AN INTRODUCTION TO PSYCHOLOGICAL SCIENCE
AN INTRODUCTION TO
PSYCHOLOGICAL SCIENCE

CANADIAN EDITION

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PEARSON
Toronto
To my wonderful wife, Jenn, and our amazing children, Oliver and Clara. Thank you for putting up with me.

Stephen Smith

To my partner in life, Andrea Krause. And many thanks to Gordon Burghardt and Michael Domjan for instilling in me a passion for science and discovery.

Mark Krause

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Dan Corts

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Stephen Smith

To my partner, Safa Ali, who is my unfailing support and inspiration toward wisdom. To my children, Alexandra, Kate, and Geoff, who love this world so deeply. And of course, to Steve, without whom this textbook would never have gotten finished!

Dan Dolderman
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From the Authors

A well-rounded university education requires a healthy dose of science. This means not just a memorized list of scientific terms and famous names, but rather the abilities and disposition that allow students to encounter, understand, and evaluate scientific as well as nonscientific claims. This is true regardless of an individual’s personal and career goals. As this text and MyPsychLab program emphasize, the science of psychology reaches across disciplinary boundaries and addresses numerous complex issues affecting individuals and society. To effectively use what they learn about psychology, students need to carry with them a scientific perspective. An Introduction to Psychological Science is written from the perspective of scientific literacy—the ability not only to define scientific terminology, but also to understand how it functions, to critically evaluate it, and to apply it to personal and societal matters.

Psychological science is in a privileged position to help students hone their scientific literacy. It is both a rigorous scientific discipline and a field that studies the most complex of all phenomena: the behavioural, cognitive, and biological basis of behaviour. With this focus on behaviour, one can rightly argue that psychology resides at the hub or core of numerous other scientific disciplines; it also shares connections with neuroscience, education, and public health, to name a few linkages. From this perspective, the knowledge acquired by studying psychological science should transfer and apply to many other fields. This is great news when you consider that psychology is one of few science courses that many undergraduates will ever take.

To make scientific literacy the core of our text and MyPsychLab, we developed content and features with the model shown in the graphic as a guide. The competencies that surround the scientific literacy core represent different knowledge or skill sets we want to work toward during the course. The multidirectional nature of the arrows connecting the four supporting themes for scientific literacy demonstrates the interrelatedness of the competencies, which span both core-level skills, such as knowing general information (e.g., terms, concepts), and more advanced skills, such as knowing how to explain phenomena from a scientific perspective, critical thinking, and application of material.

We used this model in developing all aspects of this program, the topics included in the book, the execution of the writing, the learning objectives we established, the quizzes, and other features. We believe a scientific literacy perspective and model will prove useful in addressing two course needs we often hear from instructors—to provide students with a systematic way to categorize the overwhelming amount of information they are confronted with, and to cultivate their curiosity and help them understand the relevance, practicality, and immense appeal of psychological science.

We thank the many instructors and students who have helped us craft this model and apply it to our discipline, and we look forward to your feedback. Please feel free to contact us and share your experiences with the Canadian edition of An Introduction to Psychological Science.

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For instructors, the modular content in a single sitting (e.g., between classes). For students to organize and review their learning at regular intervals. Chapters are divided into modules to make it easier for students to organize content as well as to self-test and review their learning at regular intervals. It also transforms lengthy chapters into nice “bite-sized” chunks of information that students can read in a single sitting (e.g., between classes). For instructors, the modular content makes it easy to customize delivery based on their preferred syllabus.

Learning Objectives
Learning Objectives organized around an updated Bloom’s taxonomy aim to guide students to higher-level understanding. Summaries of the key points related to these objectives are provided at the end of each module. Objectives are listed at four levels of increasing complexity: know, understand, apply, and analyze.
Another major set of forebrain structures comprises the limbic system, an integrated network involved in emotion and memory (Maclean, 1992; see Figure 3.25). One key structure in the limbic system is the amygdala, which facilitates memory formation for emotional events, mediates fear responses, and appears to play a role in recognizing and interpreting emotional stimuli, including facial expressions. In addition, the amygdala connects with structures in the nervous system that are adaptive to understanding the structures of the brain when they can click on a diagram of it and see a fully rotating illustration.

Key Terms

Key Terms are defined within the narrative, helping students place them in context, and are then listed again within the Module Summaries. A complete glossary is also included at the end of the text.

Quick Quizzes

Quizzes appear at the conclusion of major sections of the module (typically two to four quizzes per module). These quizzes contain multiple-choice questions that enable students to assess their comprehension and better prepare for exams. Like the Learning Objectives, the Quick Quizzes assess understanding at the four levels of Bloom’s taxonomy and are marked accordingly.

Active Illustration

For key figures and illustrations, animations are provided within the eText to deliver greater clarity and understanding. For example, readers are much more apt to understand the structures of the brain when they can click on a diagram of it and see a fully rotating illustration. The Pearson eText for the Canadian edition of An Introduction to Psychological Science is designed with alternative delivery models in mind. Highly visual, clearly laid out, and with integrated video and media, it is optimal for online reading and interaction. Students can access their textbook anytime, anywhere, and any way they want, including listening online or downloading it to their iPads.

MyPsychLab

MyPsychLab icons in the margin call out important information students can access online—for example, videos, simulations, and hands-on experiments. 

Content and Features :: xxi
This element of scientific literacy encompasses a basic understanding of research methodology and thinking about problems within a scientific framework. An Introduction to Psychological Science integrates and reinforces key research methodology concepts throughout the book. This interweaving of methodology encourages students to continue practising their scientific thinking skills. Learning science is more than accumulating facts; students learn to ask questions, construct explanations, test those explanations, and communicate their ideas to others.
Myths in Mind

Many commonly held beliefs people have about behaviour before taking a psychology course are half-truths or outright falsehoods. This feature sets the record straight in a concise and informative way. The selected examples are likely to have personal relevance to many readers and deal with important scientific issues.

MYTHS IN MIND
We Are Born with All the Brain Cells We Will Ever Have

For decades, neuroscience taught us that nerves do not regenerate; in other words, scientists believed that we are born with all of the brain cells we will ever have. This conclusion made perfect sense because no one had ever seen new neurons form in adults, and severe neurological damage is often permanent.

MyPsychLab Simulations

MyPsychLab Simulations allow students to participate in experiments online to reinforce what they are learning in class and in their book. More than 50 experiments, surveys, and inventories are available through this online tool (available at MyPsychLab).

How can science explain it?

In recent years, an increasing number of instructors have begun to focus on telling students how psychological science fits within the scientific community. Psychology serves, in essence, as a hub science. Through this emphasis on scientific literacy in psychology, students begin to see the practicality and relevance of psychology and become more literate in the fields that our hub science supports.
Many departments are focusing to an increasing extent on the development of critical thinking, as these skills are highly sought after in society and the workforce. Critical thinking is generally defined as the ability to apply knowledge, use information in new ways, analyze situations and concepts, and evaluate decisions. To develop critical thinking, the module objectives and quizzes are built around an updated Bloom's taxonomy. Objectives are listed at four levels of increasing complexity: know, understand, apply, and analyze. The following features also help students organize, analyze, and synthesize information. Collectively, these features encourage students to connect different levels of understanding with specific objectives and quiz questions.

Critical Thinking
Can we critically evaluate the evidence?

Working the Scientific Literacy Model

Working the Scientific Literacy Model, introduced in Chapter 1, and then featured in each module in the remaining chapters, fully integrates the model of scientific literacy. Core concepts are highlighted and students are walked through the steps of knowledge gathering, approaching the problem from a scientific standpoint, using critical thinking, and revealing applications.

Work the Scientific Literacy Model

At the end of every chapter, students have an opportunity to “Work the Scientific Literacy Model” themselves. The Work the Model feature walks students through content from the chapter, providing study tips and reminders for key content areas. Students are asked to critically evaluate what they have learned by accessing a video clip, either through MyPsychLab, the Layar app, the QR code on the page, or YouTube. They are then provided with a question prompting them to apply relevant content to the scenario depicted in the video. These questions can be assigned as either a classroom discussion or a writing assignment.

xxiv :: Content and Features
Study Plan

Through MyPsychLab (www.pearsonmylabmastering.com), students have access to a personalized study plan, based on Bloom’s taxonomy, that arranges content from basic level thinking (such as remembering and understanding) to more complex critical thinking (such as applying and analyzing). This layered approach sharpens critical thinking skills, and helps students succeed in the course and beyond.
Psychology is a highly relevant, modern science. To be scientifically literate, students should relate psychological concepts to their own lives, making decisions based on knowledge, sound methodology, and skilled interpretation of information.

MyPsychLab Video Series
Links are provided throughout the eText to relevant episodes of the MyPsychLab Video series—a comprehensive, current, and cutting-edge series featuring 17 original 30-minute videos covering the most recent research, science, and applications and utilizing the most up-to-date film and animation technology.
The “Psych @” feature reveals an everyday, personally relevant application of psychological science. The content of these features is geared toward issues and concerns that many university students care about.

**The Artist's Studio**

Although we often think of painters as being eccentric people prone to cutting off their ears, they are actually very clever amateur vision scientists. Rembrandt (1606–1669) varied the texture and color details of different parts of portraits in order to guide the viewer's gaze toward the clearest object. The result is that more detailed regions of a painting attract attention and receive more eye fixations than less detailed regions (DiPaoloa, Rabe, & Enns, 2011).

In addition to manipulating a viewer's eye movements, painters also use a variety of depth cues to transform their two-dimensional painting into a three-dimensional perception. This use of pictorial depth cues is quite challenging, which is why some paintings seem vibrant and multilayered (like nature) while others seem flat and artificial. So what are some strategies that artists use to influence our visual perception?

To understand how artists work, view the painting by Gustave Caillebotte shown in Figure 4.26. In this painting, you will notice that the artist used numerous cues to depict depth:

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**YouTube Scientific Literacy Site**

YouTube has become one of the most popular social media resources for both instructors and students. The challenge, of course, is to find clips that are relevant to key content areas. To help instructors access valuable open-source content and further bring to light the relevance of the discipline of psychology, a YouTube channel, found at www.youtube.com/workthemodel has been developed to accompany An Introduction to Psychological Science. The book provides relevant video links for instructor and student access, in addition to the videos that frame the end-of-chapter “Work the Scientific Literacy Model” activity.
What’s New in the Canadian Edition?

When we started writing the Canadian edition of this textbook, we assumed we’d just add the letter “u” a few hundred times and insert some pictures of Sidney Crosby. We did add several thousand u’s and one photo of Crosby—but, as we began to write the different chapters, we became amazed at how important Canadian researchers have been to the study of psychological science. In boxing, there is the phrase “punching above your weight.” It is used when a smaller fighter’s punches feel like they are coming from a larger, stronger fighter. Canadian psychology is like that. Despite the fact that we are a relatively small country (in terms of population and the number of research institutions), we have made incredibly important contributions to a number of areas of psychology. The work of Canadian researchers served as the foundation for many areas of neuroscience, perception, memory, social, and health research. So, although we rewrote large chunks of the book, the Canadian content isn’t just added as a bonus. The Canadian content is actually an essential part of psychological science in general. As a result, we ended up adding over 1400 new references to the U.S. edition of this book. These include the following additions:

- highlighting the importance that Canadian research has had on the development of modern psychology;
- adding research conducted by Canadian researchers from all 10 provinces;
- incorporating research related to cultural psychology and the experiences of first- and second-generation immigrants to Canada;
- discussing bilingualism and its effects on culture, cognition, and the brain;
- providing a thorough discussion of Canadian legal decisions (including references to specific Supreme Court rulings) related to issues such as sexting, hypnosis, and recovered memories;
- discussing Canadian statistics and laws related to drug use and possession;
- providing Statistics Canada and Health Canada materials for a number of topics including smoking, obesity, work stress, gambling, and clinical conditions;
- clarifying the ethical requirements for conducting research at Canadian universities and hospitals;
- incorporating discussions of social issues that are central to many Canadians’ lives such as environmental issues, the increased role of technology in our lives, and the influence that marketers and corporations try to have over us all.

We have also made an effort to make psychology less “abstract” than it is often portrayed in textbooks. Throughout this book, we use examples from the real world in order to demonstrate that the concepts the students are learning about affect their own behaviour. Although we include some traditional examples such as how to improve study habits, we go beyond that. For example, we use the concepts learned in different chapters to highlight tricks used by advertisers (including those used in negative political advertising). We also point out interesting things to look for in social interactions, such as the tendency of heterosexual males to stand up straighter in the presence of women in order to appear more powerful (discussed in Evolutionary Insights into Human Behaviour in Module 3.1). Our hope is that these engaging examples will allow the students to see the world in a slightly different way.

In addition to these examples, we also try to show the students how they can use psychology to change the world that they live in. An example found in many chapters is that of changing people’s environmental behaviours and their attitudes toward issues such as climate change. Our hope is that by seeing how psychological science can be used to change behaviours for the better, students will be motivated to take the information from this book outside of the classroom to create the types of changes that our world desperately needs.

When you begin any course, it is like starting a journey. We hope you enjoy your journey through the Canadian edition of An Introduction to Psychological Science as much as we enjoyed writing it.
For Instructors

SCIENTIFIC LITERACY is a key course goal for many introductory psychology instructors.

Learning science is an active process. How do we help instructors model scientific literacy in the classroom and online in a way that meets the needs of today’s students?

ORGANIZATION

Instructors consistently tell us one of the main challenges they face when teaching the introductory psychology course is organizing engaging, current, and relevant materials to span the breadth of content covered. How do we help organize and access valuable course materials?

YouT ube Scientifi  c Literacy Site

As mentioned earlier, a YouTube channel, found at www.youtube.com/workthemodel, provides a wealth of videos to help engage students and enhance their learning. The ready access provided to these videos, with content spanning the breadth of psychological science, means that instructors no longer have to search for just the right video links to material that meshes with the text’s content.

Instructor’s Resource Manual

The Instructor’s Resource Manual includes suggestions for preparing for the course, sample syllabi, and current trends and strategies for successful teaching. Each chapter offers integrated teaching outlines, lists the key terms for each chapter for quick reference, and provides an extensive bank of lecture launchers, handouts, and activities, as well as suggestions for integrating third-party videos and web resources. This resource saves prep work and helps professors use their classroom time more efficiently.
neurons and their function. Describe the three types of the cerebral cortex with special emphasis on the distinction between the sympathetic and parasympathetic nervous system. Describe the structure and function of the peripheral nervous system. Describe the role of the spinal cord in the control of reflexes. Describe neural transmission within the nervous system. How do neurons use neurotransmitters and relative refractory period. Action potential, and absolute refractory period. Describe the structure and function of the autonomic nervous system. Describe the function of the basic structures of the brain and relative refractory period. Action potential, and absolute refractory period. Describe the differences of function between the two hemispheres of the brain and sensory motor system. Describe how the brain and spinal cord interact. Describe forms of thought, such as language? Senses and the movement of the body? Body's automatic functions? How do the brain and spinal cord interact? How do the somatic and autonomic nervous processes at an appropriate level of complexity? State connections between diverse facts and theories. How do neurons use neurotransmitters and relative refractory period. Action potential, and absolute refractory period. Describe neural transmission within the nervous system. How do neurons use neurotransmitters and relative refractory period. Action potential, and absolute refractory period. Describe the structure and function of the peripheral nervous system. Describe the role of the spinal cord in the control of reflexes. Describe neural transmission within the nervous system. How do neurons use neurotransmitters and relative refractory period. Action potential, and absolute refractory period. Describe the structure and function of the peripheral nervous system. Describe the role of the spinal cord in the control of reflexes, and relative refractory period. Action potential, and absolute refractory period. Describe neural transmission within the nervous system. How do neurons use neurotransmitters and relative refractory period. Action potential, and absolute refractory period. Describe the structure and function of the peripheral nervous system. Describe the role of the spinal cord in the control of reflexes.
Instructors consistently tell us making their classroom lectures and online instruction exciting and dynamic is a top priority so they can engage students and bring psychology to life. We have been listening and have responded by creating state-of-the-art presentation resources, putting the most powerful presentation resources at your fingertips.

For maximum flexibility, each half-hour episode features several brief clips that bring psychology to life:

- **The Big Picture** introduces the topic of the episode and provides the hook to draw students fully into the topic.

- **The Basics** uses the power of video to present foundational topics, especially those that students find difficult to understand.

- **Special Topics** dives deeper into high-interest and cutting-edge topics, showing research in action.

- **In the Real World** focuses on applications of psychological research.

- **What’s in It for Me?** clips show students the relevance of psychological research to their own lives.

### PowerPoint Presentations

Engaging PowerPoint slides bring the powerful Krause/Corts/Smith/Dolderman design right into the classroom, drawing students into the lecture with interesting information and rich visuals. The slides are built around the learning objectives in each module and offer key material that is provided in the text. In addition, interactive presentations with “clicker” questions are provided for instructors using classroom response systems.

### MyPsychLab Video Series

The MyPsychLab Video series is a comprehensive, current, and cutting-edge series featuring 17 original 30-minute videos covering the most recent research, science, and applications and utilizing the most up-to-date film and animation technology. Questions are provided within MyPsychLab so that instructors can assign relevant clips from the series as homework; they may also use the series in the classroom to illustrate the many fascinating topics in the field of psychology as part of their lectures. Guided by the Design, Development, and Review team—a diverse group of introductory psychology instructors—each episode is organized around the major topics covered in the introductory psychology course syllabus. Find out more about the MyPsychLab Video Series:

www.pearsonhighered.com/showcase/mypsychlab_videos/
Instructors consistently tell us that assessing student progress is a critical component to their course and one of the most time-consuming tasks. Vetted, good-quality, easy-to-use assessment tools are essential. We have been listening and we have responded by creating the absolutely best assessment content available on the market today.

**TEST BANK**

The Test Bank (Test Item File) contains more than 3000 questions, many of which were class-tested in multiple classes at both 2-year and 4-year institutions prior to publication. All questions have been thoroughly reviewed and analyzed line by line by a developmental editor and a copy editor to ensure clarity, accuracy, and delivery of the highest-quality assessment tool. All conceptual and applied multiple-choice questions include rationales for each correct answer and the key distracter, which serve both as an added guarantee of quality and as a time-saver when students challenge the keyed answer for a specific item.

In addition to this high-quality Test Bank, a second bank containing more than 2000 questions is available for instructors looking for more variation.

The Test Bank also comes with Pearson MyTest, a powerful assessment generation program that helps instructors easily create and print quizzes and exams. Questions and tests can be authored online, providing instructors with the ultimate in flexibility and the ability to efficiently manage assessments wherever and whenever they want. Instructors can easily access existing questions and then edit, create, and store them using simple drag-and-drop and Word-like controls. The data for each question identifies its difficulty level and the text page number where the relevant content appears. In addition, each question maps to the text’s major section and learning objective. For more information, go to www.PearsonMyTest.com.
MyPsychLab

Educators know it. Students know it. It’s that inspired moment when something that was difficult to understand suddenly makes perfect sense. MyPsychLab was designed and refined with a single purpose in mind—to help educators create that moment of understanding with their students.

MyPsychLab offers students useful and engaging self-assessment tools, and it provides instructors with flexibility in assessing and tracking student progress. For instructors, MyPsychLab is a powerful tool for assessing student performance and adapting course content to students’ changing needs, without requiring instructors to invest additional time or resources to do so.

Instructors and students have been using MyPsychLab for more than 10 years. To date, more than 600,000 students have used MyPsychLab. During that time, three white papers on the efficacy of MyPsychLab have been published. Both the white papers and user feedback show compelling results: MyPsychLab helps students succeed and improve their test scores. One of the key ways MyPsychLab improves student outcomes is by providing continuous assessment as part of the learning process. Over the years, both instructor and student feedback have guided numerous improvements to this system, making MyPsychLab even more flexible and effective.

Pearson is committed to helping instructors and students succeed with MyPsychLab. To that end, we offer a Psychology Faculty Advisor Program designed to provide peer-to-peer support for new users of MyPsychLab. Experienced Faculty Advisors help instructors understand how MyPsychLab can improve student performance. To learn more about the Faculty Advisor Program, please contact your local Pearson representative.

MyPsychLab includes the following features:

MyPsychLab Video Series

The MyPsychLab Video Series is a comprehensive and cutting-edge series featuring 17 original 30-minute videos covering the most recent research and utilizing the most up-to-date film and animation technology. Multiple choice and short answer essay questions are provided within MyPsychLab so episodes can be assigned as homework.

MyPsychLab Study Plan

Students have access to a personalized study plan, based on Bloom’s taxonomy, that arranges content from less complex thinking (such as remembering and understanding) to more complex critical thinking (such as applying and analyzing). This layered approach promotes better critical thinking skills and helps students succeed in the course and beyond.
MyPsychLab Simulations

Online simulations help students understand scientific principles and practise through active learning. Over thirty experiments, inventories, and surveys are available through MyPsychLab.

For access to all instructor supplements for An Introduction to Psychological Science, go to vig.pearsoned.ca and follow the directions to register (or log in if you already have a Pearson user name and password). Once you have registered and your status as an instructor is verified, you will be emailed a log-in name and password. Use your log-in name and password to access the catalogue. Click on the “Browse by Discipline” link, click on “psychology” and then “introductory psychology,” and finally select the Krause/Corts/Smith/Dolderman, An Introduction to Psychological Science, text. Under the description of each supplement is a link that allows you to download and save the supplement to your desktop.

For technical support for any of your Pearson products, you and your students can contact http://247.pearsoned.com.
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We value feedback from both instructors and students, and we are sure that we will need it for our second Canadian edition. Please do not hesitate to offer suggestions or comments by writing to Steve Smith (s.smith@uwinnipeg.ca) or Dan Dolderman (doldermanuoft@gmail.com).

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