

THEMES AND

Psychology

VARIATIONS



McCANN
WEITEN
MATHESON

PSYCHOLOGY THEMES AND VARIATIONS

Sixth
Canadian
Edition



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THEMES AND VARIATIONS

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Doug McCann, Wayne Weiten, and
Deborah Hunt Matheson**

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**For Nancy, Harry, Jackie, Lucy, and Tuck,
as always—Doug McCann**

**Beth and T.J.,
this one is for you—Wayne Weiten**

**For Lois and Doug
and always for Wyatt—Deborah Hunt Matheson**

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BRIEF CONTENTS

CHAPTER 1	
The Evolution of Psychology	1
CHAPTER 2	
The Research Enterprise in Psychology	34
CHAPTER 3	
The Biological Bases of Behaviour	72
CHAPTER 4	
Sensation and Perception	119
CHAPTER 5	
Variations in Consciousness	166
CHAPTER 6	
Learning	209
CHAPTER 7	
Human Memory	253
CHAPTER 8	
Language and Thought	294
CHAPTER 9	
Intelligence and Psychological Testing	328
CHAPTER 10	
Motivation and Emotion	363
CHAPTER 11	
Human Development across the Life Span	405
CHAPTER 12	
Personality: Theory, Research, and Assessment	455
CHAPTER 13	
Social Behaviour	495
CHAPTER 14	
Stress, Coping, and Health	541
CHAPTER 15	
Psychological Disorders	578
CHAPTER 16	
Treatment of Psychological Disorders	633

APPENDIX A:
Answers to Concept Checks and Multiple-Choice Questions **A-1**

APPENDIX B:
Statistical Methods **A-7**

References **R-1**

Name Index **I-1**

Subject Index **I-27**

CONTENTS



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CHAPTER 1

THE EVOLUTION OF PSYCHOLOGY

From Speculation to Science: How Psychology Developed 3

- A New Science Is Born 4
- The Battle of the “Schools” Begins: Structuralism versus Functionalism 4
- Watson Alters Psychology’s Course as Behaviourism Makes Its Debut 5
- Freud Brings the Unconscious into the Picture 7
- Skinner Questions Free Will as Behaviourism Flourishes 7
- The Humanists Revolt 8
- Psychology in Canada 9
- Psychology Comes of Age as a Profession 11
- Cognition and Neuroscience in Psychology 12
- A Focus on Culture and Diversity 14
- Psychology Adapts: The Emergence of Evolutionary Psychology 15
- Psychology Moves in a Positive Direction: The Positive Psychology Movement 15

AN ILLUSTRATED OVERVIEW OF PSYCHOLOGY’S HISTORY 16

Psychology Today: Vigorous and Diversified 18

- Research Areas in Psychology 18
- Professional Specialties in Psychology 19

Putting It in Perspective: Seven Key Themes 21

- Themes Related to Psychology as a Field of Study 21
- Themes Related to Psychology’s Subject Matter 22

PERSONAL APPLICATION

Improving Academic Performance 26

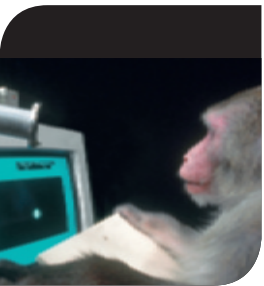
CRITICAL THINKING APPLICATION

Developing Critical Thinking Skills: An Introduction 29

Concept Chart 31

Key Terms 33

Multiple-Choice Questions 33



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CHAPTER 2

THE RESEARCH ENTERPRISE IN PSYCHOLOGY

The Scientific Approach to Behaviour 36

- Goals of the Scientific Enterprise 36
- Steps in a Scientific Investigation 36
- Advantages of the Scientific Approach 39

Looking for Causes: Experimental Research 41

- Independent and Dependent Variables 41
- Experimental and Control Groups 41
- Extraneous Variables 42
- Variations in Designing Experiments 43
- Advantages and Disadvantages of Experimental Research 44

Looking for Links: Descriptive/Correlational Research 45

- Naturalistic Observation 45
- Case Studies 46
- Surveys 47
- Advantages and Disadvantages of Descriptive/Correlational Research 48

Looking for Conclusions: Statistics and Research 49

- Descriptive Statistics 49

AN ILLUSTRATED OVERVIEW OF KEY RESEARCH METHODS IN PSYCHOLOGY 50

Looking for Flaws: Evaluating Research 57

- Sampling Bias 57
- Placebo Effects 58
- Distortions in Self-Report Data 59
- The Importance of Replication 59
- Experimenter Bias 60

Looking at Ethics: Do the Ends Justify the Means? 61

- The Question of Animal Research 62
- Ethical Guidelines for Research in Psychology in Canada 63

Putting It in Perspective: Themes 1 and 7 64

PERSONAL APPLICATION

Finding and Reading Journal Articles 65

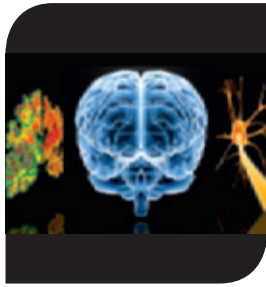
CRITICAL THINKING APPLICATION

The Perils of Anecdotal Evidence: “I Have a Friend Who ...” 67

Concept Chart 69

Key Terms 71

Multiple-Choice Questions 71



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CHAPTER 3

THE BIOLOGICAL BASES OF BEHAVIOUR

The Anatomy of the Nervous System	74
Glial Cells	74
Neurons	75
The Function of Neurons: Information Transmission	76
Neurotransmitters and Behaviour	82
Organization of the Nervous System	85
The Peripheral Nervous System	85
The Central Nervous System	87
Looking Inside the Brain: Research Methods	88
Transcranial Magnetic Stimulation	90
The Brain and Behaviour	91
The Hindbrain	92
The Midbrain	93
The Forebrain	93
The Limbic System: The Centre of Emotion	94
The Plasticity of the Brain	96
Right Brain/Left Brain: Cerebral Laterality	98
Bisecting the Brain: Split-Brain Research	98
Hemispheric Specialization in the Intact Brain	100



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CHAPTER 4

SENSATION AND PERCEPTION

Psychophysics: Basic Concepts and Issues	120
Thresholds: Looking for Limits	121
Signal-Detection Theory	121
Perception without Awareness	122
Sensory Adaptation	122
Our Sense of Sight: The Visual System	123
The Stimulus: Light	123
The Eye: A Living Optical Instrument	124
The Retina: The Brain's Envoy in the Eye	125
Vision and the Brain	126
Vision for Perception and Vision for Action	128
Viewing the World in Colour	129
The Visual System: Perceptual Processes	134
Perceiving Forms, Patterns, and Objects	134
Looking at the Whole Picture: Gestalt Principles	136
Perceiving Depth or Distance	138
Perceptual Constancies in Vision	139
The Power of Misleading Cues: Visual Illusions	140
Our Sense of Hearing: The Auditory System	143
The Stimulus: Sound	143
Human Hearing Capacities	143
Sensory Processing in the Ear	144

The Endocrine System: Another Way to Communicate	101
Heredity and Behaviour: Is It All in the Genes?	102
Basic Principles of Genetics	102
Investigating Hereditary Influence: Research Methods	103
The Interplay of Heredity and Environment	106
Epigenetics: The Interplay of Heredity and Environment	106
The Evolutionary Bases of Behaviour	107
Darwin's Insights	107
Later Refinements to Evolutionary Theory	108
Behaviours as Adaptive Traits	109
Putting It in Perspective: Themes 1, 4, and 6	109
PERSONAL APPLICATION	
Evaluating the Concept of "Two Minds in One"	111
CRITICAL THINKING APPLICATION	
Building Better Brains: The Perils of Extrapolation	113
Concept Chart	116
Key Terms	118
Multiple-Choice Questions	118

Auditory Perception: Theories of Hearing	145
Auditory Localization: Perceiving Sources of Sound	146
Our Chemical Senses: Taste and Smell	148
Taste: The Gustatory System	148
Smell: The Olfactory System	150
Our Sense of Touch: Sensory Systems in the Skin	152
Feeling Pain	152
Our Other Senses	155
The Kinesthetic System	155
The Vestibular System	155
AN ILLUSTRATED OVERVIEW OF FIVE MAJOR SENSES	156
Putting It in Perspective: Themes 2, 5, and 7	158
PERSONAL APPLICATION	
Appreciating Art and Illusion	159
CRITICAL THINKING APPLICATION	
Recognizing Contrast Effects: It's All Relative	161
Concept Chart	163
Key Terms	165
Multiple-Choice Questions	165



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CHAPTER 5

VARIATIONS IN CONSCIOUSNESS

The Nature of Consciousness 168
Variations in Awareness and Control 168
Consciousness and Brain Activity 169

Biological Rhythms and Sleep 170
The Role of Circadian Rhythms 170
Ignoring Circadian Rhythms 171
Realigning Circadian Rhythms 172

The Sleep and Waking Cycle 173
Cycling through the Stages of Sleep 173
Repeating the Cycle 175
Age Trends in Sleep 176
Culture and Sleep 177
The Neural and Evolutionary Bases of Sleep 177
Doing Without: Sleep Deprivation 178
Problems in the Night: Sleep Disorders 180

The World of Dreams 184
The Contents of Dreams 184
Links between Dreams and Waking Life 185
Culture and Dreams 186
Theories of Dreaming 186

Hypnosis: Altered Consciousness or Role Playing? 187

Hypnotic Induction and Susceptibility 188
Theories of Hypnosis 189

Meditation: Pure Consciousness or Relaxation? 190
Long-Term Benefits 190

Altering Consciousness with Drugs 191
Principal Abused Drugs and Their Effects 192
Factors Influencing Drug Effects 196
Mechanisms of Drug Action 197
Drug Dependence 198
Drugs and Health 199

Putting It in Perspective: Themes 2, 3, 4, 5, and 7 200

PERSONAL APPLICATION

Addressing Practical Questions about Sleep and Dreams 202

CRITICAL THINKING APPLICATION

Is Alcoholism a Disease? The Power of Definitions 204

Concept Chart 206

Key Terms 208

Multiple-Choice Questions 208



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CHAPTER 6

LEARNING

Classical Conditioning 211
Pavlov's Demonstration: "Psychic Reflexes" 211
Terminology and Procedures 212
Classical Conditioning in Everyday Life 213
Basic Processes in Classical Conditioning 215
Stimulus Generalization and the Mysterious Case of Little Albert 216
Cognition and Classical Conditioning 219
Evolutionary and Biological Effects on Conditioning 219

Operant Conditioning 221
Thorndike's Law of Effect 221
Skinner's Demonstration: It's All a Matter of Consequences 222
Terminology and Procedures 223
Basic Processes in Operant Conditioning 224
Reinforcement and Superstitious Behaviour 226
Schedules of Reinforcement 228
Positive Reinforcement versus Negative Reinforcement 230
Punishment: Consequences That Weaken Responses 232

Cognitive Processes in Conditioning: Latent Learning and Cognitive Maps 234
Evolutionary and Biological Effects on Conditioning 236

Observational Learning 237
Basic Processes 237
Observational Learning and the Media Violence Controversy 238
Observational Learning and the Brain: Mirror Neurons 241

AN ILLUSTRATED OVERVIEW OF THREE TYPES OF LEARNING 242

Putting It in Perspective: Themes 3 and 6 244

PERSONAL APPLICATION

Achieving Self-Control through Behaviour Modification 245

CRITICAL THINKING APPLICATION

Manipulating Emotions: Pavlov and Persuasion 248

Concept Chart 250

Key Terms 252

Multiple-Choice Questions 252



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CHAPTER 7

HUMAN MEMORY

Encoding: Getting Information into Memory	255	In Search of the Memory Trace: The Physiology of Memory	276
The Role of Attention	255	The Neural Circuitry of Memory	276
Levels of Processing	256	The Anatomy of Memory	278
Enriching Encoding	257	Systems and Types of Memory	280
Storage: Maintaining Information in Memory	259	Implicit versus Explicit Memory	280
Sensory Memory	259	Declarative versus Nondeclarative Memory	281
Short-Term Memory	260	Semantic versus Episodic Memory	282
Long-Term Memory	262	Prospective versus Retrospective Memory	283
How Is Knowledge Represented and Organized in Memory?	264	Putting It in Perspective: Themes 2, 4, and 7	284
Retrieval: Getting Information Out of Memory	265	PERSONAL APPLICATION	
Using Cues to Aid Retrieval	266	Improving Everyday Memory	286
Reinstating the Context of an Event	266	CRITICAL THINKING APPLICATION	
Reconstructing Memories	266	Understanding the Fallibility of Eyewitness Accounts	289
Source Monitoring	268	Concept Chart	291
Forgetting: When Memory Lapses	268	Key Terms	293
How Quickly We Forget: Ebbinghaus's Forgetting Curve	269	Multiple-Choice Questions	293
Measures of Forgetting	269		
Why We Forget	270		
The Repressed Memories Controversy	273		
Seven Sins of Memory: How Memory Goes Wrong	275		



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CHAPTER 8

LANGUAGE AND THOUGHT

Language: Turning Thoughts into Words	296	The Tendency to Ignore Base Rates	316
What Is Language?	296	The Conjunction Fallacy	316
The Structure of Language	296	The Sunk Costs Fallacy	317
Milestones in Language Development	297	Behavioural Economics	318
Learning More than One Language: Bilingualism	300	Evolutionary Analyses of Fast and Frugal Heuristics	319
Can Animals Develop Language?	302	Thinking Fast and Thinking Slow: Two Systems of Thought	319
Language in an Evolutionary Context	304	Putting It in Perspective: Themes 1, 5, 6, and 7	320
Theories of Language Acquisition	304	PERSONAL APPLICATION	
Culture, Language, and Thought	305	Understanding Pitfalls in Reasoning about Decisions	321
Problem Solving: In Search of Solutions	306	CRITICAL THINKING APPLICATION	
Types of Problems	307	Shaping Thought with Language: "Only a Naïve Moron Would Believe That"	324
Barriers to Effective Problem Solving	308	Concept Chart	326
Approaches to Problem Solving	310	Key Terms	327
Culture, Cognitive Style, and Problem Solving	313	Multiple-Choice Questions	327
Decision Making: Choices and Chances	313		
Making Choices about Preferences	314		
Taking Chances: Factors Weighed in Risky Decisions	315		
Heuristics in Judging Probabilities	315		



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CHAPTER 9

INTELLIGENCE AND PSYCHOLOGICAL TESTING

Key Concepts in Psychological Testing 330

- Standardization and Norms 330
- Reliability 331
- Validity 331

The Evolution of Intelligence Testing and Our Understanding of the Construct of Intelligence 332

- Origins of Modern Intelligence Testing 332
- The Debate about the Structure of Intelligence 333
- Broadening the Concept of Intelligence 335

Basic Issues in Intelligence Testing 340

- What Do Modern IQ Scores Mean? 340
- Do Intelligence Tests Have Adequate Reliability? 341
- Do Intelligence Tests Have Adequate Validity? 341
- Do Intelligence Tests Predict Vocational Success? 342
- Are IQ Tests Widely Used in Other Cultures? 343

Extremes of Intelligence 343

- Intellectual Disability 343
- Giftedness 346

Heredity and Environment as Determinants of Intelligence 347

- Evidence for Hereditary Influence 348
- Evidence for Environmental Influence 349
- The Interaction of Heredity and Environment 351
- Cultural Differences in IQ Scores 351

Putting It in Perspective: Themes 3, 5, and 6 354

PERSONAL APPLICATION

Understanding Creativity 356

CRITICAL THINKING APPLICATION

The Intelligence Debate, Appeals to Ignorance, and Reification 359

Concept Chart 361

Key Terms 362

Multiple-Choice Questions 362



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CHAPTER 10

MOTIVATION AND EMOTION

Motivational Theories and Concepts 364

- Drive Theories 365
- Incentive Theories 365
- Evolutionary Theories 365

The Motivation of Hunger and Eating 366

- Biological Factors in the Regulation of Hunger 366
- Environmental Factors in the Regulation of Hunger 367
- Eating and Weight: The Roots of Obesity 369

Sexual Motivation and Behaviour 372

- The Human Sexual Response 372
- Evolutionary Analyses of Human Sexual Behaviour 374
- The Mystery of Sexual Orientation 376

The Need to Belong: Affiliation Motivation 379

- Ostracism and the Fear of Rejection 379

Achievement: In Search of Excellence 380

- Individual Differences in the Need for Achievement 380
- Situational Determinants of Achievement Behaviour 381

The Elements of Emotional Experience 383

- The Cognitive Component: Subjective Feelings 383

The Physiological Component: Diffuse and Multifaceted 384

The Behavioural Component: Nonverbal Expressiveness 387

Culture and the Elements of Emotion 388

Theories of Emotion 391

- James–Lange Theory 391
- Cannon–Bard Theory 391
- Schachter’s Two-Factor Theory 392
- Evolutionary Theories of Emotion 393

Putting It in Perspective: Themes 2, 3, 4, 5, and 6 395

PERSONAL APPLICATION

Exploring the Ingredients of Happiness 396

CRITICAL THINKING APPLICATION

Analyzing Arguments: Making Sense Out of Controversy 400

Concept Chart 402

Key Terms 404

Multiple-Choice Questions 404



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CHAPTER 11

HUMAN DEVELOPMENT ACROSS THE LIFE SPAN

Progress before Birth: Prenatal Development 407

- The Course of Prenatal Development 407
- Environmental Factors and Prenatal Development 409

The Wondrous Years of Childhood 411

- Exploring the World: Motor Development 411
- Easy and Difficult Babies: Differences in Temperament 413
- Early Emotional Development: Attachment 414
- Personality Development in Childhood 417
- The Growth of Thought: Cognitive Development 419
- The Development of Moral Reasoning 426

The Transition of Adolescence 428

- Physiological Changes 428
- Neural Development: The Teen Brain 430
- Time of Turmoil? 430
- The Search for Identity 432
- Emerging Adulthood as a New Developmental Stage 432

The Expanse of Adulthood 433

- Personality Development 434
- Transitions in Family Life 434
- Aging and Neural Changes 438
- Aging and Cognitive Changes 439
- Death and Dying 440

Putting It in Perspective: Themes 2, 3, 4, 5, and 6 441

AN ILLUSTRATED OVERVIEW OF HUMAN DEVELOPMENT 442

PERSONAL APPLICATION

Understanding Gender Differences 446

CRITICAL THINKING APPLICATION

Are Fathers Essential to Children's Well-Being? 450

Concept Chart 452

Key Terms 454

Multiple-Choice Questions 454



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CHAPTER 12

PERSONALITY: THEORY, RESEARCH, AND ASSESSMENT

The Nature of Personality 457

- Defining Personality: Consistency and Distinctiveness 457
- Personality Traits: Dispositions and Dimensions 457
- The Five-Factor Model of Personality Traits 458

Psychodynamic Perspectives 459

- Freud's Psychoanalytic Theory 459
- Jung's Analytical Psychology 465
- Adler's Individual Psychology 466
- Evaluating Psychodynamic Perspectives 467

Behavioural Perspectives 468

- Skinner's Ideas Applied to Personality 468
- Bandura's Social Cognitive Theory 469
- Mischel and the Person–Situation Controversy 471
- Evaluating Behavioural Perspectives 471

Humanistic Perspectives 472

- Rogers's Person-Centred Theory 472
- Maslow's Theory of Self-Actualization 474
- Evaluating Humanistic Perspectives 476

Biological Perspectives 476

- Eysenck's Theory 476

Behavioural Genetics and Personality 477

The Neuroscience of Personality 478

The Evolutionary Approach to Personality 478

Evaluating Biological Perspectives 479

FOUR VIEWS OF PERSONALITY: AN ILLUSTRATED OVERVIEW OF MAJOR THEORIES OF PERSONALITY 480

Contemporary Empirical Approaches to Personality 482

Narcissism 482

The Dark Triad 483

Culture and Personality 483

Putting It in Perspective: Themes 2, 3, and 5 486

PERSONAL APPLICATION

Understanding Personality Assessment 487

CRITICAL THINKING APPLICATION

Hindsight in Everyday Analyses of Personality 490

Concept Chart 492

Key Terms 494

Multiple-Choice Questions 494



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CHAPTER 13 SOCIAL BEHAVIOUR

Person Perception: Forming Impressions of Others 497

- Effects of Physical Appearance 498
- Cognitive Schemas 499
- Stereotypes 500
- Subjectivity and Bias in Person Perception 501
- An Evolutionary Perspective on Bias in Person Perception 501

Attribution Processes: Explaining Behaviour 502

- Internal versus External Attributions 502
- Attributions for Success and Failure 502
- Bias in Attribution 503
- Culture and Attributions 505

Interpersonal Attraction: Liking and Loving 505

- Key Factors in Attraction 506
- Perspectives on the Mystery of Love 507
- Culture and Close Relationships 509
- The Internet and Close Relationships 509
- An Evolutionary Perspective on Attraction 511

Attitudes: Making Social Judgments 512

- Components and Dimensions of Attitudes 512
- Implicit Attitudes: Looking Beneath the Surface 513
- Trying to Change Attitudes: Factors in Persuasion 514
- Theories of Attitude Formation and Change 517

Conformity and Obedience: Yielding to Others 520

- Conformity 520
- Obedience 522
- Cultural Variations in Conformity and Obedience 523
- The Power of the Situation: The Stanford Prison Simulation 524

Behaviour in Groups: Joining with Others 525

- Behaviour Alone and in Groups: The Case of the Bystander Effect 525
- Group Productivity and Social Loafing 526
- Decision Making in Groups 527

Social Neuroscience 529

- A Neuroscience Perspective on Social Psychology 529
- Topics in Social Neuroscience 530

Putting It in Perspective: Themes 1, 5, and 7 531

PERSONAL APPLICATION

Understanding Prejudice 532

CRITICAL THINKING APPLICATION

Whom Can You Trust? Analyzing Credibility and Social Influence Tactics 536

Concept Chart 538

Key Terms 540

Multiple-Choice Questions 540



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CHAPTER 14 STRESS, COPING, AND HEALTH

The Nature of Stress 544

- Stress as an Everyday Event 544
- Appraisal: Stress Lies in the Eye of the Beholder 544

Major Types of Stress 545

- Frustration 545
- Internal Conflict 545
- Change 546
- Pressure 547

Responding to Stress 548

- Emotional Responses 548
- Physiological Responses 550
- Behavioural Responses 553

The Effects of Stress on Psychological Functioning 555

- Burnout 555
- Post-Traumatic Stress Disorder 556

The Effects of Stress on Physical Health 557

- Personality, Hostility, and Heart Disease 557
- Emotional Reactions, Depression, and Heart Disease 558
- Stress, Other Diseases, and Immune Functioning 558
- Sizing Up the Link between Stress and Illness 559

Factors Moderating the Impact of Stress 560

- Social Support 560

Optimism, Conscientiousness,
and Hardiness **562**
Positive Effects of Stress **563**

Health-Compromising Behaviour 563

Smoking **564**
Lack of Exercise **565**
Alcohol and Drug Use **566**
Risky Sexual Behaviour **567**

Putting It in Perspective: Themes 4 and 7 567



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CHAPTER 15

PSYCHOLOGICAL DISORDERS

Abnormal Behaviour: Myths, Realities, and Controversies 581

The Medical Model Applied to Abnormal Behaviour **581**
Criteria of Abnormal Behaviour **582**
Stereotypes of Psychological Disorders **583**
Psychodiagnosis: The Classification of Disorders **584**
The Prevalence of Psychological Disorders **586**

Anxiety, Obsessive-Compulsive, and Post-Traumatic Stress Disorders 587

Anxiety Disorders **587**
Obsessive-Compulsive Disorder **589**
Post-Traumatic Stress Disorder (PTSD) **591**
Etiology of Anxiety and Anxiety-Related Disorders **593**

Dissociative Disorders 595

Description **595**
Etiology of Dissociative Disorders **596**

Depressive and Bipolar Disorders 596

Major Depressive Disorder **597**
Bipolar Disorder **599**
Diversity in Mood Disorders **600**
Mood Disorders and Suicide **601**
Etiology of Depressive and Bipolar Disorders **601**

Schizophrenia 605

General Symptoms **606**
Etiology of Schizophrenia **608**

PERSONAL APPLICATION

Improving Coping and Stress Management **569**

CRITICAL THINKING APPLICATION

Thinking Rationally about Health Statistics and Decisions **573**

Concept Chart 575

Key Terms 577

Multiple-Choice Questions 577

AN ILLUSTRATED OVERVIEW OF THREE CATEGORIES OF PSYCHOLOGICAL DISORDERS 612

Personality Disorders 614

Antisocial, Borderline, and Narcissistic Personality Disorders **614**
Etiology of Personality Disorders **616**

Neurodevelopmental Disorders 616

Autism Spectrum Disorder **617**

Psychological Disorders and the Law 618

Insanity **619**

Culture, Pathology, and Trauma 620

Are Equivalent Disorders Found Around the World? **620**
Are Symptom Patterns Culturally Invariant? **621**
Intergenerational Trauma **621**

Putting It in Perspective: Themes 3, 4, 5, and 6 622

PERSONAL APPLICATION

Understanding Eating Disorders **624**

CRITICAL THINKING APPLICATION

Working with Probabilities in Thinking about Mental Illness **627**

Concept Chart 630

Key Terms 632

Multiple-Choice Questions 632



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CHAPTER 16

TREATMENT OF PSYCHOLOGICAL DISORDERS

The Elements of the Treatment Process 635

- Treatments: How Many Types Are There? 635
- Clients: Who Seeks Therapy? 636
- Therapists: Who Provides Professional Treatment? 637

Insight Therapies 639

- Psychoanalysis 639
- Therapies Inspired by Positive Psychology 643
- Group Therapy 644
- Couples and Family Therapy 644
- How Effective Are Insight Therapies? 645
- How Do Insight Therapies Work? 646

Behaviour Therapies 646

- Systematic Desensitization 647
- Aversion Therapy 648
- Social Skills Training 649
- Cognitive-Behavioural Therapies 649
- How Effective Are Behaviour Therapies? 651

Biomedical Therapies 652

- Treatment with Drugs 652
- Electroconvulsive Therapy (ECT) 656
- New Brain Stimulation Techniques 658

Current Trends and Issues in Treatment 659

- Increasing Multicultural Sensitivity in Treatment 659

AN ILLUSTRATED OVERVIEW OF FIVE MAJOR APPROACHES TO TREATMENT 660

- Using Technology to Expand the Delivery of Clinical Services 663

Institutional Treatment in Transition 664

- Disenchantment with Mental Hospitals 664
- Deinstitutionalization 665

Mental Illness, the Revolving Door, and Homelessness 666

Putting It in Perspective: Themes 2 and 5 667

PERSONAL APPLICATION

- Looking for a Therapist 668

CRITICAL THINKING APPLICATION

- From Crisis to Wellness—But Was It the Therapy? 671

Concept Chart 674

Key Terms 676

Multiple-Choice Questions 676

WELCOME TO *PSYCHOLOGY*: THEMES AND VARIATIONS

Welcome to the sixth Canadian edition of *Psychology: Themes and Variations*. Not only has this book been extensively updated and revised, but we have managed to do all of this while under the restrictions produced by the COVID-19 pandemic. We hope that you and yours emerged from that pandemic healthy and well. You will see in the text that follows that we have integrated some of what we know about the pandemic and the stresses it elicited to illustrate both how we were challenged by it and how we evidenced considerable resilience.

A good textbook must evolve with the field of inquiry it covers, as well as new directions in higher education. We have updated and revised this edition of the text extensively to reflect the considerable recent and exciting changes and findings in the field. We have included references to over 1000 new articles and scholarly works. We have revised our text not only to reflect recent changes in psychology, but have done so with a Canadian context in mind. As just one example, we have included new data, research, and discussion reflecting the experiences of Indigenous Peoples, including the intergenerational trauma experienced by Indigenous Peoples as a result of, among other things, the Sixties Scoop and the residential school system in Canada.

An introductory psychology text must satisfy two disparate audiences: professors and students. Because of the tension between the divergent needs and preferences of these audiences, textbook authors usually indicate that they have attempted to strike a compromise between being theoretical versus practical, comprehensive versus comprehensible, research-oriented versus applied, rigorous versus accessible, and so forth. However, we believe that many of these dichotomies are false. As Kurt Lewin once remarked, “What could be more practical than a good theory?” Similarly, is rigorous really the opposite of accessible? Not in our courses in psychology. We maintain that many of the antagonistic goals that we strive for in our textbooks only *seem* incompatible and that we may not need to make compromises as often as we assume.

In writing this text, we have several objectives in mind. First, in surveying psychology’s broad range of content, we have tried to show that our interests are characterized by diversity *and* unity. Second, we have emphasized both research *and* application and how they work in harmony. Finally, we have aspired to write a book that is challenging to think about *and* easy to learn from. Let’s take a closer look at these goals.

Goals

1. *To show both the unity and the diversity of psychology’s subject matter.* Students entering an introductory psychology course are often unaware of the immense diversity of subjects studied by psychologists. We find this diversity to be part of psychology’s charm, and throughout the book we highlight the enormous range of questions and issues addressed by psychology. Of course, psychology’s diversity proves disconcerting for some students, who see little continuity between such disparate areas of research as physiology, motivation, cognition, and abnormal behaviour. Indeed, in this era of specialization, even some psychologists express concern about the fragmentation of the field.

However, we believe there is considerable overlap among the subfields of psychology and that we should emphasize their common core by accenting the connections and similarities among them. Consequently, we portray psychology as an integrated whole rather than as a mosaic of loosely related parts. A principal goal of this text, then, is to highlight the unity in psychology’s intellectual heritage (the *themes*), as well as the diversity of psychology’s interests and uses (the *variations*).

2. *To illuminate the process of research and its intimate link to application.* For us, a research-oriented book is not one that bulges with summaries of many studies but one that enhances students’ appreciation of the logic and excitement of empirical inquiry. We want students to appreciate the strengths of the empirical approach and to see scientific psychology as a creative effort to solve intriguing behavioural puzzles. For this reason, the text emphasizes not only *what* psychologists know (and don’t know) but *how* they attempt to find out. It examines methods in some detail and encourages students to adopt the skeptical attitude of a scientist and to think critically about claims regarding behaviour.

Learning the virtues of research should not mean that students cannot also satisfy their desire for concrete, personally useful information about the challenges of everyday life. Most researchers believe that psychology has a great deal to offer those outside the field and that psychologists should share the practical implications of their work. In this text, practical insights are carefully qualified and closely tied to data, so that students can see the interdependence of

research and application. We find that students come to appreciate the science of psychology more when they see that worthwhile practical applications are derived from careful research and sound theory.

3. *To make the textbook challenging to think about and easy to learn from.* Perhaps most of all, we have sought to create a *book of ideas* rather than a compendium of studies. We consistently emphasize concepts and theories over facts, and focus on major issues and tough questions that cut across the subfields of psychology (e.g., the extent to which behaviour is governed by nature, nurture, and their interaction), as opposed to parochial debates (e.g., the merits of averaging versus adding in impression formation). Challenging students to think also means urging them to confront the complexity and ambiguity of psychological knowledge. Hence, the text doesn't skirt around grey areas, unresolved questions, and theoretical controversies. Instead, it encourages readers to contemplate open-ended questions, to examine their assumptions about behaviour, and to apply psychological concepts to their own lives. Our goal is not simply to describe psychology but to stimulate students' intellectual growth.

However, students can grapple with "the big issues and tough questions" only if they first master the basic concepts and principles of psychology—ideally, with as little struggle as possible. In our writing, we never forget that a textbook is a tool for teaching. Accordingly, we have taken great care to ensure that the book's content, organization, writing, illustrations, and pedagogical aids work in harmony to facilitate instruction and learning.

Admittedly, these goals are ambitious. If you're skeptical, you have every right to be. Let us explain how we have tried to realize these objectives.

Special Features

The book contains a variety of unusual features, each contributing in its own way to the book's paradoxical nature. These special elements include unifying themes, Personal Application sections, Critical Thinking Application sections, a didactic illustration program, an integrated running glossary, Concept Checks, Key Learning Goals, and Concept Charts.

Unifying Themes

Chapter 1 introduces seven key ideas that serve as unifying themes throughout the text. The themes serve several purposes. First, they provide threads of continuity across chapters that help students see

the connections among various areas of research in psychology. Second, as the themes evolve over the course of the book, they provide a forum for a relatively sophisticated discussion of enduring issues in psychology, thus helping to make this a "book of ideas." Third, the themes focus a spotlight on a number of basic insights about psychology and its subject matter that should leave lasting impressions on your students.

In selecting the themes, the question we asked ourselves (and other instructors) was "What do we really want students to remember five years from now?" The resulting themes are grouped into two sets.

THEMES RELATED TO PSYCHOLOGY AS A FIELD OF STUDY

Theme 1: Psychology is empirical. This theme is used to enhance the student's appreciation of psychology's scientific nature and to demonstrate the advantages of empiricism over uncritical common sense and speculation. We also use this theme to encourage the reader to adopt a scientist's skeptical attitude and to engage in more critical thinking about information of all kinds.

Theme 2: Psychology is theoretically diverse. Students are often confused by psychology's theoretical pluralism and view it as a weakness. We don't downplay or apologize for the field's theoretical diversity, because we believe that it is one of psychology's greatest strengths. Throughout the book, we provide concrete examples of how clashing theories have stimulated productive research, how converging on a question from several perspectives can yield increased understanding, and how competing theories are sometimes reconciled in the end.

Theme 3: Psychology evolves in a sociohistorical context. This theme emphasizes that psychology is embedded in the ebb and flow of everyday life. The text shows how the spirit of the times has often shaped psychology's evolution and how progress in psychology leaves its mark on our society.

THEMES RELATED TO PSYCHOLOGY'S SUBJECT MATTER

Theme 4: Behaviour is determined by multiple causes. Throughout the book, we emphasize, and repeatedly illustrate, that behavioural processes are complex and that multifactorial causation is the rule. This theme is used to discourage simplistic, single-cause thinking and to encourage more critical reasoning.

Theme 5: Behaviour is shaped by cultural heritage. This theme is intended to enhance students' appreciation of how cultural factors moderate psychological processes and how the viewpoint of one's own culture can distort one's interpretation of the behaviour of people from other cultures. The discussions that elaborate on this theme do not simply celebrate diversity. They strike a careful balance—one that accurately reflects the research in this area—highlighting both cultural variations *and* similarities in behaviour.

Theme 6: Heredity and environment jointly influence behaviour. Repeatedly discussing this theme permits us to air out the nature versus nurture issue in all of its complexity. Over a series of chapters, students gradually learn how biology shapes behaviour, how experience shapes behaviour, and how scientists estimate the relative importance of each. Along the way, students will gain an in-depth appreciation of what it means when we say that heredity and environment interact.

Theme 7: People's experience of the world is highly subjective. All of us tend to forget the extent to which people view the world through their own personal lenses. This theme is used to explain the principles that underlie the subjectivity of human experience, to clarify its implications, and to repeatedly remind the readers that their view of the world is not the only legitimate view.

After introducing all seven themes in Chapter 1, we discuss different sets of themes in each chapter as they are relevant to the subject matter. The connections between a chapter's content and the unifying themes are highlighted in a standard section near the end of the chapter, "Putting It in Perspective," in which we reflect on the "lessons to be learned" from the chapter. We have not tried to make every chapter illustrate a certain number of themes. Rather, the themes were allowed to emerge naturally, and we found that two to five surfaced in any given chapter. The chart on the next page shows which themes are highlighted in each chapter. Colour-coded icons at the beginning of each "Putting It in Perspective" section indicate the specific themes featured in each chapter.

Personal Applications

To reinforce the pragmatic implications of theory and research stressed throughout the text, each

chapter closes with a Personal Application section that highlights the practical side of psychology. Personal Applications devote two to three *pages* of text (rather than the usual box) to a single issue that should be of special interest to many students. Although most of the Personal Application sections have a "how to" character, they continue to review studies and summarize data in much the same way as the main body of each chapter. Thus, they portray research and application not as incompatible polarities but as two sides of the same coin. Many of the Personal Applications—such as those on finding and reading journal articles, understanding art and illusion, and improving stress management—provide topical coverage unusual for an introductory text.

Critical Thinking Applications

A great deal of unusual coverage can also be found in the Critical Thinking Applications that follow the Personal Applications. These applications are based on the assumption that critical thinking skills can be taught. They do not simply review research controversies, as is typically the case in other introductory texts. Instead, they introduce and model a host of critical thinking *skills*, such as looking for contradictory evidence or alternative explanations; recognizing anecdotal evidence, circular reasoning, hindsight bias, reification, weak analogies, and false dichotomies; evaluating arguments systematically; and working with cumulative and conjunctive probabilities.

The specific skills discussed in the Critical Thinking Applications are listed in the accompanying table, where they are organized into five categories using a taxonomy developed by Halpern (2004). In each chapter, some of these skills are applied to topics and issues related to the chapter's content. For instance, in the chapter that covers drug abuse (Chapter 5), the concept of alcoholism is used to highlight the immense power of definitions and to illustrate how circular reasoning can seem so seductive. Skills that are particularly important may surface in more than one chapter, so students see them applied in a variety of contexts. For example, in Chapter 7, students learn how hindsight bias can contaminate memory, and in Chapter 12 they see how hindsight can distort analyses of personality. Repeated practice across chapters should help students spontaneously recognize the relevance of specific critical thinking skills when they encounter certain types of information.

UNIFYING THEMES HIGHLIGHTED IN EACH CHAPTER

Chapter	Theme						
	1 Empiricism	2 Theoretical Diversity	3 Sociohistorical Context	4 Multifactorial Causation	5 Cultural Heritage	6 Heredity and Environment	7 Subjectivity of Experience
1. The Evolution of Psychology							
2. The Research Enterprise in Psychology							
3. The Biological Bases of Behaviour							
4. Sensation and Perception							
5. Variations in Consciousness							
6. Learning							
7. Human Memory							
8. Language and Thought							
9. Intelligence and Psychological Testing							
10. Motivation and Emotion							
11. Human Development across the Life Span							
12. Personality: Theory, Research, and Assessment							
13. Social Behaviour							
14. Stress, Coping, and Health							
15. Psychological Disorders							
16. Treatment of Psychological Disorders							

TAXONOMY OF SKILLS COVERED IN THE CRITICAL THINKING APPLICATIONS

Verbal Reasoning Skills

Understanding the way definitions shape how people think about issues	Chapter 5
Identifying the source of definitions	Chapter 5
Avoiding the nominal fallacy in working with definitions and labels	Chapter 5
Understanding the way language can influence thought	Chapter 8
Recognizing semantic slanting	Chapter 8
Recognizing name-calling and anticipatory name-calling	Chapter 8
Recognizing and avoiding reification	Chapter 9

Argument/Persuasion Analysis Skills

Understanding the elements of an argument	Chapter 10
Recognizing and avoiding common fallacies, such as irrelevant reasons, circular reasoning, slippery slope reasoning, weak analogies, and false dichotomies	Chapters 10 and 11
Evaluating arguments systematically	Chapter 10
Recognizing and avoiding appeals to ignorance	Chapter 9
Understanding how Pavlovian conditioning can be used to manipulate emotions	Chapter 6
Developing the ability to detect conditioning procedures used in the media	Chapter 6
Recognizing social influence strategies	Chapter 13
Judging the credibility of an information source	Chapter 13

Skills in Thinking as Hypothesis Testing

Looking for alternative explanations for findings and events	Chapters 1, 9, and 11
Looking for contradictory evidence	Chapters 1, 3, and 9
Recognizing the limitations of anecdotal evidence	Chapters 2 and 15
Understanding the need to seek disconfirming evidence	Chapter 7
Understanding the limitations of correlational evidence	Chapters 11 and 14
Understanding the limitations of statistical significance	Chapter 14
Recognizing situations in which placebo effects might occur	Chapter 16

Skills in Working with Likelihood and Uncertainty

Utilizing base rates in making predictions and evaluating probabilities	Chapter 14
Understanding cumulative probabilities	Chapter 15
Understanding conjunctive probabilities	Chapter 15
Understanding the limitations of the representativeness heuristic	Chapter 15
Understanding the limitations of the availability heuristic	Chapter 15
Recognizing situations in which regression toward the mean may occur	Chapter 16
Understanding the limits of extrapolation	Chapter 3

Decision-Making and Problem-Solving Skills

Using evidence-based decision making	Chapter 2
Recognizing the bias in hindsight analysis	Chapters 7 and 12
Seeking information to reduce uncertainty	Chapter 14
Making risk–benefit assessments	Chapter 14
Generating and evaluating alternative courses of action	Chapter 14
Recognizing overconfidence in human cognition	Chapter 7
Understanding the limitations and fallibility of human memory	Chapter 7
Understanding how contrast effects can influence judgments and decisions	Chapter 4
Recognizing when extreme comparitors are being used	Chapter 4

Reality Checks

Each chapter includes three or four Reality Checks, which address common misconceptions related to psychology and provide direct refutations of the misinformation. These Reality Checks are sprinkled throughout the chapters, appearing adjacent to the relevant material. Examples of misconceptions that are dispelled include the myth that B. F. Skinner raised his daughter in a Skinner box, which led to her becoming severely disturbed (Chapter 1); the notion that people use only 10 percent of their brains (Chapter 3); the assumption that people who are colour blind see the world in black and white (Chapter 4); and the idea that it is dangerous to awaken someone who is sleepwalking (Chapter 5).

Most of the misconceptions covered in these Reality Checks were addressed in previous editions, but not always with direct refutations. In other words, accurate information was provided on the issues, but usually without explicitly stating the misconception and providing a rebuttal. Why the change in strategy? The impetus was a fascinating article in *Teaching of Psychology* by Patricia Kowalski and Annette Taylor (2009). This article summarized evidence that students typically come into introductory psychology with a variety of misconceptions and that, for the most part, they tend to leave the course with their misconceptions intact. To see if this problem could be ameliorated, they tested the impact of direct refutations on students' misconceptions in the introductory course. Their data suggested that explicit repudiations of erroneous ideas reduce students' misconceptions more effectively than the simple provision of correct information. With that evidence in mind, we decided to craft this feature that explicitly confronts and disputes common fallacies that range from oversimplified to profoundly inaccurate. Because the Reality Checks mostly supplement the normal coverage in the text, they have been kept concise.

Featured Studies

Each chapter includes at least one Featured Study. Each Featured Study is explored in our online content and provides a relatively detailed but clear summary of a particular piece of research. Each Featured Study is presented in the conventional purpose–method–results–discussion format seen in journal articles, followed by a comment in which we discuss why the study is featured (to illustrate a specific method, raise ethical issues, and so forth). By showing research methods in action, we hope to improve students' understanding of how research is done while also giving them a painless introduction to the basic format of journal articles. Additionally, the Featured Studies show how

complicated research can be, so students can better appreciate why scientists may disagree about the meaning of a study. The Featured Studies are fully incorporated into the flow of discourse in the text and are *not* presented as optional boxes.

In selecting and updating the Featured Studies, we assembled a mixture of classic and recent studies that illustrate a wide variety of methods. To make them enticing, we tilted our selections in favour of those that students find interesting. So, readers will encounter explorations of the effects of day-dreaming or mind wandering in class on university students' understanding of lectures and their performance on exams, the effects of fear on sexual attraction, bullying in Canadian schoolyards, the brain and mental time travel, the relationship between depression and heart disease, studies of infant babbling, and studies of suicide rates among Indigenous youth in Canada.

A Didactic Illustration Program

When we outlined our plans for the sixth Canadian edition of the text, we wanted every aspect of the illustration program to have a genuine didactic purpose. We were intimately involved in planning every detail of the illustration program. We have endeavoured to create a program of figures, diagrams, photos, and tables that work hand in hand with the prose to strengthen and clarify the main points in the text.

The most obvious results of this didactic approach to illustration are the eight Illustrated Overviews that combine tabular information, photos, diagrams, and sketches to provide well-organized and exciting overviews of key ideas in the areas of history, methods, sensation and perception, learning, human development, personality theory, psychopathology, and psychotherapy.

We hope you will also notice the subtleties of the illustration program. For instance, diagrams of important concepts (conditioning, synaptic transmission, experimental design, and so forth) are often repeated in the end-of-chapter Concept Charts and in several other chapters (with variations) to highlight connections among research areas and to enhance students' mastery of key ideas.

Numerous easy-to-understand graphs of research results underscore psychology's foundation in research, and photos and diagrams often bolster each other (e.g., see the treatment of classical conditioning in Chapter 6). Colour is used carefully as an additional organizational device, and visual schematics are used to simplify hard-to-visualize concepts (e.g., see Figure 9.15 on page 349, which explains reaction range for intelligence). All of these efforts were made in the service of one master: the desire to make this an inviting book that is easy to learn from.

Integrated Running Glossary

An introductory text should place great emphasis on acquainting students with psychology's technical language—not for the sake of jargon, but because a great many of the key terms are also cornerstone concepts (e.g., *independent variable*, *reliability*, and *cognitive dissonance*). This text handles terminology with a running glossary embedded in the prose itself. The terms are set off in **red boldface italics**, and the definitions follow in **red, boldface** type. This approach retains the two advantages of a conventional running glossary: vocabulary items are made salient and their definitions are readily accessible. However, the approach does so without interrupting the flow of discourse, while eliminating redundancy between text matter and marginal entries.

Concept Checks

To help students assess their mastery of important ideas, Concept Checks are sprinkled throughout the book. In keeping with the goal of making this a book of ideas, the Concept Checks challenge students to apply ideas instead of testing rote memory. For example, in Chapter 6 the reader is asked to analyze realistic examples of conditioning and identify conditioned stimuli and responses, reinforcers, and schedules of reinforcement.

Many of the Concept Checks require the reader to put together ideas introduced in different sections of the chapter. For instance, in Chapter 4, students are asked to identify parallels between vision and hearing. Some of the Concept Checks are quite challenging, but students find them engaging, and they report that the answers (available in Appendix A) are often illuminating.

Key Learning Goals

To help students organize, assimilate, and remember important ideas, each major section of every chapter begins with a succinct set of Key Learning Goals. The Key Learning Goals are found adjacent to the main headings that begin each major section. The Key Learning Goals are thought-provoking learning objectives that should help students focus on the key issues in each section.

Concept Charts for Study and Review

This sixth Canadian edition incorporates summaries—Concept Charts—directly into the end of each chapter. Designed to help students organize and master the main ideas contained in each chapter, Concept Charts provide a detailed visual map of the key ideas found in the main body of that chapter.

Seeing how it all fits together should help students better understand each chapter. They can use

these charts to preview chapters, to get a handle on how key ideas fit together, to double-check their mastery of the chapters, and to memorize the crucial principles in chapters. We have tested these out with our own students and they tell us that they are a very valuable tool in preparing for course exams.

Multiple-Choice Questions

The multiple-choice questions are new to the sixth Canadian edition. Each chapter ends with a set of multiple-choice questions. These questions should give students a realistic assessment of their mastery of that chapter and valuable practice taking the type of test that many of them will face in their introductory psychology course. These are aimed to test beyond recall and test student's higher-level thinking skills.

Content

The text is divided into 16 chapters. The chapters are not grouped into sections or parts, primarily because such groupings can limit your options if you want to reorganize the order of topics. The chapters are written in a way that facilitates organizational flexibility, as we assume that some chapters might be omitted or presented in a different order.

The topical coverage in the text is relatively conventional, but there are some subtle departures from the norm. For instance, Chapter 1 presents a relatively “meaty” discussion of the evolution of ideas in psychology. This coverage of history lays the foundation for many of the crucial ideas emphasized in subsequent chapters. The historical perspective is also our way of reaching out to the students who find that psychology just isn't what they expected it to be. If we want students to contemplate the mysteries of behaviour, we must begin by clearing up the biggest mysteries of them all: “Where did these rats, statistics, synapses, and JNDs come from, what could they possibly have in common, and why doesn't this course bear any resemblance to what I anticipated?” We use history as a vehicle to explain how psychology evolved into its modern form and why misconceptions about its nature are so common.

We also devote an entire chapter (Chapter 2) to the scientific enterprise—not just the mechanics of research methods but the logic behind them. We believe that an appreciation of the nature of empirical evidence can contribute greatly to improving students' critical thinking skills. Ten years from now, many of the “facts” reported in this book will have changed, but an understanding of the methods of science will remain invaluable. An introductory psychology course, by itself, isn't going to make a student think like a scientist, but we can't think of a

better place to start the process. Essential statistical concepts are introduced in Chapter 2, but no effort is made to teach actual calculations.

Changes in the Sixth Canadian Edition

There has been so much new, exciting, and important research and theory in psychology since we wrote the fifth Canadian edition. For the sixth Canadian edition, we have added new material and topics and updated our existing text with new examples, findings, and explanations.

The following is a partial list of specific chapter changes that highlights some of the key new and updated topics and examples that have been included in the sixth Canadian edition.

CHAPTER 1: THE EVOLUTION OF PSYCHOLOGY

- Revised introduction.
- New material added concerning the gut microbiome and mental health.
- New material on the testing effect in psychology and its relevance to studying for exams.
- Revised discussion of the contributions of William James and John Watson.
- Revised discussion of Psychology in Canada.
- Updated information concerning neuropsychologist Brenda Milner.
- Updated statistics describing Canada's population diversity.
- New discussion of the Sixties Scoop and Canada's residential school system and their impact on Indigenous intergenerational trauma.
- Updated discussion regarding students' study habits and strategies.
- New discussion on sleep and student academic performance.

CHAPTER 2: THE RESEARCH ENTERPRISE IN PSYCHOLOGY

- New section discussing reproducibility and the replication crisis in psychology.
- New figure detailing the peer review process in psychology.
- New discussion on the topic of discipline and physical punishment of children.
- New illustration of the use of case studies in clinical psychology.
- New section describing research on the links between social media use and students' procrastination.
- New data on response rates in survey research.
- Revised and updated discussion of statistical significance and hypothesis testing in psychology.
- New material on the links between social activity and well-being.

- New figure illustrating the third variable problem in psychology.
- New discussion of the problems with the use of phones in survey research.
- New research on the placebo effect.
- Updated discussion of the social desirability bias and response sets.
- Updated research concerning public attitudes toward animal research.

CHAPTER 3: THE BIOLOGICAL BASES OF BEHAVIOUR

- New introduction.
- New material regarding the nature and function of glia cells has been added.
- Added a new section discussing the patterns of neural activity and the process of integrating signals in those systems.
- Revised the description of neurotransmitters and their operation.
- Revised and updated description of the dopamine hypothesis in schizophrenia.
- New material added regarding the functions of the cerebellum.
- Provided updates to the discussion of the neural circuits that regulate sleep.
- Added new material regarding the links between autism and mirror neuron functioning.
- Provided new information concerning the effects of practice on the structure of the hippocampus.
- Updated the discussion of the process of neurogenesis and its sensitivity to environmental factors.
- Added new material regarding the effects of oxytocin on social processes and the controversy over the effects of oxytocin on prosocial behaviour.

CHAPTER 4: SENSATION AND PERCEPTION

- New material added to the discussion of synaesthesia concerning calendar synaesthesia.
- References to new work on subliminal perception.
- New discussion of the links between saccades and memory, the saccade-induced retrieval enhancement effect (SIRE).
- New material related to the distinction between the dorsal and ventral streams of perception.
- Added a new discussion of our memory for colour.
- New statistics on gender and colour blindness.
- New section on the topic of individual differences in colour perception and research on perception of the colour of "the dress."
- Revised discussion of inattention blindness.
- Added commentary on the legacy of the Gestalt approach to perception.
- Revised discussion of hearing loss, along with new Canadian statistics on hearing loss.

- New section added on the topic of retronasal olfaction and new data on human sensitivity to odour detection.
- New discussion added concerning Doty's work on the assessment of deficiencies in odour detection.
- New Canadian statistics regarding chronic pain disability.
- A new section was added discussing the opioid crisis and opioid addiction with specific attention to the Canadian context.
- New section added concerning Schwann cells and pain perception.

CHAPTER 5: VARIATIONS IN CONSCIOUSNESS

- Updated discussion of the sleep crisis in North America.
- New statistics on sleep problems in Canada.
- New figure and updated material on the prediction on when mind wandering is most likely to occur, plus how social media use leads to increased mind wandering.
- New discussion on chronotype and ideal sleep times.
- New figure and updated information on jet lag and sleep disturbance.
- Introduction to the concept of social jet lag.
- Updated figure of EEG patterns in sleep and wakefulness.
- Updated discussion of age and the sleep cycle.
- New figure and discussion of sleep, cerebrospinal fluid flow, and clearance of metabolic toxins from the brain.
- New statistics on sleep behaviours in Canada.
- Revised discussion on sleep deprivation, and the connections between sleep deprivation and cognitive functioning; sleep deprivation and exam performance; sleep deprivation and driving behaviour; and sleep deprivation and calorie consumption.
- Revised and updated discussion of sleep disorders.
- Revised and updated discussion of dreams.
- Expanded and updated discussion of meditation.
- Expanded discussion of cannabis effects and use in Canada.
- New figure and Canadian statistics on alcohol and marijuana use, and on impaired driving offences in Canada.
- Updated discussion on the increase in opioid use and overdose.
- Reference made to the use of hallucinogens in psychotherapy.
- New figure depicting the impact of alcohol and acute causes of death, disease, and injury.

CHAPTER 6: LEARNING

- Updated discussion of learning theory and superstitions, including new cultural examples.
- Revised discussion concerning the role of evaluative conditioning in human behaviour.
- New coverage of classical conditioning in physiological processes.
- New material added describing the process of immune conditioning.
- New examples added to the discussion of evaluative conditioning in advertising.
- New coverage of the concept of preparedness in evolution.
- Revised discussion of the role of shaping in conditioning.
- New research examples concerning the development of superstitions were added.
- New section added distinguishing between the concepts of positive and negative punishment.
- Revised and updated discussion evaluating the short- and long-term effects of physical punishment of children as a discipline technique.
- The introduction to the concept of observational learning was revised.
- New Canadian statistics on screen use by Canadian children.
- New research added concerning the extent to which watching media violence is associated with elevated aggression.
- New cross-cultural research and explanatory figure added evaluating the links between media violence and other factors that serve to increase aggressive behaviour.
- New coverage of the links between video gaming and risky behaviour.
- New research on the potential benefits of video gaming.
- New Featured Study added related to the links between mirror neuron functioning and psychopathology.
- New material added evaluating the role and effectiveness of sexual content in advertising.

CHAPTER 7: HUMAN MEMORY

- Revised and updated introduction with new references.
- Revised discussion of divided attention and multi-tasking effects, with a focus on cellphone use while driving.
- New research added concerning multitasking and academic performance by students.
- Revised discussion of afterimages and echoic memory.
- New Featured Study added on the topic of information encoding and autism.

- Shortened and tightened discussion of the durability of memory storage.
- New examples for the concept of memory chunking are provided along with a revised discussion of chunking.
- New data on the long-term results of flashbulb memory research were added.
- New research added that examines the effects of post-event misinformation.
- Revised and shortened discussion of source monitoring in memory.
- New section added discussing the concept of time-related mechanisms in memory.
- New discussion added concerning the important functions served by forgetting.
- Revised discussion of the concept of relearning.
- The discussion of repressed memories has been revised, and new material and research findings have been added.
- Revised introduction to the section dealing with physiological bases of memory with updated references to the work of Nobel Laureate Eric Kandel.
- Updated discussion of Richard Thompson’s contributions to research on the biology of memory.
- The material on the topic of neurogenesis was updated with a revised discussion and the addition of new material.
- New material added regarding what was learned from H.M. autopsy about the structures of the brain related to memory functioning.
- New Featured Study added on the topic of memory consolidation during sleep.
- New photo added to give context to memory for perceptual-motor skills.
- Recent research concerning the nature of prospective memory was added, including the effects of aging and the effects on prospective memory on cellphone use.
- New material added to the discussion on the topic of memory as time travel.
- New research added on the relative benefits of the testing effect for recall and recognition tests and on the use of mnemonics for different types of study materials.
- New discussion with recent research on the effectiveness of the method of loci.
- New discussion added on the role of confidence in memory for events, with an application to eyewitness testimony and the confidence of eyewitnesses.

CHAPTER 8: LANGUAGE AND THOUGHT

- Updated statistics on language diversity in Canada.
- New statistics on the number of students in Canada studying one of the official languages

as a second language and number of students in French immersion programs.

- New discussion regarding the research on bilingualism and its effects on attentional control.
- Updated description of the functions of language with an introduction of the relationship function of language use.
- Updated commentary on the legacy of the linguistic relativity hypothesis.
- Revised and updated discussion regarding the positive benefits of bilingualism.
- Revised section on the role of analogies in problem solving.
- New material on the concept of fake news and our judgments of the sources of information.
- Revised discussion and new applications of the problems associated with choice overload.
- Reference made to new research examining brain structures implicated in insight experiences.
- Revised introduction to the topic of culture and problem solving.
- Revised and updated discussion of the effects of choice on decision making.
- Revised introduction to trial-and-error heuristics in problem solving.
- New research reviewed on the topic of incubation effects and the effectiveness of changing problem context.
- New section added regarding the concept of choice mindset.
- Major new section on the sunk costs fallacy using examples drawn from the work of Nobel Laureate Richard Thaler.
- New discussion added concerning the explanatory implications of behavioural economics for a variety of human behaviours, including suicide.
- New section “Evolutionary Analyses of Fast and Frugal Heuristics” with extensive revision of the material concerning rationality, irrationality, and adaptation.

CHAPTER 9: INTELLIGENCE AND PSYCHOLOGICAL TESTING

- Revised chapter introduction including new material distinguishing between entity and incremental lay theories of intelligence and the impact of these beliefs on peoples’ construal of intelligence.
- New detail provided regarding Leilani Muir and her fight against the government for justice and her advocacy on behalf of others.
- Revised description of the concept of reliability; the section was shortened and tightened.
- Revised and updated description of the nature of the Wechsler IQ tests.

- The section describing Galton's seminal work on IQ was tightened.
- New research discussed examining the relationship between brain volume and IQ including recent MRI and meta-analytic results.
- New research presented concerning the relationship between intelligence measured in middle school and university performance.
- New photo added of Canadian Nobel Laureate John Polanyi from the University of Toronto.
- New discussion of the links between emotional intelligence and academic performance added, with context provided regarding the links between success and low IQ.
- New photo added to illustrate examples of multiple intelligences.
- Revised figure depicting the normal distribution of intelligence.
- New section added describing Dweck's formulation of fixed- and growth-mind sets and academic performance.
- Updated summary of research based conclusions regarding the genetic basis of intelligence.
- New research-based conclusions regarding cohort increases in intelligence relevant to the Flynn effect.
- New discussion added focused on the relationship between socioeconomic variables and intelligence.
- Additional explanations added to account for the rise in IQ scores in the past few decades.
- New research by Trent University's James Parker concerning the social implications of emotional intelligence was added.
- New detail and explanations added for the effect of socioeconomic status on measured IQ.

CHAPTER 10: MOTIVATION AND EMOTION

- Updated research on contextual factors affecting eating/obesity.
- New discussion on which contributes more to obesity—excessive eating or inadequate exercise.
- New research linking sexual frequency and happiness.
- Updated discussion of sexual orientation.
- New figure and expanded discussion of affective forecasting.
- Expanded and updated discussion of detecting deception.
- New figure depicting the neural circuitry for the basic emotions proposed by theorists.
- New discussion of how cultural variability influences how much people experience specific emotions.
- Expanded discussion of the correlation between income, generosity, and happiness.

- Introduction to socioemotional selectivity theory.
- New figure and discussion of happiness and longevity.

CHAPTER 11: HUMAN DEVELOPMENT ACROSS THE LIFE SPAN

- Revised chapter introduction.
- New examples provided regarding achievements in seniors.
- New statistics provided regarding conception rates.
- Revised discussion on the topic of premature birth.
- Revised discussion of the concept of the threshold of viability, the age at which babies can survive a premature birth.
- New figure added presenting data on proportion of babies carried to full term.
- Updated Government of Canada guidelines for maternal nutrition are provided along with a revised description of the importance of good maternal nutrition for newborn health.
- Revised description and statistics regarding fetal alcohol spectrum disorder in Canada.
- Added discussion relating mother stress and genetic predisposition to disease.
- New examples provided regarding environmental toxins affecting babies in the womb.
- New international statistics on HIV-positive babies.
- New Canadian statistics regarding number of pregnant Canadian women using illicit drugs of various types.
- New discussion of the effects of pregnant mothers' cannabis use on children's health.
- Revised discussion of the effects of alcohol use and cigarette smoking.
- Revised discussion and statistics regarding Canadian mothers who exclusively breastfeed their babies.
- Revised introduction to the section on motor development.
- Additional references and descriptions regarding the work of Queen's University professor Valerie Kuhlmeier on the social world of babies.
- New details added regarding University of Toronto Ph.D. Mary Salter Ainsworth, who did seminal work on patterns of attachment.
- New references to research relating early attachment experiences to adult functioning.
- Revised discussion of maternal sensitivity and the emergence of attachment experiences.
- New section discussing recent theory and research concerning the relationship between culture and attachment.

- New material added about the ability of adolescents to engage in hypothetico-deductive reasoning, including a Canadian illustration of this effect.
- New photo added of Thomas K. Khairy, a 15-year-old from Montreal who published a first-authored paper in the prestigious *New England Journal of Medicine*.
- Discussion of moral intuitions and their implications for Kohlberg's theory of moral development was added.
- New research areas related to the development of morality were identified.
- Updated discussion of the role neural imbalance plays in adolescent risk-taking.
- Introduction to the teen brain was shortened, tightened, and revised.
- New Canadian statistics regarding attempted suicides and suicide rates for specific demographic groups.
- New Canadian statistics on suicide rates for Indigenous Peoples.
- New photo added depicting Canada's residential school system.
- Added discussion of intergenerational trauma among Indigenous Peoples, the residential school system, and the Sixties Scoop.
- Material added to the discussion of age and personality stability and change.
- New Canadian statistics regarding trends in age of marriage.
- New Canadian statistics regarding current marriage and divorce rates.
- Updated discussion of the social and personal consequences of the aging of the Canadian population.
- Updated discussion and statistics on medically assisted dying in Canada.
- New detail regarding Bill C-14, the legislation permitting and giving context to medically assisted dying in Canada.
- New section added on the concept of subjective age.
- New statistics added on dementia and Alzheimer's disease.
- New section added on cognitive training programs for the elderly.
- New discussion added on death anxiety.

CHAPTER 12: PERSONALITY: THEORY, RESEARCH, AND ASSESSMENT

- Revised chapter introduction including new material regarding the Canadian Space Agency and its selection criteria for astronauts.
- Revised and updated (with new research) discussion of the five-factor model of personality,

including gender differences, well-being, academic performance, and the model suggesting that ability of the Big Five to predict job success depends partially on the job context and demands.

- New context examples provided for Freud's defence mechanisms.
- New section added examining the recent revival of interest in defence mechanisms.
- The concept of repressive coping style is introduced and described.
- New material added examining current research and theory on the topic of birth order effects.
- Updated comments regarding the legacy of Skinner's behaviourism and its impact on personality theory.
- Revised and updated discussion of the implications of perceptions of self-efficacy for behaviour and well-being.
- Revised discussion of Jung's analytical psychology and its legacy.
- New section added discussing the Dunning-Kruger effect and its implications for self-perception.
- Additional explanation provided for Rogers's concept of conditional and unconditional love.
- New research concerning Maslow's conceptualization of self-actualization.
- New research summarized related to the heritability of personality.
- New discussion of the relevance of genetic mapping to understanding the genetics of personality.
- New major section added on the topic of contemporary approaches to personality. Two concepts are highlighted—narcissism and the Dark Triad.
- Revised discussion of culture and personality, with Markus and Kitayama's work on independent and interdependent selves highlighted and updated.

CHAPTER 13: SOCIAL BEHAVIOUR

- Updated statistics on prejudice and hate crimes in Canada.
- Updated discussion of face perception.
- Updated discussion on the attractiveness stereotype and its relations to job success.
- New evolutionary material on mate poaching and mate choice copying.
- New discussion of attitude alignment.
- New figure and description of Sternberg's triangular theory of love.
- Extensive new discussion of social media and both the positive and the negative impact it has on factors such as social connection.

- New findings presented about the use of Internet dating sites.
- New discussion of women’s curvature of the spine contributing to physical attractiveness.
- New research suggesting that gender disparities in mate preferences are large and occur across cultures.
- New research on fear appeals and application to the COVID-19 pandemic.
- New material and critique of the Stanford Prison Simulation.
- Updated information on stereotypes and prejudice.
- New expanded section on using humour as a stress reducer.
- New Featured Study added related to promoting canine health to improve owner health.
- New research on mindfulness-based stress reduction (MBSR).
- New coverage of biophilia or nature relatedness.

CHAPTER 14: STRESS, COPING, AND HEALTH

- New discussion of and reference made to the stress experienced by those “stranded” on cruise ships during the COVID-19 pandemic.
- New figure and statistics concerning the declining levels of well-being of Canadian students.
- New discussion on Lazarus and Folkman’s (1984) cognitive appraisal model of stress.
- New research discussing negative events as far more stressful than positive events.
- Updated discussion of the pressure experienced by students and others today.
- New coverage of the tend-and-befriend response.
- New figure of the general adaptation syndrome.
- New section outlining the neural network changes that may occur in response to severe or chronic stress.
- Revised discussion on gambling.
- New research on stress and income.
- Updated discussion on burnout.
- Updated discussion on the intergenerational effects of stress.
- New research on the link between stressors and compromised immune functioning.
- New research on the link between stress and social support.
- New discussion of post-traumatic growth.
- New table outlining the prevalence rates of health-risk behaviours among Canadian undergraduates.
- New figure of smoking rates in North America.
- New discussion of e-cigarettes.
- New figure depicting the benefits of quitting smoking over time.
- New figure depicting physical activity rates in Canada.
- New research on the benefits of physical activity.
- Updated Canadian statistics on rates of HIV infection in Canada.
- Reference to pre-exposure prophylaxis (PrEP) as a way to control the spread of HIV.

CHAPTER 15: PSYCHOLOGICAL DISORDERS

- Updated statistics added regarding the number of Canadians who use health services for psychological disorders.
- New statistics regarding mental health and employment.
- New research concerning the reactions of Canadians to the COVID-19 pandemic and its effects on mental health.
- New discussion added concerning anxiety, stress, and refugees and immigrants new to Canada.
- New discussion concerning the increase in stigmatization for those suffering from psychological disorders.
- Updated discussion of the ICD-11 developed by the World Health Organization to classify disorders.
- New photo added of Supreme Court Justice Clement Gascon, who suffers from depression and anxiety.
- New material presenting case histories of hoarding disorder, including the case of Homer and Langley Collyer, which resulted in one of the first diagnostic categories focused on hoarding behaviour.
- New section discussing complex trauma, a category of disorder unique to the ICD-11; diagnostic criteria and symptoms are described as well as its distinctiveness from other disorders such as PTSD.
- Updated material presented concerning the role of generalization and classical conditioning in anxiety disorders.
- New research added examining the links between minority stress and suicide.
- Discussion of possession-related phenomena in dissociative identity disorder added.
- Updated statistics and discussion added regarding the episodic nature of depression and the prevalence of depression.
- New material added concerning uncomplicated depression and the prognosis for those who experience this form of depression.
- New statistics added on the gender gap for depression.
- Updated statistics provided for bipolar disorder, its gender distribution, and age of onset.