

NINTH CANADIAN EDITION

THE WORLD OF PSYCHOLOGY

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About This Course

An Invitation to the Student

We all learn best when we can apply new concepts to the world we know. The ninth edition of *The World of Psychology* allows you to do just that. Highly interactive and active, clearly written, and thoroughly up to date, this new edition of our textbook will encourage you to think for yourself as you learn about, relate to, and apply the psychological principles that affect your life.

So that you can make the most of all the material in the following pages, this textbook package incorporates a number of helpful features and ancillary items.

A Clear, Engaging Writing Style

Over the years, few texts have received such positive responses from students as *The World of Psychology*, and first and foremost is praise for its writing style. In fact, class tests of the first edition got 100 percent positive feedback and it has received continued positive reviews for each subsequent edition of the book. The style is conversational, and the text uses numerous everyday examples and real-life events to help you grasp even the most complex concepts. As well, the contents of each chapter are organized into modules to help chunk the information for easier reference.

Each chapter opens with a vignette (a dramatic real-life story or series of stories) or an activity that draws you into the topics that will be covered in the chapter and shows how psychology relates to the world around you. Each vignette or activity is memorable and directly related to the chapter's content.

You'll be especially interested in the stories and activities related to

- The positive and negative impact of social media.
- How our brain has adapted to the use of emojis.
- How to control your dreams.
- What happens if a child is raised in the wild.

Canadian Connections introduces interesting historical or more recent Canadian news events with the goal of demonstrating how these experiences you have heard about fit within psychology. These interesting stories provide meaningful real-world examples to aid in understanding the material presented in the chapters. Some *Canadian Connections* boxes highlight cutting-edge contemporary research being conducted in Canadian universities. This will give you an opportunity to see what current research is being conducted in Canada with respect to the topics you are reading about and an idea of the diverse array of research being conducted across Canada today.

Interact with Your Textbook

What better way to learn new material—to make it fresh, interesting, and memorable—than for you to demonstrate the principles for yourself? The unique *Try It* feature encourages you to learn by doing. This highly praised feature provides simple experiments that you can perform without elaborate equipment, usually as you read.

Knowing what to study and how to discriminate between critical points and fine or more peripheral details is a challenge for any new learner to an area. The *Learning Objectives* at the beginning of each module will help orient you to the key ideas and organize information as you read. These features follow from a substantial body of research showing that memory and comprehension can be improved by organizing information.

In addition, research has shown that checking your progress at key points as you study will also help you remember what you have read. One other way you can interact with your textbook is by taking the quizzes at the end of each module.

Finally, you'll have a chance to relate psychological principles to your own life in the *Apply It* section at the end of each chapter. Each *Apply It* helps you to apply psychology to your personal life and issues. Topics include

- Tips to reduce anxiety about public speaking.
- How to prepare and make a good impression in job interviews
- How dangerous is it to talk on, text, or use a cellphone while driving?
- What should you consider when choosing a therapist?
- How can you improve your memory using mnemonic strategies?

Content Highlights

In preparing the ninth edition of this book, our primary goals were to introduce critical issues in psychology accurately and clearly to students, using a format that is both interesting and memorable. We present the principles of psychology using a clear and engaging writing style and a pedagogically sound learning format that is accessible and appealing to students.

Having taught thousands of students their first course in psychology, we are sensitive to the complexities of the teaching/learning process, and are acutely aware of the tremendous changes that have occurred in the field of psychology over the years. With this in mind, we sought to create a textbook that is sensitive to the changing needs of students and their professors and that will provide a context in which readers may learn about psychology's past, present, and probable future.

The Ninth Edition

Despite the overwhelming response to our first eight Canadian editions of *The World of Psychology*, we have incorporated a number of improvements into the new edition. In accordance with reviewer suggestions and the goals stated above, the ninth Canadian edition features the following elements:

- The modular structure introduced in our fifth edition was retained and further refined in this edition. The modular framework divides each chapter into manageable “chunks” of information that are easier for instructors to assign and for students to read. Organizing material into meaningful chunks helps improve students’ memory by supporting the organization of information, and the smaller units make it easier to remember by minimizing the demands on working memory capacity—or memory span. It also allows for increased flexibility for instructors when assigning material.
- *Learning Objectives* appear at the beginning of each module, and learning objective numbers are presented with the corresponding material in the text. The goal of the learning objectives is to provide an organizer for students at the outset of each module. This will help students to understand how to read the material in each chapter by highlighting the critical information to be learned. This feature will enhance the learning experience by promoting greater memory and comprehension. Learning objectives and the corresponding summaries at the end of the chapter have been revised to ensure clear, succinct connections throughout this text.
- Canadian and international research has been updated to reflect new trends and areas of focus in psychology research as well as societal changes.
- The *Canadian Connections* boxes highlight events past and present that show how Canadians are or have been involved in the issues being presented in the text. For example, some *Canadian Connections* boxes highlight key Canadian researchers and their most recent work, while others integrate Canadian historical events with current issues. These boxes integrate Canadian contributions and events within the broader field of psychology.
- The opening vignettes share important stories to draw attention to the practical and real-world importance of the information in the chapter. New vignettes invite students to complete activities or mini-surveys to engage them more directly in the content that will follow.

Canadian Context

Our Canadian colleagues and their students find that many introductory psychology texts target an American audience. We believe that students learn best when materials are relevant to their lives. The Canadian content in this text includes events in the media, current research, and historical references to Canadian facts and contributors. By including information

that is more meaningful to Canadian students, we hope to enhance their understanding and retention of the material.

Part of the Canadian identity is our recognition of the diversity in society. To acknowledge this, we have made an effort to include the influential work of psychologists from around the world. Also, we have tried to include events and studies from different regions of Canada. We believe this added value makes *The World of Psychology*, Ninth Canadian Edition, a balanced, universal text.

A Clear, Understandable, Interesting Writing Style

First and foremost, a textbook is a teaching instrument. A good psychology textbook must communicate clearly to a wide audience of various ages and levels of academic ability. Our book is appealing to accomplished students, yet accessible to those whose academic skills are still developing.

We achieved this objective (we hope) by explaining concepts in much the same way as we do in our own psychology classes. Throughout the text we sought to ensure flow and continuity by using a conversational style and avoiding abrupt shifts in thought. In addition, the text is filled with everyday examples that are pertinent to students’ lives.

A Series of High-Interest Features That Will Appeal to Today’s Students

Every chapter opens with a vignette or activity to capture student interest and build motivation. We have also included special features:

- *Apply It* sections show the practical applications of the principles of psychology.
- *Canadian Connections* discuss Canadian news events that demonstrate concepts outlined in the text and/or highlight contemporary research being conducted in Canadian universities.
- *World of Psychology* boxes in selected chapters explore issues that should be of special interest to students.

A Textbook That Encourages Students to become Active Participants in the Learning Process

Reading about psychology is not enough. Students should be able to practise what they have learned, where appropriate. Many of the principles we teach can be demonstrated, often without elaborate equipment and sometimes as the student reads. What better way to teach new material and make it fresh, interesting, and memorable than to have students demonstrate principles for themselves using an important and innovative

element of the book: *Try It* sections? The response to *Try It* demonstrations from professors and students has been so positive that this feature appears in every chapter. The *Try It* sections personalize psychology and make it come alive.

Student involvement is also promoted through the use of rhetorical questions and by casting the student in the role of the participant in selected studies and descriptions of real-life events. Thus, students who use *The World of Psychology* become active participants in the learning process rather than simply passive recipients of information.

An Emphasis on Critical Thinking

Thinking critically does not call for being critical of all viewpoints other than one's own. Rather, critical thinking is a process of evaluating claims, propositions, or conclusions objectively in order to determine whether they follow logically from the evidence presented. Critical thinkers are open-minded, objective, and unbiased, and they maintain a skeptical attitude that leads them to search for alternative explanations.

Help for Students to Understand Human Diversity and More Fully Comprehend the Part Multicultural Issues Play in Contemporary Psychology

Human diversity issues are integrated throughout the book, both within the main text presentation and as highlighted special features. This form of presentation parallels the presence of diversity in Canada as a mainstream and special-interest issue. Diversity issues include cultural, gender, and age concerns in selected topic areas in each chapter. For example, in Chapter 1 we focus on the problem of bias. Later, we discuss the impact of culture on memory, the effect of personality on perception, the interpretation of emotion, and preferred forms of therapy. These, along with other segments, help to promote understanding of human diversity and how it is an integral part of our perception of the world.

Current Coverage That Preserves the Classic Contributions in Our Field

Advances in knowledge and research are occurring at an ever-increasing pace, and modern authors must keep abreast. This edition introduces students to the most up-to-date research on many topics that feature rapid change, including advanced technologies, neuropsychology, gender, changes in social norms, violence, PTSD, aggression and stress, adolescent drug use, and new therapies.

Yet we do not value newness for its own sake. We include, as well, studies that have stood the test of time, and we explore the classic contributions to psychology in depth.

An Appreciation of Psychology's History and an Understanding That Psychology Is a Living, Growing, Evolving Science

A portion of Chapter 1 is devoted to psychology's history. But in our view, the history of psychology is best understood and appreciated in the context in which the contributions were made. Consequently, discussions of such topics as learning, memory, intelligence, emotion, and personality integrate both historical and recent research contributions to show how psychology has evolved up to the present day.

An Accurate and Thoroughly Researched Textbook That Features Original Sources

To accomplish our goal of introducing the world of psychology accurately and clearly, we have gone back to original sources and have read or reread the basic works of the major figures in psychology and the classic studies in the field. We have also reviewed countless new studies to ensure that the information provided is at the cutting edge of research. This has enabled us to write with greater clarity and assurance, without having to hedge or write tentatively when discussing what experts in the field have actually said. This book is one of the most carefully researched, up-to-date, and extensively referenced psychology textbooks available.

A Sound Pedagogical System in the Text and Learning Package

The pedagogical system in *The World of Psychology* consists of the following components:

- **Learning Objectives.** Learning objectives orient students to the critical information to be learned within each module.
- **Review & Reflect Tables and Summarize It Widgets.** We have expanded our use of the extremely popular summary tables and widgets, called *Review & Reflect* and *Summarize It*, which are useful for reviewing and comparing various perspectives, theories, and other concepts.
- **Text-Embedded Glossary.** A text-embedded glossary provides a ready reference for important key terms that appear in boldface in the text. Definitions appear in context and also in the *Glossary* at the back of the book.
- **Summary & Review.** These end-of-chapter features provide succinct summaries for key concepts.

About the Authors

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Samuel E. Wood (deceased) received his doctorate from the University of Florida. He has taught at West Virginia University and the University of Missouri–St. Louis and was a member of the doctoral faculty at both universities. From 1984 to 1996, he served as president of the Higher Education Center, a consortium of 14 colleges and universities in the St. Louis area. He was a co-founder of the Higher Education Cable TV channel (HEC-TV) in St. Louis and served as its president and CEO from its founding in 1987 until 1996.

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Ellen Green Wood received her doctorate in educational psychology from St. Louis University and was an adjunct professor of psychology at St. Louis Community College at Meramec. She has also taught in the clinical experiences program in education at Washington University and at the University of Missouri–St. Louis. In addition to her teaching, Dr. Wood has developed and taught seminars on critical thinking. She received the Telecourse Pioneer Award from 1982 through 1988 for her contributions to the field of distance learning.

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Eileen Wood received her doctorate from Simon Fraser University. She is a full professor in the Department of Psychology at Wilfrid Laurier University. She conducts research in developmental and educational psychology. Her primary research interests involve studying how people acquire, maintain, and recall information, especially when technologies are involved. She applies this research to numerous contexts including: assessing

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Dedications

To Chris, for her humour and joy in good times, and for her care and patience in bad.

—S.D.

To my family, who are my inspiration, and my greatest delight.

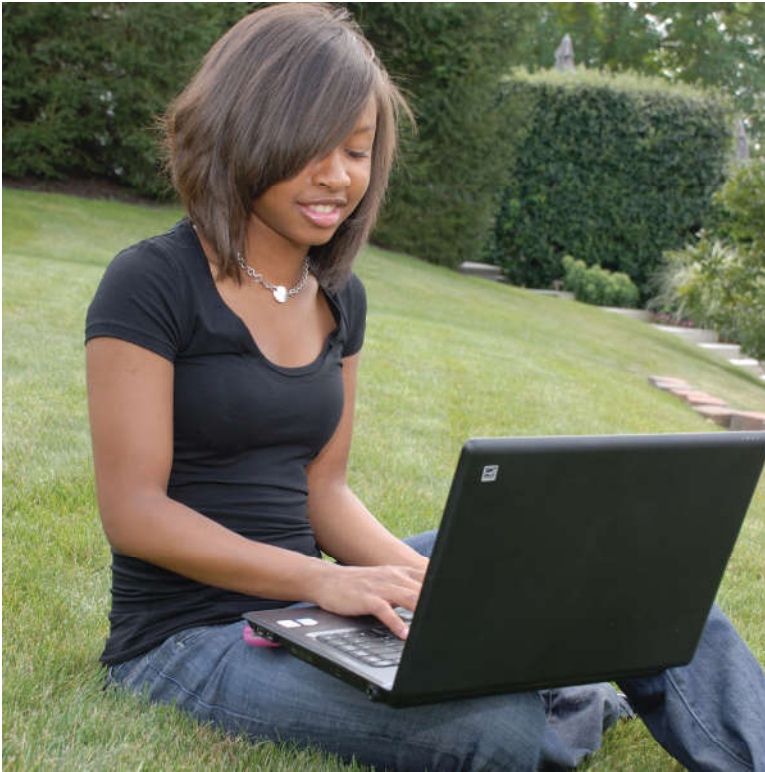
—E.W.

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Chapter 1

Introduction to Psychology



Mark edwards/Fotolia

Module 1.1 Introduction to Psychology

Module 1.2 Descriptive Research Methods

Module 1.3 The Experimental Method

Module 1.4 Participants in Psychological Research

Module 1.5 The Historical Progression of Psychology

Module 1.6 Psychology Today

How often do you use social media? Do you use Facebook, Instagram, or Twitter? Are you a regular YouTube watcher? Our educated guess is that most of you rely heavily on social media for many aspects of your daily lives. After all, recent Canadian data show that 22.69 million Canadians, or roughly 62 percent of the population, are regular users of social media (Statistica, 2017). Social media are changing the very nature of social relationships and communications. This is especially true for college and university students who were the earliest to adopt social media and remain its most frequent users (Pew Research Center, 2017).

As all of you know, social media are now integrated in many, if not most, aspects of our daily lives. They can help you keep in touch with friends, family, and acquaintances, find new friends, show pictures of trips, share selfies, and even serve as a way to start—or end—relationships. Social media are also used to watch shows, engage in political conversations, or invite people to a party. While popular, engaging, and convenient, social media are not without problems. For instance, social media open up a person's world—activities, list of friends, and personal information—to full public scrutiny (boyd & Ellison, 2007), creating some serious concerns over issues of personal privacy (Acquisti, Brandimarte, & Loewenstein, 2015). Other research indicates that social media, such as Facebook, may also cause jealousy among romantic partners and may negatively impact romantic relationships (Muisse, Christofides, & Desmarais, 2009, 2014). But the potential problems associated with social media do not change the fact that they are now a significant part of everyday life—how many of us could live without them? This fact raises many important questions: Is this technology changing us? Has it become so difficult to make personal connections in our daily lives that we must use social media as a way of keeping in touch with our friends or reconnecting with people we once knew? Why is it that people are now so willing to open up their lives for the world to see, whereas only a few years ago most of us would have hidden our diaries for fear of having our perceptions, dreams, and fantasies revealed? Has technology blurred the lines between public and private life?

When you hear the word *psychology*, what is the first thing that comes to mind? Do you think about social media such as Facebook, Snapchat, or Twitter? Probably not. However, it is exactly these simple parts of our daily lives that connect us all to the field of psychology, from our daily actions and thoughts, to the way we present ourselves to others whether in person or online, to how our brain conceives of the world around us. Most people have a very poor conception of the area of psychology. They often think that this field of research tends to focus only on psychological disorders and what is done in psychotherapy. This incorrect perception is guided most frequently by what is shown in popular media, from TV shows that only portray psychologists working in criminal fields or with clients who have psychological disorders, to self-help books that often focus on relationships and personal growth. The fact is that psychology covers more issues than you'd expect, including the everyday exchanges we have with friends and others in our virtual and online worlds!

There are many branches of psychology and you will be introduced to them all in this text. Psychologists specializing in the different areas of psychology look at situations from different perspectives. For example, given today's use of social media to connect with our friends and social network, a social psychologist might want to examine whether connecting with people online affects the quality of those relationships; do people who frequently use Facebook, Twitter, or Instagram to keep in touch with their friends or family maintain as close a relationship with them as those who tend to meet face to face? A personality psychologist, on the other hand, might want to find out what personal characteristics are associated with using social media. Are shy people more likely to prefer this means of interaction? Are self-centred people more likely to take lots of selfies or reject selfies that don't project an idealized version of themselves? In contrast, a cognitive psychologist might want to investigate whether using social media influences the way we think, write, or communicate with others. Will the increased use of abbreviations, such as those we use when communicating with each other by text message, affect how people talk to each other? And a developmental psychologist might want to know whether children who start using social media early in life will develop a different understanding of themselves and the world around them—are children aware that the material they post on most social media may be entirely accessible by anyone? (For that matter, are *you* aware of that?)

It is not possible in this brief introduction to portray the full range of research possibilities that might interest psychologists wanting to study the impact that social media or other online communication tools have on our lives or even to consider the ways in which these various research avenues might be investigated. This book, *The World of Psychology*, is designed to expose you to psychological research and to help clarify some of the complexities of this academic discipline and its application.

Module 1.1 Introduction to Psychology

- LO 1.1 Define *psychology*.
- LO 1.2 Identify and explain psychology's four primary goals.
- LO 1.3 Explain what a theory is.
- LO 1.4 Compare and contrast basic and applied research.

The word *psychology* often conjures up images of mental disorders, abnormal behaviour, and adjustment to difficult periods of life. As we pointed out above, however, although psychologists do sometimes study the strange and unusual, they are most often interested in day-to-day events—the normal and commonplace.

Just what is psychology? Psychology has changed over the years and so has its definition. In the late 1800s, mental processes were considered to be the appropriate subject matter of psychology. Later, there was a movement to restrict psychology to the study of observable behaviour alone. Today, the importance of both areas is recognized, and **psychology** is now defined as the scientific study of behaviour and mental processes. [LO 1.1]

Before you read the next section, answer the questions in the *Try It* below to see how much you already know about some of the topics we will explore in *The World of Psychology*.

psychology

The scientific study of behaviour and mental processes.

Psychology: Science or Common Sense?

Most people tend to have a vague understanding of psychology. For instance, students often begin their first course in psychology with a sense that psychology is more common sense than science. But can we make a valid claim that psychology is a science?

Try It

Test Your Knowledge of Psychology

Indicate whether each statement is true or false.

1. Memory is more accurate under hypnosis.
2. All people dream during a night of normal sleep.
3. As the number of bystanders at an emergency increases, the time it takes for the victim to get help decreases.
4. There is no maternal instinct in humans.
5. Older adults tend to express less satisfaction with life in general than younger adults do.
6. Eyewitness testimony is often unreliable.
7. Children with high IQs tend to be less able physically than their peers.
8. Creativity and high intelligence do not necessarily go together.
9. When it comes to close personal relationships, opposites attract.
10. The majority of teenagers have good relationships with their parents.

Let's consider your own answers to the questions: Is it possible that what you believed to be common sense may have led you astray? All the odd-numbered items are false, and all the even-numbered items are true. So common sense, on its own, will not take you very far in your study of psychology.

Many people believe that whether a field of study is a science depends on the nature of its body of knowledge. Physics, for example, is a science, and so is chemistry. But neither qualifies as a science solely because of its subject matter. A science is a science not because of the nature of its body of knowledge, but because of the approach—the standards, methods, values, and general principles—employed in acquiring that body of knowledge. Psychology is considered a science because it uses the scientific method, which attempts to minimize biases, preconceptions, personal beliefs, and emotions (Christensen, Burke Johnson, & Turner, 2014).

The Goals of Psychology

What are the four goals of psychology?

The goals of psychology are the description, explanation, prediction, and influence of behaviour and mental processes. **[LO 1.2]** Psychological researchers always seek to accomplish one or more of these goals when they plan and conduct their studies.

The first goal, *description*, is usually the first step in understanding any behaviour or mental process. To describe a phenomenon, we must make accurate notes about the behaviours or situations we observe. These observations become our *data*—the specific pieces of information we use in our analyses. For instance, if you are examining how two strangers from different cultures relate to each other when they meet for the first time, you need to keep accurate notes about every detail of the interaction—how long they look at each other, how far away they stand from each other, along with all other details of their behaviour. The goal of description is usually more important in a very new area of research or in the early stages of research.

The second goal, *explanation*, requires an understanding of the conditions under which a given behaviour or mental process occurs. This step certainly goes beyond description. Here, researchers try to understand the causes of the behaviour or mental process. In other words, the explanation goal allows researchers to tell “why” a given event or behaviour occurred—for example, why do strangers who meet for the first time stand far away from each other? Why does one of them smile when the other one smiles? But researchers do not reach the goal of explanation until their results have been tested, retested, and confirmed. Researchers confirm an explanation by eliminating or ruling out other, competing explanations.

The goal of *prediction* is met when researchers can specify the conditions under which a behaviour or event is likely to occur. The goal here is to understand or predict the likelihood that an event will occur under a certain set of circumstances. Researchers might ask, for example, whether the distance at which strangers stand from each other differs as a result of the culture they come from. In other words, can culture predict social distance? Is there a predictable or replicable pattern? If researchers have identified all the prior conditions required for a behaviour or event to occur, they can predict the behaviour or event.

The goal of *influence* is accomplished when researchers know how to apply a principle or change a condition to prevent unwanted occurrences or to bring about desired outcomes. The ability to influence behaviour can have positive consequences. For instance, it enables psychologists to design types of therapy to prevent anxiety attacks or depression. It also enables researchers to develop techniques that can be employed to improve one's memory.

What Is a Theory?

Any science has a well-established body of theory to guide its research, and psychology is no exception. A **theory** is a general principle or set of principles that explains how a number of separate facts are related to one another. [LO 1.3] In other words, a theory is an attempt to explain why something happens. It is based on evidence and attempts to predict the future occurrence of an event or action. A theory enables researchers to fit many separate facts into a larger framework; it imposes order on what otherwise would be a disconnected jumble of data. The value of a theory depends upon how well it accounts for the accumulated research findings in a given area and upon how accurately it can predict new findings.

A theory serves two important functions: (1) it organizes facts—a necessary step toward arriving at a systematic body of knowledge; and (2) it guides research. When researchers conduct a new study, they test the theory's accuracy. If the theory's predictions are supported, this new finding serves to reinforce the general principles that underlie the theory. But it is important to remember that a good theory is one that provides an explanation that is clear, comprehensive, explicit, simple, and always *falsifiable*. A falsifiable theory is scientific because it is testable and can be rejected if the predictions are not confirmed. Theories are not certainties—they are made to be tested and changed if the data do not support the theory's predictions. Researchers often use theories to generate hypotheses, as we'll discuss later in this chapter.

theory

A general principle or set of principles that explains how a number of separate facts are related to one another.

Basic and Applied Research

What is the difference between basic and applied research?

The two main types of research that psychologists pursue to accomplish their goals are (1) basic, or pure, research and (2) applied research. [LO 1.4] The purpose of **basic research** is to seek new knowledge and to explore and advance general scientific understanding. Basic research investigates such topics as the nature of memory, brain function, motivation, and emotional expression; the causes of mental disorders such as schizophrenia, depression, sleep and eating disorders; and so on. Psychologists doing basic research usually seek to accomplish the first three goals—description, explanation, and prediction. Basic research is not intended to solve specific problems, nor is it meant to investigate ways to apply what is learned to immediate real-world problems. Yet very often the findings of basic research are later applied in real-world settings. For example, much basic research in neuroscience has resulted in the development of new drugs that have improved the lives of those who suffer from psychological disorders.

Applied research is conducted with the specific goal of solving practical problems and improving people's quality of life. Applied research focuses on such things as methods to improve memory or increase motivation, therapies to treat mental disorders, ways to decrease stress, and factors that improve people's job satisfaction. Applied

basic research

Research conducted for the purpose of advancing knowledge rather than for its practical application.

applied research

Research conducted for the purpose of solving practical problems.

Module 1.2 Descriptive Research Methods

- LO 1.5** Identify and compare the several types of descriptive research methods.
- LO 1.6** Compare and contrast naturalistic and laboratory observations, including their advantages and limitations.
- LO 1.7** Compare and contrast case studies and survey research, including their advantages and shortcomings.
- LO 1.8** Explain why researchers use correlational studies.
- LO 1.9** Define *correlation coefficient* and explain how to interpret it.

Although naturalistic observation allows researchers to study behaviour in everyday settings, observer bias may cause them to see what they expect to see.

Bill Aron/PhotoEdit



psychologists are primarily concerned with the fourth goal of psychology—*influence*—because it specifies ways and means of changing behaviour. You will learn more about some fields of applied psychology at the end of this chapter.

The goals of psychological research—*description*, *explanation*, *prediction*, and *influence*—are typically accomplished in stages. In the early stages of research, descriptive methods are usually the most appropriate since they allow researchers to identify and describe a particular phenomenon. When using **descriptive research methods**, the intent is not to identify causes of behaviour; here, the goal is only to describe a behaviour. Naturalistic observation, laboratory observation, the case study, and the survey are examples of descriptive research methods. **[LO 1.5]**

descriptive research methods

Research methods that yield descriptions of behaviour rather than causal explanations.

Naturalistic Observation: Caught in the Act of Being Themselves

What is naturalistic observation, and what are some of its advantages and limitations?

naturalistic observation

A research method in which researchers observe and record behaviour without trying to influence or control it.

Naturalistic observation is a research method in which researchers observe and record behaviour in its natural setting without attempting to influence or control it. **[LO 1.5]** Ethologists are researchers who study the behaviour patterns of animals in their natural environment. These researchers might observe their subjects through high-powered telescopes or from blinds that they build to conceal themselves.

Often human participants are not aware that they are being observed. This can be accomplished by means of one-way mirrors, a technique researchers often use to observe children in nursery schools or special classrooms. At times, researchers may use hidden cameras or tape recorders to collect research data. The major advantage of naturalistic observation is that it allows one to study behaviour in normal settings, where it occurs more naturally and spontaneously. **[LO 1.6]** Naturalistic observation may be the only feasible way to study certain phenomena when an experiment would be impossible or unethical—for example, to learn how people react during disasters such as earthquakes or fires.

Laboratory Observation: A More Scientific Look at the Participant

Another method of studying behaviour involves observation that takes place not in a natural setting but in the laboratory. [LOs 1.5 & 1.6] There, researchers can exert more control over the environment, which helps limit the effect of unexpected factors. Making observations in a laboratory may also result in the use of more precise equipment to measure responses. Much of our knowledge about sleep, for example, has been gained by laboratory observation of participants who sleep for several nights in a sleep laboratory or sleep clinic. Of course, laboratory control can have its disadvantages. For instance, researchers may lose the spontaneity that occurs when behaviours take place in a more natural setting. This disadvantage is especially relevant for human interactions that tend to be strongly affected by environmental factors.

The Case Study Method: Studying a Few Participants in Depth

What is the case study method, and for what purposes is it particularly well suited?

Another descriptive research method used by psychologists is the **case study**, or case history. [LO 1.7] In a case study, a single individual or a small number of people is studied in great depth, usually over an extended period of time. A case study involves observation, interviews, and sometimes psychological testing. A case study is exploratory in nature, and its purpose is to provide a detailed description of some behaviour or disorder. This method is particularly appropriate for studying people who have uncommon psychological or physiological disorders or brain injuries. Case studies often emerge in the course of treatment of these disorders. In fact, much of what we know about unusual psychological disorders comes from the in-depth analyses provided by case studies.

Although the case study has been useful in advancing knowledge in several areas of psychology, it has certain limitations. In a case study, researchers cannot establish the cause of observed behaviours. Moreover, because so few people are studied, researchers do not know how generalizable their findings are to larger groups or to different cultures. [LO 1.7]

case study

An in-depth study of one or a few participants consisting of information gathered through observation, interviews, and perhaps psychological testing.

Survey Research: The Art of Sampling and Questioning

What are the methods and purposes of survey research?

Psychologists are interested in many questions that cannot be investigated using naturalistic observation or case studies. With a **survey**, researchers use interviews and/or questionnaires to gather information about the attitudes, beliefs, experiences, or behaviours of a group of people. [LO 1.7] Well-designed and carefully conducted surveys have provided much of the information available to us about the incidence of drug use, about the sexual behaviour of particular segments of the population, and about the incidence of various mental disorders.

survey

A method whereby researchers use interviews and/or questionnaires to gather information about the attitudes, beliefs, experiences, or behaviours of a group of people.

Selecting a Sample: More to Consider Than Numbers

What is a representative sample, and why is it essential in a survey?

Researchers in psychology rarely conduct experiments or surveys using all members of the group they are studying. For example, researchers studying the sexual behaviours

population

The entire group of interest to researchers to which they wish to generalize their findings; the group from which a sample is selected.

sample

The portion of any population that is selected for study and from which generalizations are made about the larger population.

representative sample

A sample of participants selected from the larger population in such a way that important subgroups within the population are included in the sample in the same proportions as they are found in the larger population.

of Canadian women do not attempt to study every woman in Canada. Instead of studying the whole **population** (the entire group of interest, or target population), they study a sample. A **sample** is a part of the population that is selected and studied in order to reach conclusions about the entire larger population of interest.

However, researchers must ensure that the sample is representative. A **representative sample** is one that includes important subgroups in the same proportion as they are found in the larger population. That is, the representative sample should reflect the economic, ethnic, cultural, and sexual diversity of the target population.

The Use of Questionnaires

Researchers using the survey method rely on information gathered through questionnaires or interviews, or through some combination of the two. Questionnaires can be completed more quickly and less expensively than interviews.

Many people believe that a survey becomes more accurate when more people answer it. In fact, the number of people who respond to a survey is not the critical element. A researcher can generalize findings from a sample only if it is representative of the entire population of interest. For example, the readers of *Chatelaine* or *The Hockey News* do not represent a cross-section of Canadians. Similarly, questionnaires in magazines or conducted online are typically not scientific; neither are TV or radio phone-in surveys. Good surveys control wording, context, and format (Hippler, Schwarz, & Sudman, 2012; Schwarz, 1999).

The Interview

Skilled interviewers can gather accurate information by asking well-worded questions of a carefully selected sample of participants. When respondents feel comfortable with an interviewer, they feel freer to share personal information. Imagine that you are being interviewed about a sensitive subject such as your sexual behaviour. Will you be equally comfortable and truthful whether the interviewer is male or female? Young, middle-aged, or old? Chinese, black, francophone, or of another ethnic group? Christian, Muslim, or Jewish? The validity or truthfulness of responses can be affected by the interviewer's personal characteristics, which include gender, age, heritage, religion, social class, accent, and vocabulary.

Using the Internet for Survey Research

The internet now offers psychologists a way of soliciting participants and collecting survey responses that is fast, inexpensive, and often generates large numbers of responses (Gosling & Mason, 2015). Some researchers are concerned that internet survey samples are often biased because they represent only the population of internet users who choose to participate in online research studies. However, some recent studies of internet samples suggest that participants in these studies tend to match very closely those in other types of studies (Gosling & Johnson, 2010; Wolfe, 2017).

Advantages and Disadvantages of Survey Research

If conducted properly, surveys can provide highly accurate information about large numbers of people and can show changes in attitudes and behaviour over time. Yet large-scale surveys can also be costly and time-consuming. Researchers must have expertise in many areas—selecting a representative sample, constructing questionnaires, interviewing, and analyzing data.

The major limitation of the survey is that the respondents may provide inaccurate information. Respondents may give false information because of faulty memory or a desire to please the interviewer (saying what they think the interviewer wants to hear). Respondents may have a tendency to present themselves in a good light (“the social desirability response”). They may even deliberately mislead the researcher. **[LO 1.7]**

The Correlational Method: Discovering Relationships, Not Causes

What is the correlational method, and when is it used?

Researchers are often interested in understanding the relationship between two variables (any conditions that can be manipulated, measured, or controlled). For instance, we may want to know whether there is a relationship between the amount of time students devote to studying and their grade point average. Similarly, we may want to determine whether increases in stress are associated with poorer coping or whether increased use of marijuana is associated with lower interest in school and lower grades. To answer these types of questions, researchers often use what can be considered the most powerful type of descriptive method—the **correlational method**—which is used to determine the degree of relationship (correlation) between two characteristics, events, or behaviours. **[LO 1.8]**

Correlations are not just important to scientists; they are also common in our everyday thinking. For example, you may have asked yourself whether the price of a new car relates to the social status you gain from owning it. Is it possible that as price goes up, status does as well? When researchers conduct correlational studies, they measure two variables with accuracy, and they apply a statistical formula to obtain a correlation coefficient that estimates the strength of association between the two variables.

correlational method

A research method used to establish the relationship (correlation) between two characteristics, events, or behaviours.

The Correlation Coefficient: How Variables Relate

What is a correlation coefficient?

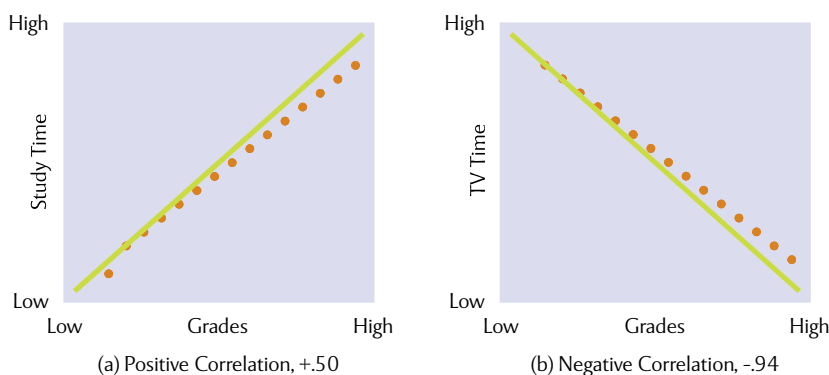
A **correlation coefficient** is a numerical value indicating the degree and direction of the relationship between two variables. **[LO 1.9]** A correlation coefficient ranges from +1.00 (a perfect positive correlation) to 0.00 (no relationship) to -1.00 (a perfect negative correlation). The sign of a correlation coefficient (+ or -) indicates whether the two variables vary in the same or opposite directions. A positive correlation indicates that two variables vary in the same direction. In other words, an increase in the value of one variable is associated with an increase in the value of the other variable, or a decrease in the value of one variable is associated with a decrease in the value of the other. There is a positive, though weak, correlation between stress and illness, for example. When stress increases, illness is likely to increase; when stress decreases, illness tends to decrease (see Figure 1.1).

correlation coefficient

A numerical value that indicates the strength and direction of the relationship between two variables; ranges from +1.00 (a perfect positive correlation) to -1.00 (a perfect negative correlation).

Figure 1.1 Positive and Negative Correlations

Here are two graphs showing positive and negative correlations. (a) When positively correlated scores on two variables are graphed, the points fall along a line that rises from left to right. This graph might represent two variables such as amount of time spent studying and grades on an exam. As study time goes up, exam grades go up as well. (b) When negatively correlated scores on two variables are graphed, the points follow a line that declines from left to right. This graph might represent two variables such as amount of time spent watching television and grades on an exam. As TV time goes up, grades go down.



A negative correlation means that an increase in the value of one variable is associated with a decrease in the value of the other variable. Think of a negative correlation as a seesaw—when one variable goes up, the other goes down. For example, there is a negative correlation between the number of cigarettes people smoke and the number of years they can expect to live. The more cigarettes people smoke, the shorter their life expectancy.

The number in a correlation coefficient indicates the relative *strength* of the relationship between two variables—the higher the number, the stronger the relationship. Examples of variables that are *not* correlated include grade point average and height, and illness and shoe size.

Correlation and Prediction

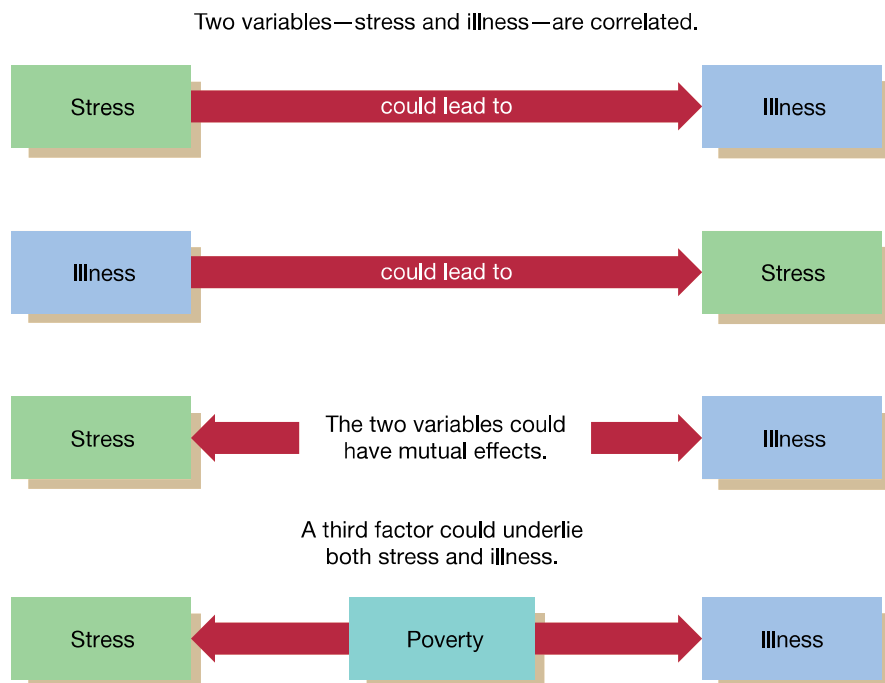
Correlations are useful in making predictions. The stronger the relationship between the variables, the better the prediction. A perfect correlation (+1.00 or −1.00) would enable you to make completely accurate predictions.

The fact that there is a correlation between two variables does not necessarily mean that one variable causes the other. Only the experimental method allows us to reach conclusions about cause and effect. When two variables such as stress and illness are correlated, we cannot conclude that stress makes people sick. It might be that illness causes stress, or that a third factor such as poverty or poor general health increases susceptibility to both illness and stress, as shown in Figure 1.2.

So, you might be thinking: If a researcher can't draw cause–effect conclusions, why do correlational studies? There are two main reasons. One reason is that it is sometimes impossible, for ethical reasons, to study variables of interest using more direct methods.

Figure 1.2 Correlation Does Not Prove Causation

A correlation between two variables does not prove that a cause–effect relationship exists between them. There is a correlation between stress and illness, but that does not mean that stress necessarily causes illness. Both stress and illness may result from another factor, such as poverty or poor general health.



Scientists can't ethically ask pregnant women to drink alcohol just so they can find out whether it causes birth defects. The only option available in such cases is the correlational method. We can ask mothers about their drinking habits and note any association with birth defects in their babies.

Another reason for using the correlational method is that many variables of interest to psychologists cannot be manipulated. We may want to know whether poverty causes health problems, but we can't assign individuals to be poor or rich so we can determine whether it causes health complications. In this case, the only option is to determine whether income and illness are correlated.

Module 1.3 The Experimental Method: Searching for Causes

LO 1.10 Define the *characteristics, process, advantages, and disadvantages* of experimental research.

LO 1.11 Define the following terms and explain their relationship to experimental research:

1. hypothesis
2. independent and dependent variables
3. experimental and control groups
4. selection bias
5. random assignment
6. the placebo effect
7. experimenter bias

What is the main advantage of the experimental method?

Descriptive research methods (naturalistic observation, the case study, the survey, and even the correlation) are all well suited for satisfying the first goal of psychology—namely, description. From descriptions, researchers may propose possible explanations for the behaviours they study. At some point researchers usually seek to determine the causes of behaviour and various other psychological phenomena.

What, for example, are the causes of depression, insomnia, stress, forgetfulness, and aggression? The **experimental method**, or the experiment, is the only research method that can be used to identify cause–effect relationships. **[LO 1.10]**

An experiment is designed to test a hypothesis. A **hypothesis** is somewhat of an educated guess; it is a testable expectation about the relationship between causes and consequences; it is a specific prediction about a cause–effect relationship between two or more conditions or variables. **[LO 1.11-1]** A variable is any condition or factor that can be manipulated, controlled, or measured. Let's consider one variable that is of great interest to you—the grade you will receive in this psychology course. Another variable that probably interests you, given how important it has now become to keep on track with work, friends, and information, is the extent to which you can multitask. For example, is it possible to attend your psychology class, pay some attention to the lecture, but still check other things on your computer? In other words, do you suppose there is a cause–effect relationship between multitasking in class and the grades you will receive?

The answer to that question is yes. In 2013, Faria Sana of McMaster University, along with Tina Weston and Nicola Cepeda from York University, conducted an experiment to determine the impact of in-class laptop use on student learning (Sana et al., 2013). Their goal was to see whether multitasking in class affected students' capacity to learn and recall information presented in a lecture. Forty students taking the

experimental method

The research method whereby researchers randomly assign participants to groups and control all conditions other than one or more independent variables, which are then manipulated to determine their effect on some behaviour measured—the dependent variable in the experiment.

hypothesis

A prediction about the relationship between two or more variables.

introductory psychology course participated in this experiment and were divided into two groups:

1. *Multitasking*: Twenty students were asked to pay attention to the lecture while also completing a series of tasks that “were meant to mimic typical student browsing during class” such as checking websites of interest including Google, Facebook, and YouTube (p. 26). Participants in this condition completed this multitasking activity for roughly 40 percent of the lecture.
2. *No Multitasking*: In this condition, the remaining twenty participants were asked to pay attention to the lecture but were not required to multitask.

Following the lecture, all participants were asked to complete a 40-question multiple-choice comprehension test to evaluate the extent to which they retained basic facts from the lecture (20 questions) and could apply this knowledge in a different context (20 questions).

What were the results? As you probably figured out, the participants who multitasked during the lecture scored significantly lower than those who did not multitask. This effect remained whether questions focused on basic facts from the lecture or application of knowledge. Overall, multitasking reduced recall on the quiz, which should be a lesson for you all as you decide how to spend your time in class to increase your likelihood of receiving better grades (see Figure 1.3).

Independent and Dependent Variables

independent variables

In an experiment, the factors or conditions that the researcher manipulates (the treatment) in order to determine their effect on another behaviour or condition, known as the *dependent variable*.

dependent variable

The variable that is measured at the end of an experiment and that is presumed to vary as a result of manipulations of the independent variable.

What is the difference between the independent variable and the dependent variable?

In all experiments there are two types of variables. First, there are one or more **independent variables**—variables that the researcher manipulates in order to determine whether they cause a change in another behaviour or condition. [LO 1.11-2] Sometimes the independent variable is referred to as the *treatment*. In the experiment by Sana and colleagues (Sana et al., 2013), there was one independent variable—the multitasking condition that was assigned.

The second type of variable found in all experiments is the **dependent variable**. It is measured at the end of the experiment and is presumed to vary (increase or decrease) as a result of the manipulations of the independent variable or variables. [LO 1.11-2] The dependent variable is presumed to depend on or to be affected by changes in the independent variable. In the study by Sana and colleagues, the dependent variable was the performance on the comprehension test administered after the lecture.

Figure 1.3 The Effect of Multitasking on Comprehension of Lecture Content

SOURCE: Based on Sana, S., Weston, T., & Cepeda, N. J. (2013). Laptop multitasking hinders classroom learning for both users and nearby peers. *Computers & Education*, 62, 24–31.

