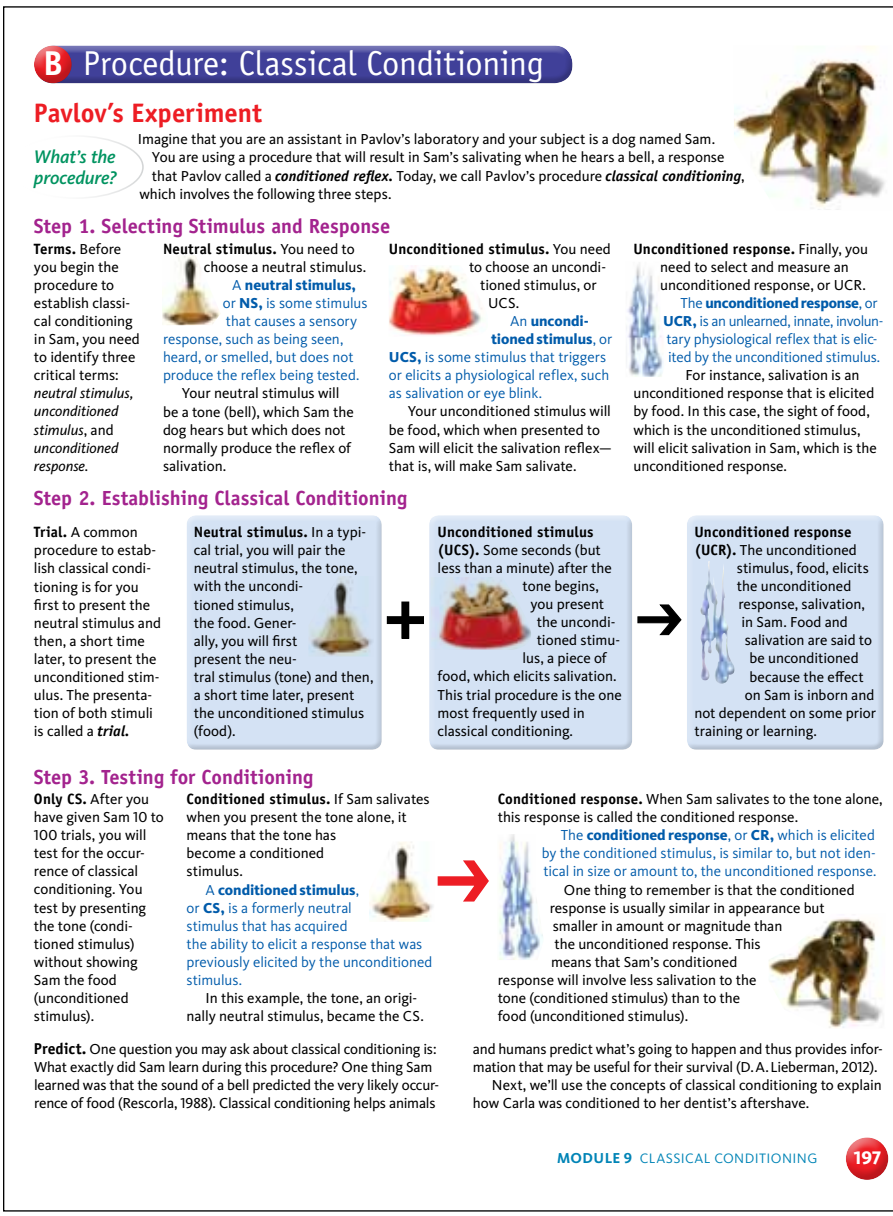
## What's Different about This Approach?

One of the first things instructors notice about this textbook is that it looks different from more traditional texts. This book looks different because its method of presenting information is based on well-known principles of learning and memory.

One principle is that if information is presented in an interesting way, then students learn and remember the concepts much more readily. Like previous editions, the 10th edition applies this principle by integrating the text with interesting graphics so that students have visual cues to help them learn and remember. As students often say, "I'm a visual learner, so this text is perfect for me."

Another principle is that if information is organized or "chunked" into smaller units, then students learn and remember the material better. As in previous editions, the 10th edition applies this principle by organizing information into smaller and smaller segments to help students remember the hundreds of terms and concepts. As one reviewer said, "The material is broken down into small, friendly pieces that are easy for students to understand."

Thus, this text looks different because it uses visual learning, which involves the use of ***VISUAL CUES* and *CHUNKING*.** There is a large body of research indicating that chunking helps students better organize and store information and that visual cues help students better retrieve and remember information. The research outcomes on visual learning make complete sense when you consider that our brain is mainly an image processor (much of our sensory cortex is devoted to vision), not a word processor. In fact, the part of the brain used to process words is tiny in comparison to the part that processes visual images. Words are abstract and rather difficult for the brain to retain, whereas visuals are concrete and, as such, more easily remembered (Meier, 2000; Patton, 1991; Schacter, 1996; Verdi et al., 1997). It is for these reasons that each page of this textbook has been individually formatted to maximize visual learning.



B Procedure: Classical Conditioning

Pavlov's Experiment

*What's the procedure?*

Imagine that you are an assistant in Pavlov's laboratory and your subject is a dog named Sam. You are using a procedure that will result in Sam's salivating when he hears a bell, a response that Pavlov called a ***conditioned reflex.*** Today, we call Pavlov's procedure ***classical conditioning,*** which involves the following three steps.

Step 1. Selecting Stimulus and Response

**Terms.** Before you begin the procedure to establish classical conditioning in Sam, you need to identify three critical terms: *neutral stimulus, unconditioned stimulus,* and *unconditioned response.*

**Neutral stimulus.** You need to choose a neutral stimulus. A **neutral stimulus,** or **NS,** is some stimulus that causes a sensory response, such as being seen, heard, or smelled, but does not produce the reflex being tested. Your neutral stimulus will be a tone (bell), which Sam the dog hears but which does not normally produce the reflex of salivation.

**Unconditioned stimulus.** You need to choose an unconditioned stimulus, or UCS. An **unconditioned stimulus**, or **UCS,** is some stimulus that triggers or elicits a physiological reflex, such as salivation or eye blink. Your unconditioned stimulus will be food, which when presented to Sam will elicit the salivation reflex—that is, will make Sam salivate.

**Unconditioned response.** Finally, you need to select and measure an unconditioned response, or UCR. The **unconditioned response**, or **UCR,** is an unlearned, innate, involuntary physiological reflex that is elicited by the unconditioned stimulus. For instance, salivation is an unconditioned response that is elicited by food. In this case, the sight of food, which is the unconditioned stimulus, will elicit salivation in Sam, which is the unconditioned response.

Step 2. Establishing Classical Conditioning

**Trial.** A common procedure to establish classical conditioning is for you first to present the neutral stimulus and then, a short time later, to present the unconditioned stimulus. The presentation of both stimuli is called a ***trial.***

**Neutral stimulus.** In a typical trial, you will pair the neutral stimulus, the tone, with the unconditioned stimulus, the food. Generally, you will first present the neutral stimulus (tone) and then, a short time later, present the unconditioned stimulus (food).

**Unconditioned stimulus (UCS).** Some seconds (but less than a minute) after the tone begins, you present the unconditioned stimulus, a piece of food, which elicits salivation. This trial procedure is the one most frequently used in classical conditioning.

**Unconditioned response (UCR).** The unconditioned stimulus, food, elicits the unconditioned response, salivation, in Sam. Food and salivation are said to be unconditioned because the effect on Sam is inborn and not dependent on some prior training or learning.

Step 3. Testing for Conditioning

**Only CS.** After you have given Sam 10 to 100 trials, you will test for the occurrence of classical conditioning. You test by presenting the tone (conditioned stimulus) without showing Sam the food (unconditioned stimulus).

**Conditioned stimulus.** If Sam salivates when you present the tone alone, it means that the tone has become a conditioned stimulus. A **conditioned stimulus**, or **CS,** is a formerly neutral stimulus that has acquired the ability to elicit a response that was previously elicited by the unconditioned stimulus. In this example, the tone, an originally neutral stimulus, became the CS.

**Conditioned response.** When Sam salivates to the tone alone, this response is called the conditioned response. The **conditioned response**, or **CR,** which is elicited by the conditioned stimulus, is similar to, but not identical in size or amount to, the unconditioned response. One thing to remember is that the conditioned response is usually similar in appearance but smaller in amount or magnitude than the unconditioned response. This means that Sam's conditioned response will involve less salivation to the tone (conditioned stimulus) than to the food (unconditioned stimulus).

**Predict.** One question you may ask about classical conditioning is: What exactly did Sam learn during this procedure? One thing Sam learned was that the sound of a bell predicted the very likely occurrence of food (Rescorla, 1988). Classical conditioning helps animals and humans predict what's going to happen and thus provides information that may be useful for their survival (D. A. Lieberman, 2012).

Next, we'll use the concepts of classical conditioning to explain how Carla was conditioned to her dentist's aftershave.

MODULE 9 CLASSICAL CONDITIONING 197

## How Are the Visuals Selected?

Every visual, whether a photo, illustration, concept map, figure, or icon, was carefully selected by the two of us in collaboration with our editorial team. As authors, we are intricately involved in decisions concerning every visual in this textbook. We work collaboratively with our photo researchers and illustrators throughout the revision process. The primary goal of each of our decisions regarding visuals is to improve student learning. If a visual doesn't clearly meet this requirement, we go back to the drawing board with our team to work toward obtaining or creating just the right visual. Based on the many hours of research for only one photo and numerous revisions of a single illustration, we're confident our team agrees that we don't settle for close enough. We believe that the right visuals can help make abstract and difficult concepts more tangible and welcoming, as well as make learning more effective and long lasting.

## How Many New Visuals Have Been Added?

We have used feedback from readers and reviewers in revising and adding new photos, figures, and illustrations, which provide effective visual cues for better learning and remembering. In this revision, we added about 600 new photos and nearly 40 original illustrations. Additionally, we retained hundreds of other effective visuals from the 9th edition. ●

# Integrated Custom Illustrations

Making a textbook that integrates visuals with every major concept is a massive endeavor. In fact, as authors, we spend as much time on the visual program as we do on the writing. We couldn't do this without the full support of our editorial team and the work of committed and talented photo researchers who won't stop short of finding the perfect photo. Thankfully, we have the privilege of having both.

**Threat to survival**

Because we integrate visuals with written content to aid student learning, many times it is simply impossible to find a photo that clearly conveys a specific concept. Consequently, it is impossible to produce a text that effectively emphasizes visual learning without an extraordinarily talented illustrator, who can literally illustrate *anything* we request. We are truly fortunate to have found Tim Jacobus, an illustrator with phenomenal talent.

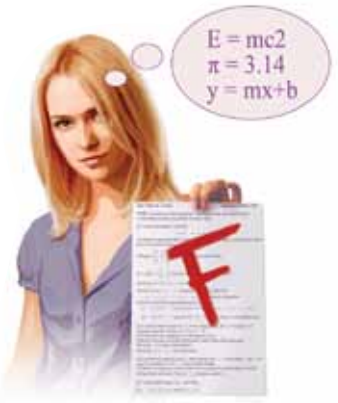
**Humanistic approach**

Tim Jacobus's work in our textbook was introduced in the 8th edition. Due to the tremendous amount of praise we received about his work, we continue to ask Tim to join us and he does in a big way. His illustrations can be found in abundance throughout the 10th edition; they include anatomy, faces, animals, objects, conceptual concepts, and so much more! In total, Tim has created nearly 300 original illustrations specifically for our textbook.

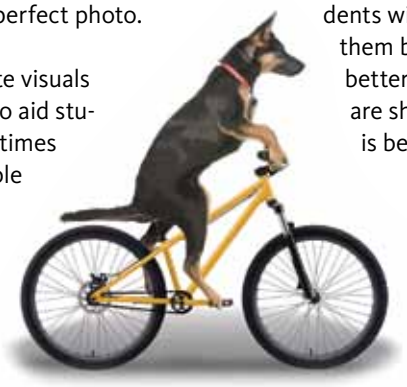
**School shooter**

As authors, we work very closely with Tim in making sure each illustration is just right. He makes working on the visual program truly pleasurable. In fact, every Monday morning, he would send a batch of new illustrations, and because of this weekly tradition, Monday mornings became highly anticipated!

We hope you find Tim's illustrations as amazing as we do. We are confident that your students will not only enjoy them but also learn psychological concepts easier and better because of them. Samples of Tim's illustrations are shown throughout this page, and his biography is below.




**Underachiever**



**Elaborative rehearsal**

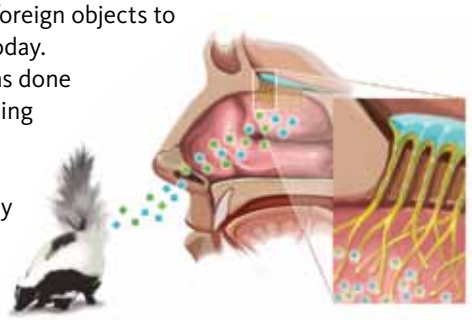

**Short-term memory**

**Adaptive theory of sleep**

## Biography of Tim Jacobus

Tim Jacobus began his art career in the early 1980s. He was taught as a traditional artist, and all of his early works were created utilizing pencils, acrylic paint, and brushes—foreign objects to most artists today.

Tim's early work was done entirely in the publishing field, designing and creating cover art. Specializing in fantasy and sci-fi work, he began to develop a style that is rich in color and extreme in depth. Tim received his greatest notoriety creating the cover art for the children's series *Goosebumps*.



**Olfaction**

After hundreds of covers, Tim broadened his scope to include the realm of digital art tools. The use of this medium helped to open a wider scope of work and subject matter, including medical illustration, character distortion, editorial concepts, and web-based animation.

**Artificial photoreceptors**

Tim continues to create—unceasingly. ●

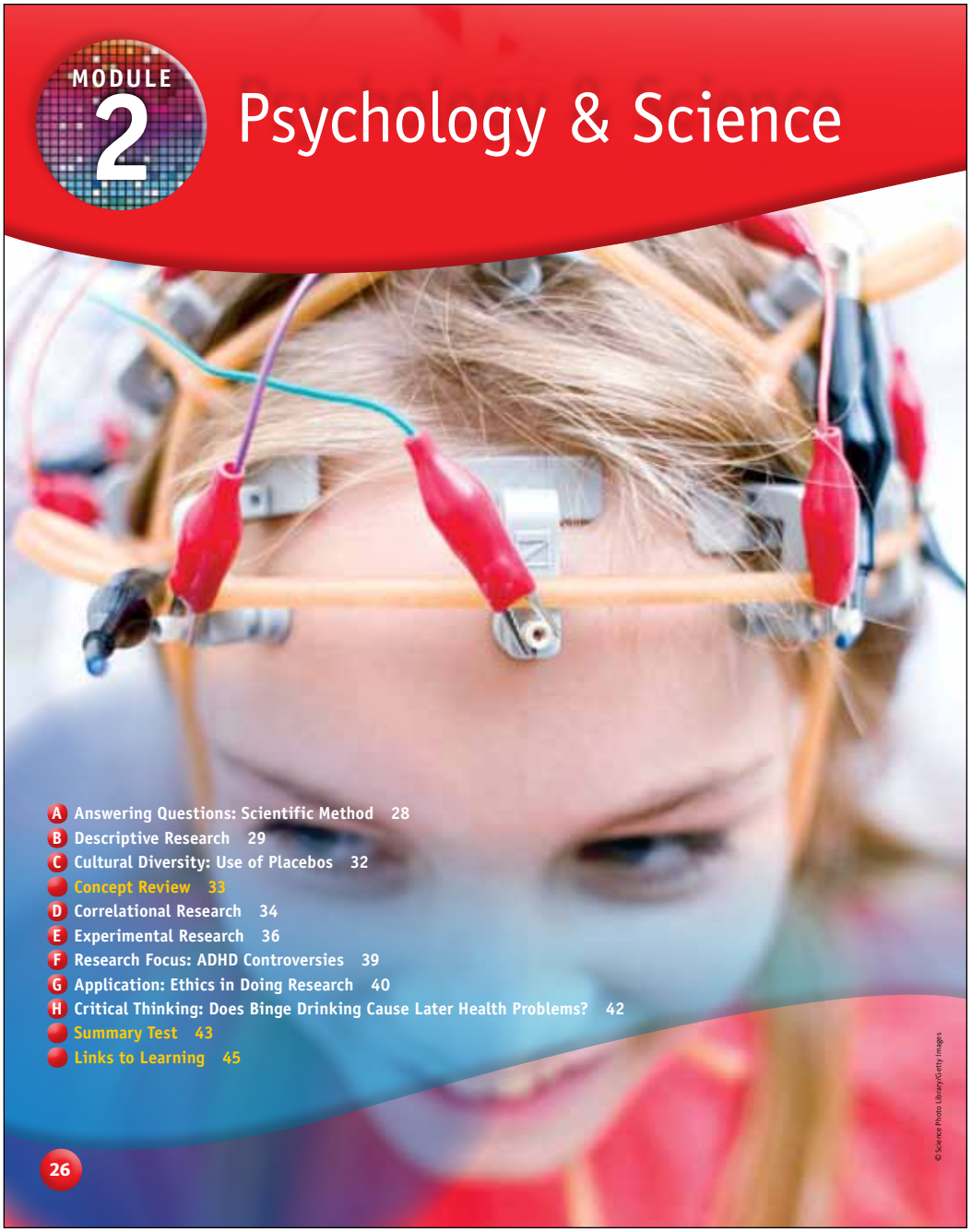
# Modules: More Flexible than Chapters

**Modules.** One of the features best liked by both instructors and students is that the text is organized into smaller units called ***modules,*** which are shorter (20–30 pages) and more manageable than traditional chapters (45–50 pages). The 10th edition has 25 ***modules*** (see p. iv), which can easily be organized, omitted, or rearranged into any order. Because individual modules all have the same structure, each one can stand on its own.

**Advantage.** Instructors said that, compared to longer and more traditional chapters, they preferred the shorter ***modules,*** which allow greater flexibility in planning and personalizing one's course.

**Example.** The sample page on your left, which is the opening page of Module 2, Psychology & Science, shows that each ***module*** begins with an outline. In this outline, the heads are designated by letter (A. Answering Questions: Scientific Method) and provide students with an overview of the entire module.

**Outline.** Students can use the ***module's*** outline to organize their lecture notes as well as to find and review selected material.



# Visual Learning: Text/Graphic Integration & Chunking

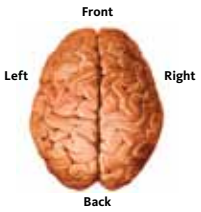
## D Brain: Structures & Functions

### Major Parts of the Brain

A human brain (right figure), which can easily be held in one hand, weighs about 1,350 grams, or 3 pounds, and has the consistency of firm JELL-O. The brain is protected by a thick skull and covered with thin, tough, plasticlike membranes. If shot in the head, a person may or may not die depending on which area was damaged. For example, damage to an area in the forebrain would result in paralysis, damage to an area in the midbrain would result in coma, but damage to an area in the hindbrain would certainly result in death.

*Can someone be shot in the head but not die?*

We'll begin our exploration of the brain by looking at its three major parts—forebrain, midbrain, and hindbrain—beginning with the forebrain.




**2 Midbrain**

If a boxer is knocked unconscious, part of the reason lies in the midbrain.

The **midbrain** has a reward or pleasure center, which is stimulated by food, sex, money, music, attractive faces, and some drugs (cocaine); has areas for visual and auditory reflexes, such as automatically turning your head toward a noise; and contains the reticular formation, which arouses the forebrain so that it is ready to process information from the senses (Holroyd & Coles, 2002).

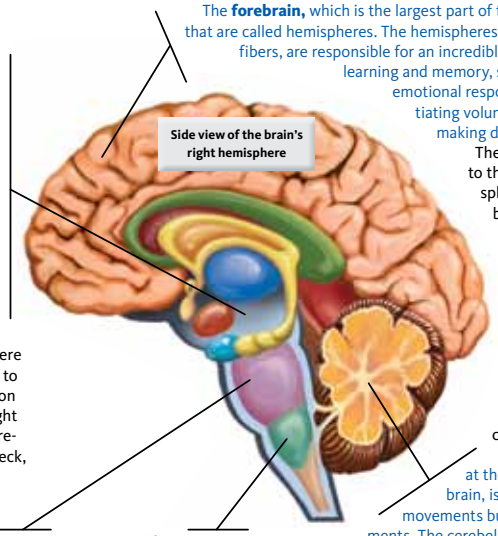
If the reticular formation were seriously damaged—by a blow to the head, for example—a person would be unconscious and might go into a coma because the forebrain could not be aroused (Bleck, 2007).

**1 Forebrain**

When you look at the brain, what you are actually seeing is almost all forebrain (figure above).

The **forebrain,** which is the largest part of the brain, has right and left sides that are called hemispheres. The hemispheres, connected by a wide band of fibers, are responsible for an incredible number of functions, including learning and memory, speaking and language, having emotional responses, experiencing sensations, initiating voluntary movements, planning, and making decisions.

The large structure outlined in orange to the left shows only the right hemisphere of the forebrain. The forebrain's right and left hemispheres are both shown in the figure at the top right. The forebrain is very well developed in humans.




**3c Cerebellum**

A person suspected of drunken driving may fail the test of rapidly touching a finger to the nose because of alcohol's effects on the cerebellum.

The **cerebellum,** which is located at the very back and underneath the brain, is involved in coordinating motor movements but not in initiating voluntary movements. The cerebellum is also involved in performing timed motor responses, such as those needed in playing games or sports, and in automatic or reflexive learning, such as blinking the eye to a signal, which is called classical conditioning (discussed in Module 9) (Gerwig et al., 2008).

Because alcohol is a depressant drug and interferes with the functions of the cerebellum, an intoxicated person would experience decreased coordination and have difficulty rapidly touching a finger to the nose, which is one test for being drunk (Oscar-Berman & Marinkovic, 2007).

Of the brain's three parts, the forebrain is the largest, most evolved, and most responsible for an enormous range of personal, social, emotional, and cognitive behaviors. For those reasons, we'll examine the forebrain in more detail.

**3 Hindbrain**

The structures and functions of the hindbrain, which are found in very primitive brains, such as the alligator's, have remained constant through millions of years of evolution. The ***hindbrain*** has three distinct structures: the pons, medulla, and cerebellum.

**3a Pons**

If someone has a serious sleep disorder, it may involve the pons. In Latin, *pons* means "bridge," which suggests its function.

The **pons** functions as a bridge to transmit messages between the spinal cord and brain. The pons also makes the chemicals involved in sleep (Monti et al., 2008).

**3b Medulla**

If someone dies of a drug overdose, the cause of death probably involved the medulla.

The **medulla,** which is located at the top of the spinal cord, includes a group of cells that control vital reflexes, such as respiration, heart rate, and blood pressure.

Large amounts of alcohol, heroin, or other depressant drugs suppress the functions of cells in the medulla and cause death by stopping breathing.



**Visual learning.** Many students who have used this text have commented that they are visual learners and that the visual layout of the text greatly helped them better understand and remember difficult concepts. The visual layout of this text involves two approaches: integrating text and graphics and using "chunking."

**Text/graphic integration.** Each of the 609 pages of this text has been individually formatted so that text and graphics are always integrated. An example of text/graphic integration is shown in the sample page on the right (Module 4). Students never have to search for a distant figure or graph because the text is always integrated with its related graphic.

**Chunking.** The second method used to help students better understand and remember the material is to break down difficult or complex concepts into smaller, more manageable "chunks." For example, in this sample page, the relatively complex structure and function of the major parts of the brain are broken down into a series of easily grasped smaller chunks or a series of steps.

**Definitions.** Finally, the sample page shows that students need never search for definitions because they are always **boldface and printed in blue.** Students need only look for **blue** words to easily find and review definitions.

# Concept Review: Tests Knowledge of Major Concepts

**Often-asked question.** How many times have students asked, "What should I study for the test?" One way to answer this question is to tell students to complete the two built-in quizzes that appear in each module. One quiz is the ***Concept Review*** (shown here), and the second is the ***Summary Test*** (shown on p. xxxv).

**Integrated approach.** The sample page on the left shows a ***Concept Review*** (Module 16), which has the unique feature of repeating the graphics that were first linked to the major concepts discussed in the text. This repeated use of visual cues has been shown to increase the learning or encoding of information as well as to promote visual learning.

**Reading versus knowing.** One reason for including quizzes within the text is that students may think that they know the material because they have read it. However, studies show that students cannot judge how well they actually know the material unless they test their knowledge of specific information. The ***Concept Review*** serves as an interim checkpoint by giving students a chance to test their knowledge of major terms before nearing the end of the module.

Student feedback on the ***Concept Review*** has been very positive. Students like the visual learning approach of having the graphics integrated with the concepts, and they find that the ***Concept Review*** is a great way to test their knowledge.

## Concept Review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**1.** An emotion is defined in terms of four components: You interpret or **(a)** _____ some stimulus, thought, or event in terms of your well-being; you have a subjective **(b)** _____, such as being happy or fearful; you experience bodily responses, such as increased heart rate and breathing, which are called **(c)** _____ responses; and you often show **(d)** _____ behaviors, such as crying or smiling.

**2.** A peripheral theory says that emotions result from specific physiological changes in our bodies and that each emotion has a different physiological pattern. The theory that says we feel fear because we run is called the **(a)** _____ theory. In contrast to this theory, the **(b)** _____ theory says that emotions originate in the brain; they are not the result of physiological responses.

**3.** Another peripheral theory says that feedback from the movement of facial muscles and skin is interpreted by your brain as an emotion; this idea is called the **(a)** _____ hypothesis. Although emotions can occur without feedback from facial muscles, facial feedback can influence your mood and contribute to the **(b)** _____ of an emotion.

**4.** A theory of emotions that grew out of the work of Schachter and Singer says that your interpretation, appraisal, thought, or memory of a situation, object, or event can contribute to, or result in, your experiencing different emotional states. This is called the _____ theory.


**5.** The most recent approach to understanding emotions studies the neural bases of mood and emotion by focusing on the brain's neural circuits that evaluate stimuli and produce or contribute to our experiencing and expressing different emotional states. This is called the _____ approach.


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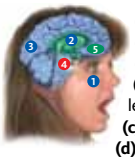


**6.** Emotions have four qualities: They are expressed in stereotypical **(a)** _____ expressions and have distinctive **(b)** _____ responses; they are less controllable and may not respond to **(c)** _____; they influence many **(d)** _____ functions; and some emotions, such as smiling, are **(e)** _____ in the brain. The brain area that functions to detect and evaluate stimuli, especially threatening ones, and to store memories with emotional content is called the **(f)** _____. Because this brain structure receives sensory information so quickly, it triggers a fearful reaction without **(g)** _____. The brain structure involved in producing emotions from thoughts alone and in analyzing the emotional consequences of actions is called the **(h)** _____.


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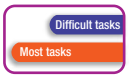
**7.** Specific inherited facial patterns or expressions that signal specific feelings or emotional states across cultures, such as a smile signaling a happy state, are called **(a)** _____. These emotional expressions, which include anger, happiness, fear, surprise, disgust, sadness, and possibly contempt, are thought to have evolved because they had important **(b)** _____ and _____ functions for our ancestors.


© Stephen Smith/Getty Images

**8.** According to one theory, we inherit the neural structure and physiology to express and experience emotions, and we evolved basic emotional patterns to adapt to and solve problems important for our survival; this is called the **(a)** _____ theory. Facial expressions that accompany emotions send signals about how one **(b)** _____ and what one intends to do. Emotions focus one's **(c)** _____ so one can better respond to emotional situations and also increases **(d)** _____ of situations that may be either beneficial or dangerous to one's well-being.




**9.** Your performance on a task depends on the amount of physiological arousal and the difficulty of the task. For many tasks, moderate arousal helps performance; for new or difficult tasks, low arousal is better; and for easy or well-learned tasks, high arousal may facilitate performance. This relationship between arousal and performance is known as the _____.

**10.** According to one theory, you soon become accustomed to big happy events, such as getting a car; this theory is called the **(a)** _____. Long-term happiness is less dependent on wealth and more dependent on pursuing your own personal **(b)** _____ and developing meaningful **(c)** _____. Some people are just generally happier and some are generally less happy because of their happiness **(d)** _____.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**11.** Specific cultural norms that regulate when, where, and how much emotion we should or should not express in different situations are called _____. These rules explain why emotional expressions and intensity of emotions differ across cultures.

***Answers:*** *1. (a) appraise, (b) feeling, (c) physiological, (d) observable; 2. (a) James-Lange, (b) Cannon-Bard; 3. (a) facial feedback, (b) intensity; 4. cognitive appraisal; 5. affective neuroscience; 6. (a) facial, (b) physiological, (c) reason, (d) cognitive, (e) hard-wired, (f) amygdala, (g) awareness or conscious thought, (h) prefrontal cortex; 7. (a) universal facial expressions, (b) adaptive, survival; 8. (a) evolutionary, (b) feels, (c) attention, (d) memory, recall; 9. Yerkes-Dodson law; 10. (a) adaptation level theory, (b) goals, (c) relationships, (d) set point; 11. display rules*

# Cultural Diversity: Opens Students' Minds

## F Cultural Diversity: Differences in Episodic Memory

### Euro-Americans Versus Asians

*Do Asians have difficulty with episodic memory?*

Cross-cultural research has found cultural differences in recalling episodic memories, which we discussed in Module 11 (see p. 246).

**Episodic memory** involves knowledge of specific events, personal experiences, or activities, such as naming or describing favorite restaurants, movies, songs, habits, or hobbies.

Compared to Asians, Euro-Americans have been reported to better recall autobiographical memories from childhood throughout the lifespan (Q. Wang et al., 2004; Q. Wang & Conway, 2004; Q. Wang & Ross, 2005).

There are several possible explanations for these cultural differences in episodic memory. Perhaps the importance of individuality and autonomy for Euro-Americans focuses their attention on retaining memories of life events that are associated with an individual's identity (e.g., winning a contest). In contrast, for Asians the importance of collectivism or relatedness may focus their attention on retaining more generic knowledge that is associated with their relationships with other people or their community (e.g., going to church every Sunday). Another proposed idea is that Asians may encode episodic memories as well as Euro-Americans but they have a faster rate of forgetting these memories over time.

There are differences in episodic memory between Euro-Americans and Asians.



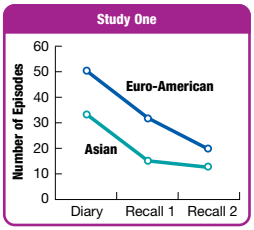


One researcher closely examined the reasons for the differences in episodic memory between Euro-Americans and Asians (Q. Wang, 2009). We will discuss three of her studies next.

#### Study One

In the first study, Euro-American and Asian adults were asked to complete daily diaries for one week that listed all the events that happened to them. When participants completed this task and turned in their diaries, researchers gave them a surprise memory test by asking them to recall the events that happened during the past week (Recall 1). Then, a week later, researchers again surprised the participants by asking them to recall the events that happened to them during the week they kept their diaries (Recall 2).

Results showed that Euro-Americans recalled a greater number of specific events than did Asians at the time they turned in their diaries. The same results held true during Recall 1 and Recall 2. That is, Euro-Americans recalled a greater number of events following a one-week and a two-week delay.

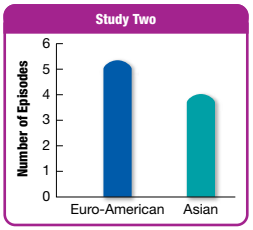



Study One: Adapted from *Cognition* 117 (1), Q. Wang, Are Asians forgetful? Perception, retention, and recall in episodic remembering, 123-131 (2009), Fig. 2, p. 125 Research Study 1 with permission from Elsevier BV via Copyright Clearance Center.

#### Study Two

In the second study, Euro-American and Asian adults were given a written diary kept by a fictional person during his travels. After participants read the diary, they were given another unrelated written task to complete in 5 minutes. Following this 5-minute task, participants were asked, without warning, to recall as many of the specific events from the fictional diary as they could.

Results found that in this immediate recall task in which the content is exactly the same for all participants, Euro-Americans recalled a greater number of specific events than did Asians. The results of this study are consistent with those of Study One and extend the findings by focusing on immediate recall (as opposed to recall at the end of the day, after one week, and after two weeks) and presenting all participants with the same content (as opposed to each participant having a unique set of life events to remember).

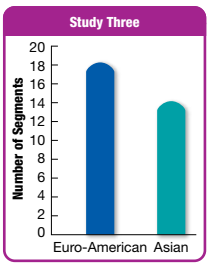



Study Two: Adapted from *Cognition* 117 (1), Q. Wang, Are Asians forgetful? Perception, retention, and recall in episodic remembering, 123-131 (2009), Fig. 3, p. 127 Research Study 2 with permission from Elsevier BV via Copyright Clearance Center.

#### Study Three

In the third study, Euro-American and Asian adults were given the same written diary used in Study Two, but this time they were asked to identify when one event ended and another event began. There was no recall task in this study. The aim was to determine whether Euro-Americans and Asians differ in their ability to perceive separate life events.

Results showed that Euro-Americans identified a greater number of specific events than did Asians. Asians may be more likely to perceive events as interconnected than Euro-Americans, who may tend to perceive events as being discrete or separate.




Study Three: Adapted from *Cognition* 117 (1), Q. Wang, Are Asians forgetful? Perception, retention, and recall in episodic remembering, 123-131 (2009), Fig. 4, p. 128 Research Study 3 with permission from Elsevier BV via Copyright Clearance Center.

#### Conclusions

Together, the findings from these three studies suggest that there are differences in perceptual and encoding processes between the two groups, as opposed to differences in the ability to remember. Asians may not be more forgetful than Euro-Americans, but rather they may perceive the world as having fewer discrete events and consequently remember fewer episodic memories.

Besides culture, other factors, such as the type of information having to be recalled, may also influence memory, as shown next in a study on recalling sexual history. ●



**Different viewpoints.** One goal of an Introductory Psychology course is to challenge and broaden students' viewpoints by providing information about other cultures. Because of their limited experience of other cultures, students may be unaware that similar behaviors are viewed very differently in other cultures. For this reason, each of the 25 modules includes a ***Cultural Diversity*** feature.

**Example.** In the sample page on the right, the ***Cultural Diversity*** feature (Module 12) describes differences in episodic memory between Euro-Americans and Asians.

**Topics.** Other ***Cultural Diversity*** topics include:

**Module 1:** Early Discrimination
**Module 2:** Use of Placebos
**Module 4:** Cultural Neuroscience
**Module 7:** Incidence of SAD
**Module 8:** Alcoholism Rates
**Module 9:** Conditioning Racial Prejudice
**Module 15:** Genital Cutting
**Module 16:** Emotions across Cultures
**Module 17:** Gender Roles
**Module 21:** Tibetan Monks
**Module 22:** Asian Anxiety Disorders
**Module 24:** Different Healer

The ***Cultural Diversity*** feature gives students a chance to see the world through very different eyes.

# Research Focus: How Psychologists Answer Questions

**Feature.** In teaching Introductory Psychology, an instructor's important but difficult goal is to explain how psychologists use a variety of research methods and techniques to answer questions. To reach this goal, each of the 25 modules includes a ***Research Focus*** that explains how psychologists answer questions through experiments, case studies, self-reports, and surveys.

**Example.** In the sample page on the left, the ***Research Focus*** (Module 8) explains how psychologists use research methods to examine the effects of meditation on school stress.

**Topics.** Other ***Research Focus*** topics include:

**Module 2:** ADHD Controversies
**Module 3:** What Is a Phantom Limb?
**Module 5:** Mind over Body?
**Module 7:** Circadian Preference
**Module 10:** Viewing Aggression
**Module 12:** Recalling Sexual History
**Module 16:** Emotional Intelligence
**Module 17:** Temperament
**Module 19:** Shyness
**Module 20:** 180-Degree Change
**Module 22:** School Shootings
**Module 23:** Exercise Versus Drugs

Each of the 25 modules includes a Research Focus, which discusses the research methods and techniques that psychologists use to answer questions.

## B Research Focus: Meditation & School Stress

### Transcendental Meditation

*Can meditation lower school stress?*

School stress is on the rise. A recent survey of college students' emotional health found that the percentage of students reporting good or above-average emotional health is at the lowest level in the past 25 years. Researchers find that college students are not the only ones experiencing poorer emotional health. Troubling rates of school stress are found in elementary, middle-school, and high-school students as well.

Stress can limit the ability of students to grow cognitively and psychologically. Stress in students is associated with negative school behaviors, such as absenteeism and violent behavior, and poor academic performance. The toll of stress extends to the physical body in serious ways, including increased risk for hypertension, obesity, and diabetes, which have become increasing concerns of children across the country. Stress has many other detrimental effects on our body, as we will discuss in Module 21.

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**Transcendental meditation can help lower stress and produce an altered state of consciousness.**

Because of the association between high stress and poorer school performance and physical health, it is important to implement programs designed to lower school stress. Consequently, researchers wanted to assess the effectiveness of a stress-reduction program on school stress. They chose to use a well-established and popular type of meditation called transcendental meditation.

**Transcendental meditation (TM)** involves assuming a comfortable position, closing your eyes, and focusing your attention on repeating words or sounds that are supposed to help produce an altered state of consciousness.

TM is a fairly simple technique that allows the mind to experience a silent, yet awake state of consciousness. The practice of TM does not involve any changes in values, beliefs, religion, or lifestyle.

The question you might ask is: Can transcendental meditation really lower the alarming level of stress in students? This question brings us to one of the major uses of research: to evaluate the effectiveness of intervention programs that claim to change a person's well-being or behavior. Here's how and what researchers discovered when they evaluated the effectiveness of TM in easing school stress (Elder et al., 2011).

### Methods and Procedures

Researchers selected 106 high-school students to participate in this study. The students were 16 to 18 years old, and there were approximately equal numbers of males and females. The students were selected from four public schools located in different areas of the country. The sample consisted of 87% racial and ethnic minorities. The researchers selected a sample with mostly racial and ethnic minority students because research data suggest that these students are at particularly high risk of experiencing school stress.

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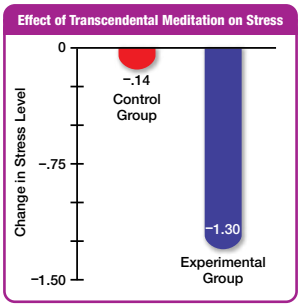
Students were divided into two groups: the experimental and control groups. The experimental group consisted of 68 students who were taught by a certified teacher how to practice TM. These students practiced TM twice a day for 10–15 minutes over a 4-month period. The control group consisted of 38 students who relaxed (such as sitting quietly or reading) but did not meditate. Stress levels were measured for all students before and after the 4-month intervention period.

### Results and Conclusions

Researchers found that students in the experimental and control groups did not differ in their reported stress levels prior to beginning the intervention. Data collected after the intervention showed a clear difference between the two groups. The graph below shows a 36% reduction in stress in the students practicing TM, compared to those in the control group. The practice of TM was associated with a significant reduction in stress.




The intervention program used by these researchers teaches students a valuable skill they can use for the rest of their lives. The ongoing practice of TM is likely to continue having a positive influence on their cognitive, psychological, and physical health. TM is a fairly easy program to implement that helps improve the emotional health of students and that should thereby improve academic achievement.

Future research should extend these findings by examining the longer-term effects of TM, studying larger student samples in schools, and focusing on students of different ages, races, and ethnicities.

Next, we turn our attention to the use of drugs. ●

# Application: Psychology's Practical Side

## H Application: Experimental Treatments

### Parkinson's Disease

Michael J. Fox is a talented actor who has starred in popular TV series, such as *Family Ties* and *Spin City,* and numerous movies, including the *Back to the Future* trilogy. He was really good at his job until he noticed a twitch in his left pinkie (M. J. Fox, 2002). Within only 6 months, this twitch spread to his whole hand. Michael tried to conceal his symptoms from the public by using medication to calm his tremors, and he was successful doing so for the first seven years (Dudley, 2006). However, it became increasingly difficult to hide his symptoms as he began having tremors that would shake his entire arm. Also, his legs would shake or become really stiff, making it difficult for him to walk. Eventually, these symptoms led Michael to quit his starring role in *Spin City* (Weinraub, 2000). Michael had all the symptoms of Parkinson's disease.

*Why do Michael's arms and legs shake?*

© AP Images/Charles Sykes

**Parkinson's disease** includes symptoms of tremors and shakes in the limbs, a slowing of voluntary movements, muscle stiffness, problems with balance and coordination, and feelings of depression. As the disease progresses, patients develop a peculiar walk and may suddenly freeze in space for minutes or hours at a time.

Michael's Parkinson's symptoms worsened because neurons in his **basal ganglia**, a group of structures located in the center of the brain that are involved in regulating movements, were running out of the neurotransmitter dopamine (see p. 55). Without a sufficient supply of dopamine in the basal ganglia, the brain loses its ability to control movement.

Like most Parkinson's patients, Michael was placed on a medication called L-dopa, which boosts the levels of dopamine in the brain, enabling him to have better control over his movements. Unfortunately, patients must take increasing amounts of L-dopa, and after prolonged use (5 to 10 years), L-dopa's beneficial effects may be replaced by unwanted jerky movements that may be as bad as those produced by Parkinson's disease (Mercuri & Bernardi, 2005). Even though Michael still takes medication, at times he has so little movement control that he cannot speak clearly, raise his arms from his side, or even smile (Dagostino, 2008). Yet, he continues to have an optimistic outlook on life and has not given up on his acting career (M. J. Fox, 2009). Most recently, he is starring in the TV drama *The Good Wife* (*People,* 2011).

In the United States, about 1.5 million adults, usually over the age of 50, have Parkinson's disease. In rare cases, such as Michael's, people are diagnosed with young-onset Parkinson's disease (Michael was only 30). To date, Parkinson's has no cure, but our knowledge of its causes, especially genetics, is continuously advancing and, as you'll see, several experimental treatments are under study (Kingwell, 2010; I. Martin et al., 2011; Mouradian, 2010).

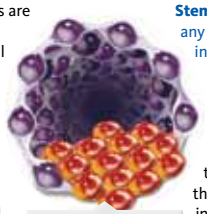
### Issues Involving Transplants

**Human cells.** As we learned above, the prolonged use of L-dopa to treat Parkinson's disease produces unwanted side effects. Because of these disappointing long-term results, researchers are investigating alternative treatments, such as fetal brain tissue transplants. Previously, researchers had shown that when fetal rat brain tissue was transplanted into older rats, the fetal neurons lived, grew, functioned, and allowed brain-damaged older rats to relearn the solutions to mazes (Shetty & Turner, 1996). Following successes in animal research, human fetal brain tissue has been transplanted into patients with Parkinson's disease (Roitberg & Kordower, 2004).

*Why not just use drugs?*

The primary reason for using 6- to 8-week-old fetal tissue for transplants is that they have a unique ability to survive and make connections in a patient's brain or body. Because fetal brain tissue is primed for growth, it has a far greater chance of survival after transplantation than does tissue from mature brains (Holden, 2002). More recently, researchers are exploring the use of stem cells to treat Parkinson's disease and spinal cord injuries.

**Stem cells.** About four days after a sperm has fertilized an egg, the resulting embryo, which is about the size of the period in this sentence (see p. 379), has divided and formed embryonic stem cells (shown below).



Embryonic stem cells have the ability to form new brain cells.

**Stem cells** have the amazing capacity to change into and become any one of the 220 types of cells that make up a human body, including skin, heart, liver, bones, and neurons.

The discovery of stem cells creates possibilities for treating various diseases. For example, when embryonic animal stem cells were transplanted into rats and mice with spinal cord injuries, the stem cells imitated the neighboring neurons and developed into new neurons that, in turn, helped the animals regain their lost functions (Wade, 2002). Some exciting news is that for the first time, surgeons have injected embryonic human stem cells into a patient with a spinal cord injury (Vergano, 2010a).

The use of human embryonic stem cells is controversial for ethical and political reasons. That's because these embryos, which are fertilized in laboratories and have the potential to develop into humans, are destroyed when the stem cells are removed. Because of these ethical and political problems, many scientists have turned to using **induced pluripotent stem cells (iPSCs)**, which are adult cells that have been genetically reprogrammed to be in an embryonic stem cell-like state (NIH, 2012).

There is much excitement in the scientific community about iPSCs, which, like embryonic stem cells, can turn into any type of cell in the body, but avoid the controversy. However, early research suggests that their effectiveness doesn't come close to that of embryonic stem cells (Choi, 2010; Kolata, 2010; Vergano, 2010b).

Next, we'll take a closer look at how fetal and stem cells are used in treating Parkinson's patients. We'll also learn about other experimental treatment options.



**Real world.** Students are very interested in how psychologists apply research findings and use basic principles to solve or treat real-life problems.

**Example.** In the sample page on the right, the ***Application*** (Module 3) describes the various experimental treatments available for Parkinson's disease, which include the use of human stem cells, a stereotaxic procedure to place tissue in the brain, removing part of the thalamus, and deep brain stimulation (pp. 60–61).

**Topics.** Other ***Application*** topics include:

**Module 1:** Study Skills
**Module 2:** Ethics in Doing Research
**Module 4:** Split Brain
**Module 5:** Artificial Senses
**Module 7:** Sleep Problems & Treatments
**Module 8:** Treatment for Drug Abuse
**Module 9:** Conditioned Fear & Nausea
**Module 10:** Behavior Modification
**Module 11:** Unusual Memories
**Module 12:** Eyewitness Testimony
**Module 16:** Lie Detection
**Module 17:** Child Abuse
**Module 18:** Suicide
**Module 21:** Stress Management Programs
**Module 22:** Treating Phobias
**Module 23:** Dealing with Mild Depression
**Module 25:** Controlling Aggression

The ***Application*** sections show the practical side of psychology—how psychological principles are applied to real-life situations.

# Critical Thinking: Challenges Students' Minds

**Critical thinking challenge.** An important goal of an Introductory Psychology course is to give students practice in critical thinking, which includes using concepts that they have learned in the modules to evaluate information from other sources. To accomplish this goal, we ask students to apply what they have learned by reading and evaluating an interesting and current newspaper article.

Research indicates that newspaper articles are a good way to create interest, nurture curiosity, and stimulate critical thinking and writing. A newspaper article is also great for stimulating class discussions.

**Example.** The sample page on the right shows the ***Critical Thinking*** feature (Module 1), which contains an interesting, current newspaper article that relates to topics discussed in the module. Students are asked to think about and evaluate the article by answering six questions that are placed next to it. The suggested answers are provided to students and instructors in Psychology CourseMate, which can be accessed by going to **CengageBrain.com**.

**Topics.** Other ***Critical Thinking*** topics include:

**Module 3:** Mirrors in Your Brain?
**Module 7:** Texting: How Distracting Can it Be?
**Module 15:** Using Money to Motivate Kids to Learn
**Module 18:** Are Teens too Young to Drive?
**Module 23:** What Is a Psychopath?

I Critical Thinking

## Learning through Visuals

A large body of research indicates that visual cues help us to better retrieve and remember information. The research outcomes on visual learning make complete sense when you consider that our brain is mainly an image processor, not a word processor. In fact, the part of the brain used to process words is quite small in comparison to the part that processes visual images.

**1** **Which goal of psychology is illustrated by stating that visual learning makes sense given that our brains are mainly image processors?**

**2** **Which area of specialization in psychology is best suited to understand how people learn through visuals?**

Words are abstract and rather difficult for the brain to retain, whereas visuals are concrete and, as such, more easily remembered. To illustrate, think back to having to learn a set of new vocabulary words each week in school. Now, think back to the first kiss you had, the high school prom, or your 16th birthday party. Most likely, you had to expend great effort to remember the vocabulary words. In contrast, when you were actually having your first kiss, going to the prom, or celebrating your birthday, we bet you weren't trying to commit it to memory. Yet, you can quickly and effortlessly visualize these experiences. You can thank your brain's amazing visual processor for your ability to easily remember life experiences.

There are countless studies that have confirmed the power of visual imagery in learning. For instance, one study asked students to remember many groups of three words each, such as *dog, bike,* and *street*. Students who tried to remember the words by repeating them over and over again did poorly on recall. In comparison, students who made the effort to make visual associations with the three words, such as imagining a dog riding a bike down the street, had significantly better recall.

**3** **Which career setting is a psychologist who examines the effectiveness of visual learning most likely to be in?**

Various types of visuals can be effective learning tools: photos, illustrations, icons, symbols, sketches, and figures, to name only a few. Consider how memorable the visual graphics are in logos, for example. You recognize the brand by seeing the visual graphic, even before reading the name of the brand. This type of visual can be so effective that Starbucks recently simplified its logo by dropping the printed name and keeping only the graphic image of the popular so-called mermaid (technically, it's a siren). We can safely assume that Starbucks Corporation must be keenly aware of how our brains have automatically and effortlessly committed the graphic image to memory.

So powerful is visual learning that we embrace it in the writing

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of this textbook. Each page of this textbook has been individually formatted to maximize visual learning. We believe the right visuals can help make abstract and difficult concepts more tangible and welcoming, as well as make learning more effective and long lasting. This is why we scrutinize every visual used in our writing to make sure it is paired with content in a clear, meaningful manner.

**4** **Which of the modern approaches to psychology is best suited to study how the brain performs during visual learning?**

**5** **How do visual learning and academic performance relate to the definition of psychology?**

As you see the visuals in this textbook, remember that, based on research outcomes, learning through visuals can decrease learning time, improve comprehension, enhance retrieval, and increase retention.

**6** **"Visual learning will improve academic performance" illustrates which goal of psychology?**

Adapted from McDaniel & Einstein, 1986; Meier, 2000; Patton, 1991; Schacter, 1996; Verdi et al., 1997.

22 PART 1 PSYCHOLOGY'S FOUNDATIONS & METHODS OF RESEARCH

# Summary Test: Review & Test of Complete Module

## Summary Test

### A Physical Development: Puberty


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**1.** Girls and boys experience three major biological changes as they go through a period called **(a)** _____. For both girls and boys, one of these changes is the development of **(b)** _____ maturity, which for girls includes the first menstrual cycle, called **(c)** _____, and for boys includes the production of sperm. These physical changes in girls and boys are triggered by a portion of the brain called the **(d)** _____. A second change is the development of **(e)** _____ sexual characteristics, such as pubic hair and gender-specific physical changes. A third change is a surge in **(f)** _____ growth, especially height. The changes for girls tend to start about two years earlier than those for boys.

### B Cognitive & Emotional Development

**2.** Piaget's fourth cognitive stage, which begins in adolescence and continues into adulthood, is called the **(a)** _____ stage. During this stage, adolescents and adults develop the ability to think about **(b)** _____ concepts, plan for the future, and solve abstract problems. One reason adolescents engage in more risky behaviors is that they have an underdeveloped **(c)** _____ but a fully functioning emotional center, called the **(d)** _____.

### C Morality & Parenting


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**3.** According to Kohlberg's theory, moral reasoning can be classified into three levels, and everyone progresses through the levels in the same order. However, not all adults reach the higher stages. The first level, the **(a)** _____ level, has two stages. In stage 1, moral decisions are determined primarily through fear of punishment, while at stage 2 they are guided by satisfying one's self-interest. The second level, the **(b)** _____ level, also has two stages. In the first of these, stage 3, people conform to the standards of others they value; in stage 4, they conform to the laws of society. In the third level, the **(c)** _____ level, moral decisions are made after thinking about all the alternatives and striking a balance between human rights and the laws of society.

**4.** Making impersonal moral decisions, such as keeping the money found in a stranger's wallet, involves areas of the brain associated with retrieving **(a)** _____. In comparison, making personal moral decisions, such as keeping the money found in a fellow worker's wallet, involves areas of the brain associated with **(b)** _____.

**5.** Parenting styles affect many aspects of adolescents' development. Parents who attempt to shape and control their children in accordance with a set standard of conduct are termed **(a)** _____. Parents who attempt to direct their children's activities in a rational and intelligent way and are supportive, loving, and committed are called **(b)** _____. Parents who are less controlling and behave with a nonpunishing and accepting attitude toward their children's impulses are called **(c)** _____.

### D Personality & Social Development

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**6.** How you describe yourself, including your values, goals, traits, interests, and motivations, is a function of your sense of **(a)** _____, which is part of the problem to be faced in stage 5 of Erikson's eight **(b)** _____ stages. Those who are unsuccessful in resolving the problems of this stage will experience **(c)** _____, which results in low self-esteem, and may become socially withdrawn.

**7.** An adolescent's feeling of worth, attractiveness, and social competence is called _____, which is influenced particularly by physical appearance, social acceptability, and management of public behaviors (anxiety and stress).

**8.** The challenges of adulthood are covered in the last three of Erikson's eight **(a)** _____ stages. According to his theory, in stage 6, young adults face the problems of intimacy versus **(b)** _____. In stage 7, middle adults face problems of generativity versus **(c)** _____. In stage 8, older adults reflect on their lives; if they feel positive and content about how they lived and what they accomplished, they will have a feeling of satisfaction or **(d)** _____; if not, they will have a feeling of regret and **(e)** _____.

### F Gender Roles, Love & Relationships


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**9.** During childhood and adolescence, males and females experience pressures and expectations from parents, peers, and society to behave in different ways. These expected patterns of behavior and thought, called _____, influence cognitive, personality, and social development.



**Problem.** How often have you heard students say, "I read the material three times but still did poorly on the test"? The problem is that students may think they know the material because they have a general idea of what they have read. However, researchers found that students are poor judges of how well they really know material unless they test themselves on specific questions.

**Remembering.** The sample page on the left shows part of the ***Summary Test*** (Module 18), which gives students a chance to test their knowledge by answering specific questions. The reason the ***Summary Test*** (and the ***Concept Review***) uses fill-in-the-blank questions instead of multiple choice is that fill-in-the-blank questions require recall, while multiple-choice questions require only recognition. Thus, fill-in-the-blank questions are a better test of a student's memory.

**Two tests.** Each module contains two tests. The first is the ***Concept Review*** (discussed on p. xxx), which occurs toward the end of each module and allows students to test their knowledge of major concepts.

The second is the ***Summary Test,*** which occurs at the end of each module and allows students to check their knowledge of the entire module. Students' comments indicate that they like the ***Summary Test*** because it's a great way to review all the material.

# Links to Learning: More Opportunities

**Links to Learning** offers students the following opportunities:

**Key Terms/Key People** allows students to check and review all the important concepts in the module.

**Psychology CourseMate** provides students with an interactive eBook, glossaries, flashcards, quizzes, videos, and more.

## Links to Learning

### Key Terms/Key People

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### Media Resources

Go to **CengageBrain.com** to access Psychology CourseMate, where you will find an interactive eBook, glossaries, flashcards, quizzes, videos, answers to Critical Thinking questions, and more. You can also access Virtual Psychology Labs, an interactive laboratory experience designed to illustrate key experiments first-hand.

# Supplements

The 10th edition of *Introduction to Psychology* is accompanied by a wide array of supplements developed to create the best teaching and learning experience inside as well as outside the classroom, in part by extending the book's visual approach to its supplemental materials. All of the continuing supplements have been thoroughly revised and updated, and some new supplements have been added. Cengage Learning prepared the following descriptions. We invite you to start taking full advantage of the teaching and learning tools available to you by reading this overview. Please contact your local representative if you would like copies of any of the following supplements.

**Instructor's Resource Manual**
1-285-17801-1
Written by Kelly Bouas Henry of Missouri Western State University, the manual includes teaching tips for new instructors, module outlines, student projects, suggested videos and films, handouts, and more.

**Test Bank**
1-285-17804-2
Written by Jason Spiegelman of Community College of Baltimore County, this test bank includes 150 multiple-choice, 25 true/false, and 10 short answer questions per module. Also available in ExamView electronic format.

**PowerLecture with ExamView**
1-285-17737-3
This one-stop digital library and presentation tool includes preassembled Microsoft® PowerPoint® lecture slides. In addition to a full Instructor's Manual and Test Bank, PowerLecture also includes ExamView® testing software with all the test items from the printed Test Bank in electronic format, enabling you to create customized tests in print or online, and all of your media resources in one place including an image library with graphics from the book itself and videos.

**CourseMate**
1-285-17796-7
Psychology CourseMate is a valuable online learning resource for your students. It includes an interactive eBook and interactive teaching and learning tools such as quizzes, flashcards, videos, and more. Engagement Tracker, a first-of-its-kind tool, monitors student engagement in the course.

**WebTutor on WebCT or Blackboard**
Jumpstart your course with customizable, rich, text-specific content within your Course Management System. Whether you want to Web-enable your class or put an entire course online, WebTutor™ delivers. WebTutor™ offers a wide array of resources including access to the eBook, glossaries, flashcards, quizzes, videos, and more.

## Guide to Wadsworth Videos for Introductory Psychology

Please contact your local representative if you would like to receive copies of any of the following videos:

**ABC® DVD: Introduction to Psychology**
Volume 1: 0-495-50306-1
Volume 2: 0-495-59637-X
Volume 3: 0-495-60490-9
ABC Videos feature short, high-interest clips from current news events as well as historic raw footage going back 40 years. Perfect to start discussion or to enrich your lectures and spark interest in the material in the text, these brief videos provide students with a new lens through which to view the past and present, one that will greatly enhance their knowledge and understanding of significant events and open up new dimensions in learning. Clips are taken from such programs as "World News Tonight," "Good Morning America," and "Nightline," as well as numerous ABC News specials and material from the Associated Press Television News and British Movietone News collections.

**Wadsworth Psychology: Research in Action**
Volume 1: 0-495-60490-9
Volume 2: 0-495-59813-5
The *Research in Action* video collections feature the work of research psychologists to give students an opportunity to learn about cutting-edge research—not just who is doing it, but also how it is done, and how and where the results are being used. By taking students into the laboratories of both established and up-and-coming researchers, and by showing research results being applied outside of the laboratory, these videos offer insight into both the research process and the many ways in which real people's lives are affected by research in the fields of psychology and neuroscience.

**Psych in Film**
0-618-27530-4
PSYCH IN FILM® DVD contains 35 clips from Universal Studios films, illustrating key concepts in psychology. Film clips are combined with commentary and discussion questions to help bring psychology alive for students and demonstrate its relevance to contemporary life and culture. Teaching tips are correlated with specific text chapters and concepts and are available on the instructor website.

**Wadsworth Guest Lecture Series**
0-547-00401-X
The Guest Lecture Series features many talented teachers sharing their teaching tips and best practices on a wide range of topics, including: Rational Emotive Behavior Theory, Blogging as an Effective Tool, How to Teach Writing in Psychology, and more.

# Reviewers & Many Thanks

We especially want to thank the many reviewers who put in an amazing amount of time and energy to consider and comment on various aspects of this textbook.

We would like to explain why we were not able to include all your valuable suggestions.

Sometimes your suggestions were great but required inserting material for which there simply was no room.

Other times, one reviewer might suggest changing something that another reviewer really liked, so we tried to work out the best compromise.

Still other times, reviewers forcefully argued for entirely different points so that we felt like the proverbial starving donkey trying to decide which way to turn between two stacks of hay.

For all these reasons, we could not make all your suggested changes but we did give them a great deal of thought and used as many as we possibly could.

We do want each reviewer to know that his or her efforts were invaluable in the process of revising and developing a textbook. If it were within our power, we would triple your honorariums and give you each a year-long sabbatical.

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**Susan Barnett,** Northwestern State University
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**Beth Benoit,** University of Massachusetts–Lowell
**John B. Benson,** Texarcana College
**Joan Bihun,** University of Colorado at Denver
**Kristen Biondolillo,** Arkansas State University
**Angela Blankenship,** Halifax Community College
**Pamela Braverman Schmidt,** Salem State College
**William T. Brown,** Norwalk Community College
**Linda Brunton,** Columbia State Community College
**Alison Buchanan,** Henry Ford Community College
**Lawrence Burns,** Grand Valley State University
**Ronald Caldwell,** Blue Mountain Community College
**James Calhoun,** University of Georgia
**Peter Caprioglio,** Middlesex Community Technical College
**Donna M. Casperson,** Harrisburg Area Community College
**Ili Castillo,** Houston Community College
**Hank Cetola,** Adrian College
**Larry Christensen,** Salt Lake Community College
**Saundra K. Ciccarelli,** Gulf Coast Community College
**Gerald S. Clack,** Loyola University
**J. Craig Clarke,** Salisbury State University
**Randy Cole,** Piedmont Technical College
**Jay Coleman,** University of South Carolina, Columbia
**Richard T. Colgan,** Bridgewater State College
**Lorry J. Cology,** Owens Community College
**Laurie Corey,** Westchester Community College
**Rita A. Creason,** Campbellsville University
**Shaunna Crossen,** Penn State University, Berk-Lehigh Valley College
**Sandy Deabler,** North Harris College
**Paul H. Del Nero,** Towson State University
**Julile P. Dilday,** Halifax Community College
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**Michael Durnam,** Adams State College
**Laura Duvall,** Heartland Community College
**Jean Edwards,** Jones County Junior College
**Tami Eggleston,** McKendree College
**Nolen Embry-Bailey,** Bluegrass Community and Technical College
**Charles H. Evans,** LaGrange College
**Melissa Faber,** Lima Technical College
**Mike Fass,** Miami-Dade Community College, North Campus
**Diane Feibel,** Raymond Walters College
**Bob Ferguson,** Buena Vista University
**Michael Firmin,** Cedarville University
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**Jan Francis,** Santa Rosa Junior College
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**Meredith C. Frey,** Otterbein College
**Grace Galliano,** Kennesaw State College
**John T. Garrett,** Texas State Technical College
**Robert Gates,** Cisco Junior College
**Andrew Getzfeld,** New Jersey City University
**Marjan Ghahramanlou,** The Community College of Baltimore, Catonsville
**Kendra Gilds,** Lane Community College
**Philip Gray,** D'Youville College
**Troianne Grayson,** Florida Community College at Jacksonville, South Campus
**Charles M. Greene,** Florida Community College at Jacksonville
**Mike Grevlos,** Southeast Technical Institute
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**Donna Holmes,** Becker College
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**Wendy Jefferson-Jackson,** Montgomery College
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**Eleanor Jones,** Tidewater Community College
**Linda V. Jones,** PhD, Blinn College
**Joanne Karpinen,** Hope College
**Stan Kary,** St. Louis Community College at Florissant Valley
**Paul Kasenow,** Henderson Community College

**Don Kates,** College of DuPage
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**Dan Klaus,** Community College of Beaver City
**Gail Knapp,** Mott Community College
**John C. Koeppel,** University of Southern Mississippi
**Jan Kottke,** California State University–San Bernardino
**Joan Krueger,** Harold Washington College
**Matthew Krug,** Wisconsin Lutheran College
**Doug Krull,** Northern Kentucky University
**Diane J. Krumm,** College of Lake County
**Raymond Launier,** Santa Barbara City College
**Kristen Lavallee,** Penn State University
**Eamonn J. Lester,** St. Philips College
**Irv Lichtman,** Houston Community College
**John Lindsay,** Georgia College & State University
**Alan Lipman,** Georgetown University
**Karsten Look,** Columbus State Community College
**Jerry Lundgren,** Flathead Valley Community College
**Linda V. Jones,** PhD, Blinn College
**Frank MacHovec,** Rappahannock Community College
**Sandra Madison,** Delgado Community College
**Laura Madson,** New Mexico State University
**Ernest Marquez,** Elgin Community College
**Peter Matsos,** Riverside Community College
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**Grant McLaren,** Edinboro University
**Mary Lee Meiners,** San Diego Miramar College
**Diane Mello-Goldner,** Pine Manor College
**Laurence Miller,** Western Washington University
**Lesley Annette Miller,** Triton College
**Malcolm Miller,** Fanshawe College
**Gloria Mitchell,** De Anza College
**Alinde Moore,** Ashland University
**Therese Nemec,** Fox Valley Technical College
**John T. Nixon,** SUNY–Canton
**Peggy Norwood,** Community College of Aurora
**Art Olguin,** Santa Barbara City College
**Carol Pandey,** Pierce College
**Christine Panyard,** University of Detroit–Mercy
**Jeff Parsons,** Rockefeller University
**Ron Payne,** San Joaquin Delta College
**Bob Pellegrini,** San Jose State University
**Julie Penley,** El Paso Community College
**Judith Phillips,** Palomar College
**James Previte,** Victor Valley College
**Joan Rafter,** Hudson Community College
**Robert R. Rainey, Jr.,** Florida Community College at Jacksonville
**Chitra Ranganathan,** Framingham State College
**Lillian Range,** University of Southern Mississippi
**Joseph Reish,** Tidewater Community College
**S. Peter Resta,** Prince George's Community College
**Melissa Riley,** University of Mississippi
**Vicki Ritts,** St. Louis Community College, Meramac
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**Harvey Schiffman,** Rutgers University Piscataway Campus
**Michael Schuller,** Fresno City College
**Alan Schultz,** Prince George's Community College
**Robert Schultz,** Fulton Montgomery Community College
**Debra Schwiesow,** Creighton University
**Harold Siegel,** Rutger's University Newark Campus
**N. Clayton Silver,** University of Nevada, Las Vegas
**Kimberly Eretzian Smirles,** Emmanuel College
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**Deborah Steinberg,** Jefferson Community College
**Mark Stewart,** American River College
**Kimberly Stoker,** Holmes Community College
**Julie Stokes,** California State University–Fullerton
**Ted Sturman,** University of Southern Maine
**Clayton N. Tatro,** Garden City Community College
**Annette Taylor,** University of San Diego
**Clayton Teem,** Gainesville College
**Andy Thomas,** Tennessee Technical University
**Cicilia Ivonne Tjoefat,** Rochester Community and Technical College
**Larry Till,** Cerritos College
**Daniel J. Tomasulo,** New Jersey City University
**Susan Troy,** Northeast Iowa Community College
**Deborah Van Marche,** Glendale Community College
**Jane Vecchio,** Holyoke Community College
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**Jeff Wachsmuth,** Napa Valley College
**Benjamin Wallace,** Cleveland State University
**James Ward,** Western New England College
**Janice Weaver,** Ferris State University
**Stephen P. Weinert,** Cuyamaca College
**Mary Scott West,** Virginia Intermont College
**Fred W. Whitford,** Montana State University
**John Whittle,** Northern Essex Community College
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Amber Chenoweth, Hiram College
Scott Cohn, Western State College of Colorado
Cheree Madison, Lanier Technical College
Patrice M. Olsenc, Humphreys College
Deborah Miller, The Ohio State University at Newark
Henry Pomerantz, Sussex County Community College
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After more than 20 years of working on my own, I decided that it was time to cut back on my workload and take on a coauthor for my 8th edition. The coauthor I chose has such unique qualifications that if I had told you about them, you might have thought I made them up. For that reason, I will let my coauthor, Haig Kouyoumdjian, tell you his own story and, after reading it, you will understand why he is so ideally and perfectly suited for this project (even though I still have trouble pronouncing his name).

***—Rod Plotnik***

When I took my first college psychology class at Diablo Valley College, I used *Introduction to Psychology* by Rod Plotnik. I can still recall the many conversations I had with peers and family members sharing the fascinating stories I read about and my overall enthusiasm for the textbook. For the first time ever, I did the unimaginable; that is, I began reading ahead because I was impatient to read the next great story and learn the next interesting concept. Plotnik's text sparked my interest in psychology, and I went on to pursue a Bachelor of Science degree at Saint Mary's College of California, a liberal arts college in the San Francisco Bay Area.

My interest in psychology continued to deepen while in college, and I went on to receive a Master of Arts degree in psychology at San Diego State University, where I had the unique experience of working closely with Rod Plotnik, a professor in the department and supervisor of the graduate teaching associates training program. Under Plotnik's close supervision, I began teaching Introduction to Psychology courses at the university using his textbook.

Following my education and training at San Diego State University, I attended University of Nebraska–Lincoln, where I received a PhD in Clinical Psychology. While there, I continued to teach Introduction to Psychology courses using Plotnik's text.

After receiving my PhD, I worked in a clinical setting providing mental health services to youths, adults, and families, and continued to teach undergraduate psychology courses. Most recently, I was a full-time faculty member at Mott Community College in Flint, Michigan.

My teaching experiences have strengthened my interest in the practice and study of teaching. I especially enjoy stimulating students by using visual learning approaches, such as breaking educational content into small, meaningful chunks of information and presenting visual cues to help students better process, retrieve, and remember information.

Rod Plotnik's influence on my interest in psychology began when I read his textbook as an undergraduate and developed as he trained me in how to become an effective instructor and later carefully guided me through revisions of this text. It is with much appreciation and pleasure that I help to continue his vision in *Introduction to Psychology*.

***—Haig Kouyoumdjian***

In revising the 10th edition, I worked with a remarkable group of creative and talented people, each of whom deserves special thanks.

**Executive Editor.** This edition continued to benefit from Jaime Perkins, who believes in the vision of this textbook and supported major updates to its content, design, and visual program to make this edition the best it could possibly be. This textbook would not be where it is now without the past support from Vicki Knight.

**Developmental Editors.** New to the team are Trina McManus and Tangelique Williams, who both skillfully coordinated many aspects of this revision. But, more important, they supported my vision while making valuable contributions that took the textbook beyond my aim. The content and visual program of this edition benefited tremendously from the attention to detail and sharp visual sense of Trina McManus.

**Designers.** As always, Vernon Boes does excellent work as our senior art director. Picture Mosaic is the creative team that did the wonderful cover image, Cheryl Carrington did a fantastic cover design, and Diane Beasley provided our new interior design, which so perfectly captures the personality of the textbook.

**Concept Illustrator.** Once again Tim Jacobus had a vital role in making this textbook visually breathtaking. He is incredibly talented and knows exactly what this textbook needs.

**Photo and Text Researcher.** New to this edition is the talented Terri Wright, who helped us find about 600 new photos that truly enhanced the visual learning focus of this book. I am very thankful for her patience and determination to find just the right photos, which can be quite time-consuming.

**Manuscript Editor.** We continued to have the best manuscript editor ever in Carol Reitz, whose editorial skills really did improve the book.

**Production.** Keeping track of everything at Cengage Learning were Pat Waldo and Carol Samet, who both made sure that everything got done on time and was where it should be. Paige Larkin of diacriTech made sure the individual pages were turned into a complete book. Paige's work is exceptional. The first-pass pages she presents to us could be mistaken for final pages…they are that good! Her strong sense for design and layout helped to make this book so visually appealing.

**Sales.** I have been fortunate to continue to have Liz Rhoden take the lead in marketing this book. She makes sure that all sales representatives know what the book is about and how to describe it to potential adopters. She is really committed to continuing the success of this book.

**And finally…** Writing a textbook inevitably asks family members to make sacrifices for an extended period of time. There is absolutely no way I could have revised this textbook without their help and understanding. My two lovely daughters, Sosi and Ani, were great at giving their baba quiet time in his office as well as spoiling me with plenty of hugs and laughs when I needed them the most. A special thank you to my wife, Zepure, who has a demanding medical career and yet somehow managed to find the time and energy to take care of many of my family responsibilities to allow me to focus on writing. She demonstrated as much of a commitment to the quality of this revision as I did.

***—Haig Kouyoumdjian***

# To the Student: A Different Kind of Textbook

**Looks different.** This textbook looks different because it uses visual learning techniques, such as breaking material into smaller units and integrating text and graphics. Every definition is boldface and printed in **blue** so that you can identify it easily.

**Concept Review.** This is a test of how well you remember some of the key concepts. As you fill in the blanks of the Concept Review, you'll be learning important terms and concepts.

**Critical Thinking.** Near the end of each module are several Critical Thinking questions about an interesting newspaper article.

**Summary Test.** This lets you check how well you remember the material from the entire module. Taking the Summary Test is also an excellent way to review all the major terms discussed in the module.

**Key Terms/Key People.** There's a list of key terms/people (with page numbers) at the end of each module.

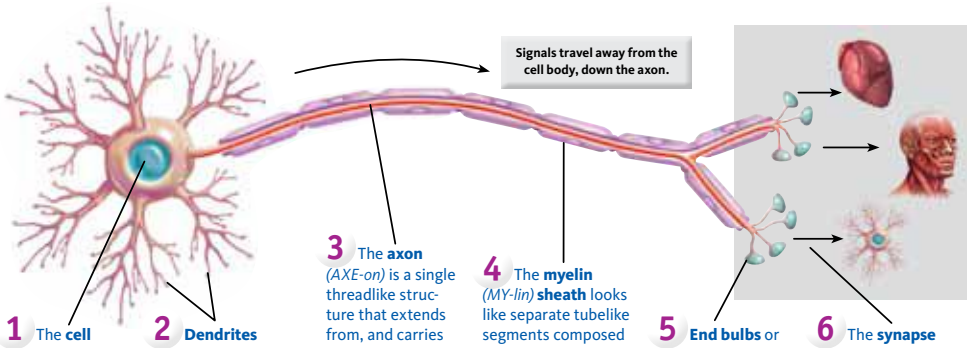


## B Neurons: Structure & Function

### Parts of the Neuron

*Why could Charles think, move, and talk?*

Before Charles developed Alzheimer's disease, he was able to engage in an incredible variety of cognitive and physical behaviors. He was able to think, remember, walk, smile, and speak—all because of the activity of millions of microscopic brain cells called neurons. We'll examine the neuron, which comes in many wondrous shapes and sizes and has only three basic structures—cell body, dendrites, and axon.




**1** The **cell body** (or soma) is a relatively large, egg-shaped structure that provides fuel, manufactures chemicals, and maintains the entire neuron in working order.

In the center of the cell body is a small oval shape representing the nucleus, which contains genetic instructions (in the form of DNA) for both the manufacture of chemicals and the regulation of the neuron.

**2** **Dendrites** *(DEN-drites)* are branchlike extensions that arise from the cell body; they receive signals from other neurons, muscles, or sense organs and pass these signals to the cell body.

At the time of birth, a neuron has few dendrites. After birth, dendrites undergo dramatic growth that accounts for much of the increase in brain size. As dendrites grow, they make connections and form communication networks between neurons and other cells or organs.

**3** The **axon** *(AXE-on)* is a single threadlike structure that extends from, and carries signals away from, the cell body to neighboring neurons, organs, or muscles.

Here the axon is indicated by an orange line inside the tube composed of separate gray segments. Axons vary in length from less than a hair's breadth to as long as 3 feet (from your spinal cord to your toes). An axon conducts electrical signals to a neighboring organ (heart), a muscle, or another neuron.

**4** The **myelin** *(MY-lin)* **sheath** looks like separate tubelike segments composed of fatty material that wraps around and insulates an axon. The myelin sheath prevents interference from electrical signals generated in adjacent axons and helps signals travel much faster through the axon.

The axons of most large neurons, including motor neurons, have myelin sheaths. You may have heard the brain described as consisting of gray and white matter. Gray is the color of cell bodies, while white is the color of myelin sheaths.

**5** **End bulbs** or **terminal bulbs** look like tiny bubbles that are located at the extreme ends of the axon's branches. Each end bulb is like a miniature container that stores chemicals called neurotransmitters, which are used to communicate with neighboring cells.

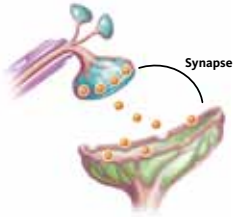
End bulbs reach right up to, but do not physically touch, the surface of a neighboring organ (heart), muscle (head), or another cell body.

**6** The **synapse** *(SIN-apse)* is an infinitely small space (20–30 billionths of a meter) that exists between an end bulb and its adjacent body organ (heart), muscles (head), or cell body.

When stimulated by electrical signals from the axon, the end bulbs eject neurotransmitters into the synapse. The neurotransmitters cross the synapse and act like switches to turn adjacent cells on or off. Below we'll take a closer look at the synapse.

**Synapse: Close-up look.** The right figure shows a close-up look of a synapse (small space) between the end bulb of one neuron (top) and the dendrites of an adjacent neuron (bottom). When stimulated, the end bulbs eject neurotransmitters (orange circles) that cross the synapse and act to either excite (turn on) or inhibit (turn off) adjacent cells. Later in the module, we'll discuss this process in more detail and describe several important neurotransmitters (see p. 54).

We have discussed the structure and function of neurons, but it is important not to confuse neurons (in your brain and spinal cord) with nerves (in your body). ●



MODULE 1

# Discovering Psychology

# introduction

## Growing Up in a Strange World

When Donna was about 3 years old, she ate lettuce because she liked rabbits and they ate lettuce. She ate jelly because it looked like colored glass and she liked to look at colored glass.

*Why did Donna avoid social interaction?*

She was told to make friends, but Donna had her own friends. She had a pair of green eyes named Willie, which hid under her bed, and wisps, which were tiny, transparent spots that hung in the air around her.

When people spoke, their words were strange sounds with no meaning, like mumble jumble. Donna did learn the sounds of letters and how they fit together to make words. Although she didn't learn the meanings of words, she loved their sounds when she said them out loud. As a child, she was tested for deafness because she did not use language like other children. She did not learn that words had meaning until she was a teenager.

Courtesy of Chris Samuel, by permission of Chris Samuel

**Donna Williams had symptoms of autism beginning in childhood.**

When people talked to Donna, especially people with loud or excited voices, she heard only "blah, blah, blah." Overstimulation caused Donna to stare straight ahead and appear to be frozen. Donna later called this state "involuntarily anesthetized."

Donna was in and out of many schools because she failed her exams, refused to take part in class activities, walked out of classes she didn't like, and sometimes threw things. When Donna did make a friend, she tried to avoid getting a friendly hug, which made her feel as if she were burning up inside and going to faint. (D. Williams, 1992). Donna Williams had symptoms of autism.

**Autism** is marked by especially abnormal or impaired development in social interactions, such as hiding to avoid people, not making eye contact, and not wanting to be touched. Autism is marked by difficulties in communicating, such as grave problems in developing spoken language or in initiating conversations. Individuals with autism are characterized by having very few activities and interests, spending long periods repeating the same behaviors, or following the same rituals. Signs of autism usually appear when a child is 2 or 3 years old (American Psychiatric Association, 2000).

Although it was once thought to be a rare disorder, estimates of autism disorders are now as high as 1 in every 110 births. Autism affects 3 to 4 times as many boys as girls, occurs in all parts of the world, and is thought to be 10 times more prevalent now than it was 20 years ago (CDC, 2009; NICHD, 2005).

Some parents blamed the increase in autism on childhood vaccinations, but after a thorough investigation, a U.S. federal court ruled this is not true (USCFC, 2009). More recently, the original research study linking vaccines to autism, and consequently spreading fear worldwide, was declared "an elaborate fraud" after it was discovered the researcher falsified data (Godlee et al., 2011). The most probable explanation for the increase in autism is better awareness on the part of doctors and parents as well as various environmental and genetic factors (Durand, 2011; Hallmayer et al., 2011; Kogan et al., 2009; Pinto et al., 2010).

Though researchers have made great strides in understanding the genetic links to autism, they report there is still much to learn and there are likely to be hundreds of genetic factors involved (Gaidos, 2010; Schaaf & Zoghbi, 2011).

A very small percentage of individuals with autism are called *savants* because they have incredible math skills, spatial abilities, musical talent, or near picture-perfect memory. For example, one savant memorized 7,600 books; another plays 7,000 songs; another lists world events that happened on any given day; another performs amazing calculations, such as doubling 8,388,628 twenty-four times in only seconds (answer: 140,737,488,355,328) (D. S. Fox, 2009; Treffert, 2006; Treffert & Wallace, 2002).

Donna Williams is an example of a savant who developed exceptional language skills. In her four autobiographies (D. Williams, 1992, 1994, 1999, 2004), Donna describes how common sights, sounds, and images become strangely distorted, which makes getting through an ordinary day like finding one's way out of a terribly complex maze. Donna has also written four textbooks (D. Williams, 1996, 1998, 2008a, 2008b) that have influenced the treatment and educational environments of people with autism.

As we describe Donna's experiences, you'll see how psychologists try to answer questions about complex behaviors, such as autism, as well as countless other behaviors discussed throughout this text. For example, one question that psychologists have studied involves the problem of test anxiety.

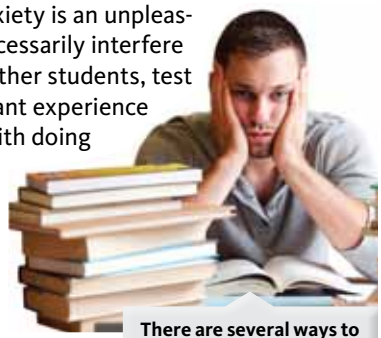
## Test Anxiety

If you're like many other students, you probably experience some degree of test anxiety.

*Why are your hands sweating?*

**Test anxiety** is a combination of physiological, emotional, and cognitive components that are caused by the stress of taking exams and may interfere with one's concentration, planning, and academic performance (Flippo et al., 2009).

For some students, test anxiety is an unpleasant experience but doesn't necessarily interfere with exam performance. For other students, test anxiety not only is an unpleasant experience but also seriously interferes with doing well on exams. We'll discuss what psychologists have discovered about test anxiety, why students differ in how much test anxiety they feel, and, perhaps most important, how to decrease test anxiety.



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**There are several ways to decrease test anxiety.**

## What's Coming

In this module, we'll explore the goals of psychology, the major approaches that psychologists use to understand behavior and answer questions, the historical roots of psychology, current research areas, and possible careers in the broad field of psychology. Let's begin with how psychologists study complex problems, such as Donna's autistic behaviors. ●

# A Definition & Goals

## Definition of Psychology

*What do psychologists study?*

When you think of psychology, you may think of helping people who have mental problems. However, psychologists study a broad range of behaviors, including Donna's autistic behaviors and students' test anxiety, as well as hundreds of others. For this reason, we need a very broad definition of psychology.

**Psychology** is the systematic, scientific study of behaviors and mental processes.

What's important about this definition is that each of its terms has a broad meaning. For example, *behaviors* refer to observable actions or responses in both humans and animals. Behaviors might include eating, speaking, laughing, running, reading, and sleeping. *Mental processes,* which are not directly observable, refer to a wide range of complex mental processes, such as thinking, imagining, studying, and dreaming. The current broad definition of psychology grew out of discussions and heated arguments among early psychologists, who defined psychology much more specifically, as we'll discuss later in this module.

Although the current definition of psychology is very broad, psychologists usually have four specific goals in mind when they study some behavior or mental process, such as Donna's autistic experiences.

## Goals of Psychology

*What are some of Donna's unusual behaviors?*

Donna (photo below) knows that she has some unusual behaviors. For example, she says that she doesn't like to be touched, held, or hugged, doesn't like to make eye contact when speaking to people, hates to talk to someone who has a loud voice, and really dislikes meeting strangers. If you were a psychologist studying Donna's unusual behaviors, you would have the following four goals in mind: to describe, explain, predict, and control her behavior.

**1 Describe** Donna says that when she was a child, she wondered what people were saying to her because words were just lists of meaningless sounds. When people or things bothered her, she would endlessly tap or twirl her fingers to create movements that completely held her attention and helped her escape from a world that often made no sense.

***The first goal of psychology is to describe the different ways that organisms behave.***

As psychologists begin to describe the behaviors and mental processes of autistic children, such as difficulties in learning language, they begin to understand how autistic children behave. After describing behavior, psychologists try to explain behavior, the second goal.

**2 Explain** Donna's mother believed that autism was caused by evil spirits. Donna thinks her autism may result from metabolic imbalance.

***The second goal of psychology is to explain the causes of behavior.***

The explanation of autism has changed as psychologists learn more about this complex problem. In the 1950s, psychologists explained that children became autistic if they were reared by parents who were cold and rejecting (Blakeslee, 2000). In the 1990s, researchers discovered that autism is caused by genetic and biological factors that result in a maldeveloped brain (Courchesne et al., 2003). Being able to describe and explain behavior helps psychologists reach the third goal, which is to predict behavior.

Psychology's goals are to describe, explain, predict, and control Donna's autistic behaviors.

Courtesy of Chris Samuel, by permission of Chris Samuel

**3 Predict** Donna says that one of her biggest problems is being so overloaded by visual sensations that she literally freezes in place. She tries to predict when she will freeze up by estimating how many new stimuli she must adjust to.

***The third goal of psychology is to predict how organisms will behave in certain situations.***

However, psychologists may have difficulty predicting how autistic children will behave in certain situations unless they have already described and explained their behaviors. For example, from the first two goals, psychologists know that autistic children are easily overwhelmed by strange stimuli and have difficulty paying attention. Based on this information, psychologists can predict that autistic children will have difficulty learning in a school environment because there are too many activities and stimuli in the classroom (Heflin & Alaimo, 2006; M. Pittman, 2007). However, if psychologists can predict behavior, then they can often control behavior.

**4 Control** Donna knows one reason she fears meeting people is that social interactions cause a tremendous sensory overload that makes her freeze up. She controls her social fear by making a rule to meet only one person at a time.

***For some psychologists, the fourth goal of psychology is to control an organism's behavior.*** However, the idea of control has both positive and negative sides. The positive side is that psychologists can help people, such as Donna, learn to control undesirable behaviors by teaching better methods of self-control and ways to deal with situations and relationships (Hanley, 2011; Taubman et al., 2011). The negative side is the concern that psychologists might control people's behaviors without their knowledge or consent. In Module 2, we'll discuss the strict guidelines that psychologists have established to prevent the potential abuse of controlling behavior and to protect the rights and privacy of individuals, patients, and participants in experiments.

Because many behaviors, such as autism, are enormously complex, psychologists use a combination of different approaches to reach the four goals of describing, explaining, predicting, and controlling behavior. To reach these goals, psychologists may use one or a combination of the following eight approaches. ●

# B Modern Approaches

## Answering Questions

*How do psychologists answer questions?*

Psychologists have many questions about Donna's unusual behaviors. For example, why did Donna believe objects were alive and made their own sounds? "My bed was my friend; my coat protected me and kept me inside; things that made noise had their own unique voices, which said vroom, ping, or whatever" (Blakely, 1994, p. 14).

Why did Donna initially hear words as meaningless sounds that people were constantly saying to her? Why did she develop her own signaling system, such as scrunching her toes to signal that no one could reach her? Why did she freeze up when staring at soap bubbles in the sink? In trying to answer questions about Donna's strange and intriguing behaviors, psychologists would use a combination of approaches.

An **approach** is a focus or perspective that may use a particular research method or technique.

The eight approaches to understanding behavior are the ***biological, cognitive, behavioral, psychoanalytic, humanistic, sociocultural, evolutionary,*** and ***biopsychosocial.*** We'll summarize these approaches below and discuss them on the following pages.

**1** As a child, was Donna unable to learn that words had meaning because of some problem with the development of her brain?

The ***biological approach*** focuses on how our genes, hormones, and nervous system interact with our environments to influence learning, personality, memory, motivation, emotions, and coping techniques.

**2** How was Donna able to develop her own signaling system that involved gestures instead of words?

The ***cognitive approach*** examines how we process, store, and use information and how this information influences what we attend to, perceive, learn, remember, believe, and feel.

**3** Why did Donna make it a rule to avoid leaving soap bubbles in the sink?

The ***behavioral approach*** studies how organisms learn new behaviors or modify existing ones, depending on whether events in their environments reward or punish these behaviors.

**4** Why did Donna develop alternate personalities, such as Willie, who had "hateful glaring eyes, a rigid corpselike stance, and clenched fists"?

The ***psychoanalytic approach*** stresses the influence of unconscious fears, desires, and motivations on thoughts, behaviors, and the development of personality traits and psychological problems later in life.


© Donna Williams

**5** How was Donna able to write several books and create beautiful paintings?

The ***humanistic approach*** emphasizes that each individual has great freedom in directing his or her future, a large capacity for personal growth, a considerable amount of intrinsic worth, and enormous potential for self-fulfillment.

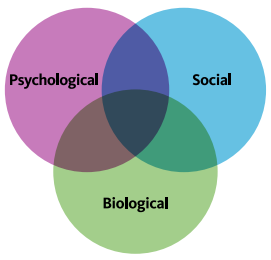
Earth © NASA

**6** Why did Donna's mother believe autism was caused by evil spirits? What do other people and cultures believe causes autism?

The ***sociocultural approach*** studies the influence of social and cultural factors on psychological and behavioral functioning.

**7** How might Donna's unique behaviors help her to adapt to the environment? How did autism evolve during the course of our human ancestry?

The ***evolutionary approach*** studies how evolutionary ideas, such as adaptation and natural selection, explain human behaviors and mental processes.




**8** How might Donna's symptoms of autism be a result of biological, psychological and social factors?

The ***biopsychosocial approach*** studies how biological, psychological, and social influences explain human health and illness.

The first six approaches are well-established and are commonly used to understand behavior. We'll use the problems of autism and test anxiety to show how each of these approaches examines these problems from a different perspective. Then, we'll provide more information about the more recent evolutionary and biopsychosocial approaches.

# Biological Approach

As Donna explains, autism has a huge effect on all parts of her life. "Autism makes me feel everything at once without knowing what I am feeling. Or it cuts me off from feeling anything at all" (D. Williams, 1994, p. 237). Donna's description of how autism so drastically affects her life raises questions about whether her brain has developed normally or functions differently. To answer these questions, researchers use the biological approach.

*Are their brains different?*

The **biological approach** examines how our genes, hormones, and nervous system interact with our environments to influence learning, personality, memory, motivation, emotions, and other traits and abilities.

Autism is thought to originate in early brain development. In children with autism, brain cells appear to connect irregularly, leading to abnormal functioning in brain areas responsible for thoughts, movement, and emotions. These abnormalities may explain why these children seem uninterested in their environment and in social interaction. Brain imaging research has shown that children with autism show different brain activity than other children while looking at faces (D. S. Fox, 2009). For example, the top figure shows that the normal brain uses one area (blue—fusiform gyrus) to process ***faces*** of people and a different area (red—inferior temporal gyrus) to process inanimate ***objects,*** such as a chair. The bottom figure shows that the autistic brain uses the area that processes inanimate objects (red—inferior temporal gyrus) to also process human faces (R. T. Schultz et al., 2000). This study uses the biological approach to look inside the brain to explain why people with autism show little interest in looking at a person's face during social interactions or in identifying facial emotional expressions.

Normal brain

Autistic brain

Also using the biological approach, researchers found that social problems associated with autism are likely linked to less activity in brain cells responsible for human empathy (mirror neurons). These cells allow us to put ourselves in other people's shoes and experience how they feel. Though there is some disagreement among researchers, many report that reduced activity in these cells may help explain why children with autism misunderstand verbal and nonverbal cues suggesting different emotions felt by others, including joy, sadness, and anger, and why they have difficulty empathizing with others (Dapretto et al., 2006; Dinstein et al., 2010; Iacoboni, 2008a; 2010).

Psychologists who use the biological approach are now collaborating more and more with specialists in other biological disciplines, such as genetics, neuroanatomy, neurophysiology, neurochemistry, and neuropharmacology. Such collaboration results in the field of neuroscience.

**Neuroscience** is an interdisciplinary field of scientific study that examines the structure and function of all parts of the nervous system, including the brain, spinal cord, and networks of brain cells (SFN, 2012).

Like the biological approach, neuroscience studies the processes underlying cognition and behavior, but it also includes more detail about anatomy, physiology, and chemistry.

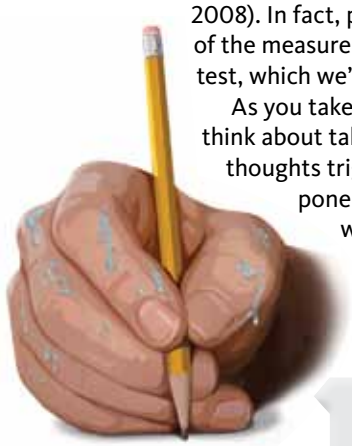
The biological approach can be used to study an experience that is familiar to many students, test anxiety.

## Biological Approach to Test Anxiety

You've probably experienced one component of test anxiety, called the emotional component. This component includes a variety of physiological responses, such as increased heart rate, dry mouth, and sweaty palms. An interesting feature of sweaty palms, called palmar sweating, is that it is caused by stressful feelings and is not related to changes in room temperature (L. A. Goldsmith, 2008). In fact, palmar sweating is one of the measures used in the lie detector test, which we'll discuss in Module 16.

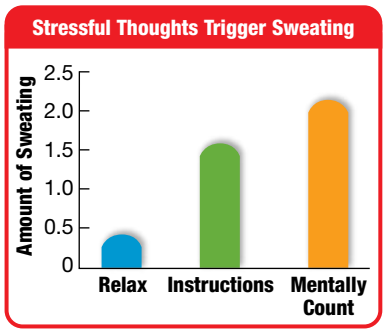
*Why do my hands sweat?*

As you take an exam—or even think about taking one—your stressful thoughts trigger the emotional component, which can interfere with processing information and increase your chances of making mistakes (Cassady & Johnson, 2002).



Sweaty hands often indicate stress.

The graph on the right shows how easily your stressful thoughts can trigger palmar sweating, which is one measure of the emotional component of test anxiety. As subjects listened to instructions telling them to do mental arithmetic, which involved them counting backward from 100 in steps of 7, there was a significant increase in palmar sweating. Then, once subjects started to actually do the mental arithmetic, their palmer sweating increased even more (Kobayashi et al., 2003). If merely listening to instructions about having to do the simple task of counting backward increased palmar sweating, a sign of physiological and emotional arousal, imagine the increased arousal that occurs while taking an exam!




Graph data from "Arithmetic calculation, deep inspiration or handgrip exercise-mediated pre-operational active palmar sweating responses in humans," by Masayoshi Kobayashi, Noriko Tomioka, Yoshihisa Ushiyama and Toshio Ohhashi *Autonomic Neuroscience*, Volume 104, Issue 1, pp. 58–65.

In fact, symptoms of test anxiety may include shaky legs, sweating, racing heart, fidgeting, physical illness, or even crying during an exam (Cizek & Burg, 2006; Strauss, 2004). In Module 21, we'll describe methods of controlling stress to help manage the emotional component of test anxiety.

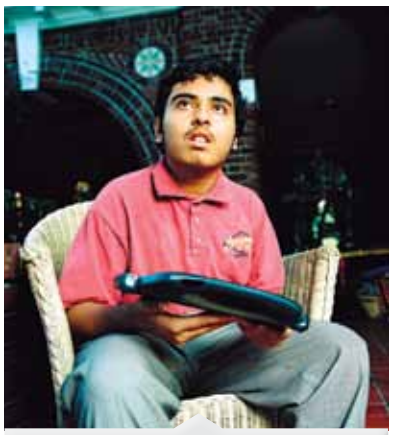
# Cognitive Approach

Individuals with autism usually have difficulty developing language skills. For example, Donna writes, "Autism makes me hear other people's words but be unable to know what the words mean. Autism stops me from finding and using my own words when I want to. Or makes me use all the words and silly things I do not want to say" (D. Williams, 1994, p. 237). Although Donna did not understand words until she was an adolescent, she eventually learned to both speak and write, has written several creative books (D. Williams, 1992, 1994, 1999, 2004), and has learned French and German. Because of her remarkable language abilities, Donna is said to be a high-functioning autistic, or *savant*. To discover why individuals with autism differ in their language and social skills, psychologists use the cognitive approach.

*Was Donna an unusual autistic?*

The **cognitive approach** focuses on how we process, store, and use information and how this information influences what we attend to, perceive, learn, remember, believe, and feel.

Unlike Donna Williams, who speaks fluently and is considered a high-functioning autistic, the photo on the right shows Tito Mukhopadhyay, a teenager with severe autism who often seems overcome by various movements, whose speech is virtually unintelligible, but who has the unusual ability to answer questions or explain what he's thinking or doing by writing or typing on the keyboard he is holding. For example, when Tito was being tested in a laboratory, he repeatedly stopped and started bursts of activity, standing and spinning, making loud smacking noises, or flapping his fingers. When asked why he does this, Tito didn't answer verbally but wrote, "I am calming myself. My senses are so disconnected I lose my body, so I flap. If I don't do this, I feel scattered and anxious" (Blakeslee, 2002, p. D1). Tito has written books inviting others to share in his inner life (Mukhopadhyay, 2000, 2003, 2008). In his writings, he explains that his brain has difficulty processing different senses at the same time, such as sound, sight, and touch. This is the reason he avoids eye contact when talking with people, as he usually chooses to focus on hearing (McEdwards, 2008). Thus, there is a cognitive difference between normal individuals who can respond simultaneously to more than one sensory input, such as seeing and hearing, and individuals with autism who are limited to concentrating on one sense at a time.



Tito is severely autistic but can type answers to questions.



Some cognitive researchers combine the study of cognitive skills with identifying their corresponding areas in the brain. This exciting new approach is called cognitive neuroscience (Purves et al., 2012).

**Cognitive neuroscience** involves taking pictures and identifying the structures and functions of the living brain during the performance of a variety of mental or cognitive processes, such as thinking, planning, naming, and recognizing objects.

For example, when listening to a conversation, 95% of right-handers use primarily the left sides of their brains and very little of the right sides to process this verbal information. In contrast, researchers found that individuals with autism used primarily the right sides of their brains and very little of the left sides when listening to a conversation (E. J. Flagg et al., 2005). This reversing of brain sides as well as difficulties in processing verbal information may help explain why autistic individuals have problems acquiring cognitive, language, and communication skills.

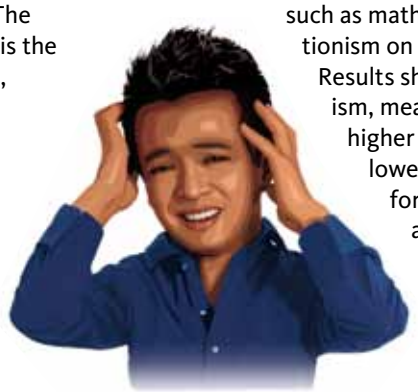
Recently, the cognitive approach and its newer relative, cognitive neuroscience, have become popular because they have proved useful in answering questions about emotions, personality, cognitive skills, and social behaviors (Banich & Compton, 2011; Gazzaniga, 2009). For example, the cognitive approach has much to say about test anxiety, especially about worrying too much.

## Cognitive Approach to Test Anxiety

Students who experience test anxiety must deal with two components. The first component, which we already described, is increased physiological arousal, which is the emotional component. The second component is the cognitive component, which is excessive worrying, usually about doing poorly on exams.

*Can you worry too much?*

Excessive worrying about your performance can interfere with your ability to read accurately, understand what you are reading, and identify important concepts (Cassady & Johnson, 2002). Thus, it is easy to see how excessive anxiety and worrying can decrease students' confidence and impair their studying and academic performance (Flippo et al., 2009; Miesner & Maki, 2007; Rana & Mahmood, 2010).



Related to test anxiety is anxiety about specific academic content areas, such as math and writing. One study examined the influence of perfectionism on math anxiety and writing anxiety in high school students. Results showed that students with higher levels of passive perfectionism, meaning they avoid trying to meet their high standards, have higher math anxiety and higher writing anxiety than students with lower levels of passive perfectionism. The same study found that for girls, math anxiety decreased as they demonstrated higher active perfectionism, meaning they engage in behaviors aimed at reaching their high standards (K. Moore, 2010).

The above studies suggest that the cognitive characteristics of excessive worrying and perfectionism may either help or hinder cognitive performance depending on how the worries and perfectionism are channeled.

# Behavioral Approach

*Why have a "no soap suds" rule?*

If Donna happened to leave soap suds in the sink, she might see a rainbow of colors reflected in the bubbles. She would become so completely absorbed in looking at the brilliant colors that she could not move; she would be in a state of temporary paralysis. Donna made her "no soap suds" rule to prevent the environment from triggering an autistic behavior—temporary paralysis. Donna and her husband, who is also autistic, have developed many rules to control some of their unwanted behaviors. Here are some of their rules: *No lining feet up with furniture; No making the fruit in the bowl symmetrical; No reading newspaper headlines in gas stations or at newsstands* (Blakely, 1994, p. 43). These rules, which help Donna and her husband avoid performing repetitive and stereotyped behaviors, illustrate the behavioral approach.

**Seeing a dazzling rainbow in soap suds stopped Donna in her tracks.**

The **behavioral approach** analyzes how organisms learn new behaviors or modify existing ones depending on whether events in their environments reward or punish these behaviors.

Donna and her husband's rules are examples of a basic behavioral principle: Rewards or punishments can modify, change, or control behavior. Psychologists use behavioral principles to teach people to be more assertive or less depressed, to toilet train young children, and to change many other behaviors. Psychologists use behavioral principles to train animals to press levers, to use symbols to communicate, and to perform behaviors on cue in movies and television shows.

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**B. F. Skinner**

Largely through the creative work and original ideas of B. F. Skinner (1989), the behavioral approach has grown into a major force in psychology. Skinner's ideas stress the study of observable behaviors, the importance of environmental reinforcers (reward and punishment), and the exclusion of mental processes. His ideas, often referred to as strict behaviorism, continue to have an impact on psychology. In Module 10, we'll explain how Skinner's ideas were integrated into a program that taught autistic children new social behaviors that enabled them to enter and do well in public grade schools.

However, some behaviorists, such as Albert Bandura (2001a), disagree with strict behaviorism and have formulated a theory that includes mental or cognitive processes in addition to observable behaviors. According to Bandura's *social cognitive approach,* our behaviors are influenced not only by environmental events and reinforcers but also by observation, imitation, and thought processes. In Module 10, we'll discuss how Bandura's ideas explain why some children develop a fear of bugs.

Behaviorists have developed a number of techniques for changing behaviors that can be applied to both animals and humans. Next, you will see how they have used a simple behavioral intervention to reduce the cognitive component of test anxiety.

## Behavioral Approach to Test Anxiety

*Can I redirect my worrying?*

We discussed how excessive worrying and perfectionism, which are cognitive components of anxiety, may either help or hinder cognitive performance depending on how the worries and perfectionism are channeled. We've also discussed how anxiety can impair academic performance. Now we'll focus on how a simple behavioral technique has been shown to prevent test anxiety from lowering test performance. If you are one of the many students who experience test anxiety, we think you will find this technique worth trying.

In a recent study, researchers measured students' test anxiety several weeks before students were to take their first final exam. Then, immediately before they took their final exam, students were randomly given envelopes with directions to either write about their feelings about the final exam or think about topics that would not be covered on the exam. Results indicated that for those students who didn't write about their feelings, there was a strong relationship between test anxiety and final exam performance (the higher the test anxiety, the lower the performance). However, for those students who did write about their feelings about the exam, the highly anxious students performed just as well as the less anxious students. Here, previous anxiety did not predict performance, as it did with the group of students who did not engage in the writing task (Ramirez & Beilock, 2011).

A simple behavior, writing about your worries, may prevent all of the built-up test anxiety from interfering with your test performance. Given that excessive worrying can negatively influence performance of varying types, such as playing in a competitive athletic match, competing in a music contest, or interviewing for a job, writing about our worries may be an effective way to improve performance in a variety of situations.

In later modules, we'll give many examples of how other behavioral interventions can be used to modify a wide range of behaviors and thought patterns.

# Psychoanalytic Approach

*How was Donna's childhood?*

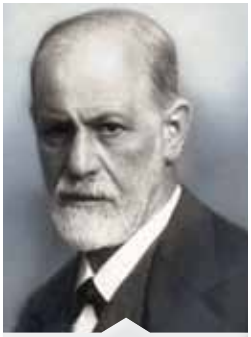
When she was about 3 years old, Donna faced a number of personal problems: having an alcoholic mother who hit and verbally abused her, having a father who was often gone, and being sent to a "special needs" school. Apparently in trying to deal with these problems, Donna developed other personalities. One personality was Willie, a child with "hateful glaring eyes, a pinched-up mouth, rigid corpselike stance, and clenched fists," who stamped and spit but also did well in school. The other was Carol, a charming, cooperative little girl who could act normal and make friends (S. Reed & Cook, 1993). Why Donna developed other personalities to deal with difficult childhood experiences would be carefully looked at in the psychoanalytic approach (Lanyado & Horne, 1999).

Donna had an alcoholic and verbally abusive mother and a mostly absent father.

The **psychoanalytic approach** is based on the belief that childhood experiences greatly influence the development of later personality traits and psychological problems. It also stresses the influence of unconscious fears, desires, and motivations on thoughts and behaviors.

In the late 1800s, Sigmund Freud, a physician, treated a number of patients with psychological problems. On the basis of insights from therapy sessions, Freud proposed some revolutionary ideas about the human mind and personality development. For example, one hallmark of Sigmund Freud's psychoanalytic approach is the idea that the first five years have a profound effect on later personality development. According to the psychoanalytic approach, Donna's first five years with a verbally abusive mother and mostly absent father would profoundly affect her later personality development.

In addition, Freud reasoned that thoughts or feelings that make us feel fearful or guilty, that threaten our self-esteem, or that come from unresolved sexual conflicts are automatically placed deep into our unconscious. In turn, these unconscious, threatening thoughts and feelings give rise to anxiety, fear, or psychological problems. Because Freud's patients could not uncover their unconscious fears, he developed several techniques, such as dream interpretation, to bring hidden fears to the surface. Freud's belief in an unconscious force that influenced human thought and behavior was another of his revolutionary ideas (Fayek, 2005). We'll discuss Freud's theory of personality in more detail in Module 19.



Sigmund Freud



Unlike the biological, cognitive, and behavioral approaches, the psychoanalytic approach would search for hidden or unconscious forces underlying test anxiety.

## Psychoanalytic Approach to Test Anxiety

We discussed two components of test anxiety—excessive worrying and increased physiological responses—that can impair a student's performance on exams. Researchers also found that students with high test anxiety are much more likely to procrastinate than students with low test anxiety (N. A. Milgram et al., 1992).

*Is test anxiety related to procrastination?*

**Procrastination** is the tendency to always put off completing a task to the point of feeling anxious or uncomfortable about one's delay.

Researchers estimate that about 20% of adults are chronic procrastinators and from 80 to 95% of students procrastinate or deliberately delay completing assignments or studying for exams (Gura, 2008b; E. Hoover, 2005; Steel, 2007). Some of the more obvious reasons students give for procrastinating include being lazy or undisciplined, lacking motivation, and not knowing how to organize their time or set deadlines (Ariely & Wertenbroch, 2002).

However, the psychoanalytic approach would look beneath these obvious reasons and try to identify unconscious personality problems that may underlie procrastination and test anxiety. Because unconscious reasons for procrastination and test anxiety are difficult to uncover, psychologists use a variety of standard personality tests in their research.

Based on personality tests, researchers concluded that students who are regular procrastinators may have low self-esteem, are too dependent on others, or have such a strong fear of failure that they do not start the task (Blunt & Pychyl, 2000). Personality tests also show that neuroticism (persistent anxiety—see p. 463) and an external locus of control (feeling little control over events—see p. 459) are associated with test anxiety (Carden et al., 2004; Chamorro-Premuzic et al., 2008). Thus, the psychoanalytic approach points to underlying personality problems as the probable cause of procrastination and test anxiety.


The psychoanalytic approach would also study how childhood experiences may have led to procrastination. For instance, researchers found that procrastinators tend to be raised by authoritarian parents who stress overachievement, set unrealistic goals for their children, or link achievement to giving parental love and approval. A child who is raised by parents like these may feel anxious when he or she fails at some task and will be tempted to put off such tasks in the future (Pychyl et al., 2002).

Psychologists know that ingrained personality characteristics, such as procrastination, remain relatively stable and persist across time unless a person makes a deliberate effort to change them. In Modules 21, 23, and 24, we'll discuss several methods that psychologists have developed to change personality characteristics.

# Humanistic Approach

*What was Donna's potential?*

Donna says that one reason she wrote her books was to escape her prison of autism. Autism has trapped her in a world where she sometimes blinks compulsively, rocks back and forth, freezes up, stares off into space without being able to stop herself, hates to be touched, cannot stand to enter public places, and hates to make eye contact with others (D. Williams, 1992).

Even though Donna has serious life challenges, she strives toward reaching her potential. She has published autobiographies and textbooks on autism. Her creative paintings and sculptures can be seen at exhibits. Donna is also a singer–songwriter who has released two albums. Also, she married a man she refers to as a "diamond of a person" (D. Williams, 2009).


© Donna Williams

**Donna's painting, titled "Believe," reflects the humanistic approach's emphasis on personal freedom and growth.**

Donna's struggle to free herself from autism, develop close personal relationships, and reach her potential characterizes the humanistic approach.

The **humanistic approach** emphasizes that each individual has great freedom in directing his or her future, a large capacity for achieving personal growth, a considerable amount of intrinsic worth, and enormous potential for self-fulfillment.

Humanists believe that, like Donna, we may have to struggle to reach our potential, but we have control of our fate and are free to become whatever we are capable of being. The humanistic approach emphasizes the positive side of human nature, its creative tendencies, and its inclination to build caring relationships. This concept of human nature—freedom, potential, creativity—is the most distinctive feature of the humanistic approach and sets it far apart from the behavioral and psychoanalytic approaches (Giorgi, 2005).

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**Abraham Maslow**

The humanistic approach officially began in the early 1960s with the publication of the *Journal of Humanistic Psychology*. One of the major figures behind establishing the journal and the humanistic approach was Abraham Maslow, who had become dissatisfied with the behavioral and psychoanalytic approaches. To paraphrase Maslow (1968), the humanistic approach was to be a new way of perceiving and thinking about the individual's capacity, freedom, and potential for growth. Many of humanism's ideas have been incorporated into approaches for counseling and psychotherapy.

Because of its emphasis on free will and lack of experimental methods, many of today's psychologists regard humanism as more of a philosophy of life than a science of human behavior. However, the humanistic approach has helped to inspire the scientific research area known as positive psychology.

**Positive psychology** is the scientific study of optimal human functioning, focusing on the strengths and virtues that enable individuals and communities to thrive.

Positive psychology aims to better understand the positive, adaptive, and fulfilling aspects of human life. We will discuss positive psychology in more detail in Module 21.

Now, we'll discuss how the humanistic approach applies to dealing with the problems some students have with test anxiety and academic performance.

## Humanistic Approach to Test Anxiety

The first year of college can be a difficult adjustment for many students, since it is more demanding and stressful than high school.

*How can students reach their potentials?*

Researchers wanted to learn which specific factors lead to high academic performance and successful adjustment among first-year college students. They found that students who were confident in their academic abilities performed significantly better than students who were less confident, and they adjusted better to college. Also, students who had higher expectations for academic success, such as performing well in courses, received better grades (Chemers et al., 2001). Based on these findings, it is evident that believing in one's abilities and potential is an important factor in being a successful student. These results may be useful for educators in helping students who do poorly in school to not give up but rather try to develop their academic potential.

Psychologists have also studied students whose academic performance ranged from poor to very good in order to develop a profile of a successful student. Studies showed that successful students share a number of similar characteristics: they feel competent about meeting the demands of their classes; they believe they can handle test situations; they are very good at organizing their study time; and they prepare themselves for tests and do not procrastinate (Kleijn et al., 1994).

Based on studies of students' performances, the humanistic approach would say that just as successful students found ways to reach their academic potential, all students should search for ways to reach their own potentials. The humanistic approach emphasizes that students have the capacity to choose, that each person is unique or special, and that students should have faith in their personal or subjective feelings (Hansen, 2000).

# Sociocultural Approach

Autism is believed to exist in every culture (Grinker 2007). Let's look at how different cultures perceive autism.

*How is autism perceived in other cultures?*

**United States.** A psychologist in the United States first described the symptoms of autism about 70 years ago (Kanner, 1943). Then autism was thought to be caused by environmental factors, such as having "cold" parents. In the 1960s, the focus changed to searching for biological causes (Rimland, 1964). Today, researchers believe the probable causes of autism include both environmental and genetic factors (Hallmayer et al., 2011; Matson & Sturmey, 2011).

Earth © NASA

There are between 1 million and 1.5 million Americans with autism (ASA, 2012). While the diagnosis of autism usually is made between ages 2 and 3, the American Academy of Pediatrics (2007) is now recommending screening children as young as 18 months, recognizing the importance of early intervention. Treatment is provided by psychiatrists and other physicians, psychologists, teachers, speech therapists, play therapists, and other professionals who understand autism.

**South Korea.** The precise number of people with autism in South Korea is unknown, as the disorder has a terrible stigma and children with autism are often kept at home hidden from the public. Parents in South Korea may fear that their family will lose face if people know a family member has autism and that marriage prospects for their other children will be negatively affected as a result of having a child with an abnormality. However, a recent study estimates that a startling number of children in South Korea have autism, 2.64% or about 1 in 38. Researchers worry that many children with autism have not been counted in previous studies (Y. S. Kim et al., 2011).

One reason to explain why many children with autism have not been included in previous estimates is that physicians in South Korea usually diagnose what would be considered autism in the United States as reactive attachment disorder (see p. 377), which South Koreans interpret as "lack of love." This is a less stigmatizing diagnosis, as parents believe they can help their child by providing more love. Also, it doesn't negatively harm the family as much as a genetic disease might. The unfortunate result, however, is that children with autism do not get the treatment they need. Within only the past several years, the perceptions of autism have begun to positively change in South Korea, resulting in new social opportunities for children. For instance, some children with autism are now going to school and walking out in public with their families (Grinker, 2007).

The differences in how autism is perceived and treated in the United States and South Korea illustrate the use of the sociocultural approach in psychology (Matsumoto & Juang, 2012; Valsiner & Rosa, 2007).

The **sociocultural approach** studies the influence of social and cultural factors on psychological and behavioral functioning.

We will be highlighting sociocultural research throughout this book.

There are also differences in how other cultures experience test anxiety.

## Sociocultural Approach to Test Anxiety

*How do other cultures deal with test anxiety?*

Culture plays an important role in determining the intensity and expression of test anxiety, and test anxiety has been examined in countries across the globe (Bodas & Ollendick, 2005).

The development and severity of test anxiety appear to be different between Asian and non-Asian students. For example, students in India experience heightened test anxiety due to several factors, including the cultural emphasis on academic achievement, parental and social pressures to perform, and the stressful, competitive nature of exams. In contrast, American students don't experience as much test anxiety, in part because parents are less involved with their children's schoolwork and they promote independence and personal responsibility. A related sociocultural difference is how children express test anxiety. Indian students express their anxiety through physical symptoms, whereas American students experience more cognitive symptoms, such as excessive worrying (Bodas & Ollendick, 2005; Verma et al., 2002).

This research shows how the sociocultural approach provides different and interesting answers to the same question.

# Evolutionary Approach

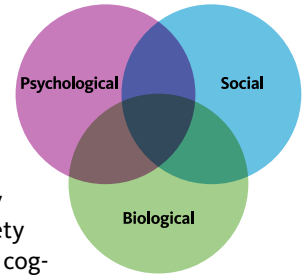
A recent modern approach to psychology emerges out of evolutionary theory and is called the evolutionary approach.

The **evolutionary approach** studies how evolutionary ideas, such as adaptation and natural selection, explain human behaviors and mental processes.

Although the evolutionary approach is relatively new, research has already examined how evolution influences a variety of behaviors and mental processes, such as aggression, mate selection, fears, depression, and decision making (Buss, 2004, 2007, 2009). We'll discuss the evolutionary approach again in Module 4 (p. 69) and include some of the exciting research resulting from this approach throughout the text.

# Biopsychosocial Approach

An integrative approach to psychology is the biopsychosocial approach.




The **biopsychosocial approach** studies how biological, psychological, and social factors influence human development.

According to the biopsychosocial approach, autism must be studied by considering the interaction of a variety of factors, such as genes, hormones, cognition, emotion, personality, and behavior.

Next, we will discuss the early approaches to psychology. As you compare early and modern approaches, you can appreciate how much psychology has changed since its beginnings. ●