

A photograph of two young women lying on their stomachs on a blue and white plaid picnic blanket outdoors. The woman on the left has a large, dark afro, wears sunglasses, and a dark blue floral patterned top. The woman on the right has long blonde hair in a ponytail, wears a white shirt with blue stars and an orange jacket. They are both laughing and looking at a white card held between them.

# PSYCHOLOGY AROUND US

THIRD CANADIAN EDITION

RONALD COMER  
NANCY OGDEN  
MICHAEL BOYES  
ELIZABETH GOULD

WILEY



# Psychology Around Us

**Third Canadian Edition**

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# About the Authors

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# To the Instructor

**Psychology is all around us.** If ever there was subject matter that permeates our everyday lives, it is psychology. Behaviour occurs everywhere, and mental processes affect all that we do; therefore, the study of individual behaviour and mental processes can help shed light on a wide range of events and issues.

**Psychology Around Us, Third Canadian Edition**, helps open students' minds to the notion that psychology is indeed around them every day and that its principles are immediately applicable to a whole host of life's questions. It also features classroom-proven pedagogy to keep students engaged and help them master the material.

We are committed to demonstrating for students the relevance and interconnectedness of all areas of psychology. We aim to encourage students to examine not only what they know about human behaviour but how they know it, and seek to open students up to an appreciation of how psychology pervades the world around them and how it can assist them in seeing, understanding, and optimizing their experiences within the world.

## About the Text

Our content is unique in that while each topic is still covered in its own chapter, the integrated nature of psychology permeates every chapter. For example, how can students get a full appreciation of memory without discussing the vital role of the hippocampus, or how memory develops, or Alzheimer's disease? **Psychology Around Us, Third Canadian Edition** is a truly integrated product—one that brings all of these elements together into one, complete discussion of any given topic of psychology.

This integration is accomplished by offering a thorough, current presentation of the nature, explanations, applications, and research (including key Canadian research) of each topic, but also includes sections on neuroscience, development, dysfunctions, and individual differences that illustrate how each of these key areas is tied to other areas of psychology. These sections present psychology as a united and integrated discipline, therefore allowing students to see “the big picture.”

## New to this Edition

Our goal for the third Canadian edition of **Psychology Around Us** was to continue to make it as engaging as possible for students and as supportive as possible for instructors. We asked reviewers to provide us with constructive input in terms of the strong science base of the coverage, their own concerns regarding key topics for inclusion, and what their students found engaging

about the material—what they wanted to know, what questions they asked, and what seemed to most pique their interest. We have incorporated many of the suggestions made by reviewers.

## Currency and Content Changes

We updated and added a considerable number of references in each chapter to ensure that readers get access to the most up-to-date research related to the topics covered. In addition, we continued to add current, relevant references to make the research foundations of the theories, concepts, and findings we discussed current and clear. Where new studies suggested new conceptual understandings of areas of psychological work, we added them and made sure their relationships to previous work was clear. A good example of this is in Chapter 15, which reflects how the neurological underpinnings of many disorder symptom patterns has been significantly expanded by the recent reorganization of funding priorities by the American National Institute of Mental Health. This move is aimed at shaking research in that area loose from the historical focus on Diagnostic and Statistical Manual of Mental Disorders (DSM) diagnostic categories. It has opened up opportunities for research in the United States and around the world into the neurological connections across diagnostic categories and the investigation of neurological assessment and diagnostic tools.

Reflecting a concern from reviewers that many students tend to view feature boxes as superfluous, we reduced the number of boxes from the second edition and embedded the content of many Psychology Around Us boxes directly into our coverage of core psychological concepts and research.

## Canadian Content

In the third Canadian edition of **Psychology Around Us** we have illuminated the important work of Canadian researchers in context. Examples of trailblazing Canadian work highlighted include that by historical figures such as Donald Hebb, Peter Milner, and James Olds (Chapter 1). Chapter 2 features work on the effects of viewing violence on television or in video games by Jonathan Freedman at the University of Toronto; work on spatial memory, frontal lobe function, and lateralization by Brenda Milner at McGill University; and research on many aspects of sensation and perception and work on dog intelligence and behavioural management by Stan Coren at the University of British Columbia. Chapter 3 highlights recent fMRI research on creativity from Melissa Ellamil and her colleagues at the University of British Columbia; the work of Lili-Naz Hazrati and her colleagues at the University Toronto on chronic

traumatic encephalopathy; and research by Kevin Englehart and colleagues at the University of New Brunswick on neural machine interface for control of artificial limbs. Chapter 3 also highlights Bill Cade’s research at the University of Lethbridge on aspects of the evolutionary process in crickets and the work of Roslyn Dakin, University of British Columbia, and Robert Montgomerie, Queen’s University, on the mating success of peacocks. Chapter 4 features the Romanian Adoption Research Project by Elinor Ames, Simon Fraser University; Jeremy Carpendale’s research out of Simon Fraser University on the cognitive development of children; Kerry Daly’s work on the Fathers’ Involvement Research Alliance from the University of Guelph; and the research of Mary Nixon and her colleagues as well as E. David Klonsky and his colleagues, from the University of British Columbia, on the mechanisms of self-harm. Chapter 6 highlights work on the complexity of brain functioning related to human consciousness by Brian Kolb and Ian Wishaw at the University of Lethbridge and research on change blindness by Ronald Resnick at the University of British Columbia. Chapter 7 features the work of E. David Klonsky and his colleagues at the University of British Columbia on the mechanisms of self-harm. Chapter 8 highlights research on memory and aging by Fergus Craik and Nicole Anderson at the Rotman Research Institute at Baycrest, Toronto, as well as Robert S. Lockhart at the University of Toronto. Chapter 8 includes classical work on explicit memory by Endel Tulving at the University of Toronto. Chapter 9 features groundbreaking work on infant phonemic processing by Janet Werker at the University of British Columbia and research on the roles of cognitive processing and self-awareness in short and longer-term planning by Michael Chandler at the University of British Columbia and Jeremy Carpendale at Simon Fraser University. Chapter 10 discusses the controversial and divisive work on race and IQ by the late Philippe Rushton at the University of Western Ontario and David Suzuki’s public challenges and debates with Rushton, as well as evaluation research on the effectiveness of early intervention programs by Mike Boyes (an author of this textbook) at the University of Calgary. Chapter 11 features research on the relationship between getting “psyched up” and “choking” among hockey goaltenders by Ryan Gelinias and Krista Munroe-Chandler at the University of Windsor and important research on eating disorders by Kristen von Ranson at the University of Calgary. Chapter 12 highlights work on the developmental trajectories of delinquent Aboriginal youth in Manitoba by government researchers Annie Yessine and James Bonta and research on the incidence of antisocial personality disorder by Rodger Bland at the University of Alberta. Chapter 13 covers research on prejudice by Bertram Gawronski and his colleagues at the University of Western Ontario and by Kerry Kawakami and others at York University, as well as research on interracial marriage in Canada by Reginald Bibby, a sociologist from the University of Lethbridge. Chapter 14 highlights the classic foundational research on stress and general adaptation syndrome by Hans Selye, who worked at McGill University. Chapter 15 features the work of Jitender Sareen and colleagues at the University of Manitoba on socio-economic class and psychopathology; research linking suicide and cultural

continuity in Aboriginal youth by Michael Chandler at the University of British Columbia and Chris Lalonde of the University of Victoria; work linking interpersonal stress and depression among adolescent girls by Kate Harkness and her colleagues at Queen’s University; the University of British Columbia’s Robert Hare’s work on psychopathy; the research of Regina Schuller of York University and James Ogloff of Simon Fraser University on the nature of criminal responsibility; and research on social anxiety and perfectionism by Paul Hewitt from the University of British Columbia and Gordon Flett from York University. Finally, Chapter 16 highlights the work of Patricia Sealy and Paul Whitehead and their colleagues at the University of Western Ontario on the effects of deinstitutionalization.

## Special Pedagogical Tools

### Tying It Together

We have structured each of the chapters in a very particular way—with a cross-sectional presentation. Using a **Tying It Together** approach, every chapter on a substantive area of psychology includes wordmarks highlighting the integration of the four subfields of psychology—*development*, *brain function*, *individual differences*, and *dysfunctions*. These wordmarks, **Development**, **Brain Function**, **Individual Differences**, and **Atypical Development**, enable students to readily integrate the material into what they already know both from within the book and from their broader experiences.

### Your Brain and Behaviour

In recent years neuroscience has been tied to virtually every subfield of psychology. Remarkable brain imaging studies, in conjunction with animal studies, have helped us to identify the neural mechanisms of everyday experience. Accordingly, **Psychology Around Us, Third Canadian Edition**, incorporates neuroscience information into chapters where it has traditionally been absent, such as social psychology and consciousness.

In addition, the product offers a key teaching feature—Tying It Together: Your Brain and Behaviour—that illustrates the link between the brain and behaviour when people are performing such common activities as eating pizza, learning to play a video game, acquiring a second language, giving a speech in public, or running a marathon. These features, which include neuroimages and findings from both human studies and relevant animal experiments, draw students into the brain and provide them with up-to-date information about the neural mechanisms at work during their everyday experiences. Each feature includes questions that allow students to test their knowledge. Regardless of their background in neuroscience, students come away intrigued by material that has traditionally been considered difficult.

# Additional Features

## Chapter Opener Outline

Every chapter begins with an outline of the main headings in the chapter, with the accompanying learning objective. Each chapter also starts with a description about a person or situation to introduce concepts and interest students in the chapter content. This introductory material helps to give readers a big-picture overview of the chapter and helps to prepare them for the material they will need to learn.

## Guided Learning

A **Learning Objective** for each chapter section identifies the most important material for students to understand while reading that section.

Following each section is a **Before You Go On** feature with questions that help students check their mastery of the important items covered. **What Do You Know?** questions prompt students to stop and review the key concepts just presented. **What Do You Think?** questions encourage students to think critically on key questions in the chapter.

## Special Topics on Psychology Around Us

Each chapter highlights interesting news stories, current controversies in and around psychology, and relevant research findings that demonstrate psychology around us.

- The **Psychology Around Us** boxes highlight how psychology affects us in our everyday lives, in every way, with examples from Canada and around the world.
- The **Practically Speaking** boxes emphasize the practical application of everyday psychology.

## Thorough Coverage

*Psychology Around Us, Third Canadian Edition*, contains 16 chapters that cover all the topics of psychology in depth. Instead of combining chapters on stress and emotion, or psychological disorders and their treatment, each topic is given full coverage in its own, separate chapter. This gives you ultimate flexibility in determining how much time you want your students to devote to each topic. If you want to cover neuroscience briefly, then simply assign the relevant pages from that chapter; but if you want to cover neuroscience in depth, you have a full chapter at your disposal that contains detailed and integrated coverage of the topic.

## Chapter Summary

The end-of-chapter summary reviews the main concepts presented in the chapter with reference to the specific Learning Objectives. It provides students with another opportunity to review what they have learned as well as to see how the key topics within the chapter fit together. End-of-chapter Self-Study Questions have been added, with answers provided, to help students do a quick check of key concepts covered.

## Resources

### WileyPlus with ORION

WileyPLUS with ORION adaptive practice improves outcomes with robust practice problems and feedback, fosters engagement with course content and educational videos, and gives students the flexibility to increase confidence as they learn and prepare outside of class. With ORION, instructors can see how their students learn best and adjust material appropriately. For students, ORION allows them to focus on their weakest areas to make study time more efficient.

#### WileyPLUS helps instructors:

- Save time by automating grading of practice, homework, quizzes, and exams
- Create a focused and personalized course that reflects their teaching style
- Quickly identify and understand student learning trends to improve classroom engagement
- Improve their course year over year using WileyPLUS data

### Wiley E-Textbook

E-Textbooks are complete digital versions of the text that help students study more efficiently as they:

- Access content online and off line on their desktop, laptop, and mobile device
- Search across the entire book content
- Take notes and highlight
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Wiley E-Text: Powered by VitalSource® provides students with anytime, anywhere access to course content. With the Wiley E-Text, students can:

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## Wiley Custom

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- Collaborate with our team to ensure your satisfaction

## Wiley Custom Select

Wiley Custom Select allows you to build your own course materials using selected chapters of any Wiley text and your own material if desired. For more information, contact your Wiley sales representative or visit <http://customselect.wiley.com/>.

## Videos

The **Psychology Around Us** series of psychology videos help bring lectures to life and, most important, engage students. They help demonstrate that psychology is all around us and that thought and behaviour, from the everyday to the abnormal, is truly fascinating. Averaging about five minutes each in length, this collection of videos covers a range of relevant topics. Each video is a high-quality excerpt from various agencies or independent video libraries chosen from a televised news report, documentary, lab study, or the like, and illustrating a specific lecture point, bringing the topic to life in exciting ways.

The wide selection of clips in this package focus on topics ranging from the split-brain phenomenon to conformity and obedience, emotions of fear or disgust, sensations of taste and smell, infant facial recognition, gender orientation, and brain development.

The video program is readily accessible and easily integrated into any introductory psychology course through the **Psychology Around Us, Third Canadian Edition, WileyPLUS** course. If instructors choose not to use any or all the videos in the classroom they have the option of assigning videos to students for viewing outside of class. Instructors can also use the prepared quizzes that test understanding of the videos' content and relevance.

## Student and Instructor Resources

The **Instructor's Manual** presents teaching suggestions for each chapter and includes ideas for lecture classroom discussions, demonstrations, and videos.

Every chapter contains a **PowerPoint Presentation** with a combination of key concepts, figures and tables, and problems and examples from the textbook. The instructor's version also includes notes for additional discussion points or activities you can use during your lecture. In addition, each PowerPoint contains links to videos and animation tutorials available for that chapter.

The **Test Bank** contains over 200 questions per chapter with a variety of question types—multiple choice, true/false, short answer, and essay. The Test Bank is available in a Word® document format, as well as a Computerized Test Bank, which allows you to upload the test bank into your learning management system. The questions are available to instructors to create and print multiple versions of the same test by scrambling the order of all questions found in the Word version of the test bank. This allows users to customize exams by altering or adding new questions.

**Practice Quizzes** offer several questions per learning objective that students can use to test their knowledge of the chapter content.

**Clicker questions** offer 10 to 15 questions per chapter that can be used with a variety of personal response (or "clicker") systems.

**An MCAT correlation guide** links MCAT topics to chapters and sections in **Psychology Around Us, Third Canadian Edition**, making it easy for students to use the content to prepare for the MCAT exam.

The **Wiley Psychology Weekly Update** site (<http://wiley-psychologyupdates.ca>) features articles and videos to help keep learners up to date on the field of psychology and illustrates the real-world significance of psychology in everyday life. Discussion questions are provided to help guide an understanding of the article or video and to encourage class participation.

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# Psychology: Yesterday and Today

## CHAPTER OUTLINE

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### What Is Psychology?

**LEARNING OBJECTIVE 1** Define *psychology* and describe the goals and levels of analysis psychologists use.

### Psychology's Roots in Philosophy

**LEARNING OBJECTIVE 2** Describe the influences of early myths and ancient Greek philosophies on psychology.

### The Early Days of Psychology

**LEARNING OBJECTIVE 3** Name important early psychologists and describe their major theories and research methods.

### Twentieth-Century Approaches

**LEARNING OBJECTIVE 4** Summarize the major principles of the psychoanalytical, behaviourist, humanistic, cognitive, and neuroscience approaches to psychology.

### Psychology Today

**LEARNING OBJECTIVE 5** Describe the three major branches of psychology and summarize key trends in psychology.

You have been looking forward to this Friday night all week. You have been planning to get into your oldest and most comfortable clothes and settle in front of Netflix watching something mindless, eating junk food and dozing until you fall asleep. You've had a long week filled with studying, exams, tension at work, and demands from friends and family. This was going to be your night to indulge yourself. But now, instead of feeling relaxed you feel anxious. Why? You looked at your Instagram feed and your Snapchat and Facebook accounts before settling in and now instead of feeling like this night is your chance to reenergize, you end up feeling insecure. Everyone, absolutely *everyone*, is having a better time than you are. And worse, if you stay



home, you might miss an opportunity to have the kind of fun that all your friends are having right now. Gone is the desire to relax and recover from your gruelling week; now you are feeling neglected and alone. FOMO (fear of missing out) has struck. This fear is not new—your parents also worried about being left out. However, social media keeps you apprised of what is happening with everyone you know, while your parents just had to wonder what their friends and acquaintances were up to. Research shows that FOMO makes people feel worse about themselves (Przybylski et al., 2013). In fact, the stronger the fear, the more you check what others are up to. And studies show that the more time you spend on social media the more likely you are to experience FOMO (Baker, Krieger, & LeRoy, 2016).

FOMO was added to the *Oxford English Dictionary* in 2013 and is defined roughly as chronic anxiety or apprehension that an exciting or interesting event may be happening elsewhere from which a person is absent. Although you know that people are making their lives look more perfect than they really are, deep down, you worry. You can't help but compare; what if it *is* just me? What if other people really *do* have this much fun? You worry that others are much happier than you are. So, what do you do? You post something about *your* awesome night. In so doing, you are now potentially making someone feel worse about their night . . . and so on. Three quarters of young adults report experiencing FOMO (Przybylski et al., 2013). Most users report that Snapchat makes them feel worse than Facebook (Utz, Muscanell, & Khalid, 2015).

When trapped in the cycle of FOMO, people tend to stop focusing on their own real lives and begin to focus instead on the lives of others. Instead of enjoying the family and friends who are physically with them, people suffering from FOMO fixate on Facebook and other social media. Instead of learning the information they are paying to learn, they check social media during lectures while at college or university. People with FOMO check their phones while driving, even though it's illegal in Canada. So, what can we do about the growing grip that FOMO and social media have on so many people? Well, first we must ask the right questions.

For example, is there anything good about social media? Are Facebook friends the same as “real” friends? Are there consequences to the way people share information on Facebook that could be changing how we think about friendship and other important human relationships? Psychologists have studied friendship for many years, but additional research may be needed to better understand how Facebook friendships are like and different from more traditional friendships (see photo). Why do people who admit that they exaggerated some claims and minimized others to make themselves look better on Facebook also report that they tended to trust what others posted on Facebook?

Psychology helps us to not only understand what we do, but why. For example, why are people drawn to social media in the first place? Why do some people develop FOMO but not others? How can we resist FOMO? As you read this book, you will see that the topics we examine contribute to what happens around us every day as well as to an understanding about unusual or problematic behaviours.

We'll discuss human development, examining how we mature and what shapes us as we age. Maybe the ease of online communication helps some otherwise shy children gain early confidence and establish more and better social relationships. We'll look at motivation and emotion, getting some ideas about why people do things and how we experience our feelings. What drives people to spend hours every day on social media, for example? We'll look at theories of intelligence, including one that suggests that the kind of intelligence needed to hack into websites and steal social insurance numbers is different from the kind of intelligence needed to empathize with people such as parents who have lost a child. Along the way, our goal is to help you gain insight not only into the attention-grabbing and sometimes bizarre things that can go wrong, but also into the often-overlooked but miraculous things that often go right.



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**Online friendships** Psychologists study all kinds of mental processes and behaviours, including using social media.



## 1.1 Practically Speaking

### Myths and Misconceptions

Have you ever heard anyone refer to “psycho-babble?” We have. This is usually a term applied to a speaker when the listener feels that the speaker is using psychological jargon to create an illusion of credibility about the issue at hand. Generally the assumption is that the speaker, an “arm chair psychologist” (Kelly, 1955), is using concepts they are unqualified to use and do not understand. We hope that by the time you finish reading this book you will have a good idea of how to tell pseudoscience from real science. Why does this matter? In their book, *50 Great Myths of Popular Psychology: Shattering Widespread Misconceptions about Human Nature*, Lilienfeld, Lynn, Ruscio, and Beyerstein (2010) say that it is important to know about myths for three reasons: (1) they can be harmful; (2) myths can create indirect damage; and (3) accepting myths in one area impedes thinking in other areas. We will present research data throughout the book to counter common myths, but first let’s examine a few common myths and misperceptions and also identify data that refute these beliefs.

- *People use only 10 percent of their brains.* Electrical brain stimulations have not identified *any* inactive areas in the brain (Beyerstein, 1999).
- *It is better to express anger than to bottle it up.* When people behave in an angry way their levels of aggression go up, not down (Lochman, Barry, Powell, & Young, 2010).
- *Some people are primarily right brained whereas others are primarily left brained.* The typical brain works in an integrated fashion (Geib, Stanley, Dennis, Woldorff, & Cabeza, 2017).
- *You can recall forgotten information under hypnosis.* Forensic psychologists believe that hypnosis either has no effect on memory or that it distorts recall (Baltman & Lynn, 2016).

- *People with schizophrenia have two personalities.* People with schizophrenia have only one personality; people with a form of dissociative identity disorder may have more than one personality, although even this idea is controversial (Renard et al., 2017).
- *Opposites attract.* People are far more likely to choose romantic partners and friends who share similar personality traits (Johnson, 2016).
- *Some look like their purebred dogs.* True (Roy & Christenfeld, 2004).



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Every journey begins with a first step, and in this chapter, the first step is to learn what psychology is and how it developed into the discipline we have now. After that, we’ll discuss where psychology originated and how it developed. Finally, we’ll learn more about psychology today, including what psychologists do, where they do it, and what’s new and changing in what they do.

## What Is Psychology?

### LEARNING OBJECTIVE 1

Define *psychology* and describe the goals and levels of analysis psychologists use.

From our earliest beginnings, people have been curious about the inner workings of the mind and have attempted to explain and predict the thoughts and emotions of themselves and of others. Today, the science of studying *mental processes* and *behaviour* is known as **psychology**. Psychology as a discipline is concerned with empirically examining the mind and behaviour and determining how each is influenced by the psychobiology of the organism as well as the effects of the external environment (see Practically Speaking 1.1).

**psychology** the study of mental processes and behaviours.

**mental processes** activities of our brain when engaged in thinking, observing the environment, and using language.

**behaviour** observable activities of an organism, often in response to environmental cues.

**Mental processes** describe the activity of our brains when we are engaged in thinking, processing information, and using language. Mental processes include complex experiences such as thinking, imagining, and remembering. During psychology's early history, the primary method for exploring internal mental processes was to observe outward **behaviour**, our observable actions, and make inferences, or guesses, about what was happening in the mind. Since psychology became an experimental science in the nineteenth century, however, psychological researchers have sought more direct ways to examine mental processes. In fact, the advent of brain imaging and other forms of technology have enabled scientists to uncover fascinating connections between behaviour and mental processes and to move toward a more comprehensive view of how mental processes occur in various individuals and situations.

When psychologists study mental processes and behaviour, they generally have one of four goals in mind:

- **Description.** Psychologists seek to *describe* very specifically the things that they observe. As you read this book, you'll see that psychologists have described phenomena ranging from how babies learn to talk to how we fall in love, how a human being is affected by early experience to how we make decisions, and more.
- **Explanation.** Telling what, where, when, and how is sometimes not enough. A key goal for many psychologists is to answer the question of "Why?" As we'll see, psychologists have developed hypotheses and theories to *explain* a huge variety of events, from why people develop addictions to substances to why we get hungry.
- **Prediction.** Psychologists also seek to *predict* the circumstances under which a variety of behaviours and mental processes are likely to occur. You'll learn later in this book, for example, about research that predicts the conditions under which we are most likely to offer help to a stranger in need.
- **Control.** We often encounter situations in which we want to either limit or increase certain behaviours or mental processes—whether our own or those of others. Psychology can give students advice on controlling their own behaviours that ranges from how to limit unhealthy stress to how to increase what you remember from a class.

To describe, explain, predict, or control mental processes and behaviours, we need to recognize the many influences on them. All our thoughts and actions, down to the simplest tasks, involve complex activation and coordination of a number of levels—the levels of the *brain*, the *individual*, and the *group*. As you will see throughout this textbook, no psychological process occurs solely at one of these levels. Analyzing how the brain, the individual, and the group influence each other reveals much about how we function—insights that might be overlooked if we were to focus on only one of these levels alone (see [Table 1.1](#)).

At the *level of the brain*, psychologists consider the neuronal (brain cell) activity that occurs during the transmission and storage of information. They also focus on the structure of the brain

**TABLE 1.1** The Levels of Analysis in Psychology

Level	What Is Analyzed	Example: Using Social Media
The brain	How brain structure and brain cell activity differ from person to person and situation to situation	What are the patterns of brain activation as people interact with "friends" online?
The person	How the content of the individual's mental processes form and influence behaviour	Are there personality factors that influence how much people use different types of social media? Can online social support or crisis resources improve people's decision making and quality of life?
The group	How behaviour is shaped by the social and cultural environments	What features of social networking sites, such as relative anonymity, ease of access, and lack of face-to-face contact, increase or decrease users' feelings of belonging and connectedness?

Source: Adapted from Gardner, 1993.

and the genes that guide its formation. As we'll see later in this chapter, technological advances in the fields of molecular biology and brain imaging have made it possible to study how brain structure and activity differ from person to person and situation to situation. For example, a psychologist studying the brain can now look at what parts of the brain are activated by the administration of a drug, or the brain changes that accompany anxiety and depression (Lim, Goh, Chan, & Poon, 2016).

At the *level of the person*, psychologists analyze how the *content* of mental processes—including emotions, thoughts, and ideas—form and influence behaviour. To use a computer analogy, this level relates to the software rather than the mechanical functioning, or hardware, of the brain. The level of the person includes ideas such as consciousness, intelligence, personality, and motivation. Although internal biological structures of the brain allow such person-level processes to occur, we cannot understand the processes unique to each individual, such as personality or motivation, without also studying this level.

Psychologists must also look beyond the individual to the *level of the group*. This perspective recognizes that humans are shaped by their social environment and that this environment changes over time. A *group* can be made up of friends, family members, or a large population. Often a large group shares a **culture**, a set of common beliefs, practices, values, and history that are transmitted across generations. The groups to which people belong or perceive themselves to belong can influence their thoughts and behaviours in fundamental ways (Gummadam, Pittman, & Ioffe, 2016). Canadian culture is rooted in the history of the First Nations as well as of the early settlers and of immigrants, resulting in a diverse population of mixed ethnic groups and cultures (Weinfeld, 2016). (See photo.)

When they conduct research, psychologists may focus on a single level of analysis. It is important to recognize, however, that activity does not take place only at one level or another. During even our most everyday activities, we are operating at all three levels at once. The levels also interact. Brain activity is affected by other levels, even by our broad cultural contexts. Similarly, changes in the biology of our brains can cause significant changes in our general state of being.

Let's go back for a moment to our earlier discussion of FOMO. If psychologists set out to understand behaviour involved in FOMO, they could examine it at various levels. Operating at the level of the brain, they could explore patterns of brain activation in users of social media suffering from FOMO to see what brain changes occur when they go online or seek to link to or interact with others. At the level of the person, psychologists could explore questions of early childhood experiences and personality to see whether there are certain characteristics related to the risk of developing FOMO. Finally, at the level of the group, psychologists might examine whether the need to compare ourselves with others can be used to promote happiness and life satisfaction. As you'll see throughout this book, the notion of multiple levels of analysis has played an important role in the development of psychological theories (Hagger, Chan, Protogerou, & Chatzisarantis, 2016).

Having examined what psychologists study and how they do it, let's next consider how psychology got its start, how historical and societal factors affected the way psychologists studied the mind and behaviour, and how perspectives and approaches vacillated over the discipline's rich and varied history. We'll examine how psychologists shifted their focus among the different goals and levels of analysis throughout psychology's history. You cannot truly appreciate psychology as it is now without a brief review of the growth and development of the field as it was shaped to become the discipline we have today.

**culture** a set of shared beliefs and practices that are transmitted across generations.



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**Diversity of Canadian culture** Canadian culture is often characterized as multicultural, encompassing influences from a wide range of nationalities as well as from its own indigenous culture.

**What Do You Know?**

1. How is behaviour different from mental processes? How are they the same?
2. What are the three levels of analysis in psychology?

**What Do You Think?** What would be the focus of each of the four goals of psychology when studying the use of Facebook and other social media? How would the questions and actions of a psychologist who seeks to describe social media use differ from those of someone who wants to limit children's and adolescents' use levels, for example?

## Psychology's Roots in Philosophy

### LEARNING OBJECTIVE 2

Describe the influences of early myths and ancient Greek philosophies on psychology.

Historically, humans have attempted to explain inexplicable events in their natural environments through *myths*. Myths are stories of forgotten origin that seek to explain or rationalize the fundamental mysteries of life and are universal—that is, common to all cultures. Myths seek to explain topics such as the reason for earthquakes, why crops are poor or plentiful, how humans came to be, and so on. A number of ceremonies and rituals based on these beliefs were then devised (see photo). Some theorists today believe that myths developed into some systems of religion, and that myths reflect an innate human need to understand and make sense of people and the natural world. In fact, according to these theorists, science is somewhat similar to mythology in that science represents our attempt to describe, explain, predict, and control our reality (Waterfield, 2000).

Although they focused on supernatural, life-giving forces, early belief systems as well as the cosmogonies (studies of the origin of the universe) of the Near East contributed to the intellectual curiosity and quest for knowledge that characterized the early Greek philosophers in the fourth and fifth centuries B.C.E. Although they did not consistently rely on empirical methods

to examine questions, the great thinkers of ancient Greece moved beyond supernatural explanations. Instead, they tried to find ways to determine the nature of reality and the limitations of human awareness. To accomplish these difficult goals, they engaged in open, critical discussions of each other's ideas.

The intellectual history of psychology (like much of Western thought) starts with the history of Greek philosophy because unlike other important world philosophies, the Greeks had a recorded language (Boeree, 2006). *Philosophy* is defined as the study of knowledge, reality, and the nature and meaning of life. Among many other questions, the ancient philosophers such as Socrates, Plato, and Aristotle queried how the human mind worked, how the human body related to the mind, and whether knowledge was inborn or had to be learned from experience (Hothersall, 1995). In addition, the Greek philosophers developed a method of introducing problems and then questioning proposed solutions that is at the core of modern scientific methods, which we will discuss in greater detail in Chapter 2. Greek philosophers also emphasized that theories, ideas about the way things work, are never final, but rather are always capable of improvement. Psychologists still take this view.



Chuck Stoodly/The Canadian Press

**Rituals** Many ceremonies and celebrations developed as a way to understand the natural and human world. The Coast Salish peoples of British Columbia passed down their oral history, including customs and beliefs, through stories, songs, and dances.



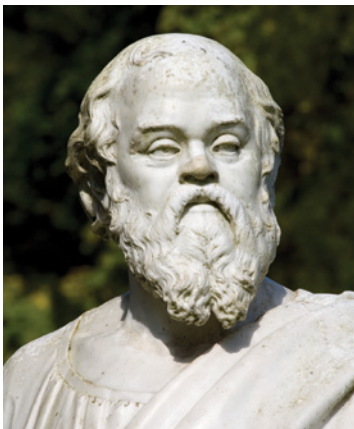
Hippocrates (ca. 460–377 B.C.E.), a Greek physician, believed that disease had a physical and rational explanation and that it was not caused by evil spirits or as a punishment from the gods. He erroneously suggested that an individual's physical and psychological health is influenced by an excess or a lack of bodily *humours*. He believed that these four bodily fluids (blood, phlegm, yellow bile, and black bile) collectively determined a person's personality and character, and predicted the individual's well-being and responses to environmental events (see illustrations). Although Hippocrates' medical theory of *humourism* was wrong, he was the first to recognize the importance of good food, fresh air, and rest, and he accurately diagnosed the symptoms for pneumonia and epilepsy. He also correctly identified the brain as the organ of mental life, and argued that thoughts, ideas, and feelings originated in the brain and not in the heart—as was commonly believed at the time. Hippocrates tested his theories with direct observation and some dissections. Because of such early efforts, academic study became rooted firmly in detailed scientific methods of study.

Other Greek philosophers, such as Socrates (ca. 469–399 B.C.E.) and Plato (ca. 427–347 B.C.E.), considered whether the mind and the body were one thing or whether each functioned separately. They concluded that the mind and body are distinct and that the mind continues after the body dies. They believed that “truth” lies in the mind and that this knowledge was innate—that is, inborn or existing within a person from birth—and is highly dependent upon our perceived, or subjective, states. Socrates therefore looked for concepts that were the “essence” of human nature and searched for elements that various concepts had in common. He tried, for example, to identify *why* something was beautiful, and what essential factors an object must possess in order to be beautiful. His student, Plato, believed that certain ideas and concepts were pure and signified an ultimate reality. Plato believed that we could use reasoning to uncover the core ideas deeply imbedded in every human soul. The ideas of these two philosophers represented early studies of mental states and processes.

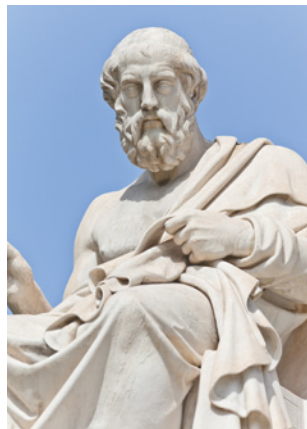


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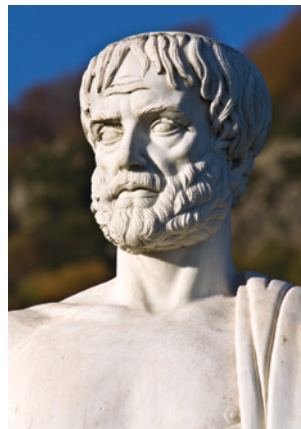
**Hippocrates' psychological theory** This medieval manuscript illustrates the psychological effects of the humours proposed by the Greek physician. The illustration on the left demonstrates the melancholia produced by black bile, while the one on the right depicts the joyous, musical, and passionate personality produced by blood.



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**Greek philosophers** Socrates mentored Plato who, in turn, mentored Aristotle.

Similarly, Aristotle (ca. 384–322 B.C.E.), a student of Plato's, and one of the most famous thinkers of the Greek period, made key contributions to the foundations of psychology (see photos). His writings represent some of the first important theories about many of the topics discussed throughout this book, such as sensations, dreams, sleep, and learning (Lorusso, 2010). Aristotle was one of the first to promote empirical, or testable, investigations of the natural world. He looked inward at sensory experiences and also scrutinized his environment carefully, searching for the basic purpose of all objects and creatures. In his studies, he formed



ideas about how living things are hierarchically categorized, concluding—centuries before Charles Darwin—that humans are closely related to animals.

## Psychology's Roots in Physiology and Psychophysics

As Europe emerged from the Dark Ages, the philosophies of the ancient Greek scientists and philosophers were rediscovered approximately 2000 years after they lived and re-emerged to influence European thinkers throughout the Renaissance. Although mysticism declined as a form of explanation for human nature, there remained great confusion and disagreement regarding human motives and origins.

In the centuries both during and after the Renaissance through to Associationism, European society underwent a scientific revolution. A spiritual worldview, which had dominated for several centuries, was increasingly replaced by a view of the world based on mathematics and mechanics. By the 1600s, modern science began to thrive and over time both the universe and human beings were viewed as machines subject to fixed natural laws. The dominant view was that the brain controlled the body by moving fluids from one area to another. The roles of magic and mysticism in science essentially disappeared (Leahey, 2000).

During this time, Francis Bacon (1561–1626), an English philosopher, scientist, and statesman who was fascinated by the human mind, became a prominent figure in scientific methodology and natural philosophy. He is widely regarded as the creator of *empiricism*: the view that all knowledge originates in experience. He established and popularized the scientific method, gathering data, analyzing data, and performing experiments.

Like Socrates and Plato, René Descartes (1596–1650; see illustration), the first of the modern philosophers and an early scientist, viewed all truths as ultimately linked and believed that the meaning of the natural world could be understood through science and mathematics. Descartes contemplated the nature of existence and dualism of the mind and body, believing the mind to be distinct from the body. He identified the point of contact between the two as the pineal gland, and he believed that the mind (which he viewed as synonymous with the soul) would survive the death of the body and was therefore the “province of God” (Pickren & Rutherford, 2010, p. 5).

The theories of both Bacon and Descartes influenced the work of British philosopher John Locke (1632–1704), who believed that we learn by our experiences. He notably argued that the mind at birth is a *tabula rasa*—a blank slate—“a white paper, void of all characters, without any ideas” (Locke, 1689), waiting for experience to imprint knowledge. That is, Locke thought that at birth the human mind has no innate ideas but instead acquires all knowledge through experience.

While philosophers debated about the nature of the human experience, other researchers believed that important insights about the brain and body could be understood by combining empirically established facts with philosophical thinking. The area of psychophysics, pioneered by prominent physiologist Johannes Müller (1801–1858), maintained that researchers needed to study the relationship between physical stimuli and their psychological effects—that is, the sensations and perceptions they affect. Psychophysics examined questions such as how much sound or light needs to be present to be detected, and how much sound or light must be added to an initial signal before we notice the change. Herman von Helmholtz (1821–1894), a student of Müller’s, was the first to measure the speed of a nerve impulse and determined that nerve impulses occur over time rather than instantaneously. This finding led to the understanding that thought and movement are linked, but are not the same thing. The work of von Helmholtz contributed to the foundation of modern physiological psychology and neuroscience (Benjamin, 2007).

Gustav Fechner (1801–1887) was a German philosopher and physicist who is considered to be one of the founders of experimental psychology. He published a book summarizing this work in 1860, called *Elements of Psychophysics*. In the book, Fechner (1860) lays out many of the methods and study techniques that would come to be used in the emerging field of psychology. His evidence of the relationship between physical and mental events demonstrated that psychology had the potential to become a quantified science. While Fechner completed



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**René Descartes** First of the modern philosophers.

his manuscript, a physiologist, Wilhelm Wundt (1832–1920), came to work in the laboratory with Helmholtz. As we will see, these two events contributed to the foundation of psychology as a discipline.

## Before You Go On

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### What Do You Know?

3. What do the earliest myths have in common with today's scientific studies?
4. Greek philosophers who believed reasoning would uncover ideals or core ideas were focused on which aspect of psychology?
5. How did the Greek philosopher Hippocrates explain mental processes and behaviour? How did Hippocrates' research methods influence today's study of psychology?

**What Do You Think?** What advantages do you think a scientific approach has for explaining behaviour and mental processes compared with a supernatural approach?

# The Early Days of Psychology

## LEARNING OBJECTIVE 3

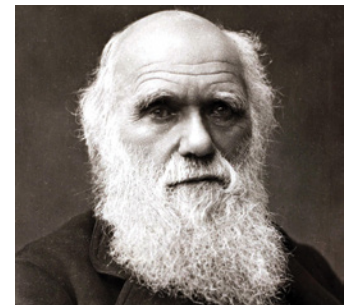
Name important early psychologists and describe their major theories and research methods.

In the latter part of the nineteenth century, Charles Darwin (1809–1882; see photo), in his book *On the Origin of Species* (1859, 1872), proposed the theory of evolution, making the radical suggestion that all life on Earth was related and that human beings were just one outcome of many variations from a common ancestral point. Darwin also suggested natural selection as the mechanism through which some variations survive over the years while other variations fall out of existence. *Natural selection* proposes that chance variations are passed down from parent to offspring, and that some of these variations are *adaptive*—better suited to an organism's environment. These adaptive variations help the organism to survive and reproduce in their specific environment. On the other hand, less-adaptive variations reduce the ability of an organism to survive.

## The Founding of Psychology

In this atmosphere of heightened interest in the mind–body duality debate and the nature–nurture debate among philosophers, physicians, and scientists, psychology emerged as a distinct scientific field of investigation. As we have observed, prior to the late nineteenth century, psychology was virtually indistinguishable from the study of philosophy. In 1879, however, the physiologist Wilhelm Wundt (1832–1920) opened a laboratory in Leipzig, Germany, dedicated exclusively to the study of psychology (see photo). As a natural scientist, Wundt believed that the study of mind and behaviour ought to be conducted using the experimental methods of other sciences such as chemistry and physics, so he established a program that trained students to perform empirically-driven experiments in psychology. Psychology's emphasis on rigorous, scientific experimentation continues to this day, as we'll see in Chapter 2.

Wundt exposed research participants to simple, standardized, repeatable situations and then asked them to make observations, an approach similar to the one used in the study of physiology. One of Wundt's most famous experiments involved a clock and pendulum.



Bob Thomas/Popperfoto/Getty Images

### Charles Darwin (1809–1882)

The theories by the English naturalist about human evolution shifted scientific attention toward human origins and behaviour.