

The Canadian Handbook for Careers in Psychological Science

THE CANADIAN HANDBOOK FOR CAREERS IN PSYCHOLOGICAL SCIENCE

Meghan Norris



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FOREWORD

When I started university in 2001, I did not intend to major in psychology. My plan was to start out in a 3-year Bachelor of Arts degree, get my feet on the ground, and then move into an Honours Bachelor of Science degree in my quest to earn a PhD in kinesiology. Like many, my career trajectory was not at all what I had expected.

I still love the field of kinesiology, but along my way, I became fascinated with psychological science. A large part of this was due to phenomenal mentors who helped me to better understand the questions I was (and still am!) truly passionate about.

This book is written in thanks to those mentors—I'm aware that not everyone meets the right mentor at the right time to help clarify possible career paths. By compiling chapters written by experts across Canada, I'm hopeful this book might be the right resource at the right time for future psychological scientists who are finding their own career paths.

I'm going to give away the ending to this book before we start. What can you do with training in psychology? I have 2 answers to this question—one more general, and one more specific.

The general answer is: **a lot**. As you will learn about in [Chapter 1](#), employers desire attributes including:

- analytic and quantitative skills
- problem-solving skills
- written and oral communication
- leadership

Evidence-based psychology programs all explicitly include content related to these attributes. For example,

- Statistics courses teach skills in data collection, analysis, management, and reporting.
- Methods courses teach how to design a study to test a hypothesis while carefully considering issues related to sample size, replicability, confounds, and generalizability.
- Students in psychology learn to search for, interpret, and apply scholarly research.
- Many students also engage in writing, oral presentations, ethics training, and data collection as a research assistant.

These experiences all build *valuable* and *marketable* skills for careers both in and out of academia. Thus, one strategy when looking for jobs is to go look at job requirements in a

posting—you might find that you meet the requirements for more jobs that you initially expect.

The more specific answer is based on my opinion and experience. I recommend working backwards when looking for specific career paths. Find examples of what could be your one-day “dream job.” You might do this by going to the websites of your favourite organizations. Identify current employees in roles that you *one day* would like to have. Using tools like LinkedIn, identify the career trajectory that brought them to those jobs. For example, it’s not likely that someone begins their career as CEO of Microsoft. What career experiences helped those professionals to develop the expertise needed for your some-day dream jobs? Once you’ve identified some of these key career milestones, you can begin identifying opportunities that are available to you *where you are now* to help you get *there*.

Throughout this book you will learn more about career search strategies, career opportunities related to psychology, and just some of the many ways that psychological science has been applied to opportunities and challenges facing our society. I want to highlight that this book is *not* grounded in “pop-psychology.” Indeed, many harms have been caused by the misunderstanding and misapplication of psychology. For this reason, this book emphasizes the rigorous application of scholarly work to maximize benefits and minimize harm at the front lines.

As with any science, the discipline of psychology continues to evolve. I hope that in the next 10 years, we know significantly more than we know now and that our methods and applications will be stronger than they are today. Thank you in advance to the students reading this who will go on to do great work, building healthier and stronger communities.

I want to thank the contributors to this book: I’m inspired by the *many* people who dedicated their time, effort, and expertise towards this open access resource so that this knowledge can be freely shared. Finally, I want to express sincere thanks to the students who participated in the development of this book by sharing their feedback and insights—thank you!

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A note on revisions: As with any new book, and any electronic source, there may be a time when a link is broken, or a typo is found. There may also be ways for us to increase the accessibility of the book based on the experiences of readers (e.g., editing how AltText was

used, etc). In instances like these, please email Meghan Norris at meghan.norris@queensu.ca and revisions will be made directly into this version.

Substantive content changes will not be made in this “live” version. Any new versions of this book completed in collaboration with Meghan Norris will be published as a new edition. This version of the book, though widely applicable, focuses on the Canadian context. It is hoped that others might also adapt this source for their contexts, providing reference to this original source. Suggestions for citation format can be found at the end of each chapter.

Please reference this chapter as

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DEDICATION

To my friends, colleagues, and mentors: I hope that this book helps to spark in others others the curiosity that you continue to inspire in me.



Image source: <https://binged.it/2rbC44b>

[1]

AN INTRODUCTION TO CAREERS IN THE PSYCHOLOGICAL SCIENCES

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WELCOME TO PSYCHOLOGICAL SCIENCE

Welcome to the world of psychological science—I'm so thrilled to share the world of psychological science with you. If you are feeling apprehensive about the word "science," don't let it throw you off. Although psychology *is* a science (more on this below!), I want to encourage you to think of science like a power tool: you might be a bit apprehensive at first, but once you learn how to use the tool, things become incredibly exciting. You will get some information on the tool of science in this chapter, with more to come in the chapters to follow.

With our science-power-tool in hand, we can systematically explore, evaluate, understand, and solve questions that we care about. For example, understanding how, when, and why the brain can re-write itself is a) cool, and b) allows us to use this information in contexts such as everyday learning, and recovery from trauma. Science allows us to *measure* and *evaluate* efficacy of treatments, including psychotherapy, providing us evidence that a specific treatment is worthwhile and won't cause harm. Science allows us to understand basic behavioural phenomena like bystander apathy (the tendency for bystanders to not intervene in an emergency), and then it allows us to create interventions *based in empirical evidence* that will facilitate bystander engagement. Applying scientific methods allows us to create better communications so that people will behave in healthier ways, to design playgrounds to promote active play, to create healthier and more efficient work-places, to develop prevention and harm-reduction programs that work, and to optimize sport performance (just to name a few benefits). By using the scientific method to systematically explore questions like this, we a) can communicate more effectively with our colleagues in other areas by virtue of a common framework, and b) most importantly, have confidence that we are making decisions about how to proceed in any context with the support of empirical evidence.

Notice that there are *many* contexts in which we can apply psychological science. In this book, we are only going to cover *some* of the *many* contexts where psychological science is relevant. Notably, I'm hopeful that future editions will cover more in-depth areas including cognitive psychology, school psychology, the psychology of teaching and learning, and disability management. For now, I'm hopeful this text will provide a strong foundation that we can jump from.

With that, let's dig in.

WHAT IS PSYCHOLOGICAL SCIENCE?

Although the terms psychology and psychological science can be used interchangeably, it is important at this point to re-state that this book approaches psychology as a science. Psychology is the scientific study of brain and behaviour. This means that in the quest to understand brain and behaviour, the scientific method is applied. Thus, those training in the field of psychological science are developing the skills to notice patterns, develop hypotheses, systematically test those hypotheses through measurement, draw conclusions, and use those conclusions to create or refine hypotheses in an ongoing process that continually gives us a more accurate and precise understanding of brain and behaviour. To establish clear boundaries, psychology is *not* using gut intuition to understand people. Psychology is *not* making unfounded assumptions. Psychology is *not* mind reading. Instead, psychology is doing careful background research. Psychology is carefully collecting observations in a systematic way. Psychology is ensuring that observations are collected in an ethical way. Psychology is having strong understanding of research methods and data analytics so as to have the tools to carefully evaluate quality of evidence. Psychology is having awareness of validity, reliability, and generalizability of research findings to appropriately apply research in practice and future research. Psychology is ensuring that ethical responsibilities are met. In this book, we will highlight the ways in which the scientific method has been used to understand brain and behaviour, and we will help you to make important connections between training in the psychological sciences and the many careers that this training prepares you for.

Highlighting the reason this book was created, surprisingly (to us), despite developing skills and knowledge in the *science* that underlies the wide variety of applications of psychological science, many students do not immediately see the value of their undergraduate degree in psychology when it comes time to employment (Borden & Rajecki, 2000). One goal of this book is to overcome this gap: psychology is an incredibly popular major (e.g., Higher Education Research Institute, 2008), and students who receive training in psychology develop concrete skills and knowledge that employers want. This book was carefully curated to highlight the many ways you can apply your training in psychology to a wide variety of careers. Further, this book was carefully curated to highlight the many ways in which *others* have applied their training in psychology to solve important questions related to the brain and behaviour. As with any science, we are continually developing and learning. If you are interested in the brain and behaviours, generally speaking, and if you get excited to ask questions, search for answers, and then to apply what you've learned, you are in the right place. If you are feeling unsure, that's okay. Hopefully the following chapters shed new light on the field of psychological science to help you as you develop your long term career goals. If you decide that psychology is *not* for you, that's also a win: it's important that you find an

area to work in that meets your personal goals. It's likely that you will interact with someone who is working from a psychological science framework during your career, and we hope this content gives you a common framework from which to work.

WHAT DO EMPLOYERS WANT

According to a survey of employers conducted by the National Association of Colleges and Employers (2016), the top 10 most highly rated attributes of job candidates were:

1. Leadership
2. Ability to work in a team
3. Communication skills (written)
4. Problem-solving skills
5. Communication skills (verbal)
6. Strong work ethic
7. Initiative
8. Analytical/quantitative skills
9. Flexibility/adaptability
10. Technical skills

Although many students might not see how their psychology degree is relevant for the workforce (Borden & Rajecki, 2000), undergraduate training in psychology directly and intentionally addresses at least the first 9 of the top 10 rated attributes desired by employers, and likely all 10. Indeed, the American Psychological Association specifies 5 goals and related learning outcomes for undergraduate programs in psychology which have direct overlap with the above listed attributes that employers seek (American Psychological Association, 2013):

Goal 1: Knowledge Base in Psychology

- 1.1 Describe key concepts, principles, and overarching themes in psychology
- 1.2 Develop a working knowledge of psychology's content domains
- 1.3 Describe applications of psychology

Goal 2: Scientific Inquiry and Critical Thinking

- 2.1 Use scientific reasoning to interpret psychological phenomena
- 2.2 Demonstrate psychology information literacy
- 2.3 Engage in innovative and integrative thinking and problem solving
- 2.4 Interpret, design, and conduct basic psychological research
- 2.5 Incorporate sociocultural factors in scientific inquiry

Goal 3: Ethical and Social Responsibility in a Diverse World

- 3.1 Apply ethical standards to evaluate psychological science and practice
- 3.2 Build and enhance interpersonal relationships
- 3.3 Adopt values that build community at local, national, and global levels

Goal 4: Communication

- 4.1 Demonstrate effective writing for different purposes
- 4.2 Exhibit effective presentation skills for different purposes
- 4.3 Interact effectively with others

Goal 5: Professional Development

- 5.1 Apply psychological content and skills to career goals
- 5.2 Exhibit self-efficacy and self-regulation
- 5.3 Refine project-management skills
- 5.4 Enhance teamwork capacity
- 5.5 Develop meaningful professional direction for life after graduation

Thus, there appears to be a gap such that undergraduate students in psychology are failing to see the strong connections between their developing skills, and the attributes desired by the job market.

Take a moment, can you see how your training in psychology maps onto employer's highly rated attributes? See Appendix 1 at the end of this chapter for a worksheet to help you identify concrete examples of your skills and knowledge. This can help you as you create cover letters, and build an elevator pitch.

This book will show you many examples of how you can use your training across a variety of careers, including those outside of “psychology.” To help demonstrate how training in psychology can translate to many careers, it is helpful to start from a common understanding of the foundation of psychological science.

PSYCHOLOGY AND THE SCIENTIFIC METHOD

To belabour the point, psychology is an empirical science. This means that, in addition to theory and logic, most professionals who work in the psychological sciences rely on the collection, analysis, and interpretation of data to inform their work. This is important: we know from research that humans can fall prey to biases including the availability heuristic (the tendency to assume that what comes to mind easily is likely accurate, e.g., Tversky & Kahneman, 1973), false consensus effects (the tendency to assume that our behaviours and opinions are similar with most other people, e.g., Ross, Greene, & House, 1977), and confirmation bias (the tendency to see information which is confirming rather than disconfirming, e.g., Nickerson, 1998). Relying on *data* (especially data verified by other scientists) to inform our professional opinions helps us to not only limit the effects of these biases, but it also helps us to gain representative insights into phenomenon of interest that are more likely to reflect the true nature of the phenomenon of interest.

As we look with an empirical lens at the brain and behaviours, and as you develop your own professional opinions, you are encouraged to always consider the following 3

concepts when you are considering information presented to you: validity, reliability, and generalizability.

Validity is the degree to which a measure or design accurately captures the construct or process of interest. This means that when you are reading about any finding, you should first ask yourself questions including “are these researchers measuring what they think they are measuring, or did they make a mistake?” “Is this research actually addressing the concept it’s claiming to?”

Reliability is the degree to which a finding consistently appears across time and/or situations. This means that when you are reading about any finding, you should ask yourself questions including “do I think this effect will appear in a similar context if this is done a year from now?” “Do I think there are other variables that might influence whether this effect will appear?” “Do I think there is a better measure of this effect that will more consistently measure this effect?”

Generalizability is the degree to which similar findings are likely to occur in other contexts. This means that when you are reading about any finding, you should ask yourself questions including “do I think that this effect will also appear in other groups of people? If not, why?” “Why should (or shouldn’t) this effect appear in other groups of people?”

A final consideration you should make when engaging with research is critically important: the ethics of the research. You should always ask yourself whether the work you are doing (or learning about) meets the Canadian Psychological Association’s principles for ensuring Dignity of Persons, Responsible Caring, Integrity in Relationships, and Responsibility to Society (Canadian Psychological Association, 2017). You can learn more about this in our chapter on [research ethics](#).

Notice that you have an important role to play here: it is your job as a reader of science to also use your developing skills to ask tough questions of other researchers. Again, even scientists are human, and even with careful work, we can all make mistakes. We need to trust that our colleagues (that now includes you!) will ask tough questions of our studies. From this point on, it is your professional responsibility as a developing psychological scientist to ask questions about validity, reliability, and generalizability if they arise, and also to ask questions about other aspects of research including ethics. You will learn more about asking questions of research in the coming chapters.

CAREERS IN PSYCHOLOGICAL SCIENCE

An undergraduate degree in psychological science is effective preparation for many types of careers. For example, as a result of strong training in the scientific method, students in the psychological sciences are equipped to distinguish causal and non-causal relationships between variables. This means that students can identify if one variable *causes* another, or if two variables are related but one doesn’t necessarily cause the other (i.e., if variables are correlated). Insights such as these prove valuable in many contexts. For example, when a client presents claiming that Treatment X cured an ailment, a practitioner trained in the psychological sciences should immediately consider the validity, reliability, and generalizability of the claim. Specifically, the treatment may not be *valid*—perhaps is there a lurking third variable, such as passage of time which often is associated with a reduction in symptoms. To put this into context, Treatment X could cure the cold after 7 days, but most instances of the cold resolve on their own in around 7 days. A student with training

in psychological science would design an experiment to test the effects of Treatment X to see whether it is indeed an effective treatment. If we want to make accurate causal claims, then there are proper ways to run the experiments (you will learn more about experimental design in our [chapter on research methods](#)). You may have noticed that this example isn't even psychological in nature. This highlights that psychologists are trained in the scientific method, which can be applied in any area that follows the scientific method.

As overviewed above, students who train in psychological science receive training in both skills and knowledge that are important to employers. Thus, there are many, many career options available to a student who has trained in psychology. Indeed, a challenge that many students in psychology is not “what can I do?,” but rather “how can I choose what to do?”

IDENTIFYING POSSIBLE PATHWAYS

You may find yourself asking one of two questions: what do I *want* to do, and/or what *can* I do with training in psychology. Both of these are good questions, and may require different processes to reach satisfying answers. Below is just a brief summary of two search strategies that I often use with students as we explore career opportunities: Broad Search Strategies and Targeted Search Strategies. Broad search strategies best answer the question “what do I *want* to do,” whereas targeted search strategies addresses “what *can* I do?”. Note that the below methods are not evidence-based in that I (Meghan) don't have data to support their use beyond my own personal experience in working with students. Specialists in career development elaborate on career search and development in [Chapter 2](#).

The Broad Search Strategy

This is a strategy for when you have *no idea* what you want to do, and you are seeking to identify careers that meet your personal interest and long-term development goals. This search strategy uses backwards planning: rather than starting from where you are now and building out, this strategy looks for an end-point and guides you in planning backwards.

Step 1: The Initial Search: Identify 5-10 jobs across organizations that you think look interesting, even if they aren't jobs that you are qualified for (yet!).

Step 2: Identifying Common Requirements: Do you notice any common requirements among these jobs? If so, this common requirement might be a qualification you consider working towards.

Step 3: Identify Exemplars: Individuals normally change jobs throughout their lifetime. The average length of time that an employee had been with an employer across all US sectors was only 4.2 years (Bureau of Labor and Statistics, 2018). It's one thing to read a job posting, but it's another to see the journey to get there. In this step, identify individuals who have jobs that are of interest to you, using tools such as LinkedIn. Are there any early career experiences of desired exemplars that are relevant for you?

Step 4: Planning for the Next Steps: Once you have identified common requirements and typical pathways among your careers of interest, you are in a position to start planning your next steps on your similar pathway. If you have learned that a specific graduate program is required for your careers of interest, it's time to start searching for graduate programs.

Similar to the broad career search steps, identify graduate programs that are of interest to you. What are their requirements? Are there common undergraduate courses that you need for admission? Consider enrolling in those courses now. Are there common volunteer or research assistantship requirements for admission? If so, consider applying for those positions now so that you meet that requirement.

If you are unsure about graduate admission requirements, it is always a good idea to contact your program of interest directly. Requirements and space availability can change year-to-year. Only that specific program has the most up-to-date information on their admissions process.

The Targeted Search Strategy

Sometimes career searches can be much more pragmatic. For example, the desired career might be within a certain geographic location that earns a certain salary.

This Targeted Search Strategy is intended to be a *career* search strategy, not a *job* search strategy. That is, if you are asking the question “what should I do with my life in terms of a career?” this may be a helpful strategy. If you are looking for a specific *job* (i.e., you have your credentials and are actively job searching), you will want to check in with your local career assistance office for guidance.

The Targeted Search Strategy involves going directly to a source and evaluating careers on your criteria of interest. Many resources exist that give specific and concrete information on career specifics. The Government of Canada’s Job Bank (Government of Canada, 2018) is one such resource. This free, online resource provides information on many occupations, the typical educational training paths required for a variety of occupations, average salary by geographic location, and the job availability outlooks associated with many careers. The website uses the National Occupational Classification system (NOC) in classifying jobs. In this classification system, each occupation is assigned a nationally recognized 4-digit code. Similar jobs are typically classified by the same NOC code, although jobs classified together may vary on important dimensions depending on your search goals. The NOC system is helpful to know about, as it may help you to streamline your job search by exploring NOC codes rather than searching for keywords. <https://www.jobbank.gc.ca/explorecareers>

Although you are encouraged to go to the Government of Canada Job Bank website directly to search for career information (it is updated often!), we have compiled career paths related to Psychology from the Government of Canada Job Bank, and have built an Open Educational Resource with this information. We encourage you to use it as a starting point if you are feeling overwhelmed: Careers Related to Psychology Sourced from The Government of Canada’s Job Bank Resource <https://github.com/MeghanNorris/PsychologyCareers>

As you look through these careers, we encourage you to think about how the knowledge and skills you are developing in your education can be applied to the careers included. You might find that Activity 1 in the Appendix can help you to make connections between a generic career description and your specific skill and knowledge expertise. For example, as a student with training in psychology, you likely have developed skills related to team work, written and oral communication, data management and analysis, and problem solving.

We want to encourage you to use the Government of Canada Job Bank in multiple ways. For example, not only is the Government of Canada Job Bank a helpful guide for

a career search, but it is also helpful for those who are actively applying for jobs. When you receive a job offer, especially for professional careers, there may be an opportunity for negotiations. The Government of Canada Job Bank is an excellent resource for benchmarking average rates of pay, and for bench-marking your credentials in light of a specific occupation. Thus, when asked for your expected salary, you might respond with “Based on data from the Government of Canada, I would like to suggest that my salary would be in the range of \$29-\$32/hour.” Notice again this tendency to seek data to inform an opinion: your psychology professors repeatedly asking you for evidence develops data-driven skills that will help you in many areas of your life!

In addition to the resources provided above, there are many additional resources available. One that we would like to direct your attention to is hosted by the American Psychological Association, and is quite comprehensive in the information it provides:

Data Tools from the Center for Workforce Studies (American Psychological Association): <https://www.apa.org/workforce/data-tools/>

COMMON PROFESSIONAL SKILLS, KNOWLEDGE, AND ETIQUETTE BEHAVIOURS

There are a number of common skills and professional behaviours that span career opportunities and that either I wish I knew as a student, or that I wish students knew. Note that this section does *not* highlight professional skills in terms of practicing psychology in a clinical sense, but rather professional skills at a more general level. Specific skills related to sub-disciplines in psychology will be addressed in the chapters to come, and in courses that you choose to pursue.

SEARCHING FOR EVIDENCE

A background in peer-review

In psychological science, our gold standard for evidence is peer-reviewed scholarly evidence. In the context of empirical research, peer-review is a system where an individual (or team) conducts a study to answer a research question, writes a manuscript describing that study, and then submits the manuscript for “peer-review” at a specific journal chosen by the author(s). The editor of that journal then chooses typically 2-3 experts in the area (*reviewers*) to read and critique the submitted manuscript. The reviewers provide feedback to the authors and editor, and make recommendations as to whether the paper should be published in that specific journal, revised and resubmitted for further consideration to that specific journal, or rejected from that journal. The editor then goes through the reviewer feedback and makes a decision as to whether the manuscript will be published, and under what conditions if revisions are requested. Very few papers are accepted without any required revisions. If authors choose not to make the requested revisions, or if their paper has been rejected, they are able to submit their manuscript to another journal of their choosing (with or without edits).

The entire research-and-peer-review process can take months, and typically years from start to finish. The feedback from reviewers is intentionally very critical, with the goal of ensuring that rigorous and accurate research is published. Research that does not meet the threshold for rigor and/or accuracy is unlikely to be published in a high calibre peer-

reviewed journal. You may have submitted term papers for classes; this is the early training that allows students to gain expertise writing scholarly reports. With enough training and practice, students become experts, and those who choose to can submit manuscripts for publication, become the peers for the peer-review system, and train students of their own.

Academic journals have differing levels of *impact*—*impact* is a rough measure of how much people read and cite certain journals. Some journals have a higher readership resulting from a very high calibre of research due to a much higher threshold for publication. For example, some high-threshold journals might require multiple studies that comprehensively test many factors related to a research question to be considered for publication. Other lower-threshold journals might publish research that is interesting but does not yet have a great deal of empirical support. Thus, not all academic journals are considered equal. One proxy of journal quality is their impact factor, usually available on their webpage. Higher impact factors mean greater readership. Note that this is a proxy for quality: high readership does not mean rigorous research. Many tabloid newspapers have high readership, but it doesn't mean the content is accurate. Highly specialized journals may have fantastic research, but only be read by a handful of specialized researchers because there are only a few experts in the world. Readers must always be thoughtful while they read research, and be actively considering the degree to which the research is valid, reliable, generalizable, and ethical (among other things, but these 4 are a great start!). This is fundamental to what reviewers and good researchers do.

Where to find peer-reviewed articles

Members of the public typically have to pay to read scholarly research, including peer-reviewed research (but, see *Changes Happening in Peer-Reviewed Research* section below). If you are currently a member of a university community, you likely have access to scholarly research through your library. Universities pay sometimes *millions* of dollars to have access to academic journals (e.g., Bergstrom, Courant, McAfee, & Williams, 2014). You are able to go into your campus library to access scholarly research, or, if you are accessing the internet from campus or have access to a proxy-server, you can typically go to a website like <http://www.scholar.google.com> and be able to access the journals your institution is subscribed to. If you type in keywords, similar to a regular Google search, the Google Scholar search engine will populate with scholarly articles. Again, remember that this doesn't mean they are quality search hits, but they will be scholarly in nature. You should always be asking yourself “to what degree is this research valid, reliable, generalizable, and ethical?”

If you have a more targeted literature search, you might use a targeted search engine such as PsycInfo which searches Psychology resources. To determine the best targeted search engine, you might use a database identification tool through your library. Here is one example of a database identification tool from Queen's University: <https://library.queensu.ca/search/databases/browse/all>

If you are struggling with finding scholarly research relevant for your question of interest, librarians are trained in conducting literature searches. Their services are typically free for you to access, and you can find librarians in libraries both at educational campuses, as well as in public libraries. When conducting any type of literature search, you would be wise to consult with a librarian.

Changes Happening in Peer-Reviewed Research

For many good reasons, changes are happening to the *process* of publishing research in psychological science. Although this will be reviewed in more detail in the [Research Methods chapter of this book](#), there are a few important changes happening that you should know in the context of reading and interpreting psychological research for your professional development.

The process of peer-review described above continues to mostly hold true. However, recently *pre-registration* has been added to the process. Pre-registration is submitting the research question(s), and basic research design plan *before* the research is conducted. That is, the research plan is registered prior to conducting the research itself.

In some cases, this pre-registered plan is peer-reviewed and researchers get feedback about potential flaws in design before conducting the study. This use of the pre-registration process has great merit in the facilitation of getting constructive criticism early in the process at a time when it can be used to tweak research design. Imagine if your professor gave your term paper feedback before you submitted it. Would that result in a stronger final paper?

In other cases, the pre-registration details are kept temporarily private, to become public once the research is complete to ensure that researchers are conducting the research consistent with their pre-registered intentions. This is intended to minimize researcher bias (intentional or unintentional) during the research process.

Another change happening in the world of scholarly publications is a trend towards *open-access* publishing. Open-access publishing is publishing in such a way that readers do not need to pay a fee to access the work. As noted above, accessing scholarly research can be expensive and prohibitive. Some academic journals, and some textbooks (this one, as an example!), have been written intentionally to be open-access. In addition to pragmatics regarding how to make the open-access system sustainable (e.g., who pays for server maintenance, etc), one downside is that typically open-access resources are viewed as having less prestige than those publications that require payment to access and, as a result, authors do not often consider them as a primary destination for research publication. It seems that a shift is now underway, though. Some open-access journals, including *PLOS ONE* (2019), employ a peer-review system and have grown in credibility. As scholarly research becomes more available to the public (which personally, we think is an excellent improvement), it is critical that the public has the tools to critically read and evaluate this research. Again, always be asking the degree to which research findings are valid, reliable, generalizable, and ethical (there are other things to consider, but this is a good first cut!).

BUSINESS ETIQUETTE

As with many professional contexts, there are professional situations that you are likely to find yourself in while working in a variety of different career trajectories, and there are some common business etiquette behaviours. These behaviours often are taught from mentors, are rarely explicitly addressed, and may or may not actually be best practices.

To help ensure that you have awareness of these types of professional etiquette behaviours, some are addressed below. Please read these with thoughtful caution, however. Etiquette can change within a professional body (and oftentimes *ought to* change), and often

varies significantly across professional bodies. To give an example, in some professional contexts it is perfectly appropriate to wear jeans and sneakers to a job interview. In others, a full suit is expected. If you are ever in doubt about appropriate professional etiquette, ask a trusted mentor. If you don't have a trusted mentor, ask any friendly professor for some advice. They may be able to steer you in the right direction. If you don't have any friendly professors, drop Meghan (editor of this book) an email and I will do my best to connect you with a helpful resource that is close to you.

Some common business etiquette behaviours within psychological science are highlighted next that will span many career trajectories, but again recognize that this can vary by region, institution, and individual. Appropriate etiquette can change over time, and it may be different within subsets of the population. If you are unsure of business etiquette (or if you want to work to change it), please connect with a trusted advisor.

Addressing Professors

Many students coming into university from high school will address their professors as "Mr./Ms. Lastname." In a higher-education setting, professional titles should be used. In the context of a North American university, instructors should professionally be referred to as "Dr. Lastname" if they have a doctorate, or "Prof. Lastname" if they do not. This is not true in other systems including the UK. In those systems, "Prof. Lastname" is used only for those professors who have achieved full professorship. Note, female instructors should never be referred to as "Miss" or "Mrs.," unless specifically requested. These titles are used to indicate a woman's marital status which is irrelevant to her professional status. Relatedly, as we learn more about the impacts of pro-nouns, gendered titles used to address individuals may change.

In the event that you are unsure of how to address someone in their preferred way, for example if you are unsure of whether a gendered title is appropriate, or whether you should refer to someone by first name, there are appropriate ways to find out. In some cases, an individual will be explicit in telling you how they preferred to be addressed. In other cases, you might ask. For example, you might ask for permission to use someone's first name if you have a close collegial working relationship with them. An example of how to ask a question like this is: "Dear Dr. Lastname, I want to ensure that I am addressing you appropriately. What is your preferred way to be addressed?"

Please note that if a professor, or any professional, prefers to be called by their professional title, this is perfectly appropriate: they are working in their professional setting and are requesting to be called by their professional title. Let's consider this in another context: A police officer might be called Officer Jeffrey. It would be out of context to call Officer Jeffrey "Mrs. Jeffrey" if Officer Jeffrey was in uniform. Likewise, it would be up to Officer Jeffrey if she was willing for someone to call her "Sue" when she was on duty. Officer Jeffrey might be comfortable with her partner calling her Sue, but not a member of the public that she is serving. Notice that there is a great deal of context in this example, just as there is in any interpersonal dynamic. If you are unsure of how to address your instructor, or any colleague, a friendly email asking for their preferred way to be addressed is appropriate.

In a professional context, for example at a lecture, you should likely default to referring to any colleague by professional title even if you have permission to use their first name. For example, I introduce some of my best friends as "Dr. Lastname" in professional contexts.

Writing An Email

We all have questions, and an email is a common way to ask those questions to professors and other professionals. Before sending an email to anyone, it is helpful to first ask yourself a couple of questions.

1. What exactly is it that I need help with?
2. What are the best resources for me to get the needed help? For example, if you are looking for deadline or absence policies, before sending an email you should first check the syllabus of the course you are in (if in the context of a class), any previous correspondence (do an email search), and relevant webpages. Some organizations, including universities, also have discussion boards in their online platforms for certain types of questions. If you have exhausted your resources and are needing some extra support from an instructor or a boss, an email may be very appropriate.

It may be tempting to send an email to an employer or instructor similar to the way you would send a text, especially if you have a quick question. Although this may be appropriate if you know someone well and are engaged in an email conversation (as we often do outside of professional contexts), text-style email is not typically an appropriate method for professional communication. When emailing in a professional context, you want to ensure the following information is included:

- a proper salutation
- who you are, and the context you are writing about
- a concise statement of your question/comment, overviewing what you've already done to try to solve the problem or answer the question
- your full name and contact information, including your student number if relevant

Two sample email templates are below, although you should edit them prior to use so that your own professional tone comes through:

Dear [Ms. CEO],

I am a new employee in your marketing department, and am writing to ask for clarification about [Project X]. Specifically, I've [read through the request for proposal and have done research on our competitors], but am unable to find information on [sales history]. My goal is to [create a thorough document that has all relevant information to ensure our success]. Could you please direct me towards more information?

Thanks for your time!

With kind regards,

Full name

Email address/phone number

Dear [Dr. Lastname],

I am a student in your [course name, and section]. I am writing to ask for [clarification on, further information regarding, etc]. Specifically [give summary of the background research you've already done e.g., consulted the syllabus], and my current understanding is [summary]. I am seeking clarification about [specification of what is not understood]. Could you please provide me more information to help me better understand?

Thanks for your time!

With kind regards,

Full Name

Student Number 0123456789

When using electronic communication, please remember that USING ALL CAPLOCKS IS CONSIDERED YELLING. Excessive use of exclamation points can also be interpreted as yelling!!! The way in which you type communicates tone. If sending an important email, you might ask a friend or colleague to first read it over to ensure that the tone you are using is appropriate for the context. If an email reads more harshly than intended, you might soften it by adding an emoji (if professionally appropriate—there are boundaries on appropriate use of emojis), or by acknowledging in text to the reader that the email reads more harshly than you intend it to.

Leaving a voicemail

Sometimes an uncomfortable task, you will undoubtedly have to leave a voicemail at some point during your professional career. When leaving a voicemail, we recommend that you speak slowly, ensure that you give your name and a way to contact you for follow up. Importantly, give this information *twice!* Sometimes there is a crack in the phone line and a digit can't be heard. Leaving your name and contact information twice helps to ensure that your recipient gets all of the information they need to follow-up with you.

Asking for letters of reference/experience

Students are sometimes uneasy asking for letters of reference. Please know that each year, most instructors get dozens of requests for letters of reference. I tell you this a.) to reassure you that you are engaging in an expected professional behaviour by asking for a letter of reference and b.) to help you understand what an effective request for a letter of reference contains.

Instructors often teach dozens, and sometimes hundreds, of students in a given year. Instructors also often teach multiple courses in a given academic year. As a result, although you may have a great relationship with your instructor, and they know you well, they may have forgotten some important details related to your professional interactions that could be helpful in a letter. Below is the information that I (Meghan) request when students ask for a letter of recommendation, along with my internal reasoning for asking the question. Your

letter-writers may request different information. Please consider this as a starting place, and use the format provided by your letter-writer when requested:

General information to help set the context:

1. The nature of the programs you are applying to

A letter of reference for a specific job might be very different than application to graduate school in psychology, which might be different from an application to another type of program. Please give a brief overview of the program so that the letter can be framed appropriately.

2. An overview of the submission process

Graduate school letters of reference are often submitted confidentially through an online portal. Not all letters go through this process, and job letters can vary significantly in their submission process. Please give a brief overview of how the process will work, and whether letters should be directly addressed to a specific recipient (e.g., Dear Graduate Committee, vs “Dear Ms. CEO”). Because reference letters have to be submitted in very specific ways, it’s easiest to give these details right away either in an attached file or link to a webpage. Be sure to include the deadline in your request, and give your referee at least two weeks before the deadline.

Specific information to help write a strong letter:

1. Full name on record, preferred name and pronouns, and student number

Sometimes students have different preferred names from those on record, and I want to make sure that those receiving the letter know who I am referring to. Having access to all names, preferred pronouns, and the student number also helps letter writers to search my records more effectively so that they can write a comprehensive letter.

2. All courses taken with me as instructor (including the year taken), the components of those courses, and your overall grades

Sometimes courses change slightly across years, and the components of the course can also change. Specifying the components in a course may help your letter writer to write a stronger letter—for example, if there was a teamwork component, they can speak to this. Remember that there are dozens of students in multiple courses asking for letters: by providing this information in your request, you are making it much easier for your letter writer, and you are demonstrating conscientious professional behaviours. Thus, this also helps your letter writer when they comment on your professional skills!

3. Academic Achievements (e.g., Honours List, any other academic awards, conference presentations, any publications if relevant)

Instructors often don’t get notice of your individual achievements, and are excited to hear about them. By letting your letter writer know about these achievements, they can

include information about them in your letter. Even if your letter writer knows about the achievement, a reminder is helpful.

4. Volunteer and work experience (both academic and non-academic)

In this section, include any volunteer or work experience that might be relevant for the letter. Even if you volunteer in the lab of your letter writer, please include this. It helps to know that you've provided a comprehensive record.

5. Non-academic Achievements

Have you done something great that isn't related to your academics? This is important and matters! Please be sure to tell us a bit about it.

Etiquette at a Conference

Depending on your area, appropriate business behaviours can vary. For example, some conferences are very formal and require full business suits, whereas others are more business-casual in nature. If you have the opportunity and resources to attend a conference, it is appropriate to ask a trusted advisor about the level of formality at the conference, including dress code. Some conferences have pictures on their website of previous conferences, so you can see typical conference attire for yourself. If the dress code is not obvious, you might ask your advisor, or even the organizer of the conference, "Is there a dress-code at the conference?" Below, additional business etiquette considerations are overviewed that are fairly common across contexts. We didn't learn many of these behaviours until after we graduated with PhDs, and wish we knew some of them earlier!

Nametags

Nametags should be worn on your *right* side. The logic is when you shake hands (with your right hand), your colleague's eyes can follow a relatively straight and natural path from your shaking hand to your visible nametag while also comfortably make eye contact.

Your left side is where you would wear a pin, if relevant. The pin would thus be "over your heart."

The Elevator Pitch

Elevators used to be where all important people met. Okay, that's not true, but the term "The Elevator Pitch" refers to a description of your expertise that you can communicate to someone in a few seconds (the length of an elevator ride). It's the ultimate tl;dr (too long; didn't read) of your expertise.

It is worth your time to develop and practice an elevator pitch of your interests *now*. This pitch can and will change with time, but you will be interacting with professors and potential colleagues throughout your training. An elevator pitch should be maximum 60 seconds in length and summarize your professional interests and experiences. For example, you might use the following structure:

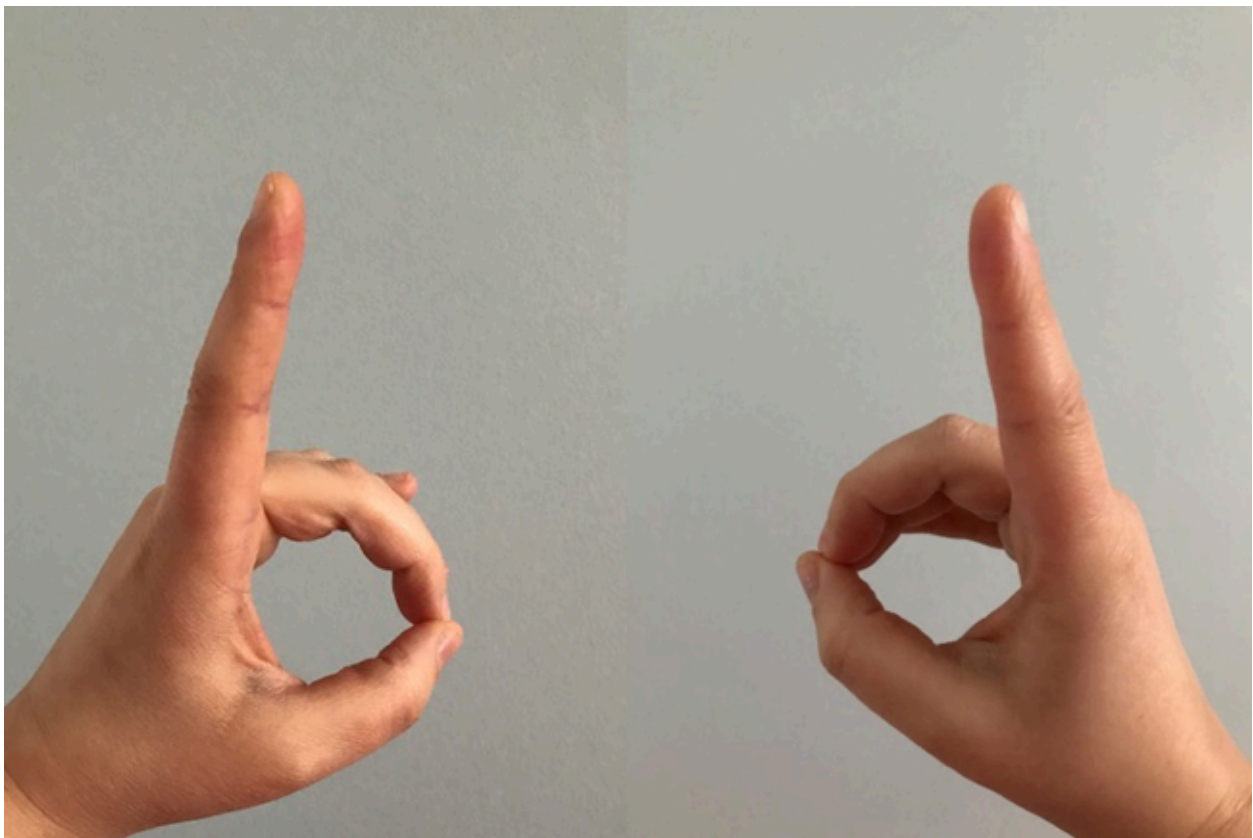
“I am a [undergraduate student/research assistant/graduate student] at [institution] and I am interested in [general summary of area of interest].”

Notice that this is a very general and short professional summary about yourself. If the person you are speaking with is interested to learn more, they are able to ask follow up questions. They can also comfortably “get off of the elevator at their floor” (i.e., discontinue the conversation) if unavailable for further follow-up.

The Dinner Table

So many glasses, plates, and cutlery. Whose is whose, and when should you use what?

Drinking glasses and bread plates: drinking glasses are to your right, and your bread plate (small plate) is to your left. Here is a *handy* trick to help you remember:



By using your hands to make the letters “b” and “d,” you can have a handy reminder for what side your bread plate is on (left), and what side your drink is on (right) when dining in a formal setting.

The “b” is your bread side (left), and the “d” is your drink side (right).

Forks: start farthest away from your plate, and work your way inwards with each course.

Food and Networking

Practice holding food and drink in your left hand during networking events so that your right hand is free for shaking hands. Passing your food or drink to your left hand just isn’t

as smooth, especially if you have crumbs or condensation on your hand. You don't want to give a *crummy* handshake.

The Handshake

Handshakes can be awkward, especially if you haven't practiced handshakes. It takes practice to have a firm-but-not-painful handshake. It also takes practice to kindly decline a handshake if you are uncomfortable or unable to shake a hand. It also takes practice to adjust if your handshake is declined (it is not necessarily a social rejection if a handshake is denied—many invisible conditions prevent handshaking). It also takes practice in shaking hands with someone who has a visible disability if you are unsure how to proceed. Notice that “practice” is repeated here. Your first few professional handshakes might be awkward, and that's to be expected. If the thought of giving handshakes makes you nervous, it is worthwhile to reach out to a trusted mentor or career centre for guidance. For more insights specifically on handshake behaviours with individuals who have a visible disability, please see (<https://styleforsuccess.com/blog/how-to-shake-hands-with-someone-with-a-disability/>). As with all interpersonal interactions, be aware that contexts can vary. Never touch someone who gives indicators that they do not want to be touched (e.g., the person steps away from you, and/or has closed body language). If you are unsure, a friendly verbal greeting is more appropriate than potentially violating someone.

The Art of Thank You

In your career you will encounter many people who will go out of their way to help you either in small or large ways. Although not expected, it can strengthen an interpersonal relationship to send a genuine thank you to a person who has helped you in a meaningful way. You can of course send an email of thanks, but in situations where someone has significantly made the world a better place for you, sending a simple hand-written thank-you card is often much appreciated. Indeed, we often underestimate how good receiving a thank you can feel for our recipients (e.g., Kumar & Eply, 2018).

Are there other areas of professional knowledge and behaviours that you are unsure about? If so, in addition to following up with a trusted mentor or career development office, please feel free to send Meghan (the editor of this book) an email. We may include your question in a future edition of this book!

HOW TO USE THIS BOOK

Building on themes highlighted in this introduction, this book has been created to provide you with content on applications of psychological science and careers in psychological science written by experts across Canada. These experts were once where you are: students in a psyc course. Their chapters will vary somewhat in format to allow each sub-discipline's “voice” to come through, but all chapters have an intentional focus on both research and application of psychological science, in addition to content regarding educational training paths and career options.

We hope that this book highlights the many careers available to students who train in the psychological sciences. We hope this book also provides you with new insights into the many ways in which psychological sciences addresses important questions, and ultimately

influences the world around us in its application. As with anything you read, I encourage you to always be considering questions related to validity, reliability, generalizability, and ethics as you read this book. Indeed, this is how new research questions are often generated! In that spirit, in case no one has done this already, I welcome you as a colleague in the psychological sciences, and look forward to learning about your future work.

Activity 1: Identifying your skills
Norris & Baker, 2019

Below you will find the top 10 most highly rated attributes on behalf of employers (National Association of Colleges and Employers, 2016). For each attribute, reflect on your experiences and see whether you can identify a *specific* example of how you have displayed or developed that attribute. For example, if in a course you had a team-based project that you scored highly on, you should include that in your chart under the “ability to work in a team” section. Have you taken a course that has required you to use software to analyze or manage data? That can go under the “technical skills” section.

You likely won’t have an example for every box, and that’s okay! The goal is to identify some specific examples so that you can rely on these to demonstrate strong attributes.

	Coursework that demonstrates my skills and ability	Volunteer experience that demonstrates my skills and ability	Paid work experience that demonstrates my skills and ability	Awards/honours that demonstrate my skills and ability
Leadership				
Ability to work in a team				
Communication skills (written)				
Problem-solving skills				
Communication skills (verbal)				
Strong work ethic				
Initiative				
Analytical/quantitative skills				
Flexibility/adaptability				
Technical skills				

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[2]

INTRODUCTION TO CAREER DEVELOPMENT

Cathy Keates, Director, Queen's University, Career Services

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INTRODUCTION

Charting your career path beyond university can be a surprisingly complex experience – potentially both exciting and daunting at times, it can be all too easy to put off thinking about your future until some other time. To ease potential stress, and help find your way in an unknown terrain, it can be helpful to have a map to make more informed choices. In this chapter we will help you start building your own map of your future as we look at the topic of careers from a number of different perspectives.

We'll examine common questions of Psychology students, look at some key labour market trends and information, and learn about leading career development theories. Then we'll boil this all down to look at how you can use it to make the most of your time studying psychology, learn about yourself, and make good career decisions. From this foundation of a broad perspective on career development, you will be better positioned to make sense of the various career paths you will be exploring throughout the remainder of this text.

PSYCHOLOGY DEGREES + CAREER PATHS - WHAT CAN I DO WITH A PSYCH DEGREE?

Before you dive in to the wealth of information in this text about all the exciting career possibilities that lay ahead, and ideas about how to navigate your career in this chapter, we want to address a few key questions and concerns that we hear from Psychology students about career options, grad school, and what you are learning in the classroom.

WHAT CAN I DO WITH A PSYCH DEGREE? – COMMON CAREER PATHWAYS



One of the most common questions asked by students in Psychology is “What can I do with a Psych degree?” A reasonable question, hoping for a clear answer to provide future direction. The truth is a bit murkier than the predictability you might be expecting.

As a student you may be used to linear relationships between steps in your education – you complete secondary school and then go to postsecondary, you take Psych 100 to be able to take Psych 200, etc. It is easy to expect to keep moving on a predictable track to specific advanced degrees and jobs. The reality is that after graduation, graduates with Psych degrees head in many directions, some highly related to their undergraduate studies, and some less obviously so.

This textbook will shed some light on some of the more common pathways for psychology graduates, as well as a few destinations you might not have anticipated. With a quick search on LinkedIn you can confirm this for yourself. You’ll see psychology graduates working as psychologists, psychiatrists, counsellors, educators, and researchers, but also people working in marketing, human resources, law, non-profit, and a multitude of other professional fields. What does this mean for you? It means that you have options – you can continue to move in directions more explicitly related to psychology, but you can also give yourself permission to explore other destinations. In fact, only roughly half of students who study any discipline at university end up moving into directly related fields (Council of Ontario Universities, 2016).

How to search alumni on LinkedIn:

1. Login to LinkedIn (create an account if you haven't yet)

2. In the search bar at the top of the page, search for your school's name.
3. On your school's page, click on the "See Alumni" button to access the database of students and alumni from your school.
4. Keep in mind that if you click on someone's page they will be notified, so you may either want to set your privacy settings to anonymous, or make sure you are comfortable with them knowing you clicked!

Why is this the case? There are a number of factors that influence the steps someone takes in their career. Although the fact that you have chosen to study psychology might tell us something about some of your aptitudes and interests, you will still find a wide degree of variety in the make up of your class. Not all psychology students are the same – each person in your class has their own life experiences, personality, skills, and values – and these will strongly influence directions you are inspired to pursue. Beyond the internal factors, there are a host of external variables that will affect this as well – parental and peer influences, networking connections, chance opportunities, barriers encountered, labour market forces, funding, and more will all alter your career trajectory in complex ways. We will get into a deeper analysis of understanding career development later in this chapter looking at the labour market and helpful career theories and models that have been refined over the last century to help us get a grasp on this complex dynamic.

SHOULD I GO TO GRADUATE SCHOOL? – FURTHER EDUCATION & TRAINING

Another very common question psych students ask is “Should I go to graduate school?” Where do you go from an undergraduate degree? Sometimes, because you are surrounded with professors and graduate students who have all done advanced degrees, you might get the impression that your only route to success is to pursue a long academic track towards a PhD or other advanced credentials. While this can certainly be a rewarding path, it is not for everyone. In fact, Rajecki and Anderson (2004) state that the majority of psychology students enter the labour market after graduation, rather than pursue additional training. And just as there are a variety of career directions, there are just as many routes you can take to get to those destinations. Once you start exploring, you will come across programs ranging from short certificates and courses, to post-grad diplomas at colleges, professional course-based master's, practicum focused master's, research-based masters, law school, med school, and more. It can be very easy to get overwhelmed trying to sort through all of these possibilities.

How can you make an informed decision? Getting a clearer sense of career direction and long-term plan can help keep you grounded while considering your next steps. Throughout this text you will be refining your own sense of direction in terms of what fits you and your life, and learning about developing the necessary qualifications and experience to be a competitive candidate in your field of interest.

WHAT AM I LEARNING STUDYING PSYCHOLOGY? THE VALUE OF YOUR DEGREE

Even though you spend so much time in classes and working on academic projects, many

students struggle to articulate what they have actually been learning, especially when it comes time to apply to jobs or further education. The good news is that your studies in psychology are providing you with valuable skills that employers want. What exactly are they looking for?

According to a recent Business Skills Council of Canada Skills Survey, the top 5 skills employers look for in entry level hires are (Business Council of Canada, 2018):

1. Collaboration and interpersonal skills
2. Communication skills
3. Problem-solving skills
4. Analytical capabilities
5. Resiliency

What are the specific skills and learning outcomes associated with studying psychology at the undergraduate level? The APA presents detailed information outlining their expectations (American Psychological Association, 2013):

- Knowledge base in psychology including key concepts, themes, domains, and applications
- Scientific inquiry and critical thinking including reasoning, information literacy, problem solving, and research
- Ethical and social responsibility in a diverse world
- Communication including effective writing and presentation skills
- Professional development including applying psychological content to career goals, self-efficacy, project management, teamwork, and meaningful professional direction for life after graduation

If you compare the skills you can get from your degree with what employers are looking for, you can quickly see that you are well positioned with a strong foundation for future success. For a more specific accounting of what you can expect to learn from your program, you can consult learning outcomes associated with the program, individual courses, or materials like the Queen's University Majors Maps that outline key skills and career options tied to each program. In the next section we will take our investigations further by looking at labour market information and how it can help you navigate your career development.

WHERE ARE THE JOBS? – LABOUR MARKET INFORMATION

The future ain't what it used to be. – Yogi Berra

Previous generations might have experienced periods of relative stability and predictable career progression, but in our modern society change is the new normal. With significant technological advancements transforming the ways we work, information technology transforming our cultures, and political, ecological and cultural changes affecting every aspect of our lives, it can be hard enough to predict the weather a month from now, let alone make informed career plans for years into the future. “Chaotic systems display ... a lack of predictability at the micro level, while at the same time appearing to have a degree of stability at the macro level” (Bright & Prior, 2005). There is no one answer to “Where are the

jobs?” because there is too much change to predict the future to that micro level. However, there are some broad changes at the macro level that we can explore.

BROAD TRENDS AFFECTING WORLD OF WORK

With the nature of working rapidly changing, understanding the future of the labour market can prove difficult. Here we will look at key forces that will influence the way work is viewed in the future; technology, globalization, demography, society, climate change, and energy resources (Gratton, 2011).

The influence of technology and globalization across the world is perhaps the most obvious. Technology has consistently driven long-term economic growth, resulting in continuous productivity gains since the mid-1990s – a narrative that is expected to continue as the world’s knowledge becomes increasingly digitized.

4 Major Trends Shaping the Future (Gratton, 2011)

1. Technology
2. Globalization
3. Demographic and social shifts
4. Climate change & energy systems

Globalization affects countries in different ways. Increased competition and trade have allowed certain countries to benefit as it becomes more cost-effective to move both goods and information. However, this has also resulted in markets that are arguably more unstable as compared to markets in the 20th century. With the development of global financial markets, undesirable market effects can spread very quickly on a global scale, such as the market crash on September 29, 2008 (Bostan, 2009).

With this increasing global connectivity, societal mindsets are shifting as consumers are exposed to more choices and are faced with an evolving definition of what it means to meet their needs (Gratton, 2011). This is further influenced by changes in the world’s demographic and societal structure. Developed countries are facing a rapidly aging population concurrent with a low birth rate. While increasing longevity means that people are able to contribute to the labour market for a longer period of time, governments are also faced with restructuring their policies to better support the population. Additionally, differing attitudes between generational cohorts will likely also contribute to a restructuring of work. Generation Z, who will be around 35 years old in 2025, is known primarily for its connectivity. As more of this generation enters the work force, they will play a larger role in reshaping the workplace to meet their expectations and needs.

The final restructuring that will inevitably occur concerns the use of energy resources and their related contribution to climate change. A reorganization appears inescapable in the future – whether it is a reluctant adaptation of the present energy framework as resources become increasingly strained, or a construction of a new energy framework that would integrate networks both locally and globally to create a new system of sustainability. All of

these trends combined will continue to reshape the future of work – how we work, with who, and where.

WHERE PEOPLE WORK

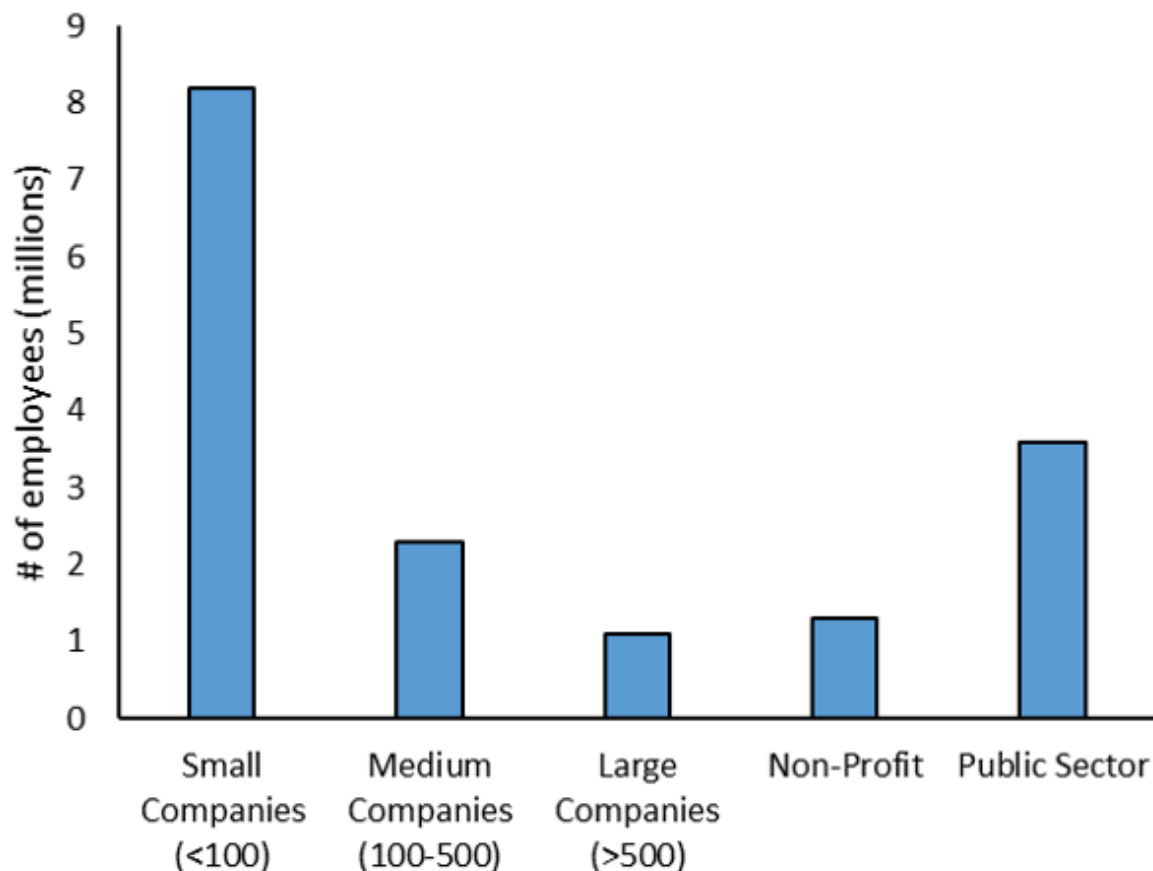
Shifting from a global perspective to a national perspective, it can be enlightening to see where people in Canada actually work. A common assumption is that most people work in large companies, but in fact large companies only employ a small percentage of the population, with the majority of people working in small companies of less than 100 people (Government of Canada, 2016), and almost a third working in non-profit (Statistics Canada, 2005) and the public sector (Fraser Institute, 2015).

Small Company (less than 100 employees) 8.2 Million

Medium Company (between 100 and 500 employees) 2.3 Million

Large Company (more than 500 employees) 1.1 Million

Labour Market Composition in Canada



OUTLOOK BY OCCUPATION

JOB	MEDIAN SALARY	MEDIAN AGE OF WORKERS IN 2014	AVERAGE RETIREMENT AGE	PERCENTAGE OF FULL-TIME WORKERS	PERCENTAGE OF WOMEN
Social Worker	\$32.29/hour	44	63	87	83
Early Childhood Educator	\$18.00/hour	40	63	76	97
Human Resource Professional	\$33.76/hour	43	64	93	72
Administrative Officer	\$23.50/hour	45	61	86	82
Lawyer	\$107,829 /year	45	65	92	42

Fig 2.3

Occupational outlooks can be a valuable source of information in trying to predict future demand for careers of interest. Using resources like the [Canadian Job Bank](#) website, you can search by occupation to access information projecting demand 10 years into the future, as well as wage information, skills, job postings, and more. Below is a quick sampling of some of the kinds of information you may find (Government of Canada, 2018c):

OUTLOOK BY AREA OF STUDY

Government data is also available by degree area and level, and can reveal some interesting details.

Searching the Canadian Job Bank website for [graduates of psychology Bachelor's Degree programs](#) (Government of Canada, 2018a):

- Unemployment is 6%
- Median salary is \$44,639.00
- 40% work in jobs closely related to field of study, 28% somewhat related, and 32% not related
- 60% of graduates continue studying after graduation

For [graduates of psychology Master's Degree programs](#) (Government of Canada, 2018b):

- Unemployment is 4%
- Median earnings are \$61,537
- 61% work in jobs closely related to their field of study, 25% somewhat related, and 14% not related
- 40% of graduates continue studying

SO WHAT DOES ALL OF THIS DATA MEAN TO YOU?

Getting information about future trends, salary surveys, and occupational outlooks can give you a sense of what is going on in the world of work to help you make informed decisions. Knowing, for example, that roughly half of graduates of psychology end up in work closely

related to their studies might encourage you to consider other possibilities. Seeing the higher salary and employment rates of Master's degree holders might lead you to think that further education could be a good investment. Or you could see the [labour market outlook for psychologists](#) in the Maritime Provinces or the prairies is better than Ontario and consider moving there for better job prospects (Government of Canada, 2018c).

While potentially quite useful, this information should be used with caution. In the dynamic modern workplace, changes can happen quite quickly. Much of the information included in job futures projections may be based on census information or graduate surveys that could be already a few years old.

Most importantly, the information speaks to general patterns and averages, but not to individuals. Although there may be broader trends or pathways that others follow, they need to be considered in the context of your specific life circumstances and particular needs. It can be tempting to follow the money, or seek out the hot jobs – but this is not a guaranteed road to success. In the 1990s, students were flocking to studying computers because the job market was so hot in IT – but when the market contracted suddenly and the dot-com bubble burst, many computing students struggled to find work (U.S. National Center for Education Statistics, 2017).

A balanced approach to decision making that considers environmental conditions and personal factors together is more likely to lead to good decisions than a strategy based on either aspect alone. To help you form your own grounded perspective way of looking at careers, we will look at some of the most prominent models and thinkers influencing career development theory today in the next section.

MODELS & WAYS OF LOOKING AT CAREERS – HOW DO I THINK ABOUT CAREERS?

Much like the other topics you have studied in your degree so far, the topic of “career development” has had a lot of academic study – with years of theory development and research looking at how people develop careers.

The central questions of career development theories have been:

- How do individuals make decisions about what career to pursue?; and
- How do career paths develop over time?

This chapter will be useful to you if you are interested in “career development” from an academic perspective, but you needn't be. As we review theories of career development, we will extract information and strategies that you can use as you map out your own future career path(s). We will review several approaches to career development, focusing on those theorists and topics that may be most helpful to you as you think about your own career decisions.

PERSON-ENVIRONMENT FIT

A foundational theory and concept in career development is **person-environment fit**, credited to Frank Parsons working from the early 1900s (Neault, 2014). The central idea of person-environment fit is that the better the match between a **person** (namely their traits such as skills, interests, and values) and the **environment** (such as the needs and demands of a specific occupation and workplace) the greater likelihood of success and happiness for that person.



Fig. 2.4

In practical terms, following the person-environment fit model to make a career decision would lead to activities such as first assessing your skills, interests, and values, then gathering data about occupations, and then comparing you (the person) and the occupations (environment) and looking for the “best fit” career choices.

This simple idea of person-environment fit continues to be the foundation of most career development activity (and in the next section of the chapter we will present some activities that you can use to learn more about yourself and about potential occupations as you look for fits). However, while useful as a foundation, this approach is too one dimensional. Simply looking at fit between an individual person’s needs and an occupation’s needs, is not representative of the actual complexity of career decisions and career development over one’s lifespan. In addition it leaves out significant other variables that impact what options are available to many people.

Constraints on Person-Environment Fit

While person-environment fit is a useful starting point, a key criticism is that it assumes that all individuals are choosing from all possible environments (jobs, organizations). Theorists such as Gottfredson (1996) argue that choosing a career is not just about your psychological self, but also your social self. Through your career choice, you are “placing [yourself] in the broader social order” (p. 181). This draws attention to the impact of social aspects such as gender and social class. Her theory of Circumscription and Compromise asserts that your self-concept and your images of occupations are impacted by social factors. **Circumscription** is a narrowing of perceived options – “the progressive elimination of unacceptable alternatives” to those that are considered *socially* acceptable (p. 187). **Compromise** is then the process of editing your preferred career options based not just on what is most compatible with you, but what *you perceive* as most acceptable. For example, some might believe that certain careers are only appropriate for certain genders such as nursing for women.

Are there career options that you think are not “acceptable” for you? Based on your gender identity? Based on your social class? Based on other social variables? Are any of those careers options that you feel **are** compatible with your skills and interest, but you’ve eliminated them as options because of perceived “unacceptability”?

Gottfredson’s concepts of circumscription and compromise illuminate how there is more to a career decision than assessing the fit between a person and the environment; there can be internal reactions to external factors, and these internal reactions change perceptions of what careers might be possible and acceptable as you plan your career options.

THE DECADE AFTER HIGH SCHOOL

While it is helpful to think about how to plan your career path, planning does not represent the full experience of how careers actually unfold. Many people think of career development as a ladder – a series of planned steps leading up to greater and greater things. In reality, people’s career trajectories are far more disordered. Recent research with youth in Canada in their decade after graduating from high school provides an interesting illustration of this (Campbell & Dutton, 2015).

Researchers interviewed 100 young people in four Canadian cities. They found that these youth used three styles of moving forward:

- *navigating* – youth who used *navigating* had a plan and were following it
- *exploring* – those using *exploring* did not know exactly where they wanted to end up, but were actively trying out different things to learn more about themselves and about career options
- *drifting* – those who were *drifting* were “going with the flow” and didn’t have a plan and were not engaged in trying to learn more or be proactive about how to move forward.

The researchers also found that many people used more than one of these approaches over time.

It is tempting to expect that *navigating*, which is the most planful strategy, would be the most successful. However, the research found that this was not always the case. Sometimes being too committed to one path without yet knowing that much about it, or having had a chance to try it on, led to later not being as satisfied. In terms of the second strategy, *exploring*, the researchers found that young people sometimes faced criticism for exploring, but that exploring helped the interviewees understand their own identities and options better. Even drifting sometimes has positive outcomes when exposed by chance to positive experiences. The researchers conclude that all three approaches can be helpful and that an overreliance on believing that you should have an answer and decision can be detrimental.

"I think drifting and exploring for awhile and then navigating is cool. Kind of like getting thrown off a ship. You drift for awhile and then think this is getting a little boring so maybe I'll swim this way for a little bit. Then you're like, it's definitely this way and you swim to shore." Colin, a 26 year old from Halifax

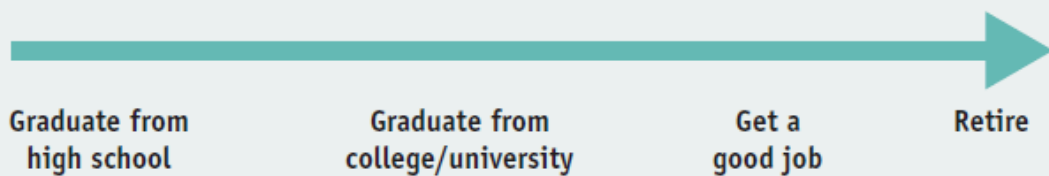
(quote used with permission)

Young people reported that they faced great expectations for being planful. In our own work at a university career centre, we also hear students telling us that they receive a lot of the following messages, whether said explicitly, or implied:

- You should know where you want to go – you should make a decision
- It is better to know what you want to do than to not know
- The most successful people set and follow plans

The way it is *supposed* to look

Many assume that young people will follow a linear, predictable path from high school to post-secondary training, and then on to a permanent full-time job. They believe that young people’s career pathways should look like this:



The way it looks for most

Rather than a straight line, most young people’s career paths will look like this:

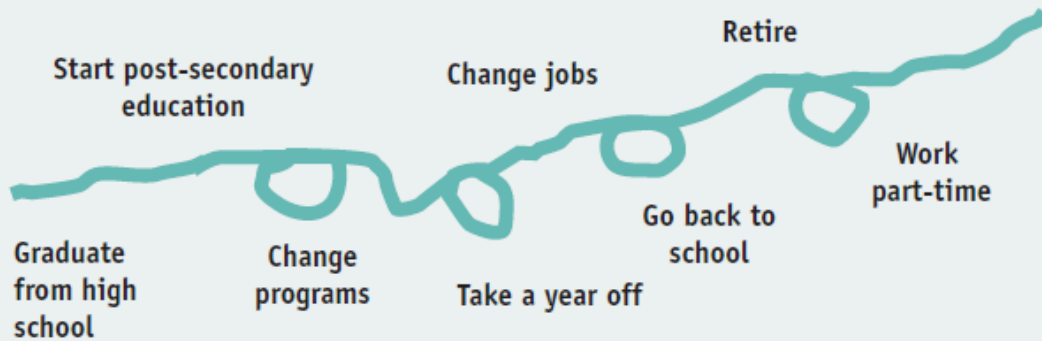


Fig. 2.5

The Decade After High School authors share the following visual (Figure 2.5) to illustrate the difference between expectations and reality and argue that “the results of this study highlight the importance of normalizing unpredictability and change in the school-to-work transition

and providing young people with tools to work more effectively with this reality.” (Campbell & Dutton, 2015, p. 65)

What has your experience been? Do you feel pressure to have an answer and clearly laid out path? When someone asks you “What are you going to do after graduation?” or “What are you going to do with your degree?” or “What do you want to be when you grow up?” – do you feel pressure to have an answer?

PLANNED HAPPENSTANCE

When I was in my final year of undergrad, I was in my second floor apartment in downtown Toronto making lunch. I randomly decided to go over and look out the window and happened to see a friend of a friend walking on the street. I shouted out to him and we chatted for a few minutes and found out that he was looking for an apartment, and I was looking for a summer job. He ended up moving in to the apartment upstairs, and I ended up working at the same camp as he was, getting a foot in the door with the director by using his name. To this day we are still close, and the friends I made at that camp are still among my best. All because I looked out the window and said “Hi!”.

– Miguel Hahn, Chapter Co-Author

The themes identified in the Decade After High School research relate well to Planned Happenstance Theory. Mitchell, Levin, and Krumboltz (1999) argue that unexpected events play a significant role in most careers, and their Planned Happenstance model, an intentional oxymoron, is a good way to conceptualize how careers actually unfold.

We have spoken with countless professionals, often alumni of the universities where we have worked. When we’ve asked “how did you get to be where you are today?” there is a startling consistency to the answers. The number one response: “**luck**”. That is the “happenstance” part. But what about the “planned”? When we ask follow up questions about the luck, such as “When that lucky situation happened, how did you respond?”, we find that people actively took advantage of the luck to turn it into a career move. And when we ask questions like “And what had you done previously that put you in the situation where the luck was able to happen?” we find that people had had to have been actively engaged in a network and in exploration, in order to be somewhere where luck found them. Although the lucky happenstance was a key occurrence, each person had created the conditions for the luck, and then had acted on the luck rather than ignored it. These alumni stories map well into the Planned Happenstance framework.

There are two key tenets of planned happenstance theory (Mitchell et al., 1999, p. 118)

- a) exploration generates change opportunities for increasing quality of life; and
- b) “skills enable people to seize opportunities.”

The first, that exploration creates opportunities, draws our attention to how we are not just passive recipients of chance events, but that we can increase the likelihood of positive happenstances through exploration and engagement. For example, individuals who have little to no interaction with the larger world are unlikely to experience a lot of exciting chance events that will bring new career opportunities. However, if we are engaged and connected, are building a strong network and attending events, speaking with colleagues, are part of an online community, and so on, then we are more likely to bump into new opportunities. Our own behaviours can generate greater likelihood for lucky opportunities. Then, when there is a lucky opportunity, we can choose to ignore it, or we can choose to take advantage of it. If there is a knock on the door we have to open it to see if it is a visit that might lead to something exciting.

Mitchell et al. (1999) lay out five skills that they believe help us generate and take advantage of happenstances, listed in the left hand column below. The interplay of these skills help us to make it more likely that we will have positive happenstances, and that we will then act on them in a way that leads to the most positive impact for our own lives.

Think of your own path so far, that has gotten you to today. What role has planning played, and what role has happenstance played?

Curiosity: exploring new learning opportunities	How has curiosity led you to new opportunities in your past?
Persistence: exerting effort despite setbacks	What is an example of a time when you persisted and that meant that you were able to move forward despite facing challenges?
Flexibility: changing attitudes and circumstances	When in the past have you been flexible and that allowed you to take advantage of an opportunity you might not have had?
Optimism: viewing new opportunities as possible and attainable	How would you describe your own level of optimism and how much you believe new opportunities will appear and be things you can act on?
Risk taking: taking action in the face of uncertain outcomes	How would you describe your risk taking approach? What is an example of a time in the past when you took a risk on a new opportunity and it led to good things?

(Adapted from Mitchell et al., 1999, p. 118)

THE CHAOS THEORY OF CAREERS

The Chaos Theory of Careers (Bright & Pryor, 2005; Pryor & Bright, 2014) has some commonality with Planned Happenstance (in particular the role of unexpected events), but is an attempt at a much broader new conceptualization of career development. The authors wanted a theory that would not just address how an individual makes a career decision, but one that also incorporates the complexity of variables, both personal and contextual, that impact career trajectories. They asked a fundamental, and very big, question: “Why should the influences on career development be different from those that brought about life or which shape our cosmos?” (Pryor & Bright, 2014, p. 4). They looked beyond the career development literature to general science and its attempts to explain the overall function of the natural world.

Careers, like other parts of nature, are part of a chaotic system: “An individual’s career development therefore is the interaction of one complex dynamical system (the person) with a series of more or less generalized other complex dynamical systems including other individuals, organizations, cultures, legislations and social contexts” (Pryor & Bright, 2014, p. 5).

The Chaos Theory of Careers uses terms from general Chaos Theory (such as complexity, non-linearity, chance and change), and applies them to career development.

Complexity – there are so many variables, linked in so many ways, that complexity is a reality of systems, including the systems within which we work and manage our careers. As covered in the labour market section, many authors are arguing that complexity is increasing and will continue to.

Non-linearity – Perhaps the most well-known component of general chaos theory is the butterfly effect, in which a butterfly flaps its wings in one part of the world, and impacts the weather somewhere on the other side of the globe. This is an example of **non-linearity** and, applied to careers as we have covered already, this emphasizes how most people’s careers do not follow a direct line, and that a small change can cause disproportionately significant impacts.

Chance – this theory reinforces the importance of recognizing how we cannot focus on predictability, but should recognize and even embrace the role of chance in our careers.

Change – the authors argue not only that there is constant change in the larger world, but that people themselves change. A criticism of the person-environment fit model (that we explored at the beginning of the section) is that it assumes little change in both the person and the environment. If people themselves are continually changing, how does that impact how people make career decisions?

The Chaos Theory of Careers draws our attention to the complexity of career development and to the multiple and often unpredictable influences on our options and opportunities.

How well do you think chaos describes the natural world? How well do you think a chaos theory can describe your career so far?

If careers are chaotic, how does that make you feel? Are you excited by the possibilities, concerned about the lack of predictability, intrigued by the complexity, or a combination of those feelings and/or others?

CONSTRUCTIVIST APPROACHES

Much recent work on career development uses a constructive approach, emphasizing that reality, and how we experience it, are individually and socially constructed. There is not one objective reality, nor one story of who we are and our career path. A subset of constructivist theories, narrative approaches specifically highlight the role of story and argue that we narrate our own lives – “we are the stories that we live” (Niles & Harris-Bowlsbey, 2013, p. 113). As we tell the story of ourselves and our careers, we are designing our own reality.

Although overall the world may be chaotic (should we ascribe to a Chaos Theory conceptualization), the narrative approach allows a look at how individuals have agency in impacting the stories they narrate for their own careers. It is “by constructing personal career narratives, we can come to see our movement through life more clearly and can understand our specific decisions with a greater life context that has meaning and coherence” (Niles & Harris-Bowlsbey, 2013, p. 112).

As an illustration of one constructivist approach, Savickas (1997) uses a “career story” process to help people narrate their own development. He asks clients five key questions about themselves – asking them to name role models, favorite magazines, favorite book, mottos and early recollections. Then, working together, the counsellor and client draw themes out of these reflections, and the client constructs a story of their career – identifying central themes that have guided them in the past, and that they may choose to use to guide them into the future. Having these themes then informs decision making about next steps.

Another example of a constructivist approach is the use of metaphor as a way for individuals to understand their own careers (Amundson, 2010). “People actively seek to make meaning of life events and this process is on-going” and metaphors are a common way humans make meaning (Amundson, 2010, p. 7). Using metaphors is helpful because by “referring to parallel examples where similar dynamics are in play” we are better able to understand a new experience by relating to the familiar metaphor (Amundson, 2010, p. 2).

Consider the following metaphors that might be used to describe your career:

	If you use this metaphor for your career, <ul style="list-style-type: none"> • What does it bring to mind? • What limits does it have – what does it miss in your experience? • How might it be helpful to organize your thoughts? • Does it make you feel more or less optimistic about my future?
Career as journey, which can include getting a call, responding to the call, facing obstacles	
Career/life as a book – with chapters, difficult challenges,	
Climbing the ladder of success	
Following the yellow brick road	
Solving a puzzle (or many puzzles)	
Undertaking a research project	

Metaphors adapted from Amundson (2010)

LIMITATIONS: ETHNOCENTRICISM

We have reviewed a few examples of how career development theory has evolved over time. During this evolution, there has been a growing conversation about diversity and the limitations of existing theories in an increasingly diverse community. **Ethnocentrism** is the assumption that one's own "value system is superior and preferable to another" (Niles & Harris-Bowlsbey, 2013, p. 135). Historically most of the career development literature that is used in North America has been produced in North America, and primarily by members of dominant groups (Niles & Harris-Bowlsbey, 2013). It is important to note that these theories do not reflect a universal value system.

Arthur and Collins (2014) draw attention to several cultural assumptions that have been made in career development literature reflecting a European-American perspective:

- Individualism and autonomy – assuming that individuals make their own choices that create their futures
- Affluence – assuming that individuals have access to affluence, or the resources needed
- Structure of opportunity open to all- assuming that all individuals have access to opportunities
- Centrality of work in people's live – assuming that work is a central part of lives
- Linearity, progressiveness, and rationality – assuming that individual's careers progress in linear and rational ways

These assumptions, based on a "Western" worldview, limit the applicability of the career theories we have reviewed. Even the term "career" itself may have different meanings for different people, depending on historical and cultural influences (Arthur & Collins, 2014). Although the theories we are reviewing in this chapter all have useful ideas to offer, we should examine them through a lens of diversity and social justice, considering how each theory may be limited within a particular world view, and consider limits, biases, and gaps .

In addition to limitations within career theories, there are also limitations and structural barriers that people from marginalized groups may experience in the labour market. Niles and Harris-Bowlsbey (2013, p. 130) argue that "there is also ample evidence to suggest that women, people of colour, persons with disabilities, gay men, lesbian women, and transgender persons continue to encounter tremendous obstacles in their career development ."

Fortunately, there are increasingly more diverse voices in career development writings. Examples of recent work includes articles looking through an Indigenous lens (Caverley, Stewart, & Shepard, 2014), and considering the experiences of immigrants to Canada (Bylsma & Yohani, 2014) and of refugees to Canada (Sutherland & Ibrahim, 2014).

What messages about "career" have you learned from your family, and what messages are routed in your family's history and experiences?

Are there any structural or systemic obstacles you believe you may (or have) experience as you pursue your career path? What privileges have you benefited from that have made your life easier?

Which, if any, of the assumptions listed above have you made when you think about careers and opportunities?

FINDING YOUR WAY- MOVING TOWARDS YOUR CAREER GOALS

In the previous section we reviewed the evolution of career development theory. We're now going to present some more concrete processes and tools that you can use as you seek to develop your own career path and a meaningful sense of direction.

THE VALUE OF PURPOSE

Research from Harackiewicz, Barron, Tauer, and Elliot (2002) and Snyder et al. (2002) shows that students are more successful academically when they are motivated in pursuing career goals, with a desire to learn and embrace necessary challenges for growth, while students with undefined goals tend to put in minimal effort. Does this mean you have to have all the answers right now? Most definitely not – as we have said before, only some of us are in a position to be navigating directly towards a clear goal. However, taking active steps in exploring potential directions can give a sense of purpose to your time at university, help keep you motivated during challenging times, and position you for success during and after your studies.

This sense of purpose is different than a specific short-term goal – it is longer-term and broader – a direction we are always working towards that motivates and guides our decisions, often with a service component. Damon writes that purpose is “a part of one’s personal search for meaning, but also has an external component, the desire to make a difference in the world, to contribute to matters larger than the self” (Damon, Menon, & Bronk, 2003, p. 121).

Living purposefully requires knowing yourself to get clarity about what unique purpose is suited to you based on your unique personal makeup and identity. Having a sense of your values and interests is fundamental in terms of making decisions that align with who you are, but it is also important to factor in your strengths (Smith, 2017). In fact, research shows that when we use our strengths at work we are more likely to find meaning in our work, and to perform at a higher level (Dubreuil, Forest, & Courcy, 2014). In this section we will look at decision making strategies, self assessment strategies, key resources, and activities to help you get clarity as you think about your future options.

MAKING CAREER DECISIONS

Decision Making Styles

Everyone has their own style of making decisions – and the role of data plays a different role in each style. Dinklage found 8 decision making styles (1968):

- Planful – systematic process with goals, options, and actions

- **Agonizing** – Try to be planful, but end up excessively focusing on data and information to their detriment and struggle to make a perfect decision
- **Impulsive** – select alternative quickly, minimal use of data
- **Intuitive** – Use experience and judgment to decide on path with little use for data
- **Compliant** – highly influenced by other opinions or social norms
- **Delaying** – Sees a decision to be made but avoids it – lacking motivation or information
- **Fatalistic** – Feels their actions don't matter, that decision is out of their hands
- **Paralytic** – Sees decision, but is paralyzed by fear of process or outcome

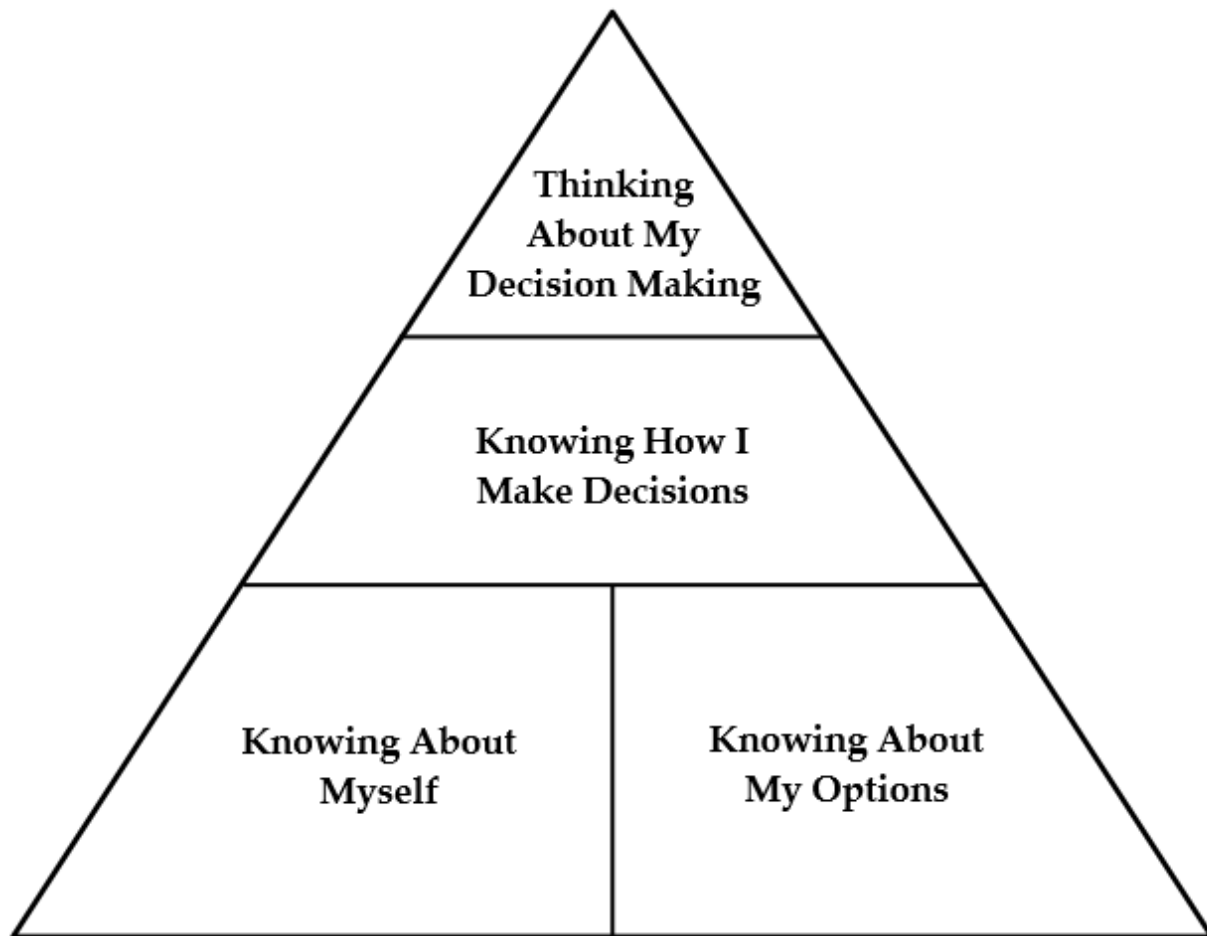
Having a sense of your own decision making style can help you to navigate your own ongoing career decision.

When have you made big decisions in the past?

Were you successful? Why? Why not?

What do you need to do differently the next time?

Decision Making Processes



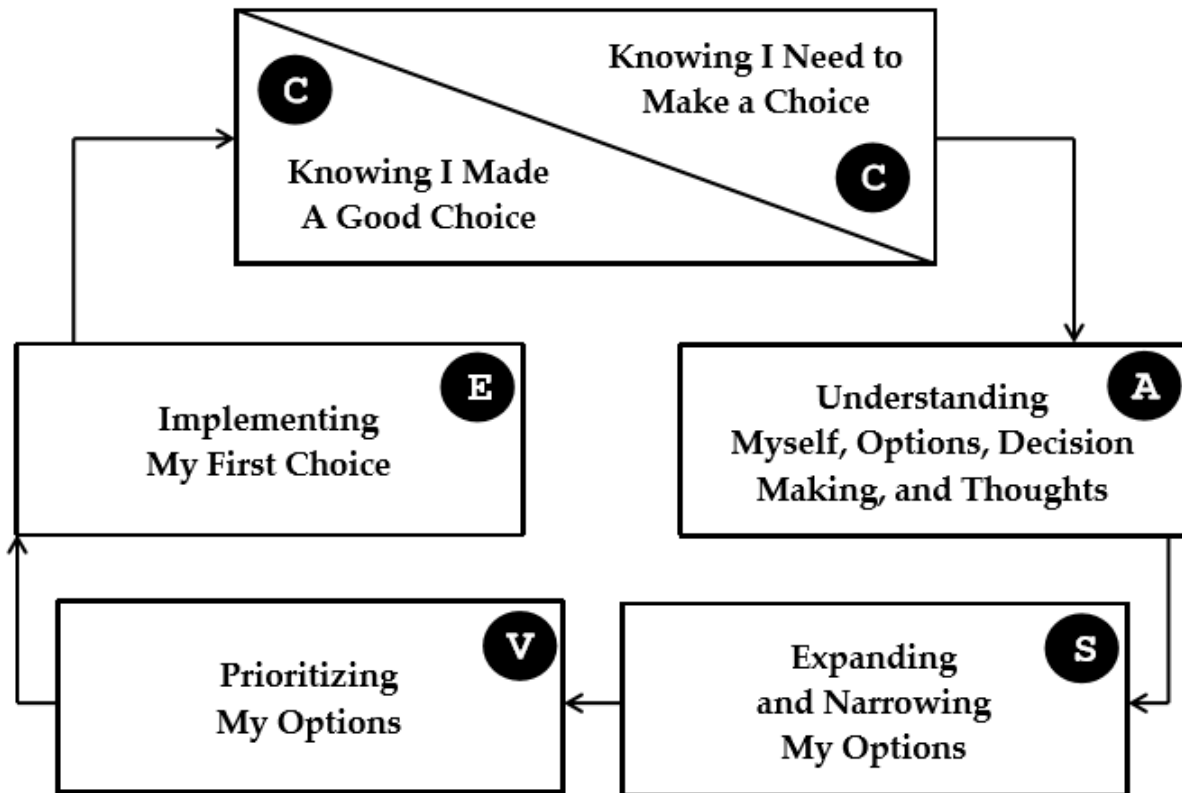
What's Involved in a Career Choice

Fig. 2.6

The Cognitive Information Processing Approach examines how we make effective career decisions (Sampson, Peterson, Lenz, & Reardon, 1992). It posits that decisions involve both cognitive and affective elements, and that career decisions are ongoing, with our knowledge evolving over time. In their information processing pyramid (Figure 2.6) they describe 3 foundational components: self-knowledge, occupational knowledge, and decision-making skills, capped by metacognition (awareness of our thoughts and processes). We will work through these pieces in the coming sections exploring self-assessment, exploring options, and decision making.

The Cognitive Information Processing Approach also includes the CASVE process (named after the phases of Communication, Analysis, Synthesis, Valuing, and Execution) featured below which explains the phases we go through in making a decision. The first two components from the pyramid are incorporated into the analysis phase, while the metacognition and decision-making skills apply throughout. The process reflects the

cyclical nature of navigating career decisions, as we incorporate new learning and experiences into future decisions.



The CASVE Cycle

Fig. 2.7

Figure 2.7. CASVE Model

By paying attention to your own thought process you can monitor your progress. Are you in need of more information or options? Or do you need to move ahead with evaluation and execution and learning from your experiences? Although not everyone is the same place, it is very common for university students to benefit from attention to all aspects of this process – starting with analysis of self and options. In the coming sections we will look at the various phases of the CASVE model of decision making to help you make informed career decisions.

ANALYSIS PART 1 – SELF-ASSESSMENT

While most students want to start with the question “what can I do with my degree?” – most career counsellors will try to shift the initial conversation to learning more about you as a person. Your unique makeup in terms of personality, skills, values, interests, experiences,

connections, and your environment will all greatly influence career directions that you might choose to pursue. As students of psychology you are well aware there are many ways to try to measure and assess people – from complex formal assessment tools, to mind-mapping, journaling, and reflective conversation – and they can all contribute different pieces to your evolving self-understanding.

Using Assessment Tools

Commonly Used Personality and Career Assessments

Assessment	Description	Availability
Six Factor Personality Questionnaire	Based on Big Five research, measures personality traits of Agreeableness, Neuroticism, Openness to Experience, Extroversion, and splits Conscientiousness into Industriousness and Methodicalness. Read more about psychometric properties at: https://www.sigmaassessmentssystem.com/assessments/six-factor-personality-questionnaire/	Assessment professional.
Strong Interest Inventory	Explores work interest areas divided into Holland's RIASEC categories of realistic, investigative, social, enterprising, and conventional. Read more about psychometric properties at: https://www.themyersbriggs.com/en-US/Support/Validity-of-the-Strong-Interest-Inventory	Assessment professional.
VIA Character Strengths	Based on Seligman's Positive Psychology, focuses on assessing character strengths. Access the free test online at: https://www.viacharacter.org Read more about psychometric properties at: https://www.viacharacter.org/researchers/assessments/via-is	Free
Strengths Finder 2.0	Based on Clifton's work with Strengths Psychology. Access the test online (for fee, or with book purchase) at: https://www.gallupstrengthscenter.com/home/en-us/strengthsfinder Read more about psychometric properties at: https://www.researchgate.net/publication/267694228_THE_CLIFTON_STRENGTHSFINDER_R_20_TECHNICAL_REPORT	Purchase online or with book.
Life Values Inventory	Helps you clarify your personal values to make more effective decisions. Access for free at: http://www.lifevaluesinventory.org/ Read more about psychometric properties at: https://www.lifevaluesinventory.org/LifeValuesInventory.org%20-%20Facilitators%20Guide%20Sample.pdf	Free

Assessment by Self-Reflection

A number of popular career books outline reflection activities to help you make sense of

your current career situation, often partly involving looking backwards at past experiences, or collecting data from current experiences. In our work with students we have found a few to be particularly useful:

Activity	Instructions
Mind-mapping – a creative open-ended way of pouring out ideas to mine your experience for insights	Start with a large blank piece of paper, and write your name in the middle. Then, radiating outwards, write out any idea that comes into your head as potentially relevant for your future – it could include past jobs, hobbies, mentors, strengths, fears, dreams, etc...
Journaling – to track daily experiences of engagement	Start paying attention to your daily experiences and record how each activity went in terms of your subjective experience – what you enjoyed, did well, or disliked.
Experience reflections – a variety of exercises for personal clarification	Write down key career stories from your past where things were going well – and reflecting on the meaning in terms of skills, interests, or values for you personally.

For more ideas and reflective activities you may want to consult a career planning book like some of these popular titles students have enjoyed in the past:

- *You Majored in What?*, Katharine Brooks, Ed. D.(2010)
- *Designing Your Life*, Bill Burnett & Dave Evans (2018)
- *What Colour is Your Parachute?*, Richard Nelson Bolles (2018)
- *Business Model You*, Tim Clark (Clarke, Osterwalder, & Pigneur, 2012)

Assessment through other's perspectives and support

Another rich source of information about ourselves can be other people around us. Family, friends, coworkers, supervisors or teachers could all offer perspectives that can complement your own internal reflection or results from formal assessments. You can ask important people (between 5-10) who know you well for their perspective on your key strengths, weaknesses, or personal qualities.

Finally, you may want to consider getting help with the self-assessment process by talking to a professional career counsellor. Most university's have some form of career centre on campus that provides career advising or counselling to students. Career counsellors are trained to guide you through the process of reflecting on yourself, exploring possibilities, and making plans to move towards your goals. Often, having a conversation with an unbiased person who doesn't know you personally can help you get clarity and perspective on your situation to help you feel more confident in knowing what directions are personally meaningful to you.

Learning about oneself is not a one-time event, but rather an ongoing process that unfolds over our lifetime. Not only do we come to understand ourselves in deeper ways, but we also continue to change and evolve from our experiences – meaning that a situation that might be a good fit for us in our twenties, could not be as good of a fit in our thirties or forties.

ANALYSIS PART 2 – EXPLORING CAREER OPTIONS

This book is an excellent starting point for exploring your career options related to psychology – it will provide a solid overview of some of the most common pathways you might want to consider, as well as some new ideas you hadn't thought of before.

Formal sources of information

To take this research further, and explore possibilities not covered here you may want to consult other sources of career information such as:

- Job Bank (Government of Canada, 2018d) – to access information on wages, outlooks, education, skills, and more. <https://www.jobbank.gc.ca/explorecareers>
- O*NET (U.S. Department of Labor, 2018) – a similar website to Job Bank from the United States <https://www.onetonline.org/>
- [Career Cruising](#) (2018)– an informative Canadian resource with information on thousands of careers covering education programs, related careers, interviews with professionals, and more. May be available through your campus career centre.
- [LinkedIn](#) (LinkedIn Corporation, 2018) – similar to Facebook in terms of profiles and newsfeed, but offers a powerful search tool including the ability to search alumni by institution to see what others have done with your degree.
- Career books – Your campus career centre may have a resource library featuring books with occupational information that can help you go more in-depth in areas of interest
- Professional Associations – most occupations have a professional association (for example NAADAC, The Association for Addiction Professionals, or CAOT, The Canadian Association for Occupational Therapists, exist for most professions. They can be a source of valuable information on a career of interest, including links to further education, job opportunities, conferences, certification, and more.

Informal sources of information

Speaking to professionals working in areas of interest can be a valuable source of insight (known as information interviewing). They can answer questions about a typical day, challenges, rewards, required qualifications, strategies for entering the field, and provide advice for your unique situation. To find people to speak to, ask people in your network if they know anyone working in the field, seek out alumni from your school, or connect with professional associations.

Questions you could ask in an information interview:

1. What interests keep you going in your work?
2. What skills are essential in doing your work?
3. What are your work/life fit preferences (values and needs) that are met in this work?
4. If you were going to start again in this field of work today, what would you do to be really ready?

(What training and experience would you need to have? What would be great ways to get it?)

5. What professional associations do you rely on to keep up to date? What publications, organizations or people do you suggest I contact for more information?

SYNTHESIS AND VALUING

As you collect information on yourself and careers, you will be moving into the next phase of the CASVE model, of synthesizing options and valuing potential directions based on the information you found which helps you move into the execution phase of testing out your ideas.

If your research does not provide an obvious career direction to explore, it may help to work through more systematic analyses of your findings. This can be as simple as a chart of pro's and con's for each career of interest to help you get a more holistic view of each option. For a more in-depth analysis, consider using a matrix to rank the options against a set of important criteria. For example – someone might analyze 3 career paths of psychologist, marketing professional, and lawyer, and explore them in terms of pay, satisfaction, creativity, status, and investment required in training.

Alternatively, you might benefit from talking through your various options with family, friends, or seeking professional help from an impartial career counsellor to help you clarify your thoughts and feelings.

EXECUTION AND TAKING ACTION

Although collecting and analyzing information is very useful, it is important to balance research with action and experience. By testing out your career ideas, you can get very important firsthand experience that can tell you more about your potential career directions. Planned Happenstance and Chaos Theory tell us of the impossibility of knowing the future in great detail, and the value of taking action despite this. As you move forward gaining various experiences from coursework, extra-curricular activities, part-time work, volunteering, and otherwise – you will likely learn new information about yourself and the world of work that could inform and maybe alter your career direction.

As you move forward learning from your coursework and other experiences, you will also be developing marketable experience that will be valuable in future applications to work or graduate school. While initially pursuing a broad range of experiences can be beneficial, at a certain point, starting to focus on a few specific directions will likely help you be more strategic in your involvement. Considering what you have learned in the research stage about careers of interest can help you prioritize the development of key skills to help you pursue the well-rounded education needed to be successful in your next step.

THE VALUE OF ONGOING REFLECTION

To get the most of your time at university, it is important to complement your education and experiences with ongoing reflection. In fact, a recent study showed that employees

who reflected for 15 minutes daily performed 23% better at their work after 10 days than employees who didn't participate in the reflection (Di Stefano, Gino, Pisano, & Staats, 2014).

Not only does ongoing reflection reinforce your learning and inform decisions, it will also help you when it comes time to apply to jobs or school as it will help you to articulate the value of your experience and skills to potential employers or graduate programs. You may want to consider some key questions after or during new learning experiences such as courses, extracurricular activities, or work:

- What was challenging about this experience? How did I overcome it? What results did I achieve?
- What impact did I have on those around me, on my environment, or on myself?
- How did this change me? What do I do or see differently now?
- What is most significant this experience for me? For a potential employer?
- What areas of growth does it show for me? What skills did I develop?

Likewise, we encourage you to reflect on your learning throughout this course. As you learn about various possible career paths, connect them back to your personal experiences and what you are learning about yourself. Are they a good fit? Why or why not? What is this telling you about what you want or where you want to go?

CHAPTER SUMMARY

In this chapter we've covered the following key ideas as you think about how to make sense of the information of this book and apply it to your own career decision making.

The value of your degree: Your Psychology degree can help to prepare you to head in many potential career directions. To position yourself for success, be able to articulate the value of your degree to future employers and grad programs with a clear sense of the skills and knowledge you have gained, and add to this with experience outside of the classroom.

Making sense of labour market information: Integrating knowledge of opportunities and labour market trends with an understanding of yourself can help you make more informed decisions now and in the future.

Consider person-environment fit: but remember it is only part of the equation.

Accept & embrace chance and chaos: chance and unpredictability are normal. In addition to planning, embrace happenstance – success derives from a combination of planning, preparedness, and taking advantage of luck. Use the five skills outlined by Krumboltz, Mitchell, and Levin (1999):

- Curiosity: exploring new learning opportunities
- Persistence: exerting effort despite setbacks
- Flexibility: changing attitudes and circumstances
- Optimism: viewing new opportunities as possible and attainable
- Risk taking: taking action in the face of uncertain outcomes

Actively explore possibilities: Proactively exploring careers of interest can give you a sense of direction, ease anxiety, and motivate you to do your best academically.

Get to know yourself: Through formal and informal means, developing a sense of you are

in terms of strengths, values, interests, and personality can help you make better decisions and articulate your value to potential employers or graduate school admission committees.

Access resources: gather information and support with online tools, people in your network, and resources at your university career centre.

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[3]

RESEARCH METHODS IN THE PSYCHOLOGICAL SCIENCES

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INTRODUCTION

The field of psychology is characterized by a diversity of research questions related to human thought and behaviour. As such, psychology is organized into several distinct sub-disciplines. Although psychological research spans a wide range of different content areas, there is quite a bit of similarity underlying how psychologists go about answering research questions in these different areas. This is not to say that differences do not exist in the research approaches used within different areas of inquiry. However, these differences are in large part variations in emphasis and in the specific tactics used to accomplish research objectives. The broader principles and fundamental empirical strategies guiding psychologists in different sub-disciplines are for the most part the same.

If you find that you struggle to understand some concepts in this chapter, do not worry: these are topics that experts throughout psychology continue to study. Indeed, understanding these concepts takes practice. Recognizing that readers have a varied background in this area, there is a key-word index at the end of this chapter. Further, there are many additional resources to learn more about these topics. Open access (free) supports for statistics basics include Andy Field's (2019) [discoveringstatistics.com](https://www.discoveringstatistics.com), and Daniel Lakens (2019) has a low-cost course titled Improving Your Statistical Inferences hosted on Coursera with financial aid options (<https://www.coursera.org/learn/statistical-inferences>). These resources are not a substitute for a university course in research methods or statistics, but they can provide supportive background information if you want to build a stronger foundation in these key areas.

The principles and procedures that guide psychologists' exploration of research questions are what we typically refer to as *psychological research methods*. The goal of this chapter is to introduce readers to the key principles that nearly all psychologists rely upon when conducting psychological research. Understanding research methods is obviously essential for any student whose ultimate goal is to embark on a career as a research psychologist in either academia or an applied setting. However, it is also important for many non-research careers; for example, many professions require employees to be "consumers" of psychological research. These individuals might not conduct research, but often might draw upon prior research to develop plans of action to help accomplish their objectives (e.g., advertising firms developing product campaigns, managers attempting to resolve conflicts between employees). Indeed, even people making decisions in their personal lives might find themselves needing to be consumers of psychological research (e.g., a parent of a child with behavioural problems considering various intervention plans). Regardless of the setting, it is impossible to be an informed consumer of psychological research without understanding the key principles that guide how research is conducted.

In discussing psychological research methods, this review is based on a series of key steps that a researcher must undertake in conducting any program of research. For ease of presentation, these steps follow a straightforward sequence. This sequence is to some degree a logical progression and, as will be seen, some steps cannot really be undertaken without first completing earlier steps. That being said, the order of some steps can be reversed or even addressed at the same time. To illustrate this design process, a recurring hypothetical example of a research program will be used: how fear and anger might influence aggression.

KEY STEPS IN THE RESEARCH PROCESS

Formulating Research Questions. The first step to any program of research is formulating the research question. Ultimately, any study is only as useful as the research question it is designed to address. Additionally, as will be seen, many of the decisions made in later stages of the research process are informed by the nature of the question a study intends to answer.

Descriptive versus inferential research questions. When formulating a research question, a first issue to address is whether the goal of the research will be primarily descriptive versus inferential in nature. *Descriptive research questions* largely focus on describing one or more psychological or behavioural constructs in a given domain of interest. For example, a researcher studying aggression might be interested in the prevalence of verbal aggression in the workplace. This researcher might wish to determine the proportion of employees in Canadian workplaces who have been verbally demeaned or insulted by their co-workers.

Although psychological research is sometimes primarily descriptive in nature, most psychological research is predominantly inferential in its goals. *Inferential research* involves the exploration of relations among psychological and behavioural constructs. For example, in the context of aggression, a researcher might want to know what characteristics of workplace employees are associated with them being perpetrators of verbal aggression. Clearly, both types of research question (descriptive and inferential) are useful and interesting. However, if we ultimately want to understand why something occurs and/or how we can influence it, research must move beyond the purely descriptive level and begin to address inferential questions.

Exploratory versus confirmatory research questions. Assuming an inferential research question,

the next consideration is whether this question will be approached in an exploratory or confirmatory manner. In *exploratory research*, researchers do not have specific expectations, but rather more general notions regarding the answer to the question. For example, a researcher interested in what characteristics are associated with the likelihood of being a perpetrator of verbal aggression in the workplace might measure a wide range of different characteristics of employees (e.g., their proclivity to experience different emotions, their level of seniority in the organization, various personality traits) and then conduct analyses to see which characteristics are associated with aggression. In contrast, for *confirmatory research*, the researcher specifies what factors are likely to cause aggression and perhaps even when and why such factors have their effects. These *hypotheses* are generally derived from past research and/or some theory regarding the phenomenon of interest. The researcher then focuses attention primarily on those factors that have been hypothesized to produce the outcome of interest.

Both approaches have their advantages and limitations. The strength of exploratory research is that it encourages researchers to think broadly about the phenomenon of interest and maximizes the opportunity of stumbling on unexpected discoveries. However, although exploratory studies often consider a wide range of possibilities, they are rarely optimal tests of any single explanation. In contrast, confirmatory studies tend to have a narrow focus, but usually provide more systematic and complete tests of the factors they are designed to explore. For instance, if a study must cover a wide range of different characteristics of employees that could predict their proclivity to engage in verbal aggression, it might not be feasible to extensively measure each factor (e.g., the researcher might only be able to include a few questions measuring each factor). In contrast, if a researcher has explicitly postulated that tendency to experience the emotions of fear and anger are major determinants of aggression, the researcher might be able to include very extensive measures of each emotion, and perhaps even multiple different types of measures of each emotion. The two approaches, however, are not mutually exclusive. Indeed, often a program of research will adopt an exploratory approach in its early phases and then gradually transition to a more confirmatory approach.

Basic versus applied research questions. A final consideration during the research question formulation stage is whether the study will be designed to primarily address a basic (i.e., theoretical) research question versus an applied research question. *Basic research* is aimed at formulating and testing fundamental psychological principles governing a domain of interest. For instance, a researcher might be interested in developing a theory of the role of emotions in aggression. The goal of this researcher is to develop principles that explain which specific emotions either increase or decrease aggression and why these emotions have the effects they do on aggression. Thus, the goal is to arrive at a fundamental understanding of the relations among the constructs of emotions and the construct of aggression.

In contrast, *applied research* questions tend to focus on a specific problem. They typically emphasize predicting or influencing an outcome rather than in understanding why that outcome is predicted or influenced by a given factor. Indeed, applied research questions often focus on the effects of a specific measure or intervention with little concern as to *why* that measure or manipulation accomplishes its goal and/or the effects of the broader construct of interest that measure or intervention is presumed to represent. For example, an applied researcher might be interested in testing if a specific measure of anger predicts

employee aggression or if a specific anger-management program lowers employee aggression.

As with other distinctions, the basic versus applied research question distinctions are not mutually exclusive. Often basic research might have the ultimate goal of developing principles that can be used to solve applied problems. Likewise, the exploration of applied questions can often contribute to the understanding of basic questions. Thus, this distinction is more a matter of emphasis than a fundamental difference in the nature of the research question being addressed. However, this difference in emphasis does have implications for the methodological decisions that a researcher might make at subsequent stages of the research process.

Selecting dependent variables. Once a researcher has formulated a research question and presuming that question is inferential in nature, the researcher's next step is to determine the specific constructs of interest. More precisely, *constructs* are those elements in a study thought to vary across people and/or situations. Although the goal of all inferential research is to determine the relationship between constructs, some of this research involves merely finding associations between constructs, whereas other studies test hypothesized causal relationships among the construct(s) of interest. A researcher cannot assess "fear", "aggression", or other constructs directly, but instead selects specific measures that represent constructs in an observable way. Measures representing the outcome constructs in hypothesized relationships are called *dependent variables* because they are conceptualized to be dependent on the levels of one or more *independent variables*, a topic that will be addressed later in the chapter.

After having determined the constructs that one intends to study, one must more precisely define them. Some constructs are more easily defined than others. For example, when measuring psychological constructs such as personality, there are numerous conceptualizations of personality, including the Big Five and HEXACO frameworks. In contrast, physical traits such as height and weight often have widely accepted definitions that are consistently applied across domains of research. Keep in mind that how a researcher chooses to define the study variables will affect the results of the study, the comparability of outcomes to other studies that have researched the same constructs, and one's ability to operationalize the constructs in a way that will allow for feasible, sensible, and meaningful measurement.

For example, there are a broad range of ways to characterize aggression (e.g., Archer & Coyne, 2005). For some research questions, a broad conceptualization that includes indirect, relational, and social aggression may be very useful. In other cases, a very specific definition of aggression as "causing physical harm to others" may be preferable. Even within this seemingly narrowed conceptualization of physical harm, important conceptual questions require answering: for example, should the mere desire or wish to cause physical harm count, or only aggressive actions that are actually expressed by a participant?

Operationalization is the formal term for the specific definition of constructs with a specific measure. For example, if one wishes to measure an individual's aggression, the experimenter must decide how, that is what method of instrumentation, should be utilized to obtain an accurate measurement (e.g., using a self-report scale, observational techniques). Thus, one possible operationalization of individual aggression could be self-report using the Aggression Scale (e.g., Orpinas & Frankowski, 2001). Researchers usually hope that they can make inferences from the measure back to the construct that the measure is trying

to capture. When operationalizing dependent variables, one must aim to select measures that are sensitive enough that the influence of the independent variable on the dependent variable can be detected. Measures should strive to accurately capture a construct of interest, a topic that will be discussed in detail later as *construct validity*.

Level of measurement. There are four major categories of measurement level. *Nominal scales* involve any measure for which scores are given as categorical labels. For example, in our fear/anger and aggression study, we might assess participants' cultural background (e.g., German, Chinese) as a nominal variable. Notice that nominal scales like this do not imply any rank ordering of the categories. That is, cultures like Germany or China are not options that vary along a single continuum of provided options, but are categories that are selected.

Conversely, *ordinal scales* provide a rank ordering of the categories. For example, a measure might ask people to rank-order several aggressive thoughts they are experiencing from most to least aggressive. Here the response options are ordered from most aggressive to least aggressive: a single continuum. However, also recognize there is no standard distance between the rankings: that is, the psychological distance implied by the gap between the first and second most aggressive thoughts might not be identical to the distance between the fourth and fifth most aggressive thoughts.

Interval data provides response options that are equally spaced. In psychology it is often difficult to create truly interval scaling. Imagine a self-reported anger scale ranging from 1 (*slight anger*) to 2 (*moderate anger*) to 3 (*strong anger*). The psychological distance between response options such as slight to moderate, versus moderate to strong, although intended to be equal, might not necessarily be equivalent to one another, making it difficult to form truly interval measurements. However, when multiple items are aggregated together, pseudo-interval scaling often functions quite similarly to true interval scaling, and such aggregated ordinal data can often be treated statistically as though it were interval (Harpe, 2015).

Ratio data additionally adds a true zero point. For example, if participants' punching a doll is used as a behavioural measurement of aggression, zero punches indicate a complete absence of this behaviour. This matters, for example, when multiplying using the scale, for example when comparing between levels on the scale. A 2 on a self-report scale of anger does not indicate "twice" as much anger as a 1, but a person who punches a doll twice has actually engaged in twice as much of this type of aggression compared to someone who punches once.

Methods of measurement. There are methods of measurement routinely used in psychology. The most common method of measurement used in psychology is *self-report measurement*. These measures ask participants to verbally report their standing on the psychological or behavioural construct of interest, typically using some form of structured rating scale. Self-report tools are usually considered to be *direct measures* because participants are directly asked to assess their own psychological attributes. Examples include the Beck Depression Inventory (Beck, Steer, & Brown, 1996) or the NEO Five-Factor Inventory (Costa & McCrae, 1991). One issue that commonly arises when using self-report measures is that they are susceptible to *socially desirable responding* (Paulhus, 1991), meaning that respondents may distort their responses in order to present themselves favourably. For example, people may wish to understate how much anger or fear they are feeling, if feeling these emotions strongly is considered inappropriate. Another issue is that people may not always be able to provide accurate self-report responses. For example, self-report responses are influenced

by the cognitive accessibility of relevant information (e.g., Strack, Martin, & Schwarz, 1988), making these responses susceptible to influence based on how questions are framed. Additionally, people may simply not have perfect introspective self-awareness (Nisbett & Wilson, 1977), and therefore not be capable of accurately describing all of why they think or feel certain ways.

Another common method of data collection is the use of *indirect measures*, which refer to tools that assess participants without directly asking them to provide self-assessment of their psychological attributes (De Houwer, 2006; Gawronski & De Houwer, 2014). A very common form of indirect measure is *implicit measurement*, referring to measures that assess relatively uncontrolled and automatic types of participants' responses. Examples of implicit measures include the Name-Letter Task (NLT; LeBel & Gawronski, 2009; Nuttin, 1985), the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998), and the Affect Misattribution Procedure (AMP; Payne, Cheng, Govorun, & Stewart, 2005). Although these implicit measures are quite diverse in form, they generally work by assessing reaction time, or subtle response patterns that would be difficult to deliberately control. For example, implicit measures often assess how quickly people pair objects together, following the logic that similar objects or ideas are "congruent" for respondents, and are easily categorized together. For example, people who pair "good" with "white" quickly, but "good" with "black" slowly may be viewed as having a preference for white over black people. Other implicit measures suggest that underlying feelings about an object can be assessed by how respondents' feelings spill over onto stimuli presented shortly after. The AMP, for example, exposes participants very briefly to an image of an attitude object (a *prime*), and then asks them to rate their opinion towards a relatively neutral stimulus (e.g., rating how much they like a meaningless shape). Individuals who rate the neutral stimulus as "bad" after viewing a particular prime are viewed as having a negative opinion of the prime object (Payne et al., 2005).

One reason that indirect measures are often championed is that they are thought to be highly resistant to social desirability concerns (Petty, Fazio, & Briñol, 2012). For example, when measuring racial attitudes with a self-report scale, psychologists may be concerned that respondents would have a powerful motivation not to admit racist attitudes. An indirect measure can subvert these social desirability concerns by measuring extremely subtle reaction time differences that would be difficult to control. It may be noted that some research has identified specific conditions whereby respondents can occasionally control 'implicit' responses (Klauer & Teige-Mocigemba, 2007), but generally respondents will find it much more difficult to deliberately control their responses on these tasks. Thus, implicit measures may not be completely immune to social desirability or other motivated control attempts, but they are highly resistant to such response biases.

One common observation about implicit measures is that they do not always show high levels of convergence with their explicit counterparts. Although critics have sometimes framed this low convergence as a problem, low correlations may simply suggest that implicit measures capture unique variance in constructs that traditional self-report measures fail to capture. Importantly, this implies that direct and indirect measures may have *incremental validity* in predicting behaviors, meaning that using both types of measure to predict behavior is more powerful than using only one type of measure. Reviews have shown that incremental validity of implicit and explicit attitudes can indeed be observed (Frieze, Hofmann, & Schmitt, 2008). Furthermore, each type of measure may be uniquely helpful in

specific contexts. In conditions where people are deliberate and thoughtful, *explicit measures* appear to have better predictive power, whereas implicit measures are better used to predict spontaneous behavior (Asendorpf, Banse, & Mucke, 2002).

Oftentimes in psychology, psychological processes are inferred based on physical changes that occur to participants' brains or other bodily regions. *Physiological measures* record processes such as voltage fluctuations in brain neurons (i.e., brain activity) captured using electroencephalography (EEG), metabolic processes using positron emission topography (PET), and blood flow in the brain using functional magnetic resonance imaging (fMRI). For example, some researchers have assessed people's fear responses by assessing activation of their amygdala region through techniques including magnetoencephalography (Moses et al., 2007). Cacioppo and Tassinary (1990) have chronicled some of the impressive advances in neuropsychology's ability to noninvasively examine brain activity. Like implicit measures, physiological measures are often seen as preferable to self-report measurement because they can obviate participants' attempts to control their responses. Although these measures therefore have great value in addressing certain concerns, one general limitation of these methods is that because of the complicated technology required, their administration requires highly specialized technicians, and they are therefore costly and time-consuming to use. More substantively, numerous neuropsychologists have warned readers about the dangers of over-assuming causal relationships between brain "signals" and participants' emotions, thoughts, or actions (Cacioppo et al., 2003).

Just as implicit and physiological measures operate by capturing respondents' relatively uncontrollable reactions, *observational measures* allow social scientists to obtain information from their subjects through evaluating participants' overt behaviours. Observations can be made with or without participants' being aware that such observations are occurring. For example, aggression has been measured by measuring how much hot sauce participants put into a glass of water supposedly intended for the next participant to enter the laboratory, with large amounts of hot sauce indicating an aggressive behaviour (Liebermann, Solomon, Greenberg, & McGregor, 1999).

Reliability and validity. A comprehensive explanation of the development of new measures goes beyond the scope of this chapter, but guidelines are available for interested readers (John & Benet-Martinez, 2014; Simms, 2008). The following section instead focuses primarily on issues of measurement reliability and validity, two fundamental psychometric properties.

Although both reliability and validity in measurement are crucial, reliability is required for a measure to be valid, but validity is not required for a measure to be reliable. In principle, *reliability* simply refers to the consistency with which a measure provides the same information, although it comes in many forms. For example, psychologists may measure the same construct in the same people across a span of time, using the same measure. If a measure provides consistent measurements across time, and the construct it assesses remains stable, people who score low or high at one time point should continue to do so later; this is called '*test-retest reliability*'. Of course, constructs that are expected to change across time (e.g., acute experiences of fear) do not typically get measured with high test-retest reliability, because participants responses change due to the fleeting nature of emotion. However, many traits are thought to be relatively stable across the lifespan, such as personality (Costa & McCrae, 1993), and high test-retest reliabilities serve to indicate that these constructs' measures are providing consistent information.

Another tool for assessing reliability is the extent to which independent evaluators judge something in a similar manner: '*inter-rater reliability*'. For example, if observers were asked to evaluate aggressive behaviour displayed by participants, inter-rater reliability would be high if all the judges observed and recorded a similar number of aggressive behaviours. If judges' evaluations completely differed from one to the next, this would be evidence that their observations lack reliability, that is, lack consistency. Similarly, when evaluating various items that are thought to assess the same underlying construct, 'internal consistency' refers to when items correlate highly with one another due to respondents answering in a consistent way across items (Henson, 2001). For example, a highly fearful individual should express that they are "terrified", "frightened", as well as "scared". The core principle is consistency: consistent responses to these items within the same respondents would indicate that the items are seen as reflecting the same construct, meaning that they have reliability.

After having operationalized your dependent measures it is important that you ensure that your measure displays *validity*. A measure is valid insofar as it quantifies accurately what it purports to measure. *Construct validity* refers to the degree to which a measure specifically and sensitively captures its intended construct (Cook & Campbell, 1979; Shadish, Cook, & Campbell, 2002). Although methodology texts often introduce dozens of unique types of validity as though each were completely separate, many of these are best viewed as types of evidence that allow researchers to determine if a measure has construct validity. For example, '*criterion validity*' is the extent to which a measure is associated with other measures that should logically be related to its construct. This is really evidence of a measure's construct validity: if a measure effectively captures its construct, it should be related to things that its construct relates to. For example, when developing a self-reported fear measure, this fear measure should be related to avoidance behaviors, because people are motivated to avoid things that frighten them. If they do correlate, this is consistent with the notion that the fear measure is accurately or validly measuring fear. Similarly, methodologists refer to '*discriminant validity*' when a measure shows minimal associations with irrelevant variables. For example, a fear measure should not be closely associated with social desirability measures. Indeed, if a fear measure was negatively related to a social desirability measure, it might indicate that people are denying any fear that they feel due to social desirability concerns such as not wanting to sound afraid. This would threaten a fear measure's construct validity, because the fear measure would no longer only be measuring fear.

If a measure appears to reflect its construct according to either experts or laypeople, then it is said to possess '*face validity*': once again, this is evidence of construct validity. If emotion experts think that the items on a fear measure are not reflective of fear, this could raise concerns about the measure's construct validity. Interestingly, sometimes it is disadvantageous for a measure to possess face validity. For example, if participants are aware that a scale seeks to measure aggression, then it is likely that participants may disagree with items to appear non-aggressive to the extent that aggression is socially inappropriate or anti-normative. To obtain accurate results it is therefore occasionally advantageous to reduce face validity depending on the construct of interest, in other words increasing a scale's *subtlety* (Holden & Jackson, 1979).

Selecting independent variables. Once the dependent variable has been determined, a researcher selects one or more independent variables (IVs), which represent variables conceptualized as predicting or influencing DVs. Many of the same criteria used to evaluate

DVs are also relevant when considering IVs. For example, the reliability and validity of IVs are as important as they are for DVs, and are often assessed in the same ways. Continuing with the example of fear or anger inducing aggression, fear/anger would be IVs: the variables understood to be increasing or decreasing aggression. However, IVs are not precisely like DVs. For one thing, DVs are always measured whereas IVs may be measured or *manipulated*. Both measurement and manipulation have some advantages and disadvantages, and each opens up several specific questions for the researcher.

Manipulations. *Manipulations* are changes in constructs induced by deliberately stimulating or inhibiting those constructs through some process of the study. In the recurring example, a manipulation would be any action designed to actively change participants' current levels of anger or fear. As with DVs, consider the many ways that fear/anger could be operationalized. One could remind participants of a time when they felt fear/anger in their own lives (recalled emotion; e.g., Baker & Guttfreund, 1993) or read fictitious narratives which are intended to make participants experience fear/anger (emotion stimulated by narrative engagement). One could employ *deception* to generate anger: for example, Nisbett and Cohen (1996) had a *confederate* "accidentally" bump into participants as they walked in a corridor, which elicited anger in participants. Despite being very different, these are all manipulations designed to stimulate an IV.

One reason to incorporate a manipulation rather than a measure of one's IV is that manipulations have advantages with respect to *internal validity*, which reflects researchers' ability to make causal claims about the relationship between study variables. Imagine measuring fear (our 'IV') and then measuring aggression (our 'DV') just a few moments afterwards. Assuming an association existed between these measures, what could a researcher conclude? It is not clear that fear caused aggression. One other possibility would be that participants were already feeling aggressive before fear was measured. Those aggressive intentions caused the participants to feel fear, and were still present when the aggression measure was collected. Thus, in this case, fear might just as easily have caused aggression (this risk is sometimes called *reverse causation*). Perhaps more likely, a third construct could be responsible for causing the other two constructs to appear associated. For example, participants may have been experiencing physiological arousal at an earlier point in the procedure. This arousal caused them to endorse the fear items because their heart was racing and their palms were sweating, so they inferred that they were feeling fear. Furthermore, their arousal led them to behave more aggressively. Note that in this case, arousal was actually responsible for both variables seeming to 'increase together' (*covary*), and no real causal relationship existed between fear and aggression. This threat to internal validity is sometimes called the *third variable problem*.

These are questions of, and perhaps serious threats to, internal validity. Now imagine *randomly assigning* half of a group of participants to watch a frightening movie scene that results in increased fear, and the other half to watch a non-frightening scene that doesn't increase fear (thus, fear is manipulated). That is, every participant has an equal likelihood of being in any of the experimental conditions. Because people are randomly sorted into these groups, it is unlikely that a third variable caused differences in fear between the two groups. This is because any idiosyncratic individual differences between participants would be distributed randomly across conditions. Instead, differences between the groups are most likely attributable to the manipulation's effects, helping to establish a causal relationship

wherein the IV causes the DV. Researchers' ability to make such causal claims are referred to as internal validity.

A common choice when using manipulations is to incorporate a *control group*, representing the condition in which participants would be if they were not subjected to the part of a manipulation that is of interest to you. For example, consider all the elements of watching a five-minute frightening film clip: five minutes of audio and visual stimuli, the feeling of wearing headphones, sitting in a chair, and (hopefully) feeling fear. A control group *controls* for as many of these irrelevant aspects as possible, leaving only the fear variable to differ across groups. Thus, a control group might watch a five-minute film clip (wearing headphones; sitting down) of an emotionally 'neutral' scene such as a mechanic fixing a dishwasher. Differences in group behaviors are now hopefully attributable only to fear, rather than sitting, wearing headphones, or film-watching in general, since even a boring dishwasher scene contains all of those elements.

This clustering of participants such that some experience one condition, others experience a different condition, and others experience a control condition is characteristic of a *between-participant design*, which helps to examine causal relationships by *randomly assigning* people to one of two conditions and examining differences emerging between the groups. Alternatively, in a *within-participant design*, participants would each undergo each condition. Re-using the video-watching example, a within-participant design might have all participants watch *both* clips, measuring aggression after each clip. In this case, no random assignment is required because the same individuals participate in both conditions. However, a researcher will often rotate the order of presentation: half of participants watch the control film before the frightening film, and half watch in the reverse order (this process is sometimes called *counterbalancing* the order of conditions). Otherwise, the order of film presentation might explain any differences between conditions.

Issues of manipulations and measurements. It is often advisable to consider a similar checklist of priorities when using measures or manipulations. Consider issues of confounding variables. One common objection to measuring IVs is that measures are almost always influenced by constructs other than the one intended. For example, it may be difficult to measure fear without a measurement being impacted by participants' neuroticism (a personality trait in which people experience chronic, negative emotionality). Therefore, manipulations may seem superior because they do not introduce such confounds. However, manipulations may also introduce irrelevant confounds if the manipulation influences constructs other than the one(s) intended (see Fiedler, Kutzner, & Krueger, 2012). For example, a manipulation designed to increase fear might almost make some participants sad, angry, or surprised, making it harder to deduce what was ultimately responsible for any aggression effects. Thus, whether a researcher measures or manipulates an IV, they should still consider how irrelevant variables may interfere with their study's validity.

Second, issues of *transparency*, the degree to which participants can understand the true purpose of a study, are relevant to both measured and manipulated IVs. For example, it is usually important that participants do not know the precise hypothesis of a study, lest they simply act as they believe they are supposed to (i.e., *demand characteristics*; Orne, 1962). Suppose a study consists only of measuring fear and anger, before measuring aggression. Participants may deduce that the researcher wants to know whether fear and/or anger predict aggression, and act accordingly (acting either to confirm or disconfirm that hypothesis). One way to avoid this problem is to use one of many measures that are designed

to measure a construct subtly, to avoid being obvious about what the experimenter is interested in, as discussed above. Another easy solution is to include *filler measures*: scales that researchers do not wish to evaluate, that are included to confuse participants' understanding of the study's purpose. Participants will typically assume that all study measures are relevant to the experimenter's research questions, and therefore these bogus measures will throw off their guessing the true hypothesis.

In some contexts, manipulations may also make the study's purposes transparent. If participants understand what a manipulation is meant to do to them, they may act differently due to their awareness of the experimenter's research goals. Transparency is a particular issue for within-participant designs, because these often imply to participants that the experimenter wants to know how something varies across conditions, each of which each participant has experienced. In between-participant designs, in contrast, the design is often well-hidden simply because participants are not aware of what other participants are experiencing and thus do not know what their responses/actions are being compared against. One precaution that is often sensible is to include a *funnel interview* (Page & Scheidt, 1971). In a funnel interview, participants are asked increasingly probing questions about their experiences in the study and what they thought the study's purpose was. Participants who truly understood the study's purpose will presumably state this when they are asked, and researchers can consider whether to refine the manipulation, cut the data of the suspicious individuals, or else simply run statistical tests with and without suspicious participants included to assess the impact of suspicion.

The concept of construct validity was previously introduced with reference to measurements, but it has applicability to manipulations as well. Consider the previous example of bumping into participants to produce anger. In reality, it was primarily participants who were raised in the Southern, not Northern U.S. states who felt anger at the staged hallway collision (Nisbett & Cohen, 1996); Northerners quite often felt amused by the experience. This raises a critical question: for whom is a manipulation likely to activate its intended construct? The same stimulus that would frighten a child may not produce fear in adults. The easiest way to determine if a manipulation has construct validity is a *manipulation check* performed either during the study, or on a separate pilot sample. A manipulation check usually asks a participant a question directly related to the construct: for example, after watching a (hopefully) scary film clip, participants may be asked "how scary was that film?" or "how scared are you?" If the fear clip is felt to be scarier than the control clip, elevated fear ratings should be produced.

Context. We next consider elements of research context that a research must consider when planning a study. In social science, *context* generally describes the population of interest (*people*) and the location and time (*setting*) in which research takes place. Context is of great importance to psychologists for at least two reasons. First, context helps to define how measures and manipulations should be designed to optimally capture a construct (i.e., construct validity). Just as some measures are only effective for children (e.g., "I want my mommy" as an item measuring fear), some stimuli have different psychological meanings in certain eras. For example, consider how the meaning of the name "John F. Kennedy" changed from 1962 to 1964 (with his assassination occurring in 1963), or how the words "John F. Kennedy" might have radically different meanings to a respondent who was alive in the 1960s compared to a respondent who was born in the 21st century. This is very important in psychology, because it means that measures and manipulations that were developed

originally for one context may or may not work effectively in other contexts. Ultimately, psychologists are interested in the relationships between constructs, not measures. Therefore, materials must be found to possess construct validity *within a given context* and *within a given population* before they can reasonably test how constructs interrelate. There is often a trade-off to consider. Materials that are very customized for a specific population may be extremely powerful tools for studying that population, but may require a serious re-evaluation and development process when alternative groups are studied, making generalization attempts more laborious.

A second reason why context and population matters is because psychologists sometimes wish to test the *external validity* or *generalizability* of findings. Suppose that psychologists discover that fear does causally produce aggressive responses among children. Of course, it does not automatically follow that the same relationship would occur among adults, whose emotional self-regulation abilities may be considerably different. Assuming that a construct-valid fear manipulation was employed among adults, and assuming that a construct-valid aggression measure was also used, the fear/aggression association could be examined among adults as well. Whether the association emerges or not would then test the *external validity* of the fear/aggression link, that is, how generalizable the link between variables is.

Participants. In psychology, the *population of interest* is typically a very large group of people about whom the researcher wishes to draw conclusions. Researchers create *inclusion criteria* and *exclusion criteria* to aid in the process of defining the population of interest. The former refers to characteristics that would render a participant eligible to participate and the latter would disqualify a subject from partaking in the planned data. For example, if a social scientist was interested in the aggression levels of criminally convicted juvenile offenders in Canada, then the inclusion criteria might include age (<18 years). Having no criminal record would be an exclusion criterion.

Measuring every individual in the population of interest is virtually never feasible (Banerjee & Chaudhury, 2010), requiring psychology researchers to test their hypotheses using a subset of the population of interest known as a *sample*. In some cases, researchers aim to obtain a truly *random sample*, which ensures that every member of the population under investigation has an equal probability of being included in the sample. One situation in which random sampling is important is when descriptive analyses are important to a researcher. For example, if researchers want to know accurately what the average aggression level is among Canadian juvenile offenders, non-random sampling will likely undermine the accuracy of their descriptive estimates.

Truly random samples are often impossible to obtain (Sweetland, 1972) resulting in the collection of data by means of a *convenience sample*, meaning that a sample is obtained from a more readily available subgroup of the population. University students are a classic example of a convenience sample when the population of interest is “all people”, because students are often easily accessible to researchers, for example participating in research in exchange for bonus marks in their courses or small cash payments. Naturally, university students differ from random members of the public in some respects: they are likely to have elevated intelligence, an increased desire for thinking, and so on. However, a worthwhile consideration is whether a convenience sample differs from the population on specific constructs of interest to a researcher. For example, a perceptual psychologist studying visual perception may consider university students to be quite representative of people with respect to rods and cones in their retinas. To this researcher, the attributes for which

university students might be expected to differ from the general population probably would not interfere with testing their key hypotheses.

Other cases may be more ambiguous, and the utility of convenience samples may also depend on the type of research question being pursued. For example, if university students have unusually developed cognitive abilities, this is likely to bias descriptive research questions about cognitive abilities. Inferential research, however, necessitates closer scrutiny regarding the use of convenience samples. For example, it is unclear whether a convenience sample of university students may have a different relationship between fear/anger and aggression, compared to children or older adults. That is, the relationship between emotion and aggression (an inferential question) may itself differ across a span of age levels. One possibility, if a researcher is concerned about such age effects, would be to collect a representative sample. However, it is not clear that this solution is without issues. For example, suppose that fear relates to increased aggression in young adults, but that children instead become less aggressive when they are afraid. If a researcher were to engage in equal sampling of children and young adults, the study might show no effect of fear when in fact there are two very different effects that are masked because the two patterns run in opposing directions. Indeed, if researchers have reasonable grounds to suspect that such differences occur across sample types, they may want to conduct multiple studies, each collecting a sample from a different population. In this hypothetical case, for instance, Study 1 would identify the positive fear/aggression association among young adults, and Study 2 would identify the negative association in children. An alternative approach would involve deliberately collecting both groups within a single large study (e.g., half young adults, half children), and then statistically analysing any differences across the groups.

Another consideration regarding population is *sample size*, that is, the number of participants who will participate in a study. There exist numerous techniques to determine an appropriate sample size, usually termed *power analyses*, but the mathematical basis for these calculations is too complex to be fully advanced here. In general, larger samples decrease the chance that a finding will represent a statistical “fluke”. This is because as our sample becomes bigger, it better approximates the population that we want to make conclusions about. For example, if 10,000 Canadian women were surveyed about workplace aggression, the conclusions that could be drawn about experiences of Canadian women related to workplace aggression are more likely to reflect the population of all Canadian women than a sample size of 10 Canadian women.

Although some psychologists advocate for always maximizing sample size, there are a few issues to consider when deciding on an appropriate sample size. Certainly, it is true that a larger sample size increases *statistical power*, or the ability to detect inferential patterns between variables where they truly exist. Similarly, descriptive statistics become more precise with larger samples. However, there are other considerations to take into account when planning research. For example, researchers may become constrained in terms of the methodologies that can facilitate such enormous samples. For example, researchers can collect thousands or even millions of participants through crowd-sourcing techniques or mass online testing (e.g., www.yourmorals.org; Iyer, 2019), but as we detail in a later section, online research has both advantages and disadvantages associated with it.

A final issue prompting close attention to population is how stimuli and measures will be developed for various populations. As previously discussed, scientific research proceeds by using measures and manipulations to operationalize abstract constructs. Thus, it is

imperative that measures/manipulations have their intended meanings within each specific population. Consider using the same religious questionnaire for a study in both San Antonio and Salt Lake City: religious items may not have the same meaning for both populations. Some methodologists advocate for *measurement invariance analysis* (Millsap & Meredith, 2007; Widaman & Grimm, 2014), which uses a mathematical procedure to establish whether items of a measure perform similarly across groups at a *psychometric* level. Without establishing, at minimum, the basic levels of measurement invariance, comparisons across groups become suspect. Using the above example again, it becomes problematic to replicate a study on Texans with a sample of Utahans if a central measure has a completely different psychometric structure for these two groups.

Setting. A major factor in setting is whether a study takes place in a laboratory, in an online survey, or in a field context. The advantages and disadvantages of these contexts have stimulated productive research and debate. For example, laboratory research has sometimes been criticized as lacking *mundane realism*, or being artificial and lacking applicability to “real-world” situations (Ilgen & Favaro, 1985). However, psychologists rarely attempt to produce contexts that resemble “the real world” literally, instead focusing on participants’ experiences of a study as psychologically meaningful (Berkowitz & Donnerstein, 1982). Recall that construct validity, for example, depends upon measures and/or manipulations being able to capture or produce psychological constructs within participants, such as fear, anger, or aggression. For example, a social rejection experience may be quite fabricated and artificial, but if it feels real to participants then causal hypotheses about the effects of feeling rejected can still be evaluated. Similarly, one might be concerned that participants will know they are being studied in a laboratory and therefore act unusually due to being observed. However, this risk can often be managed. Many experiments use deceptive procedures, or between-participant designs that hide the other conditions from participants, to disguise the true purpose of the research. For example, studies of bystander apathy examine how participants respond to emergencies (Latané & Darley, 1970). Although psychologists cannot ethically place people in real emergencies, they can lead participants to believe that they are attending a lab for one purpose, and have a simulated emergency occur, such as a person crying out in pain from an adjacent room. When participants intercede, they believe they are responding to a real emergency disconnected from the experiment, and so concerns about participants “feeling studied” can sometimes be controlled.

Practically, the laboratory offers many important advantages to researchers, such as the ability to control noise variables like time of day, temperature, noise and distractions, and so on. Although a variable like ‘temperature’ may not immediately seem important to a psychologist, note for example that room heat has been associated with aggression (Baron & Bell, 1975). Seemingly irrelevant environmental variables can directly influence psychological processes. Furthermore, lab equipment such as physiological equipment, or computers that can assess reaction time, can be made available in a laboratory with relative ease. However, a disadvantage is that some kinds of experiences are not easily cultivated in a laboratory. For example, although psychologists may study group formation in a lab, it is more difficult to study long-term group identity processes within a single-hour lab study, and impractical to have participants attend a laboratory for the years or decades required for some processes to unfold. Similarly, topics such as serious romantic relationships, bereavement, and so on, may be difficult to emulate in a laboratory and may be better studied in their natural contexts.

Although not overcoming all challenges associated with laboratory studies, one alternative context to the traditional laboratory is to conduct research in an on-line setting. There are several advantages to this setting. It is relatively easy to solicit large samples of participants, particularly when using crowd-sourcing technologies such as Amazon Mechanical Turk or Crowdflower. Furthermore, very rare (e.g., individuals with low-prevalence conditions) or distal groups (e.g., when an American researcher wishes to study Japanese populations) are much easier to obtain using online research. However, critics have suggested that attention levels may waver online, especially among university participants completing research online (Hauser & Schwarz, 2016). Others have argued that this “online inattention” problem may be obviated with attention checks (Goodman, Cryder, & Cheema, 2013; but see Hauser & Schwarz, 2015). Certainly, online studies tend to involve participants who know that they are being studied, and so the above-noted concerns about presentation biases may be a concern here once again. With respect to the control that psychologists have over respondents’ environments, the answer here is mixed. For example, an online study can request that participants work in a private, uninterrupted work environment, but can rarely enforce this behavior within participants. Similarly, numerous random variables will fluctuate across participants in online samples. Variables such as room temperature, density of people within the room, and background noise, cannot be directly controlled. Additionally, online research may constrain researchers in their choice of measures and manipulations. For example, researchers can have online participants interact socially in web forums or chat rooms, but many aspects of social interaction (e.g., physical presence, nonverbal communication) are hard to capture in online studies. Similarly, some measures (e.g., physiological) may be impossible to obtain in online contexts, again restricting the sort of research that psychologists can pursue in this format.

Finally, some psychologists have argued for the benefits of *field research*, often protesting the apparent decrease in field studies in recent psychological science (Cialdini, 2009). Field studies do offer some advantages, such as making it typically quite easy to disguise a study’s purpose. For example, field studies in which subtle aspects of an environment are altered, such as changing the signs present in a neighborhood and observing the results, will allow participants to be unaware that they are being studied, and therefore permit an authentic assessment of their reactions. However, a drawback to field research is that, although external behaviors can be easily detected and studied, internal processes such as participants’ private attitudes and emotions to stimuli can be difficult to assess in this setting. Another potential drawback of field research is that many environmental factors that are easy to control in laboratories (e.g., temperature, wind, the presence of passersby) may be much more difficult to standardize and regulate in field settings. Planning and careful attention to such factors can partially mitigate these risks, but the likely increased instability of noise variables in field research can interfere with inference testing.

Different contexts of data collection (in-lab, online, field, etc.) all carry certain advantages and disadvantages. One alternative to selecting one method and accepting all of the relevant drawbacks, is to conduct multiple studies using multiple methods. For example, a researcher might begin by testing anger’s relation to aggression using a laboratory experiment, using university students; then perform a similar test using a large sample of online participants who vary more widely across demographic variables; and then conduct a field study in which anger’s relation to aggression is monitored covertly (e.g., in a workplace setting).

ANALYSIS

Once a study is completed, the final steps in the research process are the analysis of the data, the interpretation of the results, and the report of the findings. In psychological research, the vast majority of studies involve data that are quantitative in nature. *Quantitative data* refer to information that is expressed in some numerical form. For example, people's responses to a 7-point rating scale indicating the level of anger they are currently feeling might be represented by whole numbers ranging from 1 to 7. Once the data are collected, the researcher must formulate a statistical analysis of the data that corresponds to question of interest.

If the goals of the study are purely descriptive in nature, analysis typically involves the computation of *descriptive statistics* for the measures of interest. Descriptive statistics summarize the overall pattern of responses for a given measure within a sample. The two most common types of descriptive statistics are indices of central tendency (i.e., indices of the single response that best characterizes the sample as a whole; e.g., the average of anger ratings in a sample) and indices of variability (i.e., indices of the extent to which responses are very similar to versus different from one another in the sample; e.g., the range of ratings of anger in a sample).

However, as noted earlier, most psychological research involves inferential research questions (i.e., questions regarding the relationship between two or more psychological or behavioural constructs). In these cases, a variety of inferential statistics are available to researchers. The specific type of inferential statistic that will be most appropriate for addressing a given research question depends on a number of factors. A detailed discussion of these different types of statistical tests obviously goes well beyond the scope of this chapter. However, in a broad sense, there are several factors that guide a researcher's choice of statistical tests. First, the nature of the relationship being explored is an important consideration. For example, is the researcher only interested in a relationship between two variables? Alternatively, is the researcher interested in the relationships of several independent variables to a single dependent variable, or perhaps the relationships of multiple independent variables to multiple dependent variables? Second, what is the scale of measurement for the variables to be analyzed? Are they purely nominal-level variables, purely interval level, or a mixture? Finally, what are the distributional properties of the variables? Do scores on the variables reflect a normal distribution? Depending on the answers to these sorts of questions, some types of analyses will be more appropriate than others because they make more or less assumptions about these properties of the data.

Although researchers have a vast array of different types of statistical tests from which they can choose, far and away the most commonly used statistical tests are based on the concept of *Null Hypothesis Significance Testing (NHST)*. Simply stated, these tests assess the hypothesis that the relationship of interest does not exist in the population. Tests are considered to be statistically significant when they produce a probability value equal to or less than .05. Statistical significance at the .05 level indicates that the data obtained are statistically different from those expected if the null hypothesis were true, and this difference is less than 5% likely to be due to chance alone. In these cases, the researcher is said to have rejected the null hypothesis (i.e., rejected the hypothesis that the relationship does not exist in the population).

Tests are considered "non-significant" when they produce a probability value (p) greater

than .05. That is, a test is considered to have provided insufficient evidence for the existence of a relationship if there is a greater than 5% probability that the observed relationship could have emerged simply due to chance. In such cases, the researcher is said to have “failed to reject the null hypothesis”.

When an analysis of a study has produced an accurate conclusion regarding the existence of relationship between variables, the study is said to be high in *statistical conclusion validity* (see Cook & Campbell, 1979; Shadish et al., 2002). Conceptually, there are two forms of errors that a researcher can make with a statistical test, thereby leading to low statistical conclusion validity. A *Type I error* is when a researcher falsely concludes that a relationship exists (i.e., incorrectly rejects the null hypothesis). Traditionally, researchers have considered this form of error to be very serious and set their level of risk for making such an error in their statistical tests (referred to as the *alpha level*) at .05. Recently, some researchers have called for even stricter alpha levels as a means of enhancing the statistical conclusion validity of psychological research (e.g., Benjamin et al., 2017). A *Type II error* is when a researcher falsely concludes that there is no evidence for the existence of a relationship (i.e., incorrectly accepts the null hypothesis). Although traditionally researchers have placed less emphasis on this form of error, researchers have considered this form of error to be problematic and have traditionally set their level of risk for making such an error in their statistical tests (referred to as beta) at .20. This means that researchers try to collect enough data that the risk of mistakenly concluding that no relationship exists (when a relationship actually does exist) is no greater than 20%.

Methodologists have identified a number of potential threats to the statistical conclusion validity of research (e.g., see Cook & Campbell, 1979; Shadish et al., 2002). For example, the validity of a statistical test can be undermined if the underlying assumptions of the test are violated. For example, many tests assume that interval or ratio-level measures follow a normal distribution. Other tests assume that each set of observations comprising the sample are independent of one another (e.g., that the responses provided by one person in the sample are not in any way related to the responses provided by another person in the sample). Researchers may sometimes remedy such problems by selecting a statistical test with less stringent assumptions.

Other threats to statistical conclusion validity reflect more fundamental and sometimes perhaps even more intentional errors on the part of researchers. Concerns regarding these sorts of errors have received a great deal of attention in recent years and have led some researchers to call for major changes in the way psychological research is conducted (Lilienfeld, 2017; Lilienfeld & Waldman, 2017). One issue of concern has been the fact that many studies conducted in psychology have insufficient statistical power. Statistical power refers to the probability that a study will correctly reject the null hypothesis. Traditionally, statistical power has primarily been a concern with respect to Type II error (e.g., Cohen, 1988). However, recently methodologists have noted that in the context of a single study, because studies with low power tend to be more likely to produce anomalous results, low power can sometimes also lead to Type I errors (e.g., Button & Munafo, 2017).

Another issue that has generated a great deal of interest is a set of practices known as QRPs (*Questionable Research Practices*; see John, Loewenstein, & Prelec, 2012; Simmons, Nelson, & Simonsohn, 2011). QRPs cover a wide range of data collection, analysis, and reporting practices, most of which are considered problematic because they can undermine the statistical conclusion validity of a study. Some of these practices involve incomplete

reporting of results. For example, a researcher might conduct analyses on multiple dependent variables, but then only report the results for dependent variables that produce significant effects or conduct multiple different types of analyses on a single dependent variable and only report the analysis that produces a significant effect. Similarly, a researcher might conduct a study involving multiple experimental conditions, but then only report the results for those conditions that produce significant differences. Alternatively, a researcher might conduct multiple studies and then only report those studies that produce a significant effect.

Other practices involve changes to the data set itself or the manner in which it is analyzed. For example, a researcher might decide to drop participants from a data set based on whether their deletion strengthens the key effects of interest in a study. Alternatively, a researcher might gradually add data participants to an existing data set and base their decision to stop adding participants solely on when the addition of participants produces a significant effect.

As these examples illustrate, many QRPs are practices that are intended to produce a significant effect, without any clear justification beyond the fact that they produce a desired outcome for the researchers, who may be motivated to identify a significant effect. As such, these practices can inflate Type I error rates. Indeed, although each practice can potentially undermine statistical conclusion validity on its own, the risk is even greater when several of these practices are performed in conjunction with one another (Simmons et al., 2011).

In short, numerous issues have been raised about how psychologists conduct aspects of research, and they are often accompanied with guidelines for improving the statistical validity of research. However, other commentators have suggested that there are problems inherent in NHST as a scientific tool and that no set of reforms to current practices will ultimately be successful in addressing these limitations. These commentators have argued that alternative statistical approaches are required. For instance, some have proposed that traditional statistical tests be abandoned in favour of reporting effect sizes and their corresponding confidence intervals (e.g., Cumming, 2014; Schmidt, 1996). Others have advocated use of Bayesian statistics (e.g., Wagenmakers et al., 2017). Space restrictions preclude a discussion of these alternatives and to date neither has gained widespread acceptance in psychology. However, psychologists continue to debate their potential advantages and disadvantages. This remains an important area of research for experimental and quantitative psychologists, as well as individuals who interpret and make policy recommendations based on research that is based fundamentally on statistics-based inferences. Practitioners in the field should remain familiar with developments in this evolving area as these decisions have important implications for the application of existing research.

ETHICS

The previous sections have primarily explained social science methodology with the goal of maximizing the reliability and validity of research findings. However, psychologists must balance their interests in obtaining reliable, valid results with several important ethical guidelines that establish *how* research should be conducted. Indeed, one can imagine scientific studies that could be highly reliable and valid, yet ethically egregious. For example, if a researcher was interested in the effects of socioeconomic status on aggressive behaviour,

it would be methodologically sound to randomly assign children at birth to adopting parents who are poor or wealthy. However, such a study would obviously be considered ethically problematic.

Although researchers have debated and discussed many aspects of research ethics for decades and specific guidelines and procedures vary as a function of locales and disciplines, three fundamental principles of research ethics tend to be emphasized in nearly all systems. These three core principles are a mandate to give participants information sufficient to allow informed choices about participating or not, minimizing harm to participants, and maintaining the privacy of participants' responses.

Informed consent is the principle that participants should have a reasonable understanding of what they will be expected to do in a study, and the likely benefits/harms that may affect them. For example, participants should know if research may cause them harm (including physical, emotional, financial/professional, interpersonal, or yet other kinds of harm), and how much of their time is being requested as participants. Additionally, participants should be informed in advance about issues including whether their data will be confidential and/or anonymized (see below), or whether information about them will be obtained from sources other than themselves (e.g., from their academic transcripts). The point is that participants' consent to participate in research is only meaningful if they know what they are being asked to do.

One potential challenge to informed consent is the fact that some psychological questions are best pursued by partially or fully misleading participants about aspects of the research. For example, when researchers wish to covertly monitor participants' aggressive behaviors, it may undermine the unobtrusive nature of this measurement if participants know they are being watched. Similarly, some indirect measurements rely on participants not being aware of what is being measured, and in some cases the measure may be undermined if participants realize what is being measured. In other cases, participants are given false information about society, the actions of other participants in the experiment, the purpose of a study (often provided as a *cover story* in which researchers create a fictitious purpose of the research), or about the participant themselves (e.g., falsely informing participants that they have poor intelligence).

Deception is sometimes considered acceptable provided it is necessary to effectively study the question of interest when a *debriefing document* or other method is used to inform participants at the end of a study. A debrief will often contain several elements, such as an explanation of what the truth is (e.g., what the real purpose of a study was), and why deception was considered necessary. Because this new information may alter participants' willingness to have participated, in some contexts it may be appropriate to give participants a second opportunity to consent to the research study. For example, returning to the example of covert monitoring of aggressive behavior, a researcher might reveal this covert monitoring at the study's end, and offer to delete the recording if the participant does not consent to the researcher keeping this data. After all, they originally consented without knowing that such data was to be collected. The lack of initial disclosure may be necessary because the monitoring would not be covert if participants were warned about it when they first consented.

A second principle is the *minimization of harm*. That is, participants' exposure to loss, pain, and/or damage should be reduced as much as possible. Some studies may necessitate some use of harm, such as when participants are given painful shocks to elicit anger (e.g.,

Berkowitz & LePage, 1967). Minimization of harm would here involve careful scaling of the shock: it must be painful (enough to elicit anger), but no more painful than that (to minimize participants' suffering). When possible, researchers should highlight ways in which participation can serve as a growth opportunity, such as a chance to better understand themselves, rather than as harmful. In addition to the ethical, this also has a practical benefit: participants who see research and researchers in more positive terms are presumably more likely to understand the importance and value of research in psychological science.

Turning back to the recurring example, a researcher who wishes to induce fear in a participant should aim to have participants experience fear only for as long as is necessary to test a research question. Fear is usually considered a negative, uncomfortable emotion, so while researchers can ethically study fear they should also try to respect participants' needs. For example, researchers may end the study with a positive emotion induction (Westermann, Spies, Stahl, & Hesse, 1996) to reverse the harm. Also, consider deception in the context of minimizing harm. We previously highlighted the potential issue of deception with informed consent, but there is also a risk of deception causing harm: participants may feel foolish for 'falling for' a deceptive manipulation. Thus, it may be advisable to remind participants that most experiments find only tiny suspicion rates: almost everybody 'falls for it', so participants should not feel embarrassed. It is possible that some deception could introduce other harms, such as leaving participants with inaccurate information about their having health problems. Sometimes, researchers may provide *true* information in the debriefing form, such as providing real statistics about social facts when false facts were provided in the experiment, or reminding undergraduate participants that the average undergraduate student has high intelligence when they were falsely told that they lacked intelligence. The goal is to offset the harm incurred by the false information.

A third important principle is the privacy of participant data. Two aspects of participant data privacy are *anonymity* (i.e., the degree to which participants' identifying information is disassociated from their study data), and *confidentiality* (i.e., whether researchers keep participants' identifying information to themselves). Where possible, it is usually advisable to maintain the anonymity of participants' data by dis-associating participants' identifying information (e.g., name, email address) from their response data. This may have several advantages, such as protecting participants' privacy rights. It also permits researchers to share data with others without having to compromise participants' privacy. In some cases, it is necessary for data to be non-anonymous at least temporarily, such as when a researcher tracks a sample of participants across multiple time points and wishes to correlate participants' responses across time. In longitudinal research, this could mean that data is identifiable for decades! However, once data collection has been completed, it is normally possible to *anonymize* data afterwards, stripping data of this identifying information.

Typically, even non-anonymous data should be confidential, meaning that a researcher would not share any identifier-data associations with others, even if the researcher can personally associate identifiers with data. In summary, the general principle of participant privacy is that privacy should be maintained as far as logistically possible. Tying this back to consent, in cases where confidentiality would not be possible to extend to participants, those participants should at least know what their expectations of privacy should be, preferably when they initially provide consent.

SUMMARY

Psychological research spans many diverse topics and interests, but the fundamental, conceptual steps required to create high-quality research are in many ways similar. This chapter has focused on delineating research questions, selecting dependent and independent variables, issues involving the setting and population, data analysis, and ethics. However, entire chapters and articles have been devoted to in-depth explorations of each of these individual topics (and others); we have provided many references to example articles and chapters throughout. Importantly, we hope this chapter highlights often under-recognized skills that are developed through training in psychological science. Undergraduate programs in psychological science should prepare students to effectively evaluate research methodological issues including sample size, risks associated with third variables, whether questionable research practices were likely to have been present, whether rigorous ethical safeguards were in place, whether appropriate statistical tests were used, and whether researcher conclusions are consistent with the results from statistical tests based on the methodology employed. These are all skills that are valued beyond academia: from evaluating research for policy development to interpreting survey data gathered in an applied setting, professionals who display thoughtful and critical consideration of the quality of evidence are highly sought after.

KEY WORDS AND CONCEPTS

Alpha level: The level of risk for making Type I errors within Null Hypothesis Significance Testing

Anonymity: The degree to which participants' identifying information is disassociated from their study data

Applied research: Applied research questions tend to focus on a specific problem. They typically emphasize predicting or influencing an outcome rather than in understanding why that outcome is predicted or influenced by a given factor

Basic research: Basic research is aimed at formulating and testing fundamental psychological principles governing a domain of interest

Between-participant design: This research design examines causal relationships by *randomly assigning* people to only one of two or more conditions and examining differences emerging between the groups

Confederate: Someone who appears to be a participant in a research study to other participants, but who is actually part of the research team playing a role to create desired research conditions

Confidentiality: Whether researchers keep participants' identifying information to themselves

Confirmatory research: When the researcher specifies and tests what factors are likely to cause an effect, and perhaps even when and why such factors have their effects

Constructs: Those elements in a study thought to vary across people and/or situations.

Construct validity: The degree to which a measure specifically and sensitively captures its intended construct

Context: The population of interest (*people*) and the location and time (*setting*) in which research takes place

Control group: An experimental group that receives a treatment that is not expected to influence the variables of interest, but that typically simulates other aspects of the experimental design. Control groups serve as a base-line comparison for the treatment groups

Convenience sample: A sample that is not randomly selected, but instead is obtained from a more readily available subgroup of the population

Correlational Research: A research paradigm that lacks random assignment to condition and/or experimental manipulations of variables. As a result, causal conclusions are less tenable with this type of methodology

Counterbalancing: An experimental method where the order of treatments within an experiment is intentionally varied across participants to reduce the risk of treatment order influencing the results. Thus, counterbalancing reduces a third variable concern of treatment order

Covary: The extent to which variables increase and/or decrease in similar patterns

Criterion validity: A specific type of construct validity: the extent to which a measure is associated with other measures that should logically be related to its construct

Debriefing document/debriefing: When participants are fully informed of the research design and purpose at the conclusion of the research study. This may be done through a document, or through a discussion with a researcher

Deception: When, in order to ensure participants respond as naturally as possible within a study, participants are not given a complete understanding of the research. This can occur through incomplete details being provided, or through participants being actively misled by the experimenter(s). If deception is approved for use by the reviewing ethics committee, a debriefing document and post-study consent are typically required

Demand characteristics: When participants act, behave, or report in a certain manner, due to their perceptions of what is desired of them, or perceived pressures from the experimenter

Dependent variables: Variables that are thought to be influenced by the independent variables

Descriptive research questions: These research questions typically focus on simply describing one or more psychological or behavioural constructs in a given domain of interest

Descriptive statistics: A numerical summary of the overall pattern of responses for a given

measure within a sample. Typically descriptive statistics include indices of central tendency and variability

Direct measures: Measures where participants self-report on questions being asked of them. Participants are aware of the measure, and respond to that measure directly

Discriminant validity: A specific type of construct validity: when a measure shows minimal associations with irrelevant variables

Exclusion criteria: Characteristics that would render a participant ineligible to participate in a research study

Explicit measures: Measures that assess relatively controlled and deliberative types of participants' responses

External validity: The degree to which study results can be extended to populations other than the research sample studied

Experiment: A research methodology where participants are randomly assigned to conditions, and the researcher manipulates at least one independent variable to test the influence of the specified independent variable(s) on a dependent variable. Cause-and-effect conclusions are facilitated by using an experimental methodology

Exploratory research: Research that is undertaken when researchers do not have specific expectations, but rather more general notions regarding the relationships among the constructs of interest

Face validity: A specific type of construct validity: when a measure appears to reflect its construct according to either experts or laypeople

Field research: Studies in which subtle aspects of an environment are altered and participants are unaware that they are being studied, therefore permitting an authentic assessment of participant reactions

Filler measures: Scales that researchers do not wish to evaluate that are included to confuse participants' understanding of the study's purpose

Funnel interview: Participants are asked increasingly probing questions about their experiences in the study and what they thought the study's purpose was

Generalizability: The degree to which study results can be extended to populations other than the research sample studied

Hypotheses: Researcher expectations regarding patterns of relationships among variables that are specified in advance, and formally tested in research

Implicit measures: Measures that assess relatively uncontrolled and automatic types of participants' responses

Inclusion criteria: Characteristics that a participant must display to be eligible to participate in a research study

Incremental validity: The concept of using two or more types of measures to predict behavior is more powerful than using only one type of measure

Independent variables: Variables that are thought to influence the dependent variable(s)

Indirect measures: Measures that assess participants on the construct of interest without directly asking participants to provide self-assessment of their psychological attributes

Inferential research: The exploration of relations among psychological and behavioural constructs.

Informed consent: The ethical principle that participants should have a reasonable understanding of what they will be expected to do in a study, and the likely benefits/harms that may affect them

Inter-rater reliability: The extent to which independent evaluators judge something in a convergent manner

Internal validity: Researchers' ability to make causal claims about the relationship between study variables

Interval data: Data based on scale response options that are equally spaced

Manipulation check: A measure, other than the dependent variable, to assess whether a manipulation had the desired effect

Manipulations: Variables that are deliberately chosen and changed so as to influence the dependent variables of interest

Measurement invariance analysis: A mathematical procedure to establish whether items of a measure perform similarly across groups at a psychometric level

Minimization of harm: The ethical responsibility of all researchers to reduce participants' exposure to loss, pain, and/or damage as much as possible

Mundane realism: The degree to which an experiment applies to "real world" situations

Nominal scales: Any measure for which scores are given as categorical labels

Null Hypothesis Significance Testing (NHST) Commonly used statistical tests that test the hypothesis that the relationship of interest does not exist in the population against a collected sample of data

Observational measures: These measures allow social scientists to obtain information from their subjects through evaluating participants' overt behaviours

Operationalizing: The process of deciding how to go about measuring the defined constructs with a specific measure

Ordinal scales: Scales that provide a rank ordering of the data

Physiological measures: Measurement of physical body responses including, but not limited to, heart rate, blood pressure, neuron activity, and galvanic skin response

Population of interest: Typically a very large group of people about whom the researcher wishes to draw conclusions

Power analyses: mathematical techniques to determine an appropriate sample size based on the experimental design and desired statistical power

Prime: stimulus used to activate a word or concept in a participant's mind, either with (*supraliminal*) or without (*subliminal*) the participant's being consciously aware of it

Psychological research methods: The principles and procedures that guide psychologists' exploration of research questions

Psychometric: Relating to the evaluation of the quality of psychological measurement, such as through assessment of measures' structure or validity

Quantitative data: Information that is expressed in some numerical form

Questionable Research Practices (QRPs): QRPs cover a wide range of data collection, analysis, and reporting practices, most of which are considered problematic because they can undermine the statistical conclusion validity of a study. These include, but are not limited to, selective reporting of research findings, and failure to report data manipulations. These practices can often inflate Type I error rates.

Random Assignment: An experimental feature where every participant has an equal likelihood of being placed in any of the experimental conditions

Random sample: A subset of the population of interest that is selected to participate in a research study in such a way that ensures that every member of the population under investigation has an equal probability of being included in the sample

Ratio data: Data collected based on response options that are equally spaced, and additionally include a true zero point

Reliability: The consistency with which a measure provides the same information

Reverse causation: The possibility that a variable purported to be the cause of another variable is actually its consequence.

Sample: A subset of the population of interest that is selected to participate in a research study

Sample size: The number of observations (e.g., participants) collected for a study. The number of observations in a sample must be large enough to make valid conclusions using the chosen statistical techniques

Self-report measurement: Measures where participants are directly asked to report their

standing on the psychological or behavioural construct of interest, typically using some form of structured rating scale

Socially desirable responding: The tendency for respondents to distort their responses in order to present themselves favourably

Statistical conclusion validity: The degree to which an analysis of a study has produced an accurate conclusion regarding the existence of relationship between variables

Statistical power: The ability to detect inferential patterns between variables with statistics where the patterns truly exist

Test-retest reliability: Consistency of responses across multiple time points, obtained using the same respondents and same measure

Third variable problem: When establishing causation between variables, the possibility that an unaccounted-for variable is the true cause of their association

Transparency: The degree to which participants can understand the true purpose of a study

Type I error: When a researcher concludes that there **is** a statistically significant relationship between variables of interest based on the null hypothesis significance test, but this statistical finding is inaccurate because in reality there is no such relationship

Type II error: When a researcher concludes that there **is not** a statistically significant relationship between variables of interest based on the null hypothesis significance test, but this statistical finding is inaccurate because in reality there is such an relationship

Validity: The degree to which a measure accurately quantifies what it intends to measure

Within-participant design: Experimental design in which participants each undergo every treatment condition

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[4]

THE ESSENCE OF ETHICS FOR PSYCHOLOGISTS AND ASPIRING PSYCHOLOGISTS

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INTRODUCTIONS

INTRODUCING ME

Educated and trained at McGill University, I was the first doctoral student to have her research proposal vetted by a research ethics committee. I was a graduate student in the 1960s, back when it was a time of hope, a time of questioning absolutely everything, a very exciting time of creativity and exploration.

Although trained as a clinical psychologist, the way that I chose to practise psychology was through my teaching, my research, and my service to the discipline, all of which I have thoroughly enjoyed. I have taught courses in research methodology, abnormal psychology, social psychology, psychology of women, and, of course, ethics in psychology. I loved watching students' awakenings to new world views. I was also the first person in Canada to teach courses in the psychology of women, way back in the 1970s.

I also loved conducting research, loved the almost paralyzing excitement of coming up with new ideas, new ways of asking research questions, new ways of analyzing data, and new interpretations of the results. I was brought up in the quantitative experimental models of science. As Honours students, we were not even allowed to take courses in developmental psychology, social psychology, personality, or abnormal psychology because they were "too soft". We were also not allowed to take research methods courses in the other social sciences because "they would ruin us as scientists". However, the questions that I had a burning desire to ask were always too complex and interwoven for regular univariate models of inquiry. That is how it came about that I was the first person at McGill to use the multivariate analyses newly introduced in the *Statistical Package for the Social Sciences*. Back then, there were no personal computers: All large and complex analyses had to be done on the university's

mainframe and data had to be entered on punchcards that you then carried in huge piles across campus to the Computer Centre, hoping against hope that you didn't slip on the ice going downhill. Although descriptive and analytical multivariate statistics fascinate me with their poetic beauty, I began to realize that the *quantitative* bias in which I had been trained lacked the deeper understanding that can come from rigorously applied *qualitative* research methods. *Sequential* and *concurrent mixed methods* have proven to be the most appropriate approaches to the research questions that grip my imagination.

My service to the discipline arose from a personal need for contact with and support from colleagues. Isolated in a large department where I was one of only three women and the only clinically-trained psychologist, I reached out to the Canadian Psychological Association (CPA) for validation and support from colleagues living elsewhere. In return, I was elected, twice, as Chair of the Interest Group on Women and Psychology (now the Section on Women and Psychology) during which time I organized the first CPA Pre-Convention Institute on Women and Psychology, developed guidelines for non-sexist research that were adopted as policy by CPA (Stark-Adamec & Kimball, 1982, 1984), then served on the CPA Board of Directors (first as Chair of the Applied Division, and then in my own right), eventually serving the discipline as President of the Association. I have served on the CPA Committee on Ethics since 1993. Over the years, I have also served the broader social science communities in various capacities (e.g., as Vice-President, Women's Issues of the Social Science Federation of Canada [SSFC] and as Chair of the Psychology Adjudication Committee for the Social Sciences and Humanities Research Council of Canada [SSHRC])—all with a view to giving back and paying forward. I have made many lifelong friends in the process of serving the discipline (and a few enemies).

INTRODUCING THE CHAPTER

Retired now, I maintain my service to the discipline by continuing to serve on CPA's Committee on Ethics. Developing this chapter is one of the ways that I am giving back to the discipline while paying forward to your development as students of psychology.

My aim is to acquaint you with the CPA *Code of Ethics for Psychologists, 4th Edition* (hereinafter referred to as the *Code*) first describing some of the misunderstandings, misperceptions, and confusions with respect to for whom this *Code* was developed. Next, I describe some of the herstory/history of our *Code*, as well as the structure and moral core.

I have found that one of the most effective ways of coming to a meaningful understanding of the four core **Principles** of our *Code* is to examine ethical dilemmas with respect to the relevant **Standards**. The **Standards** delineate the best ethical practices and thus serve as, in effect, operational definitions of the core **Principles**. So I have provided you with real-life examples of ethical dilemmas in what I've called **Thought Boxes**. I have altered some of the details in order to preserve the privacy of those involved (e.g., in **Thought Box 2**, I have altered the name of the granting agency). Then, I have provided you with **Tables** in which I have listed all of the **Standards** that are relevant to the incident described in the **Thought Box**. Do not be put off by the number of **Tables** or by the length of some of the **Tables**. Instead, read them through and think about how they relate to the incidents. As in life, some

of the incidents are rather complex and have more than one ethical dilemma embedded within.

The first two dilemmas both deal with research. You may gain the impression that unethical behaviour is the norm in research. Such is not the case. But to aid you in the ethical conduct of research, I have provided you with tips on how to conduct your research ethically. In this section, I cover issues related to *objectivity, representativeness, uses and abuses of statistics, control issues, free and informed consent, contract research, academic freedom* (complete with a **Thought Box**), *authorship issues*, and *respectful language*.

Unable, for space reasons, to go into more issues in depth, in the next section of the chapter I have nevertheless alerted you to some additional issues that you need to be aware of. These issues have to do with *cultural contexts, supervision and teaching, sexual liaisons, blind faith in peer review, responsibility to society*, and *service to the public*. Finally, I end the chapter with five **Thought Boxes**—four of which you are to work through on your own—and some parting advice.

It should be noted that I have chosen to use my “undergraduate lecture voice” throughout this chapter, so the tone is more conversational than the voice that I use in my journal articles. In part, this is because I miss teaching. But it is also because this chapter represents a bit of the personal journeys that I have undertaken throughout my career, journeys that I have learned from that I need to share with you. It is more comfortable for me, when sharing personal information, to converse *with* you rather than talking *at* you.

CONFUSIONS, MISPERCEPTIONS, AND MISUNDERSTANDINGS

There appears to be some confusion or misperception with respect to who needs to attend to the **Principles, Values Statements, and Standards** of the *Canadian Code of Ethics for Psychologists* (Canadian Psychological Association, 2017). For instance, some psychologists seem to think that this *Code* surely does not apply to them because they are not *clinical* or *counselling* psychologists. **Nothing could be further from the truth.** Some academic psychologists know that, if they are to conduct research with human participants, they must submit a proposal to their Research Ethics Board (REB) and their research must abide by the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (2010), so they figure that they do not even need to read the CPA *Code*. **Again, nothing could be further from the truth.** Some students of psychology appear to think that they can either ignore the *Code* (if they have even heard of it) or that they are covered by their supervisor’s responsibilities. **Nothing could be further from the truth.** And some psychologists who conduct research with *non-human* animals seem to figure that as long as they are adhering to the Animal Care Council of Canada regulations and have submitted their proposed research to their university’s Animal Care Committee for approval, then they, too, have no need even to read the CPA *Code*. **Again, you guessed it: Nothing could be further from the truth.**

So what *is* this truth of which I speak? The key to this truth is that the practice of psychology encompasses far more than the provision of clinical interventions and the conduct of research with human participants or non-human animals. Did you know that

it also encompasses all of the other tasks or duties that you might perform in your role as a psychologist? So, for instance, it applies to your roles as a student of psychology, whether you are an undergraduate or a graduate student. It applies to one's roles of a teacher of psychology, as a supervisor of both undergraduates and graduate students, as an administrator (e.g., as Department Head or Chair, as Dean of a Faculty, all the way up to when you become President of a University, and as a manager in a non-academic setting). It applies to one's roles as a consultant, as a peer reviewer of grant proposals or of potential publications, even to your interactions with your peers and colleagues. So how do we learn what constitutes best practice in all of our roles as psychologists and as students of psychology? We are very fortunate, in Canada, to have the CPA *Code* to guide us in our endeavours.

THE CANADIAN CODE OF ETHICS FOR PSYCHOLOGISTS (FOURTH EDITION, 2017)

First, it is important to stress what our *Code* is *not*. It is *not* a list of rules which, if broken, have accompanying punishments. We all know that punishment is not an effective reinforcement modality for enhancing learning—whether you are a police dog in training or a practising psychologist. Rather, our *Code* is *aspirational*. What do I mean by that? Our *Code* is organized under four *Principles*: **I: Respect for the Dignity of Persons and Peoples.** **II: Responsible Caring.** **III: Integrity in Relationships.** **IV: Responsibility to Society.** A detailed description of the *Values* underpinning each *Principle* is provided in the *Code*. Perhaps most importantly—in terms both of understanding the *Principles*, *Values*, and how these would be reflected in your *behaviour*—is the provision of the many *Standards* associated with each *Principle*. It is a delineation of what can be seen to be *best ethical practices* as they apply to psychologists and to students of psychology.

In Table 1, I have totalled up the number of *Standards* associated with each *Principle* as well as the number of those *Standards* that apply to non-clinical situations.

Table 1: Are the ethical Standards in the Canadian Code of Ethics for Psychologists Relevant Mainly to Clinicians?

Ethical Principles	Number of Ethical Standards Associated with the Principle	Number of those Ethical Standards Related to Non-Clinical Situations
I: Respect for the Dignity of Persons and Peoples	47	45
II: Responsible Caring	54	52
III: Integrity in Relationships	37	36
IV: Responsibility to Society	30	30
Totals	168	163

I did not provide you with this tabulation of **Standards** in order to overwhelm you (*GAK! You mean that I have to remember and adhere to 168 Standards in order to behave ethically?*). Rather, my purpose was to demonstrate to you that, if **163** of the **168 Standards** can be seen to be applicable to the various roles that psychologists engage in *other than* or *in addition to* interventions, one can hardly claim that our *Code* is to be adhered to only by clinical psychologists. For example, **Standard I.15** is *Establish fees that are fair in light of the time, energy, and knowledge of the psychologist and any associates or employees, and in light of the market value of the product or service.* (CPA, 2017); this clearly does not apply to psychology students preparing term papers, but would apply to clinical psychologists in private practice. On the other hand, **Standard I.11** is *Seek to design research, teaching, supervision, practice, and business activities in such a way that they contribute to the fair distribution of benefits to individuals and groups (e.g., couples, families, organizations, communities, peoples), and that they do not unfairly exclude those who are vulnerable or might be disadvantaged* (CPA, 2017). This can be seen to apply to all activities in which a psychologist might engage—even to the formulation of the research design for your Honours thesis. Likewise, **Standard I.3** (*Strive to use language that conveys respect for the dignity of persons and people’s as much as possible in all spoken, written, electronic, or printed communication.* [CPA, 2017]) clearly applies to all of the activities in which psychologists and students of psychology engage. **Note:** When I say *all* of the activities engaged in, I don’t mean purely personal activities like, for instance, washing the dishes (although it would be nice if you did not “accidentally” break your partner’s favourite coffee mug because you are angry with them). Our *Code* “... is intended to guide and regulate only those activities a psychologist engages in by virtue of being a psychologist. There is no intention to guide or regulate a psychologist’s activities outside of this context, although an individual psychologist might make a personal decision to be guided by the *Code*’s principles and values outside of this context (CPA, 2017).

Before getting into the heart of the Standards, it is important to put our *Code* into a bit of an historical context. In 1977, CPA had adopted the American Psychologist Association’s Code of Ethics—a document that differs significantly from our *Code* (see Sinclair [1996, 2005] for a detailed analysis and comparison of the two codes.). A particularly helpful component of our *Code* is the provision of a 10-step model for ethical decision making.

What few “empirical” studies on the *Code* have been conducted are reviewed by Hadjistravropoulos (2011). The major emphasis in these studies, from Hadjistravropoulos’ description of them, appears to be to test the face validity of the hierarchical organization of our *Code* (i.e., when principles are in conflict, psychologists should give more weight to the first **Principle** over, for example, the third **Principle**) and the face validity of the **Principles** and **Values** statements; the CPA *Code* fared very well in these studies. Of particular interest to me was a study in which the ethical content and functional grammar of the CPA and Canadian Medical Association’s (CMA) codes of ethics were compared (Malloy, Hadjistravropoulos, Douaud, & Smythe, 2002, cited in Hadjistravropoulos, 2011). According to Malloy, et al., our *Code*, compared to the CMA Code, “has greater educational value, is less authoritarian, provides a clear rationale for ethical behaviour, and is more empowering to the decision-maker” (Malloy et al., 2002, p. 152). It is also more likely to allow for increased consideration of situational factors and provides more flexibility in the resolution of complex ethical dilemmas (e.g., through the use of terms such as ‘generally’, ‘relatively’). Our *Code* has received praise from the national psychology associations of other countries

(Pettifor, 2011) as well as having been adopted by provincial regulatory bodies in our own country (with the exception of Quebec where special circumstances obtain [Gauthier, 2011; Richard, 2011]). It has been influential in the development of the *Tri-Council Policy Statement on Research with Human Participants* (O'Neill, 2011) that all researchers funded by the Medical Research Council (MRC) of Canada, SSHRC, and the Natural Sciences and Engineering Research Council (NSERC) of Canada must abide by. And it served as the model for the development of the Social Science Federation of Canada (SSFC) policy on ethics within all the social sciences (Stark[-Adamec] & Pettifor, 1995).

PROBLEMATIC DILEMMAS

In order to gain a better understanding of our *Code* and, in particular, the **Standards** contained therein, it is instructive to examine and analyze some real-life examples of problematic behaviours that I have either witnessed myself or have been told about by trusted (and trusting) sources. In doing so, I present the examples in **Thought Boxes** and then, since you may not yet have read our *Code*, I go over the implications of the behaviours and relate them to the **Standards** of best practices as delineated in our *Code*.

SAVING THE WORLD FROM RESEARCH ON NONVERBAL BEHAVIOUR

In **Thought Box 1** you will find described an incident that actually occurred and during which a large number of **Standards** of our *Code* were not adhered to. Take a moment to consider what is wrong with this behaviour.

Thought Box 1

What's Wrong with This Picture?

A faculty member in a department of psychology was appointed to the Psychology Adjudication Committee of the Canadian Foundation of Behaviours (FoB) and when s/he flew back from Ottawa, in the evening after her/his first meeting with the Committee, s/he rushed into the department lounge and proudly announced to the graduate students congregated there that s/he had successfully saved the world from any research into nonverbal behaviour (in other words, the faculty member claimed to have blocked funding of any nonverbal behaviour research).

How do we go about assessing this situation? Fortunately, our *Code* provides us with guidelines on how to think this through.

Who Is Affected? Paraphrasing one of the 10 steps in ethical decision making outlined in our *Code* (CPA, 2017, Preamble): *Who are the individuals and groups potentially affected by this?* Well, obviously, the graduate students who were in the department that night can be seen to be potentially affected: They may consider, since faculty are perceived as role models,

that it is acceptable behaviour and may be more likely to utter similar biased statements, in public, about areas of research that they don't respect. They may consider that it is acceptable to carry this behaviour forward into their lectures. Should, in the future, they be invited to serve on a granting agency adjudication committee or to serve as a peer reviewer of a manuscript for potential publication, they once again may consider that it is not inappropriate to quash research and research communications that they don't like. Then too, if there was a graduate student in the group who was conducting research on nonverbal behaviour for their thesis or dissertation, is s/he likely to feel validated by the faculty member's behaviour?

But those who are affected extend well beyond the students who witnessed this behaviour. The psychologists on the Adjudication Committee will also have been affected as a function of having left unfunded (in that particular year) all research proposed in this legitimate area of inquiry. The Chair of the Adjudication Committee may have been at fault for not reining in this Committee member. FoB itself may have made an error in appointing this faculty member because even a quick examination of her/his *curriculum vitae* would have revealed that the areas funded by the FoB were outside her/his areas of expertise. The faculty member should have declined the invitation to assess grant proposals that were outside of her/his area of knowledge and expertise. And, most certainly, the faculty member may be seen as having violated her/his confidentiality agreement with the FoB.

Another major impact is, of course, on the scholars whose nonverbal behaviour research proposals were rejected. Having received a prejudicial review, from which there is absolutely no possibility of appeal, their attitude towards the FoB, fuelled by hurt and justified anger, is unlikely to be positive. There is also a potential impact on the discipline of psychology. The study of nonverbal behaviour is a legitimate area of research in psychology; since the unfunded research may not be conducted, potential major breakthroughs in the field may have gone undetected. The legitimacy of the peer review process may have suffered a credibility blow as well. In addition, there is a potential impact on society. Any potential benefits for individuals or groups will have gone undetected and, if the bias in the research funding decision becomes known by the public, public trust in both the discipline and the FoB may be broken. (**Note:** This public perception can have real-world implications in terms of government funding of the FoB and of the discipline.) So the ramifications of that short utterance by that faculty member are farther reaching than one might have expected at first glance.

What Are The Relevant Issues? Again paraphrasing one of the steps in ethical decision making outlined in our *Code: What are the ethically relevant issues and practices involved?* (CPA, 2017, Preamble). This is where identification of the **Principles** and associated **Standards** come into play. As it turns out, at least **13** of the 45 relevant **Standards** associated with **Principle I** are involved here. These are delineated for you in **Table 2**. You will see that they deal with *general respect, non-discrimination, the fair treatment and due process* that nonverbal behaviour researchers were cheated out of, issues surrounding *confidentiality*, and *extended responsibility* (in this case, because s/he made this boast to graduate students).

Table 2
Principle I. Respect for the Dignity of Persons and Peoples
Standards Relevant to *Thought Box 1*
(Canadian Psychological Association, 2017)

General Respect

I.1 Demonstrate appropriate respect for the knowledge, insight, experience, areas of expertise, and cultural perspectives and values of others, including those that are different from their own, limited only by those that seriously contravene the ethical principles of this Code.

I.2 Not engage publicly (e.g., in public statements, presentations, research reports, with primary clients or other contacts) in degrading comments about others including demeaning jokes based on such characteristics as culture, nationality, ethnicity, colour, race, religion, sex, gender, or sexual orientation.

I.3 Strive to use language that conveys respect for the dignity of persons and peoples as much as possible in all spoken, written, electronic, or printed communications.

General rights

I.5 Avoid or refuse to participate in practices disrespectful of the moral rights of persons or peoples, including their human, legal and civil rights.

I.7 Make every reasonable effort to ensure that psychological knowledge is not misinterpreted or misused, intentionally or unintentionally, to infringe on moral rights.

Non-discrimination

I.9 Not practise, condone, facilitate, or collaborate with any form of unjust discrimination.

I.11 Seek to design research, teaching, supervision, practice, and business activities in such a way that they contribute to the fair distribution of benefits to individuals and groups ... and that they do not unfairly exclude those who are vulnerable or might be disadvantaged.

Fair treatment/due process

I.12 Work and act in a spirit of fair treatment to others.

I.13 Help to establish and abide by due process and other natural justice.

Confidentiality

I.43 Be careful not to relay incidental information about colleagues, team members, other collaborators, the primary clients or contract examiners of others, research participants, employees, supervises, students, or trainees gained in the process of their activities as psychologists, that the psychologist has reason to believe is considered confidential by those individuals or groups, except as required or justified by law. (Also see Standards IV.17 and IV.18)

I.45 Share confidential information with others only to the extent reasonably needed for the purpose of sharing, and only with the informed consent of those involved, or in a manner that the individuals and groups ... involved cannot be identified, except as required or justified by law, or in circumstances of possible imminent serious bodily harm. (Also see Standards II.42, IV.17, and IV.18)

Extended responsibility

I.46 Encourage others, in a manner consistent with this *Code*, to respect the dignity of persons and peoples, and to expect respect for their own dignity.

I.47 Assume overall responsibility for the scientific and professional activities of their assistants, employees, students, trainees, and supervises, with regard to Respect for the Dignity of Persons and Peoples, all of whom, however, incur similar obligations.

Responsible Caring. How does this incident fare when the **Standards** associated with **Principle II Responsible Caring** are examined? As can be concluded from **Table 3**, with **12** of the **54 Standards** relevant to non-clinical situations not having been honoured, the incident also does not fare well in this domain.

One might have conjectured that a **Principle** labelled *Responsible Caring* would only be relevant in cases of clinical interventions. But this is clearly not the case. The issues addressed here deal primarily with the *competence* in which the faculty member was lacking. Particularly telling is the seemingly total absence of the requisite *self-reflection* (**Standard II.10**).

Table 3
Principle II. Responsible Caring
Standards Relevant to *Thought Box 1*
(Canadian Psychological Association, 2017)

General caring

II.1 Protect and promote the well-being and best interests of primary clients, contract examinees, research participants, employees, supervisees, students, trainees, colleagues, team members or other collaborators, and others.

II.2 Avoid doing harm to primary clients, contract examinees, research participants, employees, supervisees, students, trainees, colleagues, team members or other collaborators, and others.

II.3 Accept responsibility for the consequences of their actions.

II.5 Make every reasonable effort to ensure that psychological knowledge is not misinterpreted or misused, intentionally or unintentionally, to harm others.

II.6 Offer or carry out (without supervision) only those activities for which they have established their competence to carry them out to the benefit of others.

II.8 Take immediate steps to obtain consultation or supervision, or to refer a primary client (*in this case the "client" is FoB*) to a colleague or other appropriate professional, whichever is more likely to result in providing the primary client with competent service, if it becomes apparent that a primary client's issues or problems are beyond their competence.

II.9 Keep themselves up to date with a broad range of relevant knowledge, research methods, techniques, and technologies, and their impact on individuals or groups ... through the reading of relevant literature, peer consultation, and continuing education activities, in order that their practice, teaching, supervision, and research activities will benefit and not harm others.

II.10 Evaluate how their own experiences, attitudes, culture, beliefs, values, individual differences, specific training, external pressures, personal needs, and historical, economic, and political context might influence their interactions with and perceptions of others, and integrate this awareness into their efforts to benefit and not harm others.

Maximize benefit

II.25 Facilitate the professional and scientific development of their employees, supervisees, students, and trainees by ensuring that they understand the values and ethical prescriptions of the discipline, as well as the competencies needed for their areas of activity, and by providing or arranging for adequate working conditions, and constructive supervision, consultation, and experience opportunities.

Extended responsibility

II.55 Encourage others, in a manner consistent with this *Code*, to care responsibly.

II.56 Assume overall responsibility for the scientific and professional activities of their assistants, employees, supervisees, students, and trainees with respect to the Principle of Responsible Caring, all of whom, however, incur similar obligations.

Integrity in Relationships. At least seven of the 36 relevant Standards (Table 4) are not upheld by the faculty member when it comes to **Principle III, Integrity in Relationships** (my favourite **Principle**). In fact, any decent person should demonstrate integrity in their relationships.

Table 4
Principle III Integrity in Relationships
Standards Relevant to *Thought Box 1*
(Canadian Psychological Association, 2017)

Accuracy/honesty

III.2 Accurately represent their own and their colleagues' qualifications (e.g., credentials, education, experience, competence, competence, affiliations) in all spoken, written, or printed communications, being careful not to use descriptions or information that could be misinterpreted (e.g., citing membership in a voluntary association of psychologists as a testament of competence.)

III.5 Accurately represent their own and their colleagues' activities, functions, contributions and likely or actual outcomes of their activities (including research results) in all spoken, written, electronic, or printed communication.

III.9 Evaluate how their own experiences, attitudes, culture, beliefs, values, individual differences, specific training, external pressures, personal needs, and historical, economic, and political context might influence their activities and thinking, integrating this awareness into their attempts to be as objective and unbiased as possible in their research, service, teaching, supervision, employment, evaluation, adjudication, editorial, and peer review activities.

Reliance on the discipline

III.34 Familiarize themselves with and take into account their discipline's guidelines and best practices for their area(s) of activity, and demonstrate a commitment to maintaining the standards of their discipline.

III.35 Seek consultation from colleagues and/or appropriate others, including advisory groups, and give due regard to their advice in arriving at a responsible decision, if faced with difficult situations.

Extended responsibility

III.36 Encourage others, in a manner consistent with this *Code*, to relate with integrity.

III.37 Assume overall responsibility for the scientific and professional activities of their assistants, employees, supervisees, students, and trainees with regard to the Principle of Integrity in Relationships, all of whom, however, incur similar obligations.

Responsibility to Society. At least eight of the 36 relevant Standards that were *not* upheld by the faculty member were related to the Principle of our responsibility to society (Table

5). By blocking all new research on nonverbal behaviour s/he has deprived society of any benefits that may have accrued as a function of new insights into human behaviour and has interfered with academic freedom—all based on unexamined prejudicial biases. Perhaps if s/he had been more self-aware, these biases would have been held in check.

Table 5
Principle IV Responsibility to Society
Standards Relevant to *Thought Box 1*
(Canadian Psychological Association, 2017)

Development of knowledge

IV. 1 Contribute to the discipline of psychology and to society's understanding of itself and human beings generally, through free enquiry, innovation, and debate, and through the acquisition, transmission and expression of knowledge and ideas, unless such activities conflict with ethical requirements.

IV.2 Not interfere with, or condone interference with, free enquiry, innovation and debate, and the acquisition, transmission and expression of knowledge and ideas, that do not conflict with ethical requirements.

Beneficial activities

IV.5 Assist in the development of those who enter the discipline of psychology by helping them to acquire a full understanding of their ethical responsibilities and the needed competencies of their chosen areas(s), including an understanding of critical analysis and of the variations, uses, limitations, and possible misinterpretations and misuses of the scientific paradigm.

IV.8 Engage in regular monitoring, assessment, and reporting (e.g., through peer review, in program reviews, and reports of one's own research) of their ethical practices and safeguards.

IV.10 Uphold the discipline's responsibility to society by promoting and maintaining the highest standards of the discipline.

IV.11 Protect the skills, knowledge, and interpretations of psychology from being misinterpreted, misused, used incompetently, or made useless (e.g., loss of security of assessment techniques) by others.

Extended responsibility

IV.29 Encourage others, in a manner consistent with this *Code*, to exercise responsibility to society.

IV.30 Assume overall responsibility for the scientific and professional activities of their assistants, employees, supervisees, students, and trainees with regard to the Principle of Responsibility to Society, all of whom, however, incur similar obligations.

Summary. It is astounding that one statement uttered by this faculty member to graduate students could, upon examination, be seen to have had such a broad potential impact on so many people. Equally astounding is the large and widely ranging number of **Standards** of best ethical practices not observed by the faculty member. The faculty member obviously should have foregone a free trip to Ottawa because s/he was in no way qualified to serve as a peer reviewer of grant proposals in psychology as a social science. But going back a step, FoB should have vetted her/his qualifications before even inviting her/him to serve on the Adjudication Committee, thereby preventing this incident from ever happening; perhaps the need to have representation from that particular region of Canada trumped the need to have a qualified assessor? Perhaps the chair of the Adjudication Committee should have insisted to the FoB officer in charge that this person be sent back home immediately? Certainly, the other members of the Committee should have overridden the bias of this particular unqualified gatekeeper. I often wonder about the outcomes in terms of the graduate students who were subjected to this unacceptable behaviour ...

GIVING CREDIT WHERE CREDIT IS DUE

In *Thought Box 2*, you will find another vignette of a case in which there were problems in honouring **Standards** of best practices in psychology. At least **23** ethical **Standards** can be seen as having relevance. Although fewer than in the first dilemma (*Thought Box 1*), the **Standards** that have been breached are very serious ones that have far-reaching implications.

Thought Box 2

What's Wrong with This Picture?

At a doctoral student's dissertation defence, the student's supervisor noticed that no credit had been given to a colleague who had made substantive contributions to the student's thinking and work, to the point even of having sent the student the page proofs of their new book. This happened despite the supervisor having instructed the student to give due credit to the colleague in draft after draft after draft of the dissertation. The supervisor drew this omission to the attention of the examining committee and to the student, stipulating that the student must acknowledge this contribution and add the appropriate references. The student did not defend their behaviour and in fact did not even respond at all. None of the examining committee members backed the supervisor. In the end, the final version of the dissertation submitted for binding did not contain the requisite changes.

Interestingly, the following year, the student's supervisor attended a book display at the CPA Convention and picked up a book that fell within her/his areas of interest and expertise. The supervisor was shocked when s/he opened the book to a chapter based on that dissertation, authored by the former student, and co-authored by another colleague

who had had nothing to do with the dissertation, and who had not even been on the student's supervisory committee. There was not even an acknowledgement of the supervisor's very substantial contributions to the research. In fact, there was no acknowledgement section at all, so even the fact that the student had been supported by a SSHRC doctoral fellowship went unrecognized.

In the *Thought Box 2*, I provided information regarding the follow-up to illustrate the effect on subsequent behaviour of the first incident having been mishandled. In the end, the student got away with the unethical behaviour, and was in fact rewarded for it with her/his doctorate, so psychology's learning theories would predict that the behaviour would have been reinforced and repeated, and *voilà!*

The people involved and affected by this behaviour are, of course, the student, the supervisor, and the rest of the examining committee. Certainly, given that her/his insistence that credit be given where credit was due went unaddressed, the dignity of the student's supervisor has been compromised both by the student and by the rest of the examining committee. And let's not forget about the impact on the supervisor, and even on the student, of awarding of co-authorship to someone who had not even been involved with the research. As the dissertation and the subsequent publication would likely be accessed by the colleague who had shared their work so generously, the supervisor's reputation and the reputation of the department are likely to suffer and it would be unlikely that this colleague would ever again trust the supervisor or be so generous as to share their work with anyone in that department of psychology again. If any other students learned about these machinations, it could potentially have an impact on their ethical behaviour down the line as well. If these behaviours became public, the reputation of the discipline would be called into question and funding for psychological research could be imperilled.

Although, by my calculation, there are a total of **23 Standards** expanding from *each* of the four **Principles** that have relevance, in this instance it is the **Principle of Integrity in Relationships** that was most involved in this situation. As mentioned before, this is my favourite **Principle**. To my mind, it is the linchpin **Principle** for, without integrity in relationships, respect for the dignity (and welfare) of others is impossible, responsible caring is impossible, and our contract with society could not possibly be honoured. So, for this dilemma, my focus is on the **Standards** that are subsumed under **Principle III (Table 6)**.

Table 6
Principle III Integrity in Relationships
Standards Relevant to *Thought Box 2*
(Canadian Psychological Association, 2017)

Accuracy/honesty

III.1 Not knowingly participate in, condone, or be associated with dishonesty, fraud, misappropriation, or misrepresentation.

III.5 Accurately represent their own and their colleagues' activities, functions, contributions, and likely or actual outcomes of their activities (including research results) in all spoken, written, electronic, or printed communication. ...

III.6 Ensure that their own and their colleagues' activities, functions, contributions, and likely or actual outcomes of their activities (including research results) are not misrepresented by others, and act quickly to correct any such misrepresentation.

III.7 Take credit only for the work and ideas that they have actually done or generated, and give credit for work done or ideas contributed by others (including students and trainees), in proportion to their contribution.

Objectivity/lack of bias

III.9 Evaluate how their own experiences, attitudes, culture, beliefs, values, individual differences, specific training, external pressures, personal needs, and historical, economic, and political context might influence their activities and thinking, integrating this awareness into their attempts to be as objective and unbiased as possible in their research, service, teaching, supervision, employment, evaluation, adjudication, editorial, and peer review activities.

Avoidance of conflict of interest

III.24 Not exploit any relationship established as a psychologist to further personal, political, or business interests at the expense of the dignity or well-being of their primary clients, contract examinees, research participants, students, trainees, employers, or others. ...

Reliance on the discipline

III.33 Familiarize themselves with their discipline's rules and regulations, and abide by them. ...

III.34 Familiarize themselves with and take into account their discipline's guidelines and best practices for their area(s) of activity, and demonstrate a commitment to maintaining the standards of their discipline.

III.35 Seek consultation from colleagues and/or appropriate others, including advisory groups, and give due regard to their advice in arriving at a responsible decision, if faced with difficult situations.

Extended responsibility

III.36 Encourage others, in a manner consistent with this Code, to relate with integrity.

III.37 Assume overall responsibility for the scientific and professional activities of their assistants, employees, supervisees, students, and trainees with regard to the Principle of Integrity in Relationships, all of whom, however, incur similar obligations.

HONESTY IS THE BEST POLICY? OBVIOUSLY NOT ACCORDING TO THIS PSYCHOLOGIST

We have explored the ramifications of not abiding by the **Standards** in relation to the incidents described in *Thought Box 2*, but I have to share with you another incident that I witnessed. It is only indirectly related to the issues implicated by the behaviours described in *Thought Box 2*, but it is very directly related to **Principle III**:

A very famous psychologist was invited to give a colloquium in a psychology department. S/he was noted especially for a seminal article that turned around people's thinking on a particular issue. After the colloquium, this pillar of the psychological community held a conversation session attended mostly by graduate students. In this session, s/he confessed that s/he had made up the entire article, had never conducted the research in which so many other psychologists had placed their trust, and that s/he frequently made up data or studies in order to win an argument.

Of course, s/he might have been lying then too. ...

TIPS FOR CONDUCTING RESEARCH ETHICALLY

Since both of our *Thought Boxes*, thus far, have dealt with research, and since research is one of the most heavily weighted functions of an academic psychologist, it is appropriate, at this juncture, to expand upon how to conduct your research ethically. One of the bottom lines that you can use in considering whether the research that you are proposing meets our ethical **Standards** (as well as evaluating the research that is already in the literature) is whether or not you would subject someone you love to your planned manipulations. Are they going to be bored out of their minds for two hours? Are they going to be in physical or psychological pain in the service of your curiosity? Are you deceiving them about the true purpose of your research? If your answer to any of these three questions is yes, you had better re-think your methodology, as well as your goals (**Standards III.23-25**). Another rule of thumb that you can use is to remember that you must return your research participants

back to the “real world” from which they came in the same condition as, or preferably in *better* condition than the one in which they came to you (**Standard II.39**).

THE MYTH OF OBJECTIVITY: THE WHOLE IS MORE THAN THE SUM OF ITS PARTS

Psychology is almost phobic of the subjective; yet it is virtually impossible to be totally objective about anything. We are the product of all our experiences and these experiences are not merely additive. They interact with each other in complex ways. Not only that, but they affect our perceptions, cognitions, attitudes, emotions, and, ultimately, our biases and behaviour. How does this affect our research? Your experiences, including all of your courses and training, affect how you approach research, your theoretical orientation, what research questions are of interest to you, how you formulate your research questions, how you evaluate the literature, whether or not you are even-handed in your critiques of those who agree with your hypotheses versus those who disagree, what methodologies you adopt to test your hypotheses (e.g., quantitative, qualitative, or mixed methods), how you analyze your data, how you interpret and discuss your results, which journal you choose for submitting your manuscript, and how you handle critiques of your work. (See **Standard III.9** in **Table 6** for how this is described in our *Code*.).

For example, unconsciously, you may, be harsher on the work of those who disagree with your approach or your findings than you are on those who agree with you. Or you may slant your discussion or conclusions in such a way that they are consistent with your biases rather than with your results. We replicated an American study of attitudes towards and accuracy of information about women held by psychiatrists. We found that, based on our results, we could not come to the same conclusions as those come to by the authors of the original study. Could it really be that Canadian psychiatrists were so much more liberal and accurate than were American psychiatrists? We thought not. Sure enough, there were no significant differences between our data and their data, but when we examined their Discussion section we found that a content analysis revealed an overwhelming negative bias against psychiatrists on the part of the authors of the American study, a pre-existing negative bias not based on their results (Stark-Adamec, & Graham, 1985).

You also may reject certain approaches to research, based on misperceptions or misinformation about those approaches. The bottom line here is that you must choose the method that is most relevant to the provision of answers to your research questions; furthermore, you must not let the tail wag the dog—you must not let your favourite research methods drive the research questions that you ask. Rather, you should let your research *questions* “wag” your research *methods*. You may choose to disregard anything that was published more than, say, five or, at a stretch, 10 years ago, thereby missing out on some important earlier insights that could have had a beneficial impact on your work. You may consider that the only good articles are published in, say, American journals, thereby missing out on important insights contained in articles published in, say, Canadian, European, or Asian journals.

Given all these entry points for biases and unethical behaviour, how can psychologists ever

conduct research ethically? Once again, our *Code* comes to the rescue. A quote from the **Values Statement for Principle III** is very relevant here:

Psychologists are not expected to be value-free or totally without self-interest in conducting their activities. However, they are expected to understand how their own experiences, attitudes, culture, beliefs, values, individual differences, specific training, external pressures, personal needs, and historical, economic, and political context interact with their activities, to be open and honest about the influence of such factors, and to be as objective as possible under the circumstances.

(CPA, 2017, **Principle III, Values Statement**)

So *self-awareness*, *openness*, and *honesty* are key factors in all of a psychologist's activities, if we are to be conducting ourselves ethically.

REPRESENTATIVENESS

Random samples are often used, in psychology, as an indication that one has achieved representativeness and the assumption is made that the results of the study can therefore be generalized to everyone and her brother. But the achievement of representativeness in psychological studies is a bit of a myth too. First and foremost, even if one has attempted to get a *true* random sample, one cannot coerce people to be participants in your research; we have absolutely no idea whether the people who did not volunteer to participate, or who outright refused, would respond to your research manipulations or questions in the same way as those who did participate. That is acceptable, *if* recognized, and *if* one does not over-generalize to the populations and peoples of the world at large.

But *not* all of the research that you conduct needs to have samples that are representative of the *entire* population. It could be that what you need is a representative (to the degree possible) sample of a *particular* sub-population. This is called *purposive sampling*. For example, I was interested in the stress experienced by women working in academic settings, their coping strategies, and their perceived advantages and disadvantages of being a woman working in academia. I was not interested in comparing the stress experienced by men in contrast to the stress experienced by women, or the coping strategies used by women in academia compared to the coping strategies used by women working in other settings or unemployed women, so the populations that I sampled from were female faculty members, female graduate students, female secretaries, and female university librarians in four regions of Canada (Stark[-Adamec] 1995c). When invited to do ride-alongs with police officers, I discovered that the research literature on policing, being primarily American, did not reflect the Canadian experience. So I conducted sequential mixed methods research with police officers in departments of varying sizes in six different police jurisdictions in Canada because it was the *Canadian* experience that interested me; I had no interest in comparing the stress levels of Canadian and American police officers as the goal was to discover the nature of the Canadian experience (Stark, 1992). I had originally proposed research with police, fire, and emergency medical services, but discovered, during the participant observation phases, that I could more accurately relate to the functions and humour of police officers than I could those of workers in the other two first responder categories. Eventually, I narrowed the scope down to canine policing (Stark, 1996, 1998), but only after working with police officers in other specialties. **The take-home ethics message here is that it is essential that you opt**

to work with samples of the populations to which you intend to generalize your results, rather than with samples of convenience merely because they are convenient. (Note that I have been saying research *with* rather than research *on*. This reflects the fact that we conduct research only *with* the co-operation and collaboration of our research participants. Furthermore, it distances us from the pretence of complete objectivity.)

USES AND ABUSES OF STATISTICS

Since its inception as a discipline separate from philosophy in the late 19th century (Sinclair, 2017), psychologists have amassed millions upon millions of numbers representing data points gathered from human participants in our research endeavours. The totality of these numbers is far too massive to wrap our heads around and to represent accurately, even from one research study, so we often use descriptive and analytical statistics as *tools* for this purpose. If we are to use statistical tools appropriately and ethically, we must heed several *caveats*. *First*, we have converted people's experiences, thoughts, perceptions, affects, and behaviours to numbers—which is the only way that we can apply statistics to them—so we must always be aware that we have removed ourselves one step from those experiences that interest us, and that the numbers, in and of themselves, have no inherent meaning. *Secondly*, when we are looking at potential differences between, for example, two samples or two experimental conditions, we have to be mindful of the origins of statistical significance in probability theory. Although often interpreted incorrectly, a p-value should be interpreted as the likelihood that the results of a study were obtained by chance, assuming that the null hypothesis is true. So, for example, if we achieve significance at the .05 level, it means that five times out of 100 we would get the same difference, or correlation, purely by chance. That should be a sobering thought when we are dealing with conclusions that may have an actual impact on real people's lives. *Thirdly*, we must always remember that statistical significance is not isomorphic with psychological significance. *Fourthly*, we must remind ourselves that each statistical tool has underlying assumptions (e.g., that the data will be normally distributed) which take us one step further removed from the experiences we are interested in. Furthermore, if the stipulated conditions for the use of the statistic are not met, we have abused the statistic and our conclusions based on our analyses will be baseless. This abuse is more easily arrived at since the availability of statistical packages/programmes for laptops, tablets, and other personal devices has become more widespread. It is so easy to have the results of statistical manipulations of your data (and keep in mind that they *are* manipulations) spew out in a manner of seconds that oftentimes the underlying assumptions are ignored. It is your ethical duty to ensure that the conclusions you draw are rooted in a solid foundation and you can only ensure that if you examine your data in light of the assumptions associated with the statistic you have chosen for your analysis.

I have an example of the abuse of statistics to give you. Two researchers claimed that you could predict complex partial seizures non-invasively on the basis of a subset of their questionnaire. They had performed a factor analysis on their data and made a big deal of the fact that they had discovered a very large first factor and a much smaller second factor. If accurate, their findings could have the potential of benefitting a substantial number of patients by either ruling out complex partial seizures or ruling them in. Many were, understandably, very excited. However, the researchers had not used any rotations while

plugging their data into a packaged statistical programme which is a necessary step, depending on your research question and design, for making sound conclusions. The programme will not shout at you: *Hey! You forgot to rotate the factors!* Or, *Correlation does not equal causation!* If you do not specify a rotation, you will always get a very large first factor accounting for a lot of the variance in your data, and a smaller second factor. Given the potential import of the study for patients who need an accurate diagnosis, I was fortunate to be funded to conduct a replication of the initial findings during a time when replications were not typically funded. Demonstrating the importance and responsibility of understanding the tools that we use as researchers, my results did not replicate those in the first study. *Sequelae:* I presented my study (Stark-Adamec, & Adamec, 1986), very calmly and “softly-softly”, at a conference with prominent researchers in that area in attendance.—including the first author of the other study. My presentation was in an enormous auditorium and, from where I stood on the stage, I could just make out the people in the first few rows. In presenting the rationale for my study, I was politely critical of the first study. Half-way through my presentation, the first author of the other study stood up, looked at me directly, then dramatically stalked out of the auditorium. After I had delivered my plenary address, a prominent epidemiologist came up to me and said: *If you can't say something nice, don't say anything at all!* I had to laugh (to myself) as I thought: *You just plagiarized Thumper's mummy in the Disney movie “Bambi”!* It is important that we are aware of, and attend to, our professional responsibilities! Further, we must be prepared to be accountable for our decisions.

PSYCHOLOGY HAS “CONTROL ISSUES”

Related to statistical issues are issues of *control* in the design of your research. Like *objectivity* and *representativeness*, the control that you can achieve is perhaps more illusory than real. For instance, you cannot control the mood in which your participants come to your research and those moods might have an effect on their responses. Say, for example, that they are sad because they just learned that their grandmother died, or they are anxious because they have an exam later in the week, or they are angry because they had a disagreement with their partner that morning, or they are irritable because they are trying to stop smoking. You have no control over these moods, and probably do not even know what mood they are in when they come to you because you have not thought to ask them, but these moods could mean that they are distracted and that could affect their performance.

A real-life example of a control issue is that marihuana researchers conjectured that participants with prior experience with marihuana would have associated expectations that could affect the effects experienced in the laboratory. Therefore, they attempted to “control for” the effects of expectations by selecting only participants who had never ever smoked (or otherwise ingested) marihuana before. This was a rather ludicrous attempt to deal with the issue because, by definition, you are only a first-time user of the substance once in your life. The results of their experiments could therefore only be generalized to first-time users, but that did not stop them from reporting their results as if they had uncovered the “pure and uncontaminated” effects of marihuana. It made more sense to me, if prior experience really had an effect, to attempt to *measure* the expectations and to *examine* any potential effects, rather than *controlling for* any expectancy effects—so that is what I did (Stark-Adamec,

Adamec, & Pihl, 1981; Stark-Adamec, & Pihl, 1980a, 1980b). All research on marihuana effects, up to that point, had participants smoke alone (or even had marihuana *injected* into them) in a formal, sterile laboratory, and the drug and the tests were administered by a researcher who was “friendly but distant”—conditions which in no way resembled those in which people smoked marihuana in those days—all in the service of discovering the uncontaminated responses to marihuana. In addition, all participants had been male because women constituted “messy variables”. So I had participants smoke alone, in small groups of strangers, or in small groups of friends, in a relaxed and informal environment (with music if they wished) ... *and* I included samples of women. All of these extra-pharmacological variables (and others) had *measurable* and statistically, as well as psychologically, *significant* effects (Stark-Adamec, & Pihl, 1978, 1980a, 1980b; Stark-Adamec, et al., 1981; Stark-Adamec, Adamec, & Pihl, 1982).

FREE AND INFORMED CONSENT

It is essential, before you conduct any research with human participants, that you first gain their informed consent; furthermore, that consent must be given to you freely. **Thirteen** of the 45 Standards within the **Principle of Respect for the Dignity of Persons and Peoples** applicable to non-clinical activities are relevant to issues surrounding consent to participate in your research, so it is obvious that this is an issue of significance for psychologists and students of psychology. These have been listed for you in **Table 7**.

Table 7
Principle I Respect for the Dignity of Persons and Peoples
Standards Related to Free *and* Informed Consent
(Canadian Psychological Association, 2017)

Informed consent

I.17 Recognize that obtaining informed consent is a process that involves taking time to establish an appropriate trusting relationship and to reach an agreement to work collaboratively, and may need to be obtained more than once. ...

I.18 Respect the expressed wishes of individuals to involve others (e.g., family members, community members, community leaders) in their decisions regarding informed consent.

I.20 Obtain informed consent for all research activities that involve obtrusive observation or measures, invasion of privacy, risk of harm, or any attempt to change the behaviour of research participants.

I.21 If signed consent forms are required by law or desired by the psychologist, the individuals or groups giving consent, or the organization for whom the psychologist works, establish and use signed consent forms that specify the dimensions of informed consent or that acknowledge that such dimensions have been explained and are understood.

I.22 Accept and document non-written consent (e.g., oral, a verbal agreement, a handshake or other culturally normative exchange) in situations in which signed consent forms are not acceptable culturally or in which there are other good reasons for accepting non-written consent.

I.23 Provide, in obtaining informed consent, as much information as reasonable individuals and groups ... would want to know before making a decision or consenting to the activity. Typically, and as appropriate to the situation and context, this would include: purpose and nature of the activity; mutual responsibilities; whether a team or other collaborators are involved; privacy and confidentiality limitations; risks and protections; likely risks and benefits of the activity, including any particular risks and benefits of the methods or communication modalities used; alternatives available; likely consequences of non-action; the option to refuse or withdraw at any time, without prejudice; over what period of time the consent applies; and how to rescind consent if desired.

I.24 Relay the information given in obtaining informed consent in language that the individuals and groups involved understand (including providing translation into another language, if necessary), and take whatever reasonable steps are necessary to ensure that the information is, in fact, understood.

I.25 Provide new information in a timely manner, whenever such information becomes available and is significant enough that it reasonably could be seen as relevant to the original or ongoing informed consent.

I.26 Clarify the nature of multiple relationships to all concerned parties, including collateral contacts, before obtaining consent, if providing services or conducting research at the request of or for the use of a retaining or other third party. This would include, but not be limited to clarifying: the purpose of the service or research; the role and responsibilities of the psychologist; the reasonably anticipated use that will be made of the information collected; access to records or the information contained therein; the limits of privacy and confidentiality; and any special legal requirements or limitations. Third parties may include schools, employers, community, or organizational leaders, third-party payers, courts, government, police, and research funding bodies.

Freedom of consent

I.27 Take all reasonable steps to ensure that consent is not given under conditions of coercion, undue pressure, or undue reward. (Also see Standard III.29.)

I.28 Not proceed with any research activity, if consent is given under any conditions of coercion, undue pressure, or undue reward. (Also see Standard III.29.)

I.29 Take all reasonable steps to confirm or re-establish freedom of consent, if consent for service is given under duress or conditions of extreme need.

I.30 Respect the moral right of individuals and groups ... to discontinue participation or service at any time, and be responsive to non-verbal indications of a desire to discontinue if the individuals or groups involved have difficulty with verbal communicating such a desire (e.g., young children, individuals with language disabilities or, due to culture, are unlikely to communicate such a desire orally).

There are several issues that merit emphasis or elaboration when it comes to informed and freely given consent. When designing your consent forms, you rightly may feel proud of having spent years perfecting the language of psychologists and may want to show it off on your informed consent form. However, this is one place where you should rein in that tendency (Standard I.24). Even if you are very literate, the rule of thumb, here, is to aim your language at a Grade 8 level of literacy (Osgood, Suci, & Tannenbaum, 1957), in order to ensure that your participants fully comprehend what you are attempting to convey and what, precisely, they are letting themselves in for if they consent to participation. For

instance, in the preceding sentence, you would use *understand* rather than *comprehend*, *trying* rather than *attempting*, and *communicate* or *tell them about* rather than *convey*.

It is also noteworthy that not all consent need be granted in written form (**Standard I.22**). For example, in the first part of my research on stress in Canadian policing, I used participant observation methods, and was partnered to actual police officers in six different Canadian police jurisdictions of varying size, working the same shifts and shift rotations as they did, doing what they did, observing what they observed, being subjected to what they were being subjected to, for over 4,000 hours on the streets, whether it was +40C or -40C. Knowing that this sub-population would be reluctant to sign any consent forms that would be stored anywhere—no matter how securely—I explained to each potential partner the true purposes and methods of my research, orally, and asked their permission to be partnered to them, but did not require them to sign any informed consent forms (this with the blessing of the REB of my university). I always gave them my university business card so that they could contact me down the line should they wish to withdraw their data (i.e., my observations) from my study; and, part way through the shift as well as at the end of the shift, I showed them my notes (fortunately, police officers take notes regarding all calls that they attend, so my note-taking was not an unusual or obtrusive behaviour). I showed them my notes, in part so that they could correct any errors that I might have made, but also to help build their trust in me.

When informed consent forms are being used, however, a copy should be given to the participants. In this way, the participants can refer back to the goals and methods of the research, will have the contact information of the REB should they have questions about the research, and will have your contact information in case they need to reschedule a session or if they want to withdraw from your study.

Note: Your participants have the right to withdraw *at any point* in the process—even *after* they have completed their participation—and they have the right to do so *without* incurring any negative consequences (**Standard I.30**). This may be particularly relevant in research employing interview techniques, especially if very confidential or upsetting information has been provided by your interviewees. Research participants may have the research participant’s equivalent of “buyer’s remorse” and will need your contact information if they decide to withdraw from your study. I have found it very useful, in terms of this issue but also for other reasons, to provide interviewees with copies of their transcripts to review and modify as they see fit (e.g., to correct inaccuracies, to add information, and to withdraw passages if necessary) and, essentially, to approve the transcript (See also **Standards I.23, I.40, III.15, and III.23**). Providing interviewees with this opportunity can make them more likely *not* to withdraw their consent; instead, they are more likely to *add* information and to *correct inaccuracies*. After all, what you want is as full and accurate a set of responses to your questions as possible—not whatever did or did not first come to their minds on that particular day. One of the reasons that I instituted this policy in my lab is because I had experienced what it feels like to have disclosed, in a research interview, information that put me at considerable risk. At the conclusion of the interview, I asked the interviewer to withdraw those passages and s/he refused. I told her/him that I was withdrawing my consent to participate and s/he said that it was too late because I had already signed the consent

form. I never wanted even one of my participants (or one of my students' participants) ever to feel as vulnerable as I had at that moment.

But informed consent forms, ensuring ongoing consent (**Standard I.17**), and ensuring that consent is given freely were not common practices in the 1950s and early 1960s. Extremely unfortunate consequences sometimes developed as a result of research conducted with human participants who were never informed that they were participating in research (e.g., who thought that they were being given therapy), and whose free and informed consent was never obtained. There was a time when the samples of convenience were patients in psychiatric facilities and prisoners, rather than undergraduates in introductory psychology courses. Samples of convenience are never a good idea if one wants to generalize the results beyond the sample to the wider public. So, as the name states, they are indeed convenient—but certainly not representative.

The importance of informed consent, and harm that can come from lack of informed consent, can be highlighted with the following case. A series of research studies was conducted in the early 1960s by Ewan Cameron at the Allan Memorial Institute, affiliated with McGill University in Montreal. According to reports, the research was partially funded by the American Central Intelligence Agency (CIA), funnelled through the Cornell Society for the Investigation of Human Ecology (Collins, 1988; Marks, 1979). In the service of what was called *de-patterning of the brain*, Cameron allegedly gave, at least some patients, LSD in large doses and/or electroconvulsive therapy (ECT) sessions at 20-75 times the recommended levels. This was done in an attempt to change their perceptions and to wipe out their memories. Patients were then allegedly placed in an insulin-induced coma for up to 65 days during which he subjected them to what he termed *psychic driving* 16-24 hours/day. A tape recorder was placed under their pillow and they were brainwashed by replacing their memories with what was on the tape loops. It has been reported that one of the purposes of this research was to find a way of replacing existing identities with cover identities for deep-cover spies, but also to study brainwashing techniques. It had little purpose in terms of the mental health of the patients. The patients were unwitting participants in this research. They did not give their consent to participate in this brainwashing experiment and were not even informed that this was research.

Although one might have argued that some so-called “mental patients” would not have had the capacity to provide valid consent, third-party consent was not sought—their family members were also not even informed that what their relatives were being subjected to was CIA-sponsored research into brainwashing.

The longstanding consequences of the research were devastating to the participants and to their families. Neither the CIA, the American government, nor the Canadian government has admitted complicity or culpability, but some of Cameron's victims and their affected family members have successfully sued the Canadian government for damages. **Note:** The above information was gleaned from two books (Collins, 1988; & Marks, 1979), as well as from two Canadian Broadcasting Corporation (CBC) documentaries aired on *The Fifth Estate* (1980; 1998). There is considerable information regarding these experiments, including videotaped interviews with victims and their family members, available on the internet if

you enter “ewen cameron” and “MK Ultra” as your search terms (the latter term was the CIA code name for the research). As with any search, be sure to evaluate the quality of the sources that come up in your search. Cameron had been the President of the American Psychiatric Association and of the Canadian Psychiatric Association. He was also the first President of the World Psychiatric Association. He died in 1967.

Today, based on our *Code*, deception and even partial disclosure are unacceptable:

Of special concern to psychologist is the provision of incomplete disclosure when conducting research for which informed consent is required (i.e., temporarily leading research participants to believe that a research project has a purpose other than its actual purpose; providing research participants with other false information). These actions sometimes occur in research where full and accurate disclosure would likely influence the responses of the research participants and thus invalidate the results. Although research that uses such techniques can lead to knowledge that is beneficial, such benefits need to be weighed against the research participant’s moral right to self-determination and the importance of public and personal trust in psychology. Psychologists have a serious obligation to avoid as much as possible the use of such research procedures. They also have a serious obligation to consider the need for, the possible consequences of, and their responsibility to correct any resulting mistrust or other harmful effects, when incomplete disclosure or deception is used. (CPA, 2017, **Principle III. Values Statement**)

Psychology has an unfortunate, but well-earned, reputation for deception, to the point that members of the public may distrust what the research psychologist tells them about the research in advance of their participation. For example, such mistrust was evident in my marijuana research: Participants were told that in the first week of their participation they would be given coltsfoot (C) to smoke and that this was to establish baselines on the measures. They were also told that in the second week they would be given either a low dose (L) or a high dose (H) of marijuana to smoke, and that they would then get the other level of dose in the third week (so either CLH or CHL). All of this was absolutely true, but some participants were so sure that I must be out to trick them that they were convinced that they had smoked marijuana in the first week and so got a mild high on the coltsfoot—especially if they were smoking in a group of friends (a social contagion effect).

Many years later, in the quantitative stage of my police stress research, there were a number of items on the questionnaire that I had developed on the basis of my 4,000+ hours of participant observation (and had checked with a representative sample of police officers to ensure that I was using police argot rather than psychology jargon) where variations on the wording of some questions were employed. I explained to the officers, before they started filling out the questionnaire, that they would likely notice this, but that these were not trick questions, that the wording differed in order to capture real differences in the situations. Sure enough, some participants commented to me that the reason that they had taken so long to fill out the questionnaire was because they knew that psychologists always employ lie scales in their questionnaires so they had to keep going back to check how they had answered the questions earlier. Experiences such as these reinforce to me that our notoriety and society’s lack of trust in us can, and have persisted for decades and decades.

Contract Research

Special consideration must be given to **Standard I.26 (Table 7)** if one is engaged in contract research (e.g., drug trials, certain industrial/organisational psychology research, programme evaluation research, Department of National Defence research), where the research is funded by a group or organization with interest in the results and potential conflict of interest. To whom is your greatest responsibility? To the entity paying you or to the participants in your evaluative activities? It would be ill-advised to enter into a contract in which you surrender your privileges of academic freedom of inquiry and of public dissemination of the results, or your ability to conduct the research ethically in other ways (see CPA, 2017, **Standard IV.14**). Should you enter into a research contract, ensure that you have the freedom to modify the research design *and* that you have the freedom to disclose your results in a publicly-accessible article or monograph. Being very used to what is called *academic freedom* in academic settings, one might assume that this freedom extends to any contract research into which you have opted. That assumption may turn out to be incorrect.

ACADEMIC FREEDOM: WHAT IT IS AND WHAT IT IS NOT

In academia we are protected from being fired “*solely on the basis that we hold and voice dissenting, controversial, or near-psychotic views. We are protected by academic freedom, as first articulated in the United States at the turn of the [last] century (Malloch, 1987), popularized in the 1940s (Poch, 1993), and as defined by the Canadian Association of University Teachers as the freedom ‘to teach, investigate and speculate without deference to prescribed doctrine’.*” (Stark, 1997a, p. 232).

Academic freedom is a treasured tenet and expectation in North American post-secondary education because it is felt to be necessary for—even vital to—an unfettered pursuit of knowledge. But it is *not* academic license; it is a *privilege* with responsibilities, not a right to “do whatever we want and say whatever we want and write whatever we want whenever we want” (Stark, 1997a, p. 232). So, there are *limits* on academic freedom. Of concern to most academics is that these limits may be abused and become *limitations* (Malloch, 1987). However, I share Cowan’s following concerns:

When academic freedom is extended without *caveat* ... it opens up the prospect of a range of ‘protected’ behaviors (*sic*) which interfere mightily with the well-being of others, as well as their ability to carry out their own work. Simply put, there is no academic freedom to harass. There is no academic freedom to be disruptive. ... There is no academic freedom to intimidate, there is no academic freedom to interfere with the academic freedom of others ... (Cowan, 1994, cited in Hornosty, 1995, p. 46)

In my view, there is another *caveat* needed, viz.: Psychologists have a duty to temper their academic freedom with respect for the dignity of persons and peoples, responsible caring, integrity in relationships, and responsibility to society. Sound familiar?

Students, too, have academic freedom that they may not be aware of. For example, you must not be penalized (e.g., with low or failing marks, or public ridicule) for expressing views that are in opposition to those of your instructor merely because they differ from those of your instructor (as long as you have backed up your claims with evidence and sound

reasoning, of course). But, once again, your academic freedom is not academic license and you bear the same responsibilities as do your instructors.

Thought Box 3

What's Wrong with This Picture?

I submitted what I knew would be a controversial presentation to an international association's convention and, much to my surprise, they made me a Plenary Address speaker and gave me one and a half hours of programme time with no other sessions scheduled concurrently. I was one of only two Canadians at the conference and one of only three women.

Knowing how threatening the issue was for this particular audience, I spoke into the microphone slowly, in a soft voice, and ensured that there was no emotion displayed on my face or in my voice. You could have heard a pin drop on the carpeted floor of the amphitheatre throughout my presentation.

There was an official Discussant assigned to my talk. However, the founder of the association, as soon as I stopped talking, very slowly and dramatically, descended from the top of the amphitheatre, came up on the stage, stood directly in front of me with his back to me, and announced to the gathered scholars: *There will be no discussion of this presentation! So much for academic freedom, thought I.*

At the closing banquet that night, no one would sit with me or talk to me—with two exceptions. When I walked, alone, up to the dessert table, across the length of the banquet hall after everyone else had picked up their desserts, one man dramatically intercepted me and announced to me (and to the scholarly diners): *Don't worry. We won't hold this against your husband! We know that HE's a good scientist.* The next day, as I was killing time on the grounds of the conference site, waiting to leave for the airport, the only other man who would talk to me confided to me that the Discussant, who had been sitting beside him during my presentation, had whispered to him *I'm going to DESTROY her!*

The incident described in **Thought Box 3** is a perfect example of the tenets of academic freedom not being adhered to because, as I was later told, what I had presented so calmly was threatening to them. I knew that what I was presenting would be controversial, but this dramatic reaction came as a shock to me. Not only is this a blatant example of curtailing academic freedom when what is presented is not what you want to hear, but it is also a prime example of academic violence. *Sequelae:* All of the proceedings of the conference were to be published as a monograph. However, I was later informed that they had decided not to publish the presentations after all. I do not know whether I was the only one to be silenced in that fashion or even whether they published all of the other presentations another way,

but I published my presentation elsewhere. The whole scenario was so ludicrous that it was almost laughable. Almost ...

AUTHORSHIP ISSUES

Authorship of publications is a valuable commodity in academia: Faculty members need them for proof of productivity for granting agencies and for consideration for promotion. Students need them to begin to establish their names in the field and to give a kick-start to their careers. The issues of who gets first authorship and who gets co-authorship or any authorship at all are often thorny ones, but they need not be at all. I recall that one prominent researcher was the first author on all publications arising from work in her/his laboratory, so s/he had hundreds upon hundreds of publications, far too many for her/him to have authored—so many that one wondered whether s/he had even had the time to read them, let alone write them. I was told that s/he expected first authorship in exchange for what s/he believed was the privilege of working in her/his lab. I also was told that this practice was more common in Europe (particularly in Germany) than in North America, but I am uncertain of the veracity of these two statements. Perhaps, if this is made clear right from the start, one could choose whether or not it is worth it to hand over ownership of one's intellectual property in exchange for being able to put on one's *curriculum vitae* that one worked in this lab, but it still smacks of intellectual dishonesty to me. Some supervisors attempt to solve this problem by discussing the authorship issue with their students at the outset and coming to a determination as to the order of authorship at that point. However, it may not be clear *before* the research is initiated just who will have contributed what by the *end* of the research process, so it is best to build some flexibility into this social contract. Does our *Code* provide us with any guidance with respect to these issues? Fortunately, it does and I have reproduced some of the key relevant **Standards** from **Principle III** in **Table 8**.

Table 8
Authorship Credit Standards: Principle III Integrity in Relationships
(Canadian Psychological Association, 2017)

Accuracy/honesty

III.2 Accurately represent their own and their colleagues' qualifications ... in all spoken, written, or printed communications, being careful not to use descriptions or information that could be misinterpreted ...

III.5 Accurately represent their own and their colleagues' activities, functions, contributions, and likely or actual outcomes of their activities (including research results) in all spoken, written, electronic, or printed communication. ...

III.6 Ensure that their own and their colleagues' activities, functions, contributions, and likely or actual outcomes of their activities (including research results) are not misrepresented by others, and act quickly to correct any such misrepresentation.

III.7 Take credit only for the work and ideas that they have actually done or generated, and give credit for work done or ideas contributed by others (including students and trainees), in proportion to their contributions.

When I was Department Head, a graduate student came to see me. S/he was very upset because s/he had accidentally discovered that her/his MA thesis supervisor had submitted the research that s/he had conducted for her thesis to an international convention on another continent and s/he wanted to know whether or not this was acceptable as the faculty member had listed her/himself as the first author and had done this without the student's consent or even her/his knowledge. When I asked the faculty member why s/he had assumed first authorship on the student's work, the faculty member stated that the person presenting the work had to appear as the first author in the conference programme and that s/he assumed that the student would not be able to afford to travel so far. I requested help from the Dean of the Faculty of Graduate Studies and Research who decided to pay for the student to attend the far-away conference. A correction was made to the convention's programme, but I do not know whether or not the work was published with appropriate authorship.

In another instance of ethically questionable conduct, a faculty member hired graduate students to conduct literature searches and write grant proposals and articles that s/he then claimed ownership of. When questioned about this behaviour s/he claimed that, because s/he had paid them for their work, they couldn't claim authorship or even an acknowledgement. What's wrong with *that* picture?! Of course, taken to its logical extreme,

this would mean that the faculty member, too, couldn't claim authorship—given that s/he was drawing a salary from the university.

RESPECTFUL LANGUAGE

We are exhorted to use language that is respectful of the dignity of others in several of the **Standards** of our *Code* (see **Table 9**). It had long been the practice in psychology to refer to those who loan you their hearts and minds and bodies in order for you to push back the frontiers of knowledge as *subjects* or, worse yet, as *Ss*. You, in turn, were referred to, often inaccurately, as experimenters or *Es*, even if your research methods did not include an experiment. The abbreviations were, no doubt, appreciated by journals because space = \$\$, but referring to participants as *subjects* is now considered demeaning and dehumanizing, while the use of *interviewees*, *respondents*, or *participants* is not. There is also an aspect of artificial distancing of the researcher from the participant in the use of the term *subject*, as if one is not really dealing with a living, breathing, thinking, feeling human being, and as if one could be more “objective” if one does not acknowledge that these people are humans who deserve respect (**Standard I.3**). (Also consult discussion of objectivity, above.) You will have noted that our *Code* uses the term *participants* throughout.

Table 9 Standards Regarding Respectful Language Use (Canadian Psychological Association, 2017)	
<i>General respect</i>	
I.1	Demonstrate appropriate respect for the knowledge, insight, experience, areas of expertise, and cultural perspectives and values of others, including those that are different from their own, limited only by those that seriously contravene the ethical principles of this Code.
I.2	Not engage publicly (e.g., in public statements, presentations, research reports, with primary clients or other contacts) in degrading comments about others, including demeaning jokes based on such characteristics as culture, nationality, ethnicity, colour, race, religion, sex, gender, or sexual orientation.
I.3	Strive to use language that conveys respect for the dignity of persons and people as much as possible in all spoken, written, electronic, or printed communication.

But **Standards I.1–I.3** have implications that you may not have considered—especially as they are also relevant to anonymous course evaluations and online blog postings (anonymous or otherwise). During the many years that I served as a department head, during which time I had to read all of the anonymous course evaluations for each member

of my department, I was shocked by how disrespectful—even venomous—and/or irrelevant (e.g., *I HATE his motorcycle jackets* or *I LOVE her hair*) some of the comments were (I will forego repeating any of the disrespectful and venomous comments). Anonymity frees one from accountability and this can lead to unethical conduct. Strangely, those making such comments always seemed to claim that their marks in the course were 80% or above, perhaps figuring that the comments would be dismissed if it were known that they were not doing well in the course. I never shared these types of comments when discussing my evaluation of the faculty member's performance with them. However, where constructive criticism (or praise) was levelled, I certainly made note of it in my evaluation.

I also cannot count the number of times that students have come to me in tears as a result of online bullying, spiteful comments, or rumour-mongering by fellow students. Remember that rumour-mongering is a form of academic violence (Stark[-Adamec], 1995a) and that any form of violence in academia is unacceptable.

Examine the last two **Standards** for each **Principle**. In each instance, you will find them under *Extended responsibility*. **Note** that, although your instructors and supervisors have a responsibility to encourage their students, employees, trainees, and supervisees to act in accordance with our *Code*, *you*, in turn, bear similar obligations.

One way of demonstrating respect in your language use is to be inclusive when you can. So, for example, you would use *Chair* or *Chairperson* rather than *Chairman* (or *Chairwoman*), *firefighter* rather than *fireman*, *police officer* rather than *policeman* (or *policewoman*), but also *First Nations* rather than *Indian*, *Inuit* rather than *Eskimo*, *women* rather than *ladies* or *girls* when referring to adults (and certainly rather than any of the derogatory and/or anatomical swear words used in reference to women). After all, what does it cost any of us to show this type of respect?

SPECIFIC ADDITIONAL ISSUES OF SIGNIFICANCE

There a number of additional issues that merit attention but that space restrictions do not permit me to address in detail. However, I have selected a few of the very crucial ones to which I need to alert you and have expanded on them below.

SPECIAL POPULATIONS

The contexts of cultures. The 1986 *Canadian Code of Ethics for Psychologists* was one of the first codes of ethics for psychologists that:

... moved from an assumption that activities related to psychology involved primarily only individuals and instead include multiple references to groups, families, and communities. (It was also) one of the first national ethics codes to state that psychologists had an ethical responsibility to be knowledgeable about and to respect cultures and cultural expectations when working with individuals, groups, or communities.

(Sinclair, 2011, p. 154)

This was, in part, due to:

... complaints made [prior to 1982] by Canada's indigenous peoples about the way researchers from various disciplines had conducted themselves when carrying out research with members of their communities. At the very least, researcher conduct indicated a lack of knowledge about indigenous cultures; more serious, however, were complaints about the insensitivity and lack of respect shown by researchers toward the cultural beliefs, practices, and expectations of members of Canada's indigenous communities.

(Sinclair, 2011, p. 155; parenthetical information added)

Of particular relevance to treating First Nations peoples with respect are **Standards I.18, I.22, and I.30**. Psychologists have had much to learn about and from First Nations cultures and peoples. This new knowledge has contributed to a better understanding of how to treat persons and peoples from differing cultural origins with the respect that is their due, for it is not only First Nations cultures to which we may have been insensitive. The population of Canadian residents is no longer of "*indigenous, French, and British origin ... (B)y the late 1990s, only 55% of Canadian residents were from these backgrounds*" (Sinclair, 2011, p. 156).

But it is not only with regard to the cultural origins of our research participants that we have been insensitive. Too often, psychologists may display a kind of arrogance regarding people's experience, perceptions, and thoughts. So, for example, we may assume that *we* are the experts on *their* lives, that "we know better" than they do how they feel, what they need, how they think when, in fact, *they* are the experts on their own lives. This is particularly evident in research with patients, with seniors, and with police, as well as with lower income families. Even the lumping together of everyone over the age of 55—as if they represented only one demographic—is disrespectful.

Vulnerable persons or peoples. We have gone over the importance of free and informed consent, but not everyone is capable of providing consent. So an entire section of the **Standards** under **Respect for the Dignity of Persons and Peoples** is devoted to best practices and protections for consent procedures with vulnerable individuals and groups (**Standards I.31-36 and I.18**). Oftentimes, it is necessary for you to obtain what is called *third-party or substitute consent*. This would be the case if, for example, you wanted to conduct observation of the play behaviours of children at a nursery school or the feeding procedures for patients with advanced Alzheimer's in a seniors' residence. In the former instance, you would need the *permission* of the nursery school supervising teacher and the head of the school, but you would also need the *free and informed consent* of the parents of the children involved. In the latter example, you would need the *permissions* of, at a minimum, the head of the residence, any supervising nurses or aides, and the *free and informed consent* of a family member or someone who had power of attorney for consent. However, you should also get the *assent* of those who are to be observed. This assent need not be in writing, but you must be sensitive to the *withdrawal of assent* that can become evident in the nonverbal behaviour of those who are being observed as well, just as you would be sensitive to the *withdrawal of consent* among those whose cultural norms might inhibit more direct expressions of the desire to put a stop to the observation.

There is, however, a different set of vulnerable individuals who are vulnerable despite

being able, legally, to provide informed consent. These are people who are in a dependent relationship to the researcher, e.g., students, employees, trainees (**Standard, I.36**). So you have to be particularly cautious in these instances.

SUPERVISION AND TEACHING

You are likely some years away from teaching or supervising students, so you might wonder why I have devoted a section to this topic. It is important, however, that you be alerted to some of the (at least) **78** relevant **Standards** so that you will know what you have a right to expect of your professors.

For instance, you have a right to a safe learning environment, free of harassment or ridicule based on your sex, your sexual preference, your culture, your worldview, your religious beliefs (or lack thereof), your political views, your race, or your disabilities, and free of exploitation. You have a right to be evaluated fairly. You have a right to instruction and supervision that is *au courant* with the latest information in the field. You have a right to privacy and confidentiality, and must not be pressured into disclosing information about your own experiences and feelings that you are not comfortable in sharing (Stark, 2011). You are entitled to a degree of academic freedom. You are encouraged to speak out against injustices, to correct misinterpretations or misperceptions of psychological constructs. You are expected to engage in both self-reflection and self-care in order to make ethical decisions. You are expected to work towards the better good, and to do so without harming others.

Should you care to explore any of these issues in greater depth, you can look up the following **Standards** in our *Code*, available online, for free at https://www.cpa.ca/docs/File/Ethics/CPA_Code_2017_4thEd.pdf

Respect for the Dignity of Persons and Peoples: I.1-13, I.38, I.46-47;

Responsible Caring: II. 1-12, II.14, II.18-22, II.25-29, II.32-33, II.35-37, II.55-56;

Integrity in Relationships: III.4, III.5, III.11, III.28, III.30, III, 36-37;

Responsibility to Society: IV.1-5, IV.7-17, IV.20-30.

You are also invited to access our guidelines for ethical supervision in teaching, research, practice, and administration (Pettifor, McCarron, Schoepp, Stark, & Stewart, 2010; Pettifor, Stewart, McCarron, Schoepp, & Stark, 2011). I elaborate on one set of these issues, below.

Sexual liaisons. It is never okay for supervisors, or others in a position of power and influence, to have an affair or sexual relationship with their subordinates. This holds whether you are male or female. The people on whom this type of behaviour has an impact would be, for instance, the other people in the office or the other students in the course. They couldn't help but wonder whether the supervisor was playing favourites, giving unearned pay raises to the object of their affection/attention, giving higher marks to the favoured one. And what happens to the dynamics of the work and learning atmospheres if they break up?

More importantly, however, when there is a *power differential* between the two parties—as there would inevitably be in these cases—it constitutes abuse of power and is thus unethical.

The relevant Principles are II: Responsible Caring and III: Integrity in Relationships. See Table 10 for the articulation of these Principles via the relevant Standards.

Table 10 Principles and Standards Related to Sexual Harassment, Sexual Coercion, and Abuse of Power (Canadian Psychological Association, 2017)
II Responsible Caring: <i>Minimize harm.</i>
II.29 Not encourage or engage in sexual intimacy with students, trainees, or others with whom the psychologist has an evaluative or other relationship of direct authority. (Also see Standard III.28.)
III Integrity in Relationships: <i>Avoidance of conflict of interest</i>
III.9 Evaluate how their own experiences, attitudes, culture, beliefs, values, individual differences, specific training, external pressures, personal needs, and historical, economic, and political context might influence their activities and thinking, integrating this awareness into their attempts to be as objective and unbiased as possible in their research, service, teaching, supervision, employment, evaluation, adjudication, editorial, and peer review activities.
III.28 Not exploit any relationship established as a psychologist to further personal, political, or business interests at the expense of the dignity or well-being of their primary clients, contract examinees, research participants, students, trainees, employees, or others.
III.30 Avoid dual or multiple relationships (e.g., with primary clients, contract examinees, research participants, employees, supervisees, students, trainees) that are not justified by the nature of the activity, by cultural or geographic factors, or where there is a lack of reasonably accessible alternatives.
III.31 Manage dual or multiple relationships or any other conflict-of-interest situation entered into in such a way that bias, lack of objectivity, and risk of exploitation and harm are minimized. ...

It sometimes can be difficult to deal with these cases. It can be difficult for those in subordinate positions to find a safe place to voice their concerns and they may feel embarrassed or ashamed. Furthermore, the abuser of power may have threatened the subordinate with reprisals if they were to lodge a complaint (I recall more than one instance in which the abuser claimed to be very well connected globally and told the person under their power that, if they were to lodge a complaint, s/he would make sure that the student would never be accepted into any graduate school anywhere). Illustrating the importance

of awareness of sexual harassment, coercion and abuses of power, in one example, each year a specific university's sexual harassment committee received information about a faculty member's unacceptable conduct. Each year, the complaints were brought to the Administration. Each year, the Administration did not act. But finally, an important and critical change in the Administration, paired with smartphone evidence, allowed the Administration to act. The faculty member was given their marching papers in short order. So the problem was solved for future students at one university in Canada. Cases such as these illustrate the responsibility Administrators have to ensure that there is no abuse of power, and the power of individuals serving in administration to do the right thing. However, I always worried about what it would take to ensure that this repeat offender did not prey on students elsewhere.

BLIND FAITH IN PEER REVIEW: THE GATEKEEPERS OF SCIENCE

We have already seen how personal biases and outright ignorance can have a negative impact on access to the funding of research (discussion of **Thought Box 1**) and, therefore on the advancement of knowledge and of our understanding of persons and peoples. But the gatekeepers of what happens to the end products of our research, i.e., the publication of our results, have also been shown to be fallible—whether or not we are talking about open reviews, single-blind reviews, or double-blind reviews (e.g., Hojat, Gonnella, & Caelleigh [2003]; Peters & Ceci [1982]; Smith [2006]). I highly recommend that you access Smith's article on the experiments that he and others conducted with manuscripts submitted to the *British Medical Journal* during his tenure as Editor there. His article is just delightful and you can access it for free on the internet. You may also be interested in Ceci and Peters (nd) explanation of why and how Peters and Ceci conducted their 1982 study, and the problems that they encountered trying to publish it, not to mention the consequences to them of their whistle-blowing (e.g., one of them was denied tenure!). The Ceci and Peters (nd) paper is published in an open access journal, so you can access the full article for free. (See the References list for where to access it, or use "Ceci and Peters" as your internet search terms.)

There is so much at stake in the publication game: Without publications, access to future funding may be limited, so future advancement of our fields of knowledge would be hampered. Then there is the "publish or perish" scene in some academic institutions where *numbers* of publications may trump the *quality* of the work. These biases, and others, are operative in the decision making for hiring, promotion, and the granting of tenure. This is an area of the academic enterprise that could use a lot of guidance from the *CPA Code*.

Even Nobel Laureates have had seminal work in their fields rejected for publication, so if you get a rejection notice from the journal in which you wanted to publish your exciting findings, you have to "pick yourself up, dust yourself off, and start all over again".

RESPONSIBILITY TO SOCIETY (PRINCIPLE IV)

We function, as psychologists and students of psychology, in a social context and we have a social contract with the society within which we operate. In exchange for the freedom to receive public funding (e.g., university salaries, scholarships, teaching assistantships,

research grants, heated, cooled, and structurally sound buildings in which to work), in order to be able to conduct research, to publish, to teach, and to have the freedom to learn, our society has a right to expect something in return. In exchange for these privileges, we are expected not to defraud the public (e.g., not to use our grant funds for purposes other than the proposed research, and associated expenses); we are expected not to exploit others (e.g., research participants, students, colleagues); we are expected to hold ourselves to a higher standard than we expect of others; we are expected to be open and honest and to treat others with respect, we are expected to recognize and respect individual and collective differences; we are expected to speak out against injustices and to advocate for evidence-based change in systemic discrimination and injustice. In other words, we are expected to conduct ourselves ethically in all that we do as psychologists and students of psychology; that is to behave in accordance with the standards that operationalize the principles of respect for the dignity of persons and peoples, responsible caring, integrity in relationships, and responsibility to society. Drawing on these principles, I see a particular responsibility that I call *Giving Back and Paying Forward*.

Giving back and paying forward. I believe that research participants should be recompensed in some way that recognizes and thanks them for having loaned you their minds and their time, as it may not be sufficient reward to know merely that they have helped you to push back the frontiers of knowledge. Of course, it is always important to remember that you should not go overboard in their rewards to the extent that you are virtually coercing them to participate (**Standards I.27, I.28, and III.29**). However, for example, if you are studying the stress experienced by single mothers and their coping strategies, you ought to pay for their babysitting expenses while they are giving you their time, and perhaps provide them with a gift card for a grocery store.

When I was working with police canine officers, I often took action photos of them and their dogs (e.g., at the Annual Canadian Police Canine Association [CPCA] Championship Trials) and gave them copies. I also donated to the CPCA the action photos for inclusion in feature articles and more formal portraits for use on the cover of their quarterly journal. I also wrote articles for their journal, often based on interviews with “big names” in the police dog training arena. But perhaps my most significant contribution to them was to correct the misuse of psychological knowledge. I had observed that many police canine officers and trainers were enamoured of the out-dated psychological construct of “drives”, a construct that had its origins in the outmoded psychological construct of “instincts”: *Is he in play drive or prey drive? He doesn't have a very strong ball drive*. I felt that it behoved me to correct this misuse and misunderstanding. So I documented for them the problems with this misuse and misunderstanding and suggested alternative understandings of canine behaviour (Stark, 1996, 1998).

But it isn't only the participants in your research who need to be recipients of your largesse. For instance, I not only served as Department Head for what, at times, seemed like an eternity, but I also served on every committee in the Department and many of the University-wide committees, as well. *But I am only a student. Surely you can't mean that I should serve on my university's committees!* But I do mean that. Instead of complaining about this, that, and the other thing, *do something constructive* about it. Very often, these committees

need to hear the voice of the students whom they are established to serve and so have allocated spaces for students. Your involvement can actually make a difference in your learning environment. You are giving back to the university that is nurturing you. At the same time, you are paying forward with your service so that future students will benefit.

Get involved in shaping your own future and the future of the discipline. You can also play a part in shaping the discipline that you have chosen and are benefiting from by joining CPA as a Student Affiliate (and later as a full Member); there is even a Section on Students in Psychology for you.

I outlined for you, in the **Introductions** section of this chapter, some of the ways that I have been involved in shaping my own future and that of the discipline. As a result, I have been provided with some slightly strange opportunities. A Guest Editor of a special issue of the *Canadian Journal of Physics* wrote an article that, although it wasn't subjected to peer review, was inserted into the special issue. In the article, s/he reported that s/he had conducted "research" using "social science research methods". On the basis of this "research", s/he concluded, among other outrageous claims, that the *September Massacre*, at *l'Ecole Polytechnique* in Montreal, could be blamed on the mass murderer's mother. Why? Well, because she worked outside the home, of course. Because I was prominent in CPA, SSFC, and SSHRC, and known for my feminist research, I was invited to write an article for the *Canadian Journal of Physics*. In this article, I corrected the Guest Editor's mischaracterization of what s/he had done as having been research, in the first place, and as having used social science research methods, in the second place—not to mention the fact that the free and informed consent of the student interviewees was never sought. At the behest of SSHRC, I also prepared a brief on scientific responsibility for the National Research Council of Canada (NRC). These two events led to me being invited to chair a plenary session on scientific responsibility at their annual convention—an event that I would otherwise not have attended. So you never know where your work on behalf of the discipline will take you.

Service to the public. There are many and diverse ways through which we can serve the public that supports us. We have a responsibility to share our knowledge for the common good. However:

In order to be responsible and accountable to society, and to contribute constructively to its ongoing development, psychologists need to be willing to work in partnership and collaboration with others, be self-reflective, and be open to external suggestions and criticisms about their work and the place of the discipline in society. They need to engage in even-tempered observation and interpretation of the effects of societal structures and policies, and their process of change, developing the ability of psychologists to increase the just and beneficial use of psychological knowledge and structures, and avoid their misinterpretation or misuse.

(CPA, 2017, **Principle IV, Values Statement**)

News media are always looking for interpretations of events and items that will capture the readers' and viewers' attention. However, you do not have to wait for them to find you. If you have discovered something that you feel the public could benefit from knowing, you

can go to them. Eventually, they will come to see you as a reliable source of trustworthy information, and they will start coming to you (e.g., Stark-Adamec, 1991). *Caveat*: Make sure that, when you are being interviewed, you take care to distinguish between facts and opinions, theories, hypotheses, and ideas when you are commenting as a psychologist (Standards III.10, III.18-19, III.21); and remember, as I've said before, not to use psychological jargon or "psychobabble".

But it isn't only the media through which we can make contributions to society. We can also contribute to society through our policy recommendations (e.g., Stark[-Adamec], 1995e) and through correction of misperceptions and misunderstandings of psychological knowledge (Stark, 1996, 1998; Stark-Adamec, 1992a-c; Stark-Adamec, & Adamec 1986; Stark-Adamec, & Kimball, 1982, 1984; Stark[-Adamec], 1995a, 1995d). Such contributions, however, are always subject to the same *caveats* as those for our interactions with the media.

PARTING THOUGHT BOXES

In this, the concluding section of your chapter on the essence of ethics, I leave you with five **Parting Thought Boxes**. For the first one, I provide you with how I dealt with the situation. As usual, I feel that only part of the dilemma was adequately dealt with, that someone might have been able to do more. For the remaining dilemmas, I would like you to think about how *you* would deal with the situations, using what you have learned about ethics and ethical decision making.

Thought Box 4

What would you do and why?

You feel that the research that you are conducting has, via extension of the logic for it, potential to cause significant harm to your participants. You are conducting this research at the behest of your employer, despite having informed her/him that her/his rationale for the research would predict potentially adverse effects. The head of the laboratory, who is not a psychologist, pays your salary and has directed you to conduct this research, despite your having explained the ethical issues.

What *can* you do? You need the salary, but are conflicted about following her/his orders.

What I did in this situation. The situation described in **Thought Box 4** is one that I faced when I worked in a brain research laboratory in a hospital. In addition to the risks to patients evident to me, there was no planned consent form (or consent process) that explained the risks and benefits; in fact, there was no consent form at all. Furthermore, the proposed research had not been approved by either the Hospital's or the University's REB. After I explained the logic to the head of the lab, and told her/him that I could not conduct what I

considered to be unethical research for her/him, s/he left town for an extended period. That gave me the opportunity to act.

I knew not only that I could not conduct the research that I had been ordered to conduct, but that I could not go to the Psychology regulatory body for the province nor to CPA to lodge a complaint, because the head of the lab was not a psychologist. So what to do?

I applied for a National Health Scholar Award and a grant to support different research altogether ... and received both. So I was no longer beholden to the head of the laboratory for my salary. I was also obliged to conduct the research for which I had just received funding. So I solved *my* ethical dilemma, but the problem remained of a head of the lab with a very poor understanding of ethics; so my solution was incomplete. I knew that there might possibly be revenge wreaked on me for my “insubordination”, and indeed there was, but I had accepted responsibility for the consequences of my actions and at least I knew that I had done the right thing for the right reasons. *However*, there were systemic issues that were not addressed that might put patients at risk.

For **Thought Boxes 5** through **8**, you are on your own. For each of these situations, make sure that you reflect on how your own experiences and your own needs will have an influence on your decision-making processes. Consider what you have learned from the **Standards** that I have provided for you, and how they relate to the four **Principles**, when you identify the issues involved. Make sure that you give thought to who would be affected by your decisions. (See Sinclair & Pettifor, 2017, pp. 129-182, for several examples of our *Code’s* ethical decision-making model in action.)

Thought Box 5

What Would You Do and Why?

You (and two others) have been asked by the Dean of a Faculty at another University to investigate allegations of sexual misconduct in a particular Department. You will be meeting with students in the Department individually and with faculty members individually.

Before you can get started on your interviews, a small delegation of faculty members arrives and tells you that you have to suspend your investigation. They claim that—if the allegations are determined to be founded—they will be punished, so your investigation is unethical. The logic provided is that you are a psychologist and your code of ethics prohibits you from doing harm.

What do you do and why do you do it?

Thought Box 6

What would you do and why?

Peters and Ceci (1982) conducted a famous (or some might say infamous) study on bias in the peer review process of journals. They took 12 articles that had been published in psychology journals written by authors from prestigious universities and resubmitted them to the journals that had originally published them. Before they resubmitted them, they made minor, non-substantive, modifications to the title of the articles, to the abstracts, and introductions. But here comes the “kicker”: They changed the names of the authors *and* of the prestigious institutions where they worked to fictitious author names working at unknown institutions—unknown because they do not exist. Furthermore, they made up institutional names that some psychologists might find somewhat “iffy” (like Tri-Valley Center for Human Potential). *Eight* of the 12 articles were *rejected* on the grounds of “poor quality”, only one was accepted, and only three were recognized as having been published by the journal before. Needless to say, the journals were not best pleased that they had been duped—played for a fool.

Peters and Ceci used deception and CPA deems that deception in research is undesirable and should only be used under strict conditions (Standards III.23-25). Did the ends justify the means in this instance? Is there any other way that Peters and Ceci could have found out how the originating institution has an impact on manuscript acceptance?

In your work, if you cite a study deemed unethical, are you being unethical? Why or why not?

On whom might there be an impact if you do or do not cite their work in your own research on peer review?

Thought Box 7

Does your right to privacy end with your death?

Perhaps, *legally*, it does. But does it *morally*? Do we, for instance, have a right to examine letters and diaries that have been archived but which clearly had been intended to be private and confidential?

Certainly, very valuable knowledge might be gained from these archives, but *does our need to know trump the right to privacy? Why or why not?*

Thought Box 8

What Do You Do and Why?

You are the Vice-President of a University. After you arrive in your office you begin to hear a loud and continuous beat in the air. Your secretary informs you that members of a nearby First Nations community are intentionally disrupting classes with ceremonial drumming in the halls and that they have blockaded the entrances/exits to the university.

A short time later, a delegation of elders from the First Nation arrives at your office, demanding an audience with you, which you gladly grant. They inform you that part of the campus is on their sacred grounds and that classes will be disrupted and the entrances/exits to campus will be barricaded until the property is returned to them.

What do you do and why?

PARTING ADVICE

If you find yourselves caught on the horns of an ethical dilemma, be sure to consult the decision-making model in our *Code* and consult someone familiar with the *Canadian Code of Ethics for Psychologists* for guidance as well. **Standard II.12** reads: *Engage in self-care activities that help to avoid conditions ... that could result in impaired judgement and interfere with their ability to benefit and not harm others.* So take care of yourself. And best wishes for an ethical and enjoyable career!

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involved. I also am indebted to my sisters, Dr. Heather Stark and Mary Stark, for their comments on earlier drafts and for their enduring and endearing support.

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[5]

CLINICAL PSYCHOLOGICAL SCIENCE

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Clinical psychological science is both the most sought-after and, at the same time, probably the most misunderstood post-graduate training program in psychology. Every year at Queen's University, we receive approximately 150 applications for somewhere between 5-7 positions in our Clinical Psychology Graduate Training Program. It is therefore highly competitive, owing to the large number of applicants and relatively few positions available in our program, and this pattern is common among clinical psychology graduate programs. The purpose of this chapter is to educate undergraduate students about the many facets of clinical psychology. In this chapter, we will define clinical psychology, the scope of practice and research, discuss training paths, and provide examples of careers in clinical

psychology. The goal of this chapter is to educate students about clinical psychology, the training needed to become a clinical psychologist, and provide models of how the different facets of clinical psychology are practiced in various settings.

THE SCIENCE OF CLINICAL PSYCHOLOGY

Clinical psychology is the science of human behaviour applied to real-world concerns with mental health and well-being. Clinical psychologists are foremost scientists, bringing the principles of the scientific method — hypothesis generation, testing, and evaluation — to bear on concerns related to mental health. In this way, we engage in this scientific process with the goals of improving lives and preventing human suffering. Clinical psychologists engage in clinical practice with populations that vary by developmental stage (children, adolescents, early, mid, and later life adults) and social contexts (individuals, couples, families, and organizations) to address a broad array of behavioural and mental disorders including neurodevelopmental, psychotic, mood, sexual, and personality disorders. Clinical psychological science encompasses a wide range of activities with the common goal of improving mental health and well-being. These activities can be divided in to at least seven broad areas of clinical practice: research, assessment, diagnosis, prevention, treatment, program evaluation, and consultation. Below, we provide a brief overview of each area of clinical psychological science.

RESEARCH

Scientific research is the foundation of clinical psychology because clinical psychology is a science. Research in clinical psychology takes as many forms as there are research questions, from asking questions about the genetics of individuals who are prone to specific mental difficulties, to the experiences of therapy clients seeking treatment. In the sections that follow, we provide numerous examples of how research is integral to the development of clinical assessment tools, diagnosis, intervention, prevention, program evaluation, and consultation. Later in this chapter, we provide specific examples of clinical psychologists careers, many of which prominently feature research.

ASSESSMENT AND DIAGNOSIS

The goal of psychological assessment is to evaluate the nature and scope of the psychological difficulties that an individual, couple, or family is experiencing. The information gathered is used to formulate a diagnosis and, in some cases, inform the best approach to intervention. A number of methods are used to gather information, including structured clinical interviews (e.g., the Structured Clinical Interview for the DSM or SCID; First, Williams, Karg, & Spitzer, 2015; First, Williams, Karg, & Spitzer, 2016), symptom checklists, and cognitive (e.g., intelligence) and neurocognitive tests. Each of these instruments is developed through the application of the scientific method to develop the pool of questions or tasks that the individual completes, how the results of the test or assessment are scored, and how ranges of response are interpreted in relation to the referral question. The most widely-used clinical assessment tools are intelligence tests, and most commonly used are the WAIS (Wechsler Adult Intelligence Scale; Wechsler, 1955) and

the WISC (Wechsler Intelligence Scale for Children; Wechsler, 1949). The WAIS has been validated and adapted for use in many clinical populations, from seniors experiencing cognitive decline, to those coping with head injury. See <https://www.sciencedirect.com/topics/neuroscience/wechsler-adult-intelligence-scale> (ScienceDirect, 2018).

With the information gathered in the assessment process, clinicians then formulate a diagnosis. If they are practising in North America, diagnosis is in accordance with the DSM 5, the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013). If they are practising outside North America, diagnosis is typically in accordance with the International Classification of Diseases, 11th revision, (ICD-11) created by the World Health Organization (see <https://icd.who.int/en/>; World Health Organization, 2019). The purpose of formulating a diagnosis is to organize symptoms into a construct that best represents the domain of psychological difficulties that the person is experiencing. The diagnosis is helpful for communicating with other mental healthcare providers, for guiding decisions about intervention and prevention, and for helping the affected person make meaning of the difficulties they are experiencing. Scientific processes inform the multiple stages of decision-making that clinicians engage in when formulating a diagnosis, including which symptoms are considered unique features of a specific mental disorder (e.g., that discriminate between groups), what severity of symptoms would indicate a disorder, and the length of time that a symptom has to be present for a particular diagnosis to be considered, among a host of other factors that come in to play when considering how to define and develop criteria for diagnosing a mental disorder.

TREATMENT

Psychological treatments encompass a wide variety of interventions aimed at improving symptoms, building skills, and restoring mental health and well-being. The modern practice of psychological treatments has been driven by empirically supported interventions originating from Behavior Therapy, with Cognitive Behavioural Therapy (CBT) receiving the most empirical support. CBT has been well established as an effective treatment for a number of conditions with research often led by clinical psychologists. In the last 20 years, there has been more interest in the development of “third wave” therapies, which have roots in CBT, including Dialectical Behavior Therapy, Acceptance and Commitment Therapy, and Mindfulness-Based Cognitive Therapy. In clinical practice, clinical psychologists typically use empirically supported interventions. To learn more about the scientific foundations psychotherapy, including a review of the evidence supporting its capacity to effect change, we recommend reading Hundley, Elliot, and Therrien’s (2013) publication on the efficacy and effectiveness of psychological treatments, (see https://www.cpa.ca/docs/File/Practice/TheEfficacyAndEffectivenessOfPsychologicalTreatments_web.pdf). Martin’s (2016) book on counseling and therapy skills gives a comprehensive overview of psychotherapy skills and the science informing their use in clinical psychology practice.

PREVENTION

Prevention of mental difficulties is among the newest skills in a clinical psychologist’s toolbox. Mental health researchers and practitioners now recognize the benefits of intervening before someone develops mental, cognitive, or emotional difficulty, and the

benefits of working to lessen the burdens associated with mental disorders. Prevention efforts can be distinguished by the stage of development they target, and generally aim to either reduce the risk of developing the disorder, or enhance factors that would protect someone from having future difficulties. Primary prevention refers to preventing a disorder before it occurs. For example, efforts to reduce aggression in interpersonal relationships, as in bullying or intimate partner violence, helps reduce the likelihood of depression and trauma that can follow being the target of these aggressive behaviours. Secondary prevention is aimed at preventing the recurrence of a disorder after it has been diagnosed and treated. For example, a clinical psychologist might be interested in how mindfulness meditation helps those people who have recovered from depression maintain their gains in treatment, and prevent recurrence of another depressive episode. Last, tertiary prevention refers to efforts to improve the quality of life and reduce disability among those living with a disease or disorder. Cognitive remediation programs are one example of methods of reducing the impact of a disorder, such as schizophrenia, on the cognitive functioning of people living with psychosis.

PROGRAM EVALUATION

Clinical psychologists are also trained in the evaluation of programs designed to assess, treat, and prevent behavioural and mental disorders. Indeed, many clinical psychologists who are situated primarily in academic settings engage in this form of research. In this context, a clinical psychologist conducting program evaluation research is able to combine applied clinical practice, that is the assessment and treatment of a clinical population, with an intensive research process, the development of a research protocol that adequately assesses outcomes relevant to the research question. For example, a team of clinical psychologists may develop an intervention, for example an internet-based implementation of a virtual therapy group, and wish to know how well that therapy group performs relative to more conventional, in-person therapies. In this case, the research question would be: Do the people who participate in the online version of group therapy show as much or more improvement in their symptoms as those who participate in conventional face-to-face therapy? Clinical psychologists would do research to develop a proposal, write a grant application to obtain funding to do the research, develop the protocol to assess mental difficulty symptoms before, during, and after treatment, train other mental healthcare providers in the implementation of the treatments, supervise the group therapy treatment, then work with a team to compile and analyze the data, and disseminate these findings to other professionals, and work to translate this knowledge so that other clinicians and practitioners learn about these scientifically-supported methods of helping others.

CONSULTATION

Clinical psychologists are also trained in consultation with other healthcare providers. Consultation with other healthcare providers (e.g., physicians) is common among practitioners of health psychology, where psychological factors, like stress, are evaluated in relation to its impact on physical health, such as cardiovascular disease. Clinical psychologists may also consult with other mental health (e.g., psychiatrists, social workers), typically in the context of practice on multidisciplinary mental health or health teams,

either in hospital or clinic settings. Forensic psychologists often consult with legal and correctional services, using data gathered in clinical assessment to inform recommendations for sentencing, probation, or treatment of an offender. Forensic psychologists may also engage in consultation with the courts to assess risk of violence or to determine if an offender was “of sound mind”, that is, was not experiencing symptoms of a mental disorder, such as a psychotic state, that would prevent them from participating in a criminal trial or would make them not legally responsible for their offense.

I THINK I WANT TO TRAIN AS A CLINICAL PSYCHOLOGIST!

Many students attracted to the idea of being a clinical psychologist arrive at this decision from the core value of wanting to help others. Clinical psychologists do this in a number of ways. Some clinical psychologists help people through direct contact with those coping with mental difficulties, as in assessment or treatment of mood disorders. Some help others more indirectly, as in the development, evaluation, and implementation of empirically-validated methods for assessment, treatment, and prevention. Still others contribute to individual well-being through the execution and dissemination of foundational scientific research that informs our understanding of the factors that underlie the development of behavioural and mental disorders. Each of these forms of clinical practice informs the other: foundational research conducted by clinical psychologists leads to empirically-validated assessment and treatment efforts, which then are implemented by clinical psychologists working directly with clients. Observations made in direct contact with clients are key to hypothesis development regarding the assessment and treatment of mental disorders, and often inspire further insights into better approaches to interventions that ultimately will improve the lives of so many. In these ways, the potential scope of clinical psychology practice is very broad.

The broadness of clinical psychology is, perhaps, among the reasons why students find it challenging to understand what it means to become a clinical psychologist. Many who express interest in pursuing post-graduate training in clinical psychology wish to be psychotherapists. Although becoming a licensed clinical psychologist and exclusively providing psychological therapy services in a private practice setting is often the desired career destination of individuals enrolling in clinical psychology graduate programs, the breadth of clinical psychology means that individuals have many degrees of freedom in sculpting a career in clinical psychology that can be quite varied and unique.

Psychologists usually focus their practice in specific areas such as clinical psychology, counselling psychology, clinical neuropsychology, school psychology, correctional/forensic psychology, health psychology, rehabilitation psychology, or industrial/organizational psychology. Within these areas, a clinical psychologist may work with a variety of individual client populations such as children, adolescents, adults, or seniors, or may focus their attention on families, couples, or organizations. They work in a range of settings including schools, hospitals, medical clinics, industry, social service agencies, rehabilitation facilities, correctional facilities, and universities. Many psychologists and psychological associates (see later in this chapter for a definition of this designation) have their own private practices.

YES! EXACTLY! I WANT TO BE A THERAPIST WITH A PRIVATE PRACTICE!

Although provision of psychotherapy is among the skills that clinical psychologists develop, providing therapy is not unique to clinical psychology. Other mental health and health practitioners, including counsellors, occupational therapists, social workers, and registered psychotherapists, provide psychotherapy to their clients. Students who are primarily interested in becoming psychotherapists are encouraged to consider these other disciplines. There is more than one training path to becoming a psychotherapist, and many of these paths are less selective and take less time to complete than clinical psychology. What makes clinical psychology unique from these other professions is our training in the application of the scientific method to the assessment, treatment, and prevention of mental disorders, and promotion of mental wellness, across a range of settings such as the direct provision of clinical services, like assessments and treatments, to conducting research in hospital and university settings.

HOW DO I BECOME A CLINICAL PSYCHOLOGIST?

When undergrad students come to me saying they want to get into clinical psychology, I (Meredith Chivers) give them “The Talk”. This speech consists of informing students that clinical psychology is not just about becoming a psychotherapist, but about becoming a scientist who uses the scientific method to have both direct and indirect impacts on mental health and well-being. I also tell them that clinical psychology graduate school is very demanding — I call it Grad School Plus. Like other graduate students in psychology, they are required to complete coursework, master’s and doctoral theses, serve as teaching or research assistants (to make money to pay for grad school!) and then (unique to clinical psychology), they complete about 1-2 days per week of practical clinical training under the supervision of a broad range of licensed clinical psychologists in multiple settings. If you like having a variety of roles in your work, are great with time management, and have energy to spare, you will be fine! If just reading that list of demands seems daunting, think carefully about choosing clinical psychology as your graduate program.

GRADUATE TRAINING EXPLAINED

Training in clinical psychology begins at the graduate level. Students who have successfully completed honours undergraduate degrees majoring in psychology are eligible to apply for graduate training in clinical psychology, and some students with more varied undergraduate education are able to apply, though often with additional coursework to meet base level of training. The typical training program lasts about 8 years, from start of the Master’s to registration with the College of Psychologists: 2 years to complete a master’s level degree (at Queen’s, it’s a Master’s of Science); 3-5 years to complete doctoral-level training (PhD), of which one year is a clinical residency or internship in a direct practice setting such as a hospital; and one year of clinical practice supervised by a licensed clinical psychologist for licensure.

To complete the Master’s degree, students take foundational courses in ethics, psychopathology, statistics, research design, assessment, and treatment, and complete a Master’s thesis. Once these requirements are successfully completed, the student is admitted

to the PhD component of training that includes more in-depth clinical practica in assessment and treatment, advanced courses in statistics and research design, advanced clinical skills training, and courses tailored to specific disorders and/or populations. Students complete a doctoral dissertation, a multi-year research program with multiple studies that converge on a particular topic in clinical psychology. As part of their doctoral requirements, students usually must also complete a comprehensive exam, typically a two-part process of an oral examination of a clinical case to evaluate knowledge of assessment and treatment, and a written portion, the scope of which varies by training program.

In the last year of PhD training, students complete a full-year clinical residency, working full time in a clinical setting, usually a hospital or outpatient clinic. Residency is among the quintessential experiences that reveals to people if they will be happy working in a mostly applied clinical setting. Although practica during graduate training are great for getting a taste of what different forms of clinical assessment and treatment are like, there's nothing that compares to doing the job 40 hrs (often more) a week for a year.

POST-GRADUATE TRAINING EXPLAINED

Once these training steps are completed, students receive their PhD and can finally call themselves Doctor! But this does not mean that the Doctor is ready to nail up their shingle and start practising. Students wishing to independently practice as a licensed psychologist are required to complete several board exams to register with the a provincial College of Psychologists. Some clinical psychology graduates never go on to become licensed, particularly if they choose an academic career, although most faculty in Clinical Psychology are required to be registered. In essence, “practice” in this sense means to provide psychological services that are regulated by the *Regulated Health Professionals Act* (1991), specifically the *Psychology Act* (1991). These services include communicating a diagnosis identifying the cause of a person's mental disorder symptoms, and the delivery of psychotherapy in a therapeutic relationship addressing a serious disorder of thought, cognition, mood, emotion regulation, perception or memory that may seriously impair the individual's judgement, insight, behaviour, communication, social functioning, or potential for harm to others.

Registration includes two written exams. The first is the Examination for Professional Practice in Psychology (EPPP), a general psychological knowledge exam. The second is the Ethics and Jurisprudence exam, evaluating knowledge of the acts and professional standards that regulate the practice of psychology in a jurisdiction. Last, students complete an oral examination with a panel of licensed clinical psychologists. These examinations are to ensure that registered Psychologists, that is, members of the College of Psychologists, practise in accordance with applicable legislation, regulations, standards of conduct, professional guidelines, and professional codes of ethics. After licensure, Psychologists are required to complete regular self-assessments of their competency to practice. For more information about the professional practice of psychology, including registration with the College of Psychologists of Ontario, see <http://www.cpo.on.ca> (College of Psychologists of Ontario, 2018).

ANOTHER PATH TO CLINICAL PRACTICE – PSYCHOLOGICAL ASSOCIATE.

Some individuals opt not to complete a PhD in clinical psychology, and instead finish their academic education with a Master's degree in clinical psychology. With a Master's degree, completion of four years of supervised applied psychology work, a year of supervised clinical practice, and required registration exams, it is possible to register with the College of Psychologists as a Psychological Associate. From the viewpoint of legislation and regulation of the profession of psychology in Ontario, the scope of applied clinical practice for Psychological Associates is identical to that of Psychologists because Psychological Associates are able to conduct psychological assessments and treatment, and to formulate and communicate a diagnosis. Because Psychological Associates do not complete a doctoral dissertation and therefore do not receive advanced training in research methods, statistics, and scientific knowledge translation, the practice of Psychological Associates tends to focus primarily on more applied clinical practice than research. Note that in Ontario, only people who complete a PhD in Clinical Psychology and register with the College of Psychologists can use the protected title, "Psychologist", or refer to themselves as "Dr.". For more information about becoming a Psychological Associate, we recommend visiting the Ontario Association of Psychological Associates (2018) webpage, <https://oapa.on.ca/>. Also note that registration requirements vary greatly by province and territory. Please see the relevant provincial governing bodies below:

Province/Territory	Provincial Governing Body	URL
Alberta	College of Alberta Psychologists	www.cap.ab.ca
British Columbia	College of Psychologists of British Columbia	www.collegeofpsychologists.bc.ca
Manitoba	The Psychological Association of Manitoba	www.cpmb.cs
New Brunswick	College of Psychologists of New Brunswick	www.cpnb.ca
Newfoundland & Labrador	Newfoundland and Labrador Psychology Board	www.nlpsycboard.ca
Northwest Territories	Registrar of Psychologists	https://www.hss.gov.nt.ca/en/services/professional-licensing/psychologists
Nova Scotia	Nova Scotia Board of Examiners in Psychology	www.nsbep.org
Nunavut	Registrar, Professional Licensing	https://www.gov.nu.ca/health
Ontario	College of Psychologists of Ontario	www.cpo.on.ca
Prince Edward Island	Prince Edward Island Psychologists Registration Board	www.peipsychology.org
Quebec	Ordre des psychologues du Québec	www.ordrepsy.qc.ca
Saskatchewan	Saskatchewan College of Psychologists	www.skcp.ca
Yukon Territory	No association	

BUT WHAT DO CLINICAL PSYCHOLOGISTS ACTUALLY DO?

There are many ways to create a vibrant career in clinical psychology. Depending on who you want to work with and how, your career could be any combination of doing research, conducting assessments and treatment, supervising other healthcare providers providing clinical services, program development and evaluation, teaching undergraduate and graduate students, consulting with community and health authorities, working with

an interprofessional team (with primary care physicians, psychiatrists, social workers, counsellors, etc.), giving expert testimony in court proceedings, or providing academic services to the mental health community, such as reviewing research grants and journal articles for publication. Depending on where the clinical psychologist works, they can choose the combination that fits best with their strengths and interests, and meets their career goals. In the section that follows, I asked several psychologists, the majority working as clinical psychologists, practising in the Queen's and Kingston communities to talk about how they became interested in clinical psychology, what their training consisted of, and how they currently practice.

CHRISTOPHER BOWIE – ADULT PSYCHOPATHOLOGY IN A UNIVERSITY/HOSPITAL SETTING.

I am a Professor and the Director of Clinical Training in the Department of Psychology, and a member of the Psychiatry Department and Centre for Neuroscience Studies, at Queen's University in Kingston, Ontario. I also practice and do research as the Head Psychologist at the Early Psychosis Intervention Program in Kingston. Much of my work that originates at Queen's is disseminated elsewhere, perhaps most often due to my additional appointment as a Clinician Scientist at the Centre for Addiction and Mental Health in Toronto. Most of my research interests focus on determining the causes and correlates, and developing treatments for, cognitive deficits in mental disorders such as schizophrenia, depression, and bipolar disorder.

I became interested in psychology during an Abnormal Psychology class with Dr. Karen Wolford at SUNY Oswego. I was fortunate to have an opportunity to immerse myself in psychology by joining Dr. Wolford's lab, as well as doing research on perception with Dr. Stephen Wurst. These early experiences provided me with an insight into the science of psychology and how studying the science of human behaviour could have profound implications on developing treatments and improving lives. This led to a switch from a Business degree to Psychology, just in time to meet criteria for graduate school admissions. I was definitely one of those students who discovered a passion for psychology late in my undergraduate career and was lucky to have great mentors who not only trained and inspired me, but also showed me what the life of a psychologist is like on a daily basis. Five years later, I completed my Ph.D. at Hofstra University in New York, training with Drs. Mark Serper and Philip Harvey. My doctoral internship at the Clinical Neuroscience Center of Pilgrim Psychiatric Center introduced me to the integration of science and practice – in fact the cognitive remediation treatments that we are now sharing across the globe had their origins in my ability to test new ideas during my work on this inpatient unit with people who had experienced very severe mental illness with few periods of high functioning following their diagnosis. I did post-doctoral training with Dr. Barbara Cornblatt, earning a Young Investigator Award from the National Alliance for Research in Schizophrenia and Depression (NARSAD) to study how to treat cognitive impairments in adolescents who showed early risk signs for schizophrenia. My first academic appointment at Mount Sinai School of Medicine came a year later and continued to study the functional consequences of cognitive impairment in schizophrenia before moving to Queen's in 2008. Currently our lab is leading multiple trials of cognitive remediation for severe mental disorders and studying early intervention for mental illness. More recently, I have put more emphasis on

advocacy for clinical psychology and dissemination of our research. Our flagship treatment, Action-Based Cognitive Remediation, is being used in over 50 sites worldwide, from treating those with Bipolar Disorder in Copenhagen, Depression in New Zealand, to First-Episode Psychosis in Georgia (Best & Bowie, 2017; Bowie, Gupta, & Holshausen, 2013; Horan & Green, 2017). Our research group has created an online portal to share our treatment methods, including those to treat cognitive deficits and to combat internalized stigma in early psychosis. These methods of delivering treatment materials and staying in touch with a community allows us to examine all of the challenges and excitement of taking clinical treatment research from lab to clinic to community. I have also joined the board of the Ontario Psychological Association, with an active role in addressing academic issues and advocating for the training of the science of psychology. To read more about the science informing cognitive treatments for psychosis, I recommend Best and Bowie (2017), Bowie, Gupta, and Holshausen (2013), and Horan and Green (2017).

SU BUCHANAN – CLINICAL PSYCHOLOGY IN A FAMILY HEALTH TEAM SETTING

When I was in my undergraduate program at the University of Manitoba, I greatly enjoyed the Introduction to Psychology course, taught by Dr. Jim Forrest, which led me down the path to Major in Psychology. During my undergraduate degree, I had opportunities to volunteer with research labs. I found working directly with people to be most interesting, rather than the data entry or the animal behavior training research. I would say that the combination of this direct experience with children with disabilities, both physical and mental, and the Abnormal Psychology course experience solidified my goal to become a Clinical Psychologist. I completed a Bachelor of Arts in Psychology and Sociology, a Master of Arts in Social Psychology, and a Ph.D. in Clinical Psychology all through the University of Manitoba. I completed a Pre-doctoral Residency in Clinical Health Psychology at the University of Manitoba.

For my Ph.D., I was advised by a research advisor, Dr. Gerry Sande, and a clinical advisor, Dr. David Martin. This allowed me to continue my social-clinical research in the sociocultural factors that influence the development of psychological well-being in children, both boys and girls, including body image, self-esteem, and mental wellness. During my Ph.D., I assisted in the development and subsequent delivery of four distance education classes, team-taught Introduction to Psychology, and taught Abnormal Psychology. As Ph.D. student I was financially supported by a SSHRC doctoral scholarship. During my Clinical Psychology Ph.D. program, I had three children. As a result, it took me longer to complete the Ph.D. than my original plan of five years.

Currently, I am a Clinical Psychologist working in a Family Health Team in Kingston, Ontario. There are 26 family physicians and 8 Nurse Practitioners who can refer almost 40,000 patients, who are under their care, to my psychological services. Referrals are for therapy, consultation, and assessment. I work within a mental health team including social work, psychiatry, psychology, and mental health counsellors. As a team, we have agreed to provide time-limited, solution-focused cognitive behaviour therapy. I explain to the patients that we will be working together (collaborative therapy) to teach healthy skills for coping with difficult situations that life brings. As a result of this brief therapy model, I will refer people to other more specialist services in the community for additional therapy (e.g., Mood Disorders Clinic, Personality Disorders Clinic, etc.) and will bridge the time waiting

for the other clinic services to start. As a result, I am able to see 200 new patients per year. I am registered with the College of Psychologists of Ontario (CPO) to see children, adolescents, and adults, couples, families, and groups.

In addition to conducting individual therapy, I have developed, run, and evaluate group programs in Cognitive Behaviour Therapy. I supervise a mental health counsellor's clinical practice as she is working to become a Psychological Associate. I hold a position as an Adjunct Associate Professor and Clinical Supervisor with the Department of Psychology at Queen's University. Frequently, I give workshops and lectures in the community on a variety of topics including mental health concerns in children, youth, and parenting concerns. This past year, in collaboration with the Clinical Psychology Outreach Program (CPOP) and Kingston, Frontenac and Lennox & Addington (KFLA) Public Health, I helped to run a series of eight lunch time workshops in a local high school. We applied for a Bell Let's Talk Grant, as we are hoping that this initial pilot project will expand into other area high schools.

MEREDITH CHIVERS – ADULT SEXUALITY AND GENDER PSYCHOLOGY IN A UNIVERSITY SETTING

I am a psychological scientist and clinical psychologist whose research focuses on how sex (biological attributes) and gender (social roles and identities) influence our sexuality.

From an early age, I was fascinated by science, nature, and behaviour. All pets underwent (humane!) behavioural experiments, including a grade 7 science project on factors influencing maze-running behaviour in hamsters. In high school, I discovered social sciences and decided to pursue a science degree in psychology, a program that wasn't widely available yet. I was fascinated by the brain, at one time wanting to be a neurosurgeon, so neuroscience and neuropsychology became my focus. I had considered psychiatry, curious about the application of psychological science to helping others, but discovered clinical psychology and the potential to do both clinical work and scientific research, and science was consistently a strong interest of mine, from biology to physics. For my undergraduate honour's thesis, I investigated sexual orientation variations on cognitive abilities and thus discovered (and fell in love with) the science of sexuality. After graduating, I worked as a research assistant in a forensic sexuality clinic, firming my decision to pursue clinical psychology with a focus on sexuality. At that time, I envisioned a career in a teaching hospital, applying clinical and research skills to understanding sexual difficulties.

I left Canada in 1997 to study clinical psychology at Northwestern University, and received my PhD in 2003. Trained by scientists at the Kinsey Institute at the University of Indiana Bloomington, I built a sexual psychophysiology lab and began a program of research on gendered sexual response at Northwestern University, discovering that women's and men's sexual responses were not two sides of the same coin. I came back to Canada to complete my clinical residency at the Centre for Addiction and Mental Health (CAMH) in 2002/3, completing rotations in dialectical behaviour therapy, sexuality-related aspects of forensic psychology, and gender dysphoria. After residency, I continued my research training as a postdoctoral fellow at the University of Toronto and CAMH, and continued my clinical training, conducting assessments and providing treatment, doing sex therapy with a local physician, and doing some clinical consulting. After a proposal to open a sex addiction assessment and treatment clinic was turned down by CAMH, I came very close to taking a full-time clinical position in forensic psychology. When I consulted my research supervisor

on this career move, he reminded me that I was always my happiest when doing the science; it was clear that I needed to pursue an academic career. I needed to stay in Canada, however, if I was to be able to fund my research program on sexual response; long story, but the US government got involved in decisions about funding sexuality research in 2003 and it was clear I couldn't have a career in the US (see Epstein (2006), if you're curious to read more about the politics of doing sexuality research!).

In 2007, I received a Queen's National Scholar Award and was recruited to Queen's University. After parental leave, I began my academic phase of my career in 2009. I am now an Associate Professor and Canadian Institutes of Health Research New Investigator, leading an exceptional team of junior researchers keen to understand how gender and sex influence our sexual responses, sexual orientations, and sexual health. I spend most of my time doing research, but also teach undergraduate and graduate students. I also collaborate on research with a number of clinical research teams outside Queen's, consult with community and health authorities, and provide varied academic services.

My graduate training began with the intent of having an applied clinical position in a teaching hospital, but evolved in to a full-time academic career. Although I do miss working directly with clients doing assessment and treatment, I have learned that academia can also have a huge impact on individual lives. My career as a predominantly research-focused clinical psychologist conducting research on basic and applied aspects of sexuality and gender, and working to disseminate these findings outside of academia, has had significant influence on many aspects of people's sexual well-being, from informing clinical assessment and practice, to helping people understand what is "normal" about their sexuality (a question I often receive via email). In the future, my career may include more direct clinical practice — we'll see! One of the best parts of being a clinical psychologist is the flexibility my training affords me. For now, however, there's a lot of work to be done on the basic science of sexuality and gender so I'm content to focus my career on addressing those knowledge gaps. To read more about the basic and clinical science I've conducted that informs clinical practice, I recommend Chivers and Brotto (2017) and Chivers (2017).

TESS CLIFFORD – CHILD/ADOLESCENT PSYCHOLOGY IN AN OUTPATIENT/UNIVERSITY SETTING

While I cannot exactly pinpoint when I decided to become a clinical psychologist, I am sure being raised by a parent who advocated for meaningful vocation for people with developmental disabilities was very influential in the decision-making process. My undergraduate education focused on psychology with a specialization in development, especially atypical development and neurodiversity, with a minor in Health Studies, focused on social justice issues related to mental health and disability. I was fortunate to engage in a number of applied research activities during my last 2 years of undergraduate training, including observing structured clinical interviews with an anxiety treatment and research centre, and applied behaviour analysis with children with developmental disabilities. I entered graduate training in Clinical Psychology having spent the previous year as an instructor therapist with two young children with autism. I was passionate about issues related to parenting children with atypical development, and focused my Master's thesis and Dissertation on these topics, including implementing and evaluating an online support group for parents of children with Autism Spectrum Disorders (ASD) (at a time when

online support was transitioning from open forums to closed groups). I became passionate about knowledge translation and finding ways to share research with the wider community, especially participants. I was involved in several other research projects, including one that allowed me to engage in specialized training for the diagnosis of ASD, and assess numerous individuals with this tool, developing expertise. At the same time, I completed a number of practicum placements in a broader range of child and adolescent psychology, including psychological assessments and therapy. I was sparked by the detective work of assessment in complex cases where development and mental health intersect, and pursued more advanced training in this area of dual diagnosis during my internship, including broadening my experience to work with adults as well.

Currently, I am a registered clinical psychologist and the director of a training clinic for graduate students in clinical psychology that serves our community by offering services with fees that are geared to income. I have focused the last several years on learning about theory and best practice in supervision, and recently started teaching senior students on this topic. I supervise almost all of the students in our graduate program at some stage of their training, and am invigorated by their energy and knowledge, and the learning they encourage for me on a daily basis. I am still very involved in the detective work of complex assessment, often with children and adolescents, although I see many adults in my work as well. I provide parenting support, and have recently become more involved in community education related to positive parenting and emotion regulation skill development. I consult on smaller research projects related to early diagnosis and intervention for ASD. I very much enjoy the flexibility of my work to see a variety of presenting problems, and engage in a number of different activities, while also serving clients who may not otherwise access services. To learn more about evidence-based practices with people with autism spectrum disorder, I'd recommend reading Wong et al.'s (2015) review paper. To learn more about how mindfulness can benefit teachers and students, I recommend Meiklejohn et al. (2012) paper on this topic.

JULIE GOODMAN – CLINICAL PSYCHOLOGY IN AN EDUCATIONAL SETTING

I have only vague memories of times when my career path was not set on clinical psychology. My father was a clinical psychologist who practiced in Ontario for more than 45 years, and I learned early on that studying psychology would give me the opportunity to help others and to put my interest in science, math, and English to good use. I grew up learning to look at situations with a critical eye, always looking for the evidence that would support or refute a claim. My undergraduate education taught me about the scientific foundations of clinical psychology and sparked an interest in research and statistics. Following my 3rd year, I had the opportunity to spend a summer working as a research assistant in the Pain Research Laboratory at Dalhousie University in Halifax, under the supervision of Dr. Patrick McGrath. Dr. McGrath later became my Ph.D. supervisor, where I spent several years examining the factors that influence how children learn about pain from their parents, and the prevalence of painful conditions and its associated disability among children and adolescents. I completed a pre-doctoral internship in clinical and child health psychology at the children's hospital in Halifax, where I had the opportunity to learn how to help young people with chronic or severe illnesses using cognitive-behavioural interventions. I also had the opportunity to further my skills in psychological assessment.

Since completing my formal training, I have worked in a variety of settings with children and adolescents, including an inpatient mental health unit, outpatient mental health service, and a children's treatment centre serving young people with physical, developmental, or complex neurocognitive disabilities. In all these settings, consultation with school personnel helped to ensure that the child's needs were supported. Currently, I am a registered clinical psychologist working for the Algonquin and Lakeshore Catholic District School Board. My clinical work mostly consists of assessing students with complex learning and/or mental health concerns and identifying the remediation and support that students require. I also conduct educational sessions and workshops for school personnel on a broad range of topics. Through an appointment with Queen's, I have had the opportunity to supervise graduate students on practicum at varying stages of their training. Through all of these experiences, I have learned that regardless of the clinical setting, psychologists who work with children often support a child's functioning at school, and can bridge the gaps between education, medicine, and mental health care to ensure that they are able to fulfill one of their primary social roles. To learn more about clinical science's role in understanding and helping children with typical and atypical cognitive development, I recommend reading Pugh and McCardle's (2009) book on how children learn to read, and the Ontario Psychological Association's (2018) guidelines on assessment and diagnosis of children with learning disabilities.

LINDY KILIK - NEUROPSYCHOLOGY IN HOSPITAL, COMMUNITY, AND ACADEMIC SETTINGS

My interest in psychology came from my curiosity about biology and human behaviour. I wasn't sure how these two areas might combine until taking an intro psychology course taught by a Neuropsychologist... I was hooked! My training included a psychology/neuroscience undergraduate degree, followed by graduate work where my coursework and clinical placements focused on clinical psychology, rehabilitation psychology and neuropsychology. I am registered in all three areas. My student research included the areas of normal aging, dementia and program evaluation. I had the opportunity to be part of different labs for these projects and work with different teams. I was a TA and also gave some guest lectures... it was great preparation for the future.

My career has always been a combination of clinical work, clinical research and teaching. The variety is my way of stemming boredom and protecting against burnout. My clinical work has included working with countless clinical multidisciplinary teams, each with their own character and focus, including stroke, ABI, dementia, spinal cord and dementia, all in the context of, inpatient, outpatient and outreach models. Collaboration has been key in this work. My clinical functions include neuropsychological assessment, behavioural assessment, cognitive remediation and behavioural intervention with patients, but much is also working with teams in implementing interventions, supporting them in their roles, and some administrative/committee work. There is also a leadership part to play, such as in leading behaviour rounds and developing consensus in behavioural care plans for inpatient teams. I teach at both the Undergraduate and Graduate levels in psychology and supervise students ranging from diploma behaviour technology students, to practicum and internship students. I do this with great joy. My research has always had an applied focus: my clinical practice informs my research questions; my research informs my practice, (and hopefully

that of others). My goal in research is to put something useful into the hands of clinicians, for example, developing the “Priming/Timing/Miming” model of behavioural care planning for inpatient dementia unit staff. Often my research has involved collaborating with other organizations: the Ministry of Transportation – developing pamphlet materials for patients with dementia and their families as well as for clinicians making decisions about driving and dementia; working on a driving simulator for seniors, developing a screening tool for police officers to use in the field when working with seniors they suspect may have a cognitive impairment, and crisscrossing the province to train various police groups, participating in a provincial working group on revising a Long-term-care behavioural observation tool. Development of dementia screening tools has been a considerable part of my research – these are aimed to measure cognitive and behavioural changes, the capacity for safe driving, as well as caregiver stress and patient self-awareness. I also offer clinical workshops based on my research and am often invited to speak at conferences. Opportunities have appeared all along the way to do innovative and rewarding work. I wouldn’t have imagined all of these ahead of time – it has been a wonderful journey so far.

MARTIN LOGAN – REHABILITATION/NEUROPSYCHOLOGY IN A HOSPITAL SETTING

My interest in the area of psychology stems from my family and personal history. Having had family members who required the support of psychologists and mental health teams allowed me to have a glimpse of the benefits of psychologists from an early age. My interest in neurological functioning came from personal experiences with concussion and brain injury and a desire to better understand rehabilitation and neuroplasticity.

I started my studies in the area of Clinical Psychology at the University of Ottawa; however, because of my interest in “disability”, rehabilitation, and brain functioning, I decided to complete my Ph.D. at the University of Calgary. The reason for the move was a new program at the University of Calgary that offered the opportunity to train specifically in the area of rehabilitation. My research there focused on resiliency following neurological injury (congenital vs. adult onset). In addition, I was part of a national study examining vocational opportunities for individuals with disability and identifying best practice for vocational rehabilitation. This was incredibly rewarding and allowed me to focus my training to working with clients with neurologically based injuries and their families. Following the completion of my Ph.D. at the University of Calgary I enrolled in a post-doctoral Internship at McMaster’s Hamilton Health Sciences in the area of Neuropsychology.

My career path has led me to working with individuals with traumatic and acquired brain injuries, developmental/intellectual disabilities, and back to individuals with acquired brain injuries. The settings have included: hospitals and clinics, private practice, community supported living, and community outreach. I became a member of the Ontario College of Psychologists a year after my internship (2001) and I registered in the areas of Rehabilitation and Neuropsychology with adults. Even though my interning included children and older adults, I decided that my fit was more with adults. In my current role as a neuropsychologist at Providence Care – Community Brain Injury Services (CBIS), I provide consultation to our outreach rehabilitation team, complete neuropsychological assessments, and have a limited counselling roster (pertaining directly to adjusting to brain injury). Through CBIS we are conducting ongoing research into the areas of best practice for rehabilitation (Roles as

Goals) and resiliency following concussion (Post Concussion Action Group). We are closely involved with Queen's University where I am a clinical supervisor and adjunct member of the Departments of Psychology and Psychiatry.

CAROLINE PUKALL – SEXUALITY RESEARCH AND SEX THERAPY IN A UNIVERSITY/ OUTPATIENT CLINIC SETTING

Since early adolescence, I knew that I wanted to work in a job that involved “helping people”. Friends in my social circle would often ask for my advice relating to many issues, and I did lots of research, reading, and asking questions in order to stay “on top” of the topics. I wound up developing a reputation for being the “go to” person for advice. I really liked this role—I enjoyed getting to know people on a deeper level. It wasn't apparent to me at this time that I was developing skills that would help lay the foundation for my eventual career as an academic clinical psychologist. All of this didn't happen right away, of course; it took a number of years and many experiences to shape my particular career track.

By the time I completed high school, I recognized that there were many careers that involved “helping people”, so I enrolled in an undergraduate psychology program for exposure to the different fields within it. My plan was to stick with psychology later on if it appealed to me, and if not, then I could use this undergraduate experience as a stepping stone into a different field, such as medicine. During this time, I fully explored what psychology had to offer: I volunteered at different clinical facilities (e.g., psychiatric, medical), took a broad range of courses, and was involved in different research labs. What I wasn't prepared for was the compelling “pull” of research; I loved the process of developing hypotheses, using methods to test those hypotheses, delving into different literatures, learning new skills... and importantly, learning not only from the professor, but also from lab members—especially the graduate students. I spent a lot of time trying to “choose” which path would be best for me (research *or* clinical), and then realized that I could do *both*: it all clicked for me in a sex research lab when I was working on a treatment study of women with genital pain—a *clinical research study*—one that involved research *and* “helping people”! I ultimately stayed in this lab for my graduate studies in a combined Masters-PhD program in Clinical Psychology. This program was research intensive and involved extensive clinical training and courses, which was challenging at times but also very rewarding. I ran studies, worked with people at different levels of training, published and presented my work, took courses, was a teaching assistant, received clinical training, and was part of a supportive, collaborative, and productive lab environment.

Currently, I am Professor of Psychology at Queen's University. I am the supervisor of a dynamic lab called the Sexual Health Research Lab (SexLab) in which we study various aspects of human sexuality, from arousal to relationships in healthy participants as well as those with clinical conditions (e.g., genital pain, sexual dysfunction, cancer). In this lab, I supervise trainees of all levels as well as a part-time employee (who keeps us all on track), and I collaborate with researchers from Queen's and beyond. I am also the Director of the Sex Therapy Service (Queen's Psychology Clinic) in which I train and supervise selected graduate students in Clinical Psychology in sex and couples therapy; we see clients with sexual, gender identity, and relationship concerns. We conduct assessments and therapy, as well as engage in consultations with other healthcare providers in order to best serve our clients; recently, we have started to offer therapy groups for certain sexual issues (e.g., genital

pain). In addition, I teach in-demand sexuality and clinical psychology courses, write grants to fund our research studies, publish and present, and am involved in various committees, journals, and organizations. Although it may seem like a lot to juggle, I absolutely would choose to do nothing else in terms of my career. To learn more about how sex therapy helps people with sexual difficulties, I recommend reading The Knowledge Centre for the Health Service's 2012 report on this topic, available here (https://www.mentalhealthcommission.ca/sites/default/files/KEC%252520%25255BInterim%252520Report%25255D%252520Low%252520Res_0.pdf).

MICHAEL SETO – FORENSIC PSYCHOLOGY IN A HOSPITAL SETTING

I had what I think is a very common experience, of taking intro psych as a first-year elective in a general science course load, out of curiosity, and discovering I was fascinated by the topics that were covered and deciding then and there to pursue a degree in psychology. Combining my new interest in psychology and a longer standing interest in science (biology, zoology, chemistry), I completed a B.Sc. in biological psychology at the University of British Columbia, in my hometown of Vancouver. By third year, I was confident I wanted to pursue graduate studies in psychology. I was originally interested in addictions and applied to a number of programs in Ontario in 1989, though I knew my chances weren't great because I had had a terrible work ethic as an undergraduate (I'd describe myself as smart but lazy) and therefore didn't have the best grades, but I did have killer GRE scores. I was only accepted by two Canadian programs, Queen's and the University of Waterloo, and chose Queen's because it had the best reputation out West, even though I had to do an extra qualifying year because I didn't complete an honour's thesis. Demonstrating the role of luck in career paths, I had no idea that Queen's (at the time) had a very strong clinical forensic program and was ideally situated for that kind of program, with six federal penitentiaries within an hour and a forensic unit at the local psychiatric hospital. My first choice advisor was on sabbatical the year I arrived and wasn't taking new students, so I looked at the other faculty and decided sexual behavior was also really interesting. Howard Barbaree agreed to supervise my honour's thesis and then master's thesis, both on sexual offending. When Howard left to take over as clinical director of the forensic program at the then Clarke Institute of Psychiatry in Toronto, my PhD supervision was taken over by Vern Quinsey (PhD topic was on risky sexual behavior, because my interests were veering towards general sex research rather than specifically forensic research at the time.)

Luck struck again when Howard offered me a research scientist position at the Clarke in 1994 while I was still completing my PhD. I hustled to finish collecting my data and then took longer than I should have to finish writing my dissertation on topic of a full-time job (not recommended). I did complete the thesis and other requirements and was registered as a clinical and forensic psychologist in 1998. I initially spent about half my time in research and half involved in clinical work, conducting assessments of forensic clients, offering individual and group therapy, and supervising MA-level psychology staff. Over time, that has shifted to almost entirely research, though I continue to be involved in some clinical supervision and training of practicum students and interns.

A lot of people don't know that I had tried to switch over from the clinical to experimental stream as a PhD student because I knew I wanted to focus on research and didn't want to have to complete the one year internship requirement; I might have been the first student

who had ever tried to switch OUT of clinical rather than INTO clinical. I wasn't allowed to do so, and I am glad now because I have had a rich, varied, and I believe productive career as a clinical and research psychologist. I stayed at the job in Toronto (as the Clarke Institute merged with other institutions and became the Centre for Addiction and Mental Health) from 1994 to 2008, when I moved to the Royal Ottawa Health Care Group as a psychologist and now the forensic research director. I am cross-appointed to four different universities – University of Toronto, Ryerson University, Carleton University, University of Ottawa – and currently supervise three graduate students, two at Carleton and one at the University of Ottawa. I flirted with seeking an academic position at times, with two job offers that didn't work out for different reasons, but I'm glad that I've stayed in a university-affiliated academic hospital environment. To learn more about clinical forensic science, I'd recommend Bonta and Andrews (2016) book, Farrington and Welsh's (2005) review on experimental criminology research, and Fazel, Singh, Doll, and Grand's (2012) review on how risk assessment predicts violent behaviour.

CONCLUSION

Clinical psychology can lead to many different career paths– not just becoming a professor, practising as a clinical psychologist in a hospital or clinic setting, or some combination of those two, but other paths like teaching, working in a pharmaceutical company designing clinical trials, and supervising other healthcare professionals, just to name a few possibilities. If you think that you might be interested in pursuing a career in clinical psychology, get involved! Volunteer in a lab, volunteer in a clinical setting, ask healthcare professionals what their day is filled with and what they find rewarding and challenging. Although searching the web can be an informative start to making decisions about a possible career in psychology, you need to be ready to work with people, and talking to people who actually work with people is a valuable start to learning more. And remember that learning what career you want to devote yourself to is a process, indeed, for some, a lifelong process. We encourage you to allow yourself the time and experience to learn what is the right balance for you, knowing that, even if you train in one aspect of a profession, your interest can, and may change at any point in your career. With a degree in clinical psychology, practitioners have many degrees of freedom to pursue the range of activities that they find rewarding, that fit their talents, and help them meet their career goals. Although training in clinical psychology is a long process, it is also one of self-discovery that allows for numerous learning opportunities. In the end, a career in clinical psychology is one that offers considerable flexibility to follow one's intellectual curiosities and passions, to engage in a variety of activities that are meaningful in the lives of many people, and to participate in these pursuits from a grounding in science.

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APPLICATIONS AND CAREERS FOR COUNSELLORS AND COUNSELLING PSYCHOLOGISTS

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The purpose of this chapter is to provide an overview of the counselling profession in Canada. Professional counselling is offered primarily by two groups in our country – counsellors and counselling psychologists. The chapter will focus on Canadian definitions of counselling and counselling psychology and the scope of practice in each area. Beginning with a brief history of these specializations within psychology, this chapter will also describe typical training and licensure requirements, research approaches, evidence of quality, and contexts in which each are practiced.

OVERVIEW OF COUNSELLING AND COUNSELLING PSYCHOLOGY

A BRIEF HISTORY OF COUNSELLING AND COUNSELLING PSYCHOLOGY IN CANADA

The historical and ongoing confusion around terminology, titles, and scope of practice in the broad field of “counselling” is well documented (Gazzola, 2016; Haverkamp, Robertson, Cairns, & Bedi, 2011; Neault, Shepard, Benes, & Hopkins, 2013). In part, this is not surprising given that formal psychological counselling is a relatively new profession, beginning to establish itself as a profession in the mid-1960s. Some confusion around the term “counselling” is easy to understand: the common English understanding of the verb “to counsel” is “giving professional advice.” This common understanding is particularly ironic given that many counsellors/psychotherapists and counselling psychologists would distance themselves today from advice-giving, preferring to work alongside their clients in finding solutions to the problems clients seek help with. Another source of confusion comes from the fact that many professionals provide advice and guidance, working under the title of “counsellor” – camp counsellors, credit counsellors, weight counsellors, counsellors at law,

employment counsellors, program counsellors, and admissions counsellors are just a few examples. Others may not use the title counsellor but may see “counselling” as within their scope of practice – an athletic coach, a lawyer, a medical doctor or a mentor may provide “counsel,” as in offering advice. Reinforcing the broad conceptualization of counselling within the Canadian employment context, the National Occupational Classification (NOC) system in Canada identifies 86 occupations that incorporate the word “counsellor” (Government of Canada, 2018).

To distinguish psychological counselling from the myriad of other types of counselling, the five provinces that have regulated counselling have used descriptors with the word “counselling” or have used other words. For example, although in Nova Scotia, New Brunswick, and Alberta the title “counselling therapist” has been regulated, in Quebec the regulated title is “Conseiller / conseillère d’orientation” (or “guidance counsellor”) and, in Ontario the regulated title is “registered psychotherapist.” Similarly, in 2009, the national association for counsellors was renamed as the Canadian Counselling and Psychotherapy Association (CCPA, 2018a), adding “psychotherapy.”

In Ontario, the Health Professions Regulatory Advisory Council (HPRAC) distinguished between counselling and psychotherapy, stating, “Examples of activities that do not constitute the controlled act of psychotherapy include counselling, coaching, crisis management, motivational interviewing, information and knowledge transfer, and spiritual or faith guidance.” (HPRAC, 2017, p. 4). On the other hand, CCPA (2018b) argues against such a distinction, stating:

It is not possible to make a generally accepted distinction between counselling and psychotherapy. There are well founded traditions which use the terms interchangeably and others which distinguish between them. If there are differences, then they relate more to the individual psychotherapist’s or counsellor’s training and interests and to the setting in which they work, rather than to any intrinsic difference in the two activities. A psychotherapist working in a hospital is likely to be more concerned with severe psychological disorders than with the wider range of problems about which it is appropriate to consult a counsellor.

In private practice, however, a psychotherapist is more likely to accept clients whose need is less severe. Similarly, in private practice a counsellor’s work will overlap with that of a psychotherapist.

Those counsellors, however, who work for voluntary agencies or in educational settings such as schools and colleges usually concentrate more on the “everyday” problems and difficulties of life than on the more severe psychological disorders. Many are qualified to offer therapeutic work which in any other context would be called psychotherapy. (pp. 4-6)

Counselling and counselling psychology have grown from roots in both counselling psychology in the US and educational counselling in Canada (Bedi et al., 2011); this link to education continues today as all doctoral programs in counselling psychology are in faculties of education. As both counselling and counselling psychology have grown as professions, much work has been done to clarify their unique identities and scope of practice (Gazzola, 2016; Gignac & Gazzola, 2018). The following sections trace the history of

these distinct, but closely related, professions and provide the definitions currently used to clarify who counsellors and counselling psychologists are and what they do.

Counselling and psychotherapy. CCPA is the national association in Canada that promotes standards of practice and education for professional counsellors and psychotherapists. Established in 1965, it began as the Canadian Guidance and Counselling Association (CGCA), clearly indicating the close ties with education and career counselling. In 1999, the name change to the Canadian Counselling Association (CCA) represented movement away from its educational roots and towards a broader definition of counselling. In 2009, the most recent name change to the Canadian Counselling and Psychotherapy Association (CCPA) was, as described previously, intended to help further establish “counselling” as a distinct profession within psychology and distinguishing it even more clearly from other, non-psychological uses of the word. For a concise history of CCPA’s first 50 years, see Robertson and Borgen’s (2016) introduction to the special anniversary issue of the *Canadian Journal of Counselling and Psychotherapy*. Neault et al. (2013) also provided a concise overview of counselling in Canada in their contribution to an international handbook, *Counseling Around the World*. Another informative resource for those interested in further exploring counselling careers is the *Handbook of Counselling and Psychotherapy in Canada*, co-edited by Gazzola, Buchanan, Sutherland, and Nuttgens (2016) for the CCPA.

Within the current Canadian context of counselling and psychotherapy, an increase in statutory regulation, a greater focus on evidence-based practice, a commitment to embracing diversity and other social justice values, and, as in all fields, a wide range of technologies are impacting the professionalism and day-to-day practices of counsellors (Gazzola et al., 2016). Although technology has made counselling more accessible, it has also raised issues related to confidentiality, jurisdiction (in terms of licensing, regulation, and access to emergency supports), and insurance coverage. Gazzola and his colleagues also made an interesting link between emerging technologies and evidence-based practice, recognizing that our research has not kept up with the proliferation of such emerging technologies as virtual reality, wearable sensors, and mobile phone apps. Without such research, counsellors (and other professionals) are, in many cases, unsure about how to proceed. To help with this, CCPA has established a “Technology and Innovative Solutions” chapter (CCPA, 2018c); in other countries, such as the UK, organizations have prescreened various apps, preapproving them for client use (Gazzola et al., 2016). It is important to note that setting standards for the regulation and licensure of counsellors is a provincial and territorial responsibility; currently requirements vary from one region of the country to another. In 2018, four provinces have legislation that regulate counselling or psychotherapy and others are working towards that goal.

Counselling psychology. Prior to the recognition of Counselling Psychology as a specialization within the Canadian Psychological Association (CPA) in 1986 (Bedi et al., 2011), many counselling psychologists found their professional home in the Counsellor Educators Chapter of what is now the CCPA (Bedi, Sinacore, & Christiani, 2016). That link continues today, with many counselling psychologists holding dual registrations (i.e., as psychologists and counsellors) and memberships in both CPA and CCPA. Those who work under the title Counselling Psychologist are registered and licensed Psychologists with their provincial governing body. However, counselling psychology is generally distinguished from clinical psychology in terms of a focus on wellness (counselling) versus disability or dysfunction (clinical). This distinction varies from one jurisdiction to the next with terminology ranging

from “maladjustment” and “disability” (Alberta) to “reasonably well-adjusted people” and “normal human functioning” (Ontario, Saskatchewan; Bedi, Klubben, & Barker, 2012, p. 130).

The practice of counselling psychologists is provincially or territorially regulated. Beginning in the early 2000s the federal government sought to increase the national mobility of psychologists through requiring regulatory bodies to consider applicants from other jurisdictions, under the Agreement on Internal Trade. Sinacore and Ginsberg’s (2015) edited book, *Canadian Counselling and Counselling Psychology in the 21st Century*, provides an overview of current issues, areas of focus, and training and supervision concerns for both counsellors and counselling psychologists within the Canadian context.

It is clear that counselling and counselling psychology have many shared elements. The following sections will examine some of the essential elements that guide practice in both professions.

CANADIAN DEFINITIONS OF COUNSELLING AND COUNSELLING PSYCHOLOGY

Counselling in Canada has been described as being in its adolescent years (Neault et al., 2013); the same could be said of counselling psychology as a Canadian area of specialization. Part of the natural growth and development of adolescents is identity formation. Indeed, Robertson and Borgen (2016) identified that “a particular issue currently facing the field is that of counsellor identity and professional regulation” (p. 198). Further, Gignac and Gazzola (2018) supported this view through the examination of a specific case of counsellors’ professional identities in transition during a period of government regulation of counselling within one Canadian province. Not surprisingly, in the adolescence of any profession, discussions intensify about who those professionals are, how they do their work, and what distinguishes them from others.

Counselling. Aside from clearly defining its professional identity, an additional motivation for clearly defining the field of counselling in Canada is related to Canadian commitments to labour mobility across our provinces and territories. Specifically, if an individual is licensed to practice in one Canadian jurisdiction, it is important for that individual to be able to continue his/her profession after relocating to another part of the country. Similar to earlier efforts regarding the work of psychologists, Human Resources and Skills Development Canada (HRSDC) funded a Project Working Group on Labour Mobility from 2008 –2010 to research, both internationally and across Canada, questions related to titles and scope of practice in counselling. Based on the outcomes of this research, in May 2011, the CCPA Board of Directors approved and adopted the following nationally validated definition and scope of practice for counselling in Canada:

Counselling is a relational process based upon the ethical use of specific professional competencies to facilitate human change. Counselling addresses wellness, relationships, personal growth, career development, mental health, and psychological illness or distress. The counselling process is characterized by the application of recognized cognitive, affective, expressive, somatic, spiritual, developmental, behavioural, learning, and systemic principles. (CCPA, 2018b, p. 10)

CCPA also commented on the counselling process and the intentions of the counsellor. They described counselling as:

the skilled and principled use of relationship to facilitate self- knowledge, emotional acceptance and growth and the optimal development of personal resources. The overall aim of counsellors is to provide an opportunity for people to work towards living more satisfyingly and resourcefully. Counselling relationships will vary according to need but may be concerned with developmental issues, addressing and resolving specific problems, making decisions, coping with crisis, developing personal insights and knowledge, working through feelings of inner conflict or improving relationships with others. (CCPA, 2018b, p.3)

Counselling psychology. Similar to counselling, and also in its adolescent phase of development, the Counselling Psychology section of the CPA in June 2009, after 3 years of work by the “Executive Committee for a Canadian Understanding of Counselling Psychology” (Bedi et al., 2011), approved the following definition for counselling psychology in Canada:

Counselling psychology is a broad specialization within professional psychology concerned with using psychological principles to enhance and promote the positive growth, well-being, and mental health of individuals, families, groups, and the broader community. Counselling psychologists bring a collaborative, developmental, multicultural, and wellness perspective to their research and practice. They work with many types of individuals, including those experiencing distress and difficulties associated with life events and transitions, decision making, work/career/education, family and social relationships, and mental health and physical health concerns. In addition to remediation, counselling psychologists engage in prevention, psycho education and advocacy. The research and professional domain of counselling psychology overlaps with that of other professions such as clinical psychology, industrial/organizational psychology, and mental health counselling.

Counselling psychology adheres to an integrated set of core values: (a) counselling psychologists view individuals as agents of their own change and regard an individual’s pre-existing strengths and resourcefulness and the therapeutic relationship as central mechanisms of change; (b) the counselling psychology approach to assessment, diagnosis, and case conceptualization is holistic and client-centred; and it directs attention to social context and culture when considering internal factors, individual differences, and familial/systemic influences; and (c) the counselling process is pursued with sensitivity to diverse sociocultural factors unique to each individual. (CPA, 2018a, pp.1-2)

It is clear from these definitions the shared roots of counselling and counselling psychology. The following section will examine some of the similarities between both professions.

SIMILARITIES ACROSS COUNSELLING AND COUNSELLING PSYCHOLOGY

As you may have noticed, there are many important areas of overlap between counselling and counselling psychology. Gazzola (2016) identified “an overlap in the work of counsellors, clinical psychologists, social workers, psychiatrists, psychotherapists, and other mental

health practitioners” (p. 3). Similarly, Haverkamp et al. (2011) examined the professional identity of counsellors and counselling psychologists and identified several factors contributing to the lack of distinction between the two groups, including inconsistent role modelling by faculty, who may themselves identify as either a counsellor or counselling psychologist, both, or neither. Even at a regulatory level, there is inconsistency across provinces and territories. For example, in Alberta, counselling and clinical psychology are combined into one area of practice whereas in Quebec counselling psychology is not specifically named by the Ordre des Psychologues du Québec (the provincial regulating body for psychologists in Québec).

Part of the cause for blurred boundaries between counselling and counselling psychology is likely due to shared aspects of their historical development. Both counselling and counselling psychology came from similar roots, in education, assessment, vocational psychology, and the mental hygiene movement (Van Hesteren, 1971). In terms of practice, counsellors and counselling psychologists engage in therapeutic processes and utilize a variety of interventions in working with clients.

Many theoretical models that describe counselling and counselling psychology processes have three general phases. The first phase emphasizes understanding the client’s perception of their situation and the context in which they are living. This provides a basis for building a relationship with the client that needs to be maintained and strengthened as the counselling proceeds. The relationship creates a foundation of trust that allows the client to begin to consider different perspectives regarding their situation. Depending on the theoretical orientation of the counsellor or counselling psychologist, these different perspectives may focus on emotions, cognitions, or behaviours. When the different perspectives have been sufficiently explored clients may be ready to begin to act on their problematic situation differently in their everyday work, family, friendship, or personal situations (Borgen, 1981; Egan, 1975).

Theoretical orientations. Bedi, Christiani, and Cohen (2018) surveyed doctoral students in counselling psychology about their theoretical orientations and found that an eclectic/integrative approach was most typical as their primary theory (41.9%), with about half as many practicing primarily from a humanistic/person-centred approach (20.9%), and the rest primarily using such theories as cognitive-behavioural, psychodynamic, existential, systems, emotion-focused, acceptance and commitment, solution-focused, narrative, multicultural, and feminist. To provide a current foundation for this chapter, we reached out to counsellor educators who serve as liaisons to the Counsellor Educators Chapter of CCPA, asking them about the theoretical foundations of their program(s), the setting and types of related work that their students have been offered post-graduation, work that their alumni are engaged in 5-10 years post-graduation, and the percentage of masters students moving on to post-doctoral studies. Regarding theoretical orientations, only 2 of the 11 universities with counselling and counselling psychology programs responding to the survey indicated that their programs aligned to a specific theoretical perspective (i.e., 82% were training students to use diverse theoretical perspectives). However, despite different theoretical foundations, according to Bedi et al. (2011) there are a number of shared values and the areas of intervention are remarkably similar, including a focus on client strengths, diversity and context, and client-centred assessment.

Strengths-based. As already noted, the definitions of counselling and counselling psychology both focus on the aim to build on strengths and the capacity of individuals to

live satisfying and fulfilling lives. This is reinforced by Bedi et al. (2016) and Goodyear et al. (2016). In his study, Goodyear and his colleagues found that the most strongly supported value cluster by counselling psychologists “concerned focusing on clients’ strengths and assets, attention to issues of diversity, focusing on person–environment interactions, and maintaining a developmental focus” (p. 129).

Therapeutic alliance. The first phase of the generic counselling process that was briefly described in an earlier section of this paper – that is paying close attention to clients and working to understand their perspective on their situations – leads to the development of a strong and trusting relationship between the client and the counsellor. This strong and trusting relationship between client and counsellor is often described as the therapeutic alliance. Several studies over a number of years have demonstrated the therapeutic alliance as being the single most effective determinant of the counselling intervention that has been utilized (Bedi et al., 2011; Flückiger, Del Re, Wampold, & Horvath, 2018; Horvath & Greenberg, 1989).

Multiculturalism and social justice. Early influences on counselling have sometimes been referred to as the three “forces”: (1) psycho-dynamic, (2) cognitive-behavioural, and (3) existential-humanistic. More recently, multiculturalism and social justice have been referred to as the fourth and fifth forces (Ratts & Pedersen, as cited in Gazzola et al., 2016), indicating the widely accepted importance of these two emerging areas of attention for counsellors and counselling psychologists. Supporting this, Gazzola and his colleagues (2016) noted that the codes of ethics and standards of practice for both CCPA and CPA stress the importance of incorporating diversity and social justice principles into all counselling. Young and Lalande (2011) observed that:

the increasing diversity in the Canadian population brings a variety of distinct cultures to Canada and the counselling profession must provide culturally appropriate services within this context. Counselling psychologists in Canada have the opportunity to continue to support the Canadian emphasis on equality and freedom for diverse individuals, working toward social justice by helping the underprivileged within society to improve their situations. (p. 249)

Although their comments were made within a counselling psychology context, they certainly apply to counselling in general. Chapters on multicultural counselling (Arthur & Collins, 2016) and social justice and advocacy (Audet, 2016) provide further evidence of how seriously these topics are being treated in the current Canadian context.

Interventions. Respondents to Bedi et al.’s (2018) survey of doctoral students in counselling psychology indicated that most of their time as counsellors (63.3%) comprised direct counselling/psychotherapy activities, with only a few hours of their weekly time, on average (10.7%) spent engaging in assessment activities – primarily conducting personality and intellectual assessments. The bulk of the balance of their time was fairly evenly split between service to their university or the profession (7.2%) and consultation (6.5%). This survey also reported that most of the respondents’ work was with individual clients (77.7%), with considerably less time working with groups (12%), families (6.9%), or couples (3.8%). When asked about the purpose for their counselling interventions, most acknowledged that it was primarily remedial or rehabilitative (58.9%), with considerably less time devoted to developmental (24.5%) or preventative (16.6%) counselling interventions. This seems to

indicate a shift from earlier areas of counselling focus; Bedi et al. (2011) cited several articles from the 1980s and early 1990s by counsellor educators including Hiebert and Uhlemann that highlighted more of a developmental and psychoeducational focus, concluding that “teaching clients strategies for dealing with life challenges, or to avoid potential future challenges, is a key role of counselling psychologists” (p. 132).

DIFFERENCES BETWEEN COUNSELLING AND COUNSELLING PSYCHOLOGY

Although there are many similarities between counselling and counselling psychology, it is important to note that differences do exist, albeit sometimes subtle ones. Gazzola (2016) noted that:

In the U.S. there is a clear demarcation between counselling psychology (whose home is Division 17 of the American Psychological Association) and counsellor education (whose national association is the American Counseling Association). In Canada, however, the distinction between the two is not as clear-cut, even though counsellors are likely to join the CCPA and counselling psychologists join the CPA. Most Canadian counsellor training programs are in fact called counselling psychology and they are housed in faculties of education. (p. 5)

The distinction between counselling and counselling psychology is further blurred by the fact that, as already noted, in some provinces in Canada psychologists may be licensed with a master’s degree, which is the same level of training held by most counsellors.

Given their similarities how do counsellors and counselling psychologists perceive themselves? Summarizing a previous survey of counsellors conducted by CCPA (then CCA, Gazzola and Smith (as cited in Gazzola, 2016) wrote,

Counsellors did perceive themselves as having a unique role in society but . . . as a whole the professional identity of counsellors remained unclear. What they found was that, typically, (a) counsellors in Canada described themselves as having eclectic theoretical perspectives, privileging client-centered/humanistic . . . perspectives, (b) just over 40% had a private practice, (c) about 39% worked in more than one setting, (d) they tended to engage in a wide variety of professional activities and, (e) although they were mostly unsatisfied with their income, [they] reported a high degree of career satisfaction. (p. 4)

Supporting the distinction between counselling and counselling psychology, counselling psychology programs typically require courses in the cognitive, affective, behavioural, and social bases of behavior whereas this is not as common of a requirement in counselling programs. Some counselling psychology programs also provide much more education and training related to the assessment and diagnosis of psychopathology. When licensed as psychologists, people with this background may also be granted permission to operate under a reserved act to diagnose psychopathology. Most counselling psychology programs also have a strong emphasis on understanding and conducting research. They typically subscribe to a scientist-practitioner model of education, with the intent that clinical practice is informed by research evidence (Bedi et al., 2011). Although there is an emphasis on research in counselling programs that require a thesis, they “oftentimes embrace a scholar-

practitioner training model whereby master's-level trainees become consumers of research rather than researchers themselves" (Sinacore & Ginsberg, 2015, pp. 5-6).

EVALUATING EFFECTIVENESS IN COUNSELLING AND COUNSELLING PSYCHOLOGY

Significant work has been done to evaluate efficacy and outcomes associated with counselling and counselling psychology. For example, Domene, Buchanan, Hiebert, and Buhr (2015) described the breadth of recent research in Canadian counselling and counselling psychology, citing published literature supplemented by a 2011 survey of counsellor educators and counselling psychologists. They reported, "In order, the most frequently endorsed research foci were in the fields of health and health counselling, counselling process research, career counselling and development, stress and related psychological disorders, and qualitative research methods" (p. 16).

Early writers in the area extensively examined what made counselling effective. An influential pioneer was Dr. Carl Rogers. He suggested that in order for counselling to be effective, the counsellor must bring genuineness, empathy, and positive regard for the client (Rogers, 1961). As the professions of counselling and counselling psychology have evolved, studies focusing on the importance of the therapeutic alliance between the client and the counsellor have continued to demonstrate the importance of the counsellor in making counselling and counselling psychology interventions effective. Research continues to demonstrate that the strength of the therapeutic relationship is important in determining the effectiveness of counselling and counselling psychology interventions (Flückiger et al., 2018; Galbraith, 2018).

Another strand that has evolved in studying the effectiveness of counselling and counselling psychology is the use of specific interventions; the terms *evidence-based practice* and *evidence-informed practice* have come into common use (Galbraith, 2018; Goodheart, Kazdin, & Sternberg, 2006). The American Psychological Association endorses the following definition of evidence-based practice: "*Evidence-based practice in psychology* (EBPP) is the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences" (APA Presidential Task Force on Evidence-Based Practice, 2006, p. 273). These interventions can often be characterized as helping clients to consider different perspectives on their situations. As noted by Pare and Sutherland (2016), considerations regarding evidence of effective practice have been guided by the APA definition. These authors cited the Canadian definition formulated by the CPA in 2012 which reflects a hierarchy of evidence and encourages psychologists to utilize:

the best possible evidence (evidence which is highest on hierarchy) which includes findings that are replicated across studies and that have used methodologies that address threats to validity (e.g., randomized controlled trials to address threats to internal validity, naturalistic studies to address threats to external validity [generalizability]). (p. 183)

Regarding research approaches utilized to assess the effectiveness of counselling psychology, within the Canadian context Hiebert, Domene, and Buchanan (2011) indicated:

As counselling psychology has grown in Canada, it has established a unique identity and set of practices that distinguish the discipline from other areas of Canadian

applied psychology, as well as from counselling psychology in the United States (Bedi et al., 2011). This is particularly evident in the research dimensions of the discipline, which has embraced a commitment to methodological diversity that accepts both qualitative and quantitative as legitimate strategies for generating knowledge. This acceptance of methodological diversity, combined with engagement in research areas reflecting the full range of psychological development and health may explain why Canadians have contributed to the counselling psychology literature in many substantive ways. Despite the concern . . . expressed that there has been a historical disconnection between research and practice in the discipline (Young & Domene, 2010), recent Canadian innovations in research methods, program evaluation, and the proposal of a local clinical scientist approach to practice have the potential to promote a close integration of research and practice. (p. 273)

Scholars including Magnusson and Hiebert (2016) critiqued definitions such as the ones just provided by APA and CPA as focusing too much on evaluating specific interventions for isolated defined psychological conditions. They argue that this approach often does not reflect the complexity of client issues that are brought to counselling and does not encourage counsellors to become local clinical scientists who evaluate the effectiveness of their practice on an ongoing basis.

A DIVERSE PROFESSION: COUNSELLORS AND COUNSELLING PSYCHOLOGISTS AT WORK

A common question is “what is the difference between clinical psychology and counselling?” In Lalande and Hurley’s (2015) foreword to *Canadian Counselling and Counselling Psychology in the 21st Century*, Lalande shared that “she used to joke with colleagues that she could distinguish counselling psychologists from other psychological professionals because of the smile lines on their faces and their openness in social interactions” (p. xi). In recent years, several Canadian publications, as cited throughout this chapter, have helped to unpack and explain the unique culture associated with the counselling profession.

In the survey we conducted with counsellor educators regarding employment status of students and alumni, responses confirmed what has been previously published (Bedi et al., 2011; Bedi et al., 2016; Sinacore & Ginsberg, 2015): counsellors and counselling psychologists work in a wide variety of settings, supporting diverse clients who are facing many types of life challenges. In short, counselling is not a “one-size-fits-all” profession! In the following sections, we will introduce some of the settings, client groups, and presenting problems to offer a flavour of the types of work that counsellors and counselling psychologists engage in.

SETTINGS

Surveys conducted in both the United States and Canada indicate that counselling psychologists and counsellors work in an expanding range of settings. These include independent practice, universities, hospitals/clinics, colleges, correctional facilities, public agencies, corporations, and human services (Bedi et al., 2016; CCPA, 2018b; Haverkamp et al., 2011). The University of Toronto at Mississauga (2005) compiled an interesting resource on careers in counselling – although the training mentioned is exclusively in Ontario, the other information has relevance across Canada.

There are some differences, however, between counselling psychologists and counsellors in terms of their representation in different settings. Bedi (2016) reported that, for counselling psychologists, treatment-oriented services comprise 45% of their time, with developmental services accounting for just over 34% of their time, and only 20% of their time being devoted to preventative services. Respondents indicated that, by far, most of their time was spent with individuals; the remainder, on average, was split between couples (10%), families (7.5%), and groups (4.8%). Although career counselling had been a cornerstone of the field historically, in recent years less than 8% of the counselling psychologists surveyed reported this as part of their practice and, of those few, very little of their overall time was devoted to career counselling or vocational assessment. Also, some of the roles held by counselling psychologists were different from those typically held by counsellors; some counselling psychologists reported their primary role as academics (20%) and indicated secondary roles as consultants (26.3%), teachers/instructors (23.7%), researchers (16.7%), and, to a lesser extent, supervisors and administrators, alongside their roles as practitioners.

In response to the 2018 survey of Canadian counsellor educators conducted to inform this chapter, although there was overlap in the types of settings and services for counsellors and counselling psychologists, the focus for counsellors seemed to be less on treatment. All respondents mentioned having graduates employed in school settings and most also indicated graduates in private practice (in some cases, only after several years of supervised experience). Many graduates were working as counsellors in not-for-profit community agencies or directly for the government (e.g., in corrections). More than half of the respondents reported graduates working within university / college counselling centres and over one-third specifically mentioned addictions. Other work settings identified through this survey included career and employment centres, mental health centres, health care (e.g., hospitals, clinics, and rehabilitation centres), and forensics.

CLIENT GROUPS AND PRESENTING PROBLEMS

Counsellors and counselling psychologists work with children, adolescents, and adults across the lifespan, individually, and in family and other groups, regarding a range of issues. Our survey of counsellor educators revealed that their counselling and counselling psychology graduates are supporting clients with career, addictions, trauma, grief, marital, abuse, cultural, spiritual, transition, and learning challenges. Issues related to these problems often involve clients wanting to come to a better understanding of themselves, and/or how they interact with those around them, in order to live more satisfying and productive lives. As already stated, counsellors and many counselling psychologists do not become directly involved in diagnosing psychopathology. However, they do see clients who have been diagnosed with a psychopathology and have been treated for it, who want assistance in moving forward with their lives in a positive way. This broad range of involvement is reflected in the CCPA (2018c) chapters; aside from regional chapters, interest groups include animal-assisted therapy in counselling, career counselling, counsellor educators, creative arts in counselling, indigenous circle, spirituality in counselling, private practitioners, school counsellors, social justice, technology and innovative solutions, and post-secondary counsellors.

Given the diversity of settings, client groups, and presenting problems, it's not surprising that counsellors and counselling psychologists also use a variety of job titles; in one study

reported on the “Profession” page of the CCPA (2018b) website, counsellors identified more than 70 different titles!

CAREER PATHS FOR COUNSELLORS AND COUNSELLING PSYCHOLOGISTS

The analogy of many paths in the woods leading to the same destination is very true for counsellors and counselling psychologists. Some people pursue a straightforward path of education and work experience that strategically positions them for registration as a psychologist. Others take a more meandering approach, with twists and turns over a lifetime of employment. Depending on their geographic location in Canada, some graduates of master’s programs in counselling or counselling psychology can become licensed as psychologists; in other regions, graduates from the same or similar programs could work as counsellors but would need to complete doctoral studies to become psychologists. Some of those who complete doctoral studies move on to become counsellor educators. The following stories from Canadian counsellors and counselling psychologists illustrate some of the unique directions that career paths can take. All names are used with permission.

My strongest subjects in high school were mathematics, physics, and chemistry. Because I was a strong student I was often asked by friends to help them with those subjects. At university I completed a BSc in mathematics, but realized that I was most interested in work that involved people. This led me to complete a professional year in teacher education, and to become a high school teacher of mathematics, chemistry, and physics for 2 years. Through that experience I realized that my real interest was in how I could effectively communicate with my students, and a colleague suggested that I should go into counselling. I completed a master’s degree in counselling with a goal to become a high school career counsellor. I was on leave from my school board and the job I was given was in a city centre Kindergarten to Grade 9 school. I completed a lot of professional development to feel more competent in that setting, and it was there that I learned how to be a counsellor. After 3 years in that job I became aware of gaps in my knowledge and applied for a doctoral program in counselling psychology. When I graduated I was hired by a university into a 1-year term position, which was converted into a full-time tenure track position that I have held ever since.

William Borgen, PhD, CCC, RPsyc
Professor of Counselling Psychology
University of British Columbia

My first awareness of the power of counselling came from my father who, as a military Chaplain, was often called in the wee hours to support an individual or family in crisis. Despite a vague notion that I too wanted to help people in some way, when my high school guidance counsellor suggested that I pursue a degree in Economics based on my marks, I blithely agreed to his plan. After a year of feeling like a fish out of water studying Economics, I happened to see a flyer asking for volunteers at a local drop-in centre serving folks who had a number of life challenges. Despite a complete lack of qualification, I was hired to work there for the summer – an experience that changed the trajectory of my career. I switched to a Psychology major and worked

there every summer as I completed my degree. After a Master's Degree in Educational Counselling and a post-graduate certificate focused on psychiatric rehabilitation (as it was called at the time), I worked in community-based mental health for a number of years. I learned more about the world and myself in those years than I was ever able to repay, including an awareness of just how thin the veil is between those who are seen as "successful" and those labelled "at risk" or "broken." I also saw firsthand the impact on health when people were given opportunities to work. Believing in the potential of career development to contribute positively to a significant range of mental health and life issues, I stayed connected with the Director of the Canadian Career Development Foundation until I was finally hired. I have been there now, loving every moment of it, since 1993 and feel enormously blessed to be working in a field that can so vitally make a difference to individuals, communities, and our world today.

Sareena Hopkins

Executive Director, Canadian Career Development Foundation
 Founding Executive Officer, Canadian Council for Career Development

I started my career in human resource (HR) management and business, as HR was as close as I could get to working with people without having a counselling degree. I started my undergraduate degree in Psychology as a part-time mature student and completed it while working full-time in various HR positions. These HR positions allowed me to deal with workers facing retirement, family, grief and loss, health, disability, downsizing, workplace safety, and other major life transitions. I needed more counselling skills to effectively help them, so I did an MA in Counselling Psychology and became a Canadian Certified Counsellor (CCC). A year after obtaining my MA, I ended my HR career and did a PhD in Counselling Psychology. Since completing the PhD and becoming a Registered Psychologist, I have worked as a clinician in my private practice and in a university counselling centre, as a researcher, as an academic/Program Director for two counselling psychology master's programs, and as a counsellor educator teaching various counselling psychology courses and providing clinical supervision to master's and doctoral students.

Lee Butterfield, BA, MA, PhD, CCC, RPsych

I always knew I wanted to do something that "helped" people, so without too much thought or research I enrolled in a nursing program after high school. Upon completing my nursing diploma, I focused on a career as an operating nurse. Unfortunately, this career ended quickly when I discovered I was anaphylactic to latex, and at a time when nurses with latex allergies were not welcome in a surgical setting. Rather than "begin again," I felt reluctantly forced to move to the only area of nursing with limited latex: psychiatry. To my surprise, however, this "accidental career move" began a passion for truly listening and caring for people in the midst of mental health struggles. I never looked back, actively pursuing a Master's in Counselling, followed by an interdisciplinary doctorate combining education, nursing, and counselling. The knowledge I had gained around psychiatric illness, psychopharmacology, and navigating our complex mental health system was indispensable to my work as a clinical counsellor and educator of counsellors. So while the road to get here was not

one I had anticipated, I love my work and I can honestly say I wouldn't want to be doing anything else!

Briar Schulz RN, RCC, MA, PhD

I was always interested in helping others from an early age as a peer counsellor, and even started university in Psychology stemming from that interest. However, I had a competing career path and joined the Royal Canadian Navy before I finished my degree. While serving my country, and seeing the world when deployed overseas, I realized that it was not my only passion. Although I remained with the Naval Reserve in various leadership positions including commanding 2 warships, I returned to school to pursue my academic studies. After realizing the need for psychological support for military members, I decided to complete a MA in Counselling Psychology and followed it with a PhD in the Centre for Cross Faculty Inquiry in Education with concentrations in Counselling Psychology and Educational Theory. My research focused on helping military members transition (including Career), and work through trauma reactions from their service. I am currently in private practice, instruct in various universities, and take contracts as a Clinical Counsellor in BC, and a Provisional Psychologist in Alberta.

Michael Sorsdahl, CD, PhD (Education), R.Psyc, CCC, RCC, GCDF-i

From early childhood, I always liked "helping" and teaching; by adolescence, I was a member of the junior teacher's club at school and held volunteer positions as a camp "counsellor" and director. In university, I graduated with a BEd with double majors in psychology and special education and was hired by the Canada Employment Centre to manage an office to support student summer employment. Before summer ended, I was seconded to the main office as the employment "counsellor" for women and youth. Although my intent had been to immediately pursue a master's degree in counselling, it was 16 years before I was able to return to school. During those years, I worked primarily in community-based agencies facilitating workshops and counselling the unemployed, and eventually started my own training and consulting business. After completing my MA in Counselling Psychology, I was hired to teach a career management course at a local university and, concurrently, my business was contracted to provide outplacement services to displaced managers. Soon after, I began doctoral studies in educational psychology (the closest fit at the university where I was teaching). After graduating with a PhD, as my business was well established, I chose not to pursue a tenure-track position; however, I've enjoyed consistent contracts as a counsellor educator within several universities and also served as Associate Dean for an MA in counselling psychology program.

Roberta Neault, PhD, CCC, CCDP, GCDFi

These stories are just a sampling of the myriad of educational and career pathways that practicing counsellors and counselling psychologists have taken. As has been already mentioned, a wide range of occupations claim to involve counselling; the word has come to mean different things in different occupational contexts. In terms of how we have described

counselling in this chapter, a number of other professionals seek out counsellor training – physicians, educators, dentists, and lawyers for example. In addition, other professionals engage in counselling work as we have defined it; examples include psychiatric nurses and social workers.

In terms of job opportunities in the field, Bedi et al.'s (2016) survey results indicated that 35% of counselling psychologists who responded would be retiring within the next 5 years; it is likely that this is also the case for counsellors. As counsellors and counselling psychologists also have many of the personal characteristics and training that are anticipated to be in demand in the future workplace, prospects seem bright. Pearson (2017), looking ahead to potential employment in 2030, identified counselling as one of the top 10 occupations most likely to experience increased demand; interestingly, they also listed psychology as the second highest skill anticipated to be in demand within the United States, so one might expect Canada to be similar. In their implications section, in an era of increased automation and artificial intelligence, they recommended developing “skills that are uniquely human” (Pearson, 2017, p. 8). As counselling and counselling psychology prepare to leave their adolescence, both seem poised to become very successful adults in the workforce of the future.

TRAINING PATHS AND LICENSING FOR COUNSELLORS AND COUNSELLING PSYCHOLOGISTS

This is where the inherent messiness described in the history section becomes very important. Although the title “psychologist” can only be used by regulated members of the psychology profession (i.e., it is a reserved title), there are no restrictions on the use of the title “counsellor.” In this section, we will distinguish between paths to becoming a counsellor and a psychologist. However, to a certain extent, some of the distinctions are arbitrary as an individual might begin his or her career as a counsellor and then pursue advanced education and supervision that will lead to qualification as a psychologist. Further complicating this are regional differences (i.e., as previously noted, in some provinces, it is possible to register as a psychologist with a master’s degree; in others, doctoral level training is required. However, regardless of degree, individuals who want to practice as psychologists must successfully complete the Examination for Professional Practice in Psychology (EPPP; PsychPrep, 2017).

Although the primary scope of this chapter is on counsellors with master’s level training and registered psychologists (with master’s or doctoral degrees, depending on their province), it seems also important to acknowledge the wide range of certificate, diploma, and undergraduate degree programs that also result in a job title with “counsellor” in it, or prepare individuals for relevant work in the field that may, in turn, lead them to further education and eventual registration as a counsellor or counselling psychologist.

As noted in Bedi et al. (2011) both counselling psychology and counsellor education programs in Canada are generally located in faculties of education. This fits well with the developmental and growth-oriented perspectives of both disciplines, and in some cases both programs are located within the same department.

UNDERGRADUATE TRAINING

There have been long-standing efforts by the CPA to make doctoral level training required for psychologists. Similarly, there have been ongoing efforts by the CCPA to require master's level training for counsellors. That said, there are a number of colleges as well as other private and public educational institutions that offer certificates and diplomas that teach counselling skills and theories. People who complete these programs can call themselves counsellors; however, they cannot use the protected titles of "counselling therapist" or "psychotherapist" in areas of the country that are regulated by legislation.

Even when not working in counselling-related roles, graduates of such certificate and diploma programs, as well as those with undergraduate degrees in psychology, often use their training to incorporate more effective communication and interpersonal skills into their other work settings.

GRADUATE TRAINING

Master's level training in counselling and/or counselling psychology generally prepares graduates to work as counsellors. In most jurisdictions in Canada, training at a doctoral level is required to prepare for work as counselling psychologists. However, there are significant exceptions to this, as noted in the following sections.

Master's. Applicants to master's level programs in counselling are typically required to have completed an undergraduate degree. Applicants most often have completed undergraduate programs in psychology or education. In many cases, however, applicants have chosen to change occupational fields in order to become counsellors. To accommodate these applicants, programs typically designate a number of senior undergraduate prerequisite courses that must be completed prior to admission. Potential applicants often enroll in these courses following the completion of their undergraduate degrees. It is important for potential applicants to access the program's website and to contact program advisors to check on prerequisite requirements.

With the support of CCPA, the Council on Accreditation of Counsellor Education Programs (CACEP) offers accreditation to master's level programs that meet specific requirements. Currently master's programs in counselling at Acadia University, Trinity Western University, the University of British Columbia, and the University of Victoria are accredited.

Accredited and non-accredited master's level counselling programs are offered in Canada by Canadian and international universities on a full-time or part-time basis; CCPA (2018d) has a fairly comprehensive list of these graduate programs, available on its website. Accredited programs are offered using face-to-face or blended (online and on campus) delivery. Non-accredited programs may offer total online program delivery.

Like programs in counselling psychology, counsellor education programs comprise research, theory, and practice components. CACEP-accredited programs must be a minimum of 48 course credits in length (the equivalent of 16 one term courses). Current core program requirements are: Counselling as a profession, ethical and legal issues, counselling and consultation processes, group counselling, human development and learning, diversity, lifestyle and career development, assessment processes, research methods, and program evaluation. According to Bedi et al. (2012), there is often less focus

on assessment training and practical experience, “particularly as related to diagnosis, psychopathology, and cognitive functioning” (p. 251), than in clinical psychology programs.

In addition, there are counselling practice requirements that total 500 hours. Given the changing context in Canada regarding counsellor education, including the expanding provincial regulation of counselling and psychotherapy practice, the increasing complexity of client issues being brought to counsellors, the increasing range of diversity in our country, and the need to recognize and start to effectively address indigenous issues, CCPA has initiated a review and updating of counselling standards and processes.

In some provinces, graduates of master’s level programs may apply for registration as a psychologist. Students with this goal in mind need to carefully compare registration requirements with the courses and practicum/internship components of the programs that they are considering; additional courses and/or hours of supervision may be required beyond the requirements for becoming registered as a counsellor.

Many master’s programs are terminal – Haverkamp et al., in 2011, identified 13 master’s programs and only 5 doctoral programs in counselling psychology, indicating that many graduates of counselling psychology programs end their formal academic studies at the master’s level. In our previously introduced survey of Canadian counsellor educators, most respondents indicated that less than 10% of their master’s program graduates moved on to doctoral studies – many reporting as few as 2% – 5% advancing to a doctoral level. One respondent reported that about 1/3 of their students had historically moved on to doctoral studies; however, that had recently changed due to counselling now being a regulated profession within that province, creating more opportunities for good work for counsellors with a master’s degree.

Doctoral. Admission requirements to doctoral programs in counselling psychology typically involve the completion of a master’s degree in counselling or a closely related field. In a study by Bedi et al. (2018), of the doctoral students who reported related master’s degrees, 74.4% were specifically in counselling psychology; others had related degrees in clinical psychology or counselling/counsellor education or had diverse educational backgrounds that included graduate education in other areas of psychology, epidemiology, education, communication studies, gender studies, and medicine. It is important to check the program’s website and contact advisors within the program to identify required prerequisite courses that need to be completed prior to admission to the program.

The University of Alberta offered the first doctoral program in counselling psychology in Canada, beginning in 1956 (Haverkamp et al., 2011). There are currently five doctoral-level counselling psychology training programs in Canada (McGill University, University of Alberta, University of British Columbia, University of Calgary, and University of Toronto; Bedi et al., 2018). All of these programs are accredited by CPA. In terms of the content of the programs, counselling psychology programs in Canada have adopted the scientist-practitioner approach, which means that they focus on research and theory as well as practice. What makes them distinct from a number of other graduate level university programs is that they require courses that teach and supervise students in clinical skill acquisition and practice that culminates in completion of a required 1-year internship prior to graduation. Bedi et al. (2011) also noted:

Although all CPA-accredited programs in professional psychology (i.e., counselling, school, clinical, clinical neuropsychology) require training in the core areas of

biological bases of behaviour, cognitive-affective bases of behaviour, social bases of behaviour, individual behaviour, historical and scientific foundations of psychology, scientific and professional ethics and standards, research design and methods, statistics, and psychological measurement, there is between-program variation in how curriculum requirements are addressed. Courses beyond those needed to meet minimum accreditation requirements are at the discretion of individual programs, and training programs have tended to differ in the degree to which they mandate coursework associated with counselling psychology's historical roots. (pp. 133-134)

SUMMARY AND CONCLUSION

Counselling and counselling psychology are growing unique, but related, professional identities within Canada. As described in this chapter, they share similar roots, have significant overlap in training at the master's level (often housed within the same faculty), and serve clients of all ages dealing with a wide range of problems in living. Counsellors and counselling psychologists are working with increasingly complex issues, within a shifting Canadian context of regulation of the professions and, as discussed, rapidly emerging new technologies that are already impacting how clients and counsellors connect and interact. Amidst an overall focus of building cultural competencies to support a broader conceptualization of diversity, there is also an increased awareness and mandate to inform therapeutic approaches with Indigenous perspectives and ways of knowing (Fellner, John, & Cottell, 2016; Stewart & Marshall, 2015).

Not surprisingly given this changing landscape, there is heightened awareness of the importance of access to clinical supervision throughout a counsellor's or counselling psychologist's professional lifespan – not just during pre-graduation practicum and internship placements (Fitzpatrick, Cairns, & Overington, 2015; Jevne, Sawatzky, & Paré, 2004; Shepard & Martin, 2016). CCPA (2018e) has initiated certification for supervisors (Canadian Certified Counsellor-Supervisor, CCC-S), offering relevant training, publishing a textbook (Shepard, Martin, & Robinson, 2016), and officially changing the name of the Counsellor Educators Chapter to include supervisors: the Counsellor Educators and Supervisors Chapter. Further demonstrating commitment to advancing clinical supervision, CCPA hosted the first Clinical Supervision Symposium in late 2018.

Both counselling and counselling psychology offer diverse and engaging opportunities for work, career growth, and varied career paths. As regulation of counselling continues within Canada, there will be more shifts in professional identity, emerging arenas of practice, a need for ongoing professional development, and, perhaps for some, doctoral studies to facilitate practice as a psychologist. We encourage counsellors and counselling psychologists to find one or more professional homes in their local, national, or international associations to support ongoing professional development, a sense of professional identity, and opportunities to actively engage in a profession that is rapidly transforming from adolescence into maturity.

CAREER CONSIDERATIONS FOR COUNSELLORS AND COUNSELLING PSYCHOLOGISTS

1: Look ahead. Do you want to become a counsellor or a counselling psychologist? Although some of the steps are similar, there are some significant differences to be aware of.

These differences include, but are not limited to, different training requirements and scopes of practice. It is up to the individual practitioner to thoroughly research educational training options and career outcomes to choose the practice that best suits their specific career goal.

2: Consider location. In Canada, occupational regulation is a provincial jurisdiction. For example, there are some provinces where psychologists can be certified with a master's degree; in other provinces a doctorate is required. Also, there are several provinces where counselling is a regulated profession and other provinces where, although it's not yet regulated, professional associations offer opportunities for professional but not legislated certification. For example, the Canadian Counselling and Psychotherapy Association offers the Canadian Certified Counsellor designation. Regulation of professions involves legal nuances that can change, and that individuals in these fields are responsible for understanding and complying with. Whether you plan to become a counsellor or a psychologist, you will need to check requirements with the regulatory colleges and/or professional associations within the provinces that you are considering.

3: Explore graduate schools. Master's and doctoral programs are generally most closely aligned to the requirements of the provinces they are in, but also have similarities based on their accreditation (e.g., Council on Accreditation of Counsellor Education Programs [CACEP]; Canadian Psychological Association accreditation). Ensure that the graduate program that you are considering will meet the requirements for the province(s) that you hope to work in and the designation (i.e., counsellor or psychologist) that you hope to achieve. You might consider connecting directly with your intended regulatory board and/or professional association to ensure that a program satisfies their requirements **prior** to attending.

4: Check prerequisites – well in advance. Each graduate program will specify prerequisite courses. Many doctoral programs require a master's thesis; however, many master's-level counselling programs do not have a thesis component. Knowing prerequisites in advance will help you to make decisions regarding program streams and/or elective courses that will keep doors open for your preferred next steps. You can investigate these requirements through using program websites, or connecting directly with the graduate chair of that department. Programs and entrance requirements can change; it is prudent to connect directly with your program(s) of interest regarding admission requirements rather than to rely on past student advice.

5: Confirm admission requirements. Aside from specifying prerequisites, many graduate programs will have other admission requirements. By exploring graduate schools early, you can ensure that your grades, volunteer or work experience, letters of reference, and other admission criteria meet or exceed the requirements and maximize your chances of being selected. Again, programs and entrance requirements can change; it is prudent to connect directly with your program(s) of interest regarding admission requirements rather than to rely on past student advice.

6: Understand employer expectations. There will be regional differences as well as differences related to areas of specialization and places of employment for both counsellors and psychologists. Consider the type of work that you'd like to do when you graduate and ensure that your course work, field training (practicum or internship) hours, supervisors' qualifications, professional designation, and work experience work together to prepare you well for work as a counsellor or counselling psychologist. Investigate your desired career options and clearly identify required qualifications *prior* to beginning a graduate program.

Ensure the graduate program that you attend meets your desired career qualification requirements.

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[7]

SOCIAL PSYCHOLOGY

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SOCIAL PSYCHOLOGY

Social Psychology is the scientific study of how our feelings, our beliefs, and our behaviours are affected by our social environments. Social Psychologists use scientific methods to address issues that have profound importance for individuals and societies. In undergraduate Social Psychology classes, students have the opportunity to learn about diverse topics such as Interpersonal Perception, Attitudes and Persuasion, Conformity and Compliance, Romantic Relationships, Aggression, Altruism, Prejudice, and Discrimination. One of the central themes of Social Psychology is that we are fundamentally motivated to be accepted by, and liked by, others, and maintain our social relationships with others (Baumeister & Leary, 1995). Further, our sense of self is comprised not only of our own unique traits, aptitudes and abilities, but is also based on the social groups to which we belong at a relational (i.e., our friend groups and families) and communal level (e.g., institutions that we belong to, our ethnic and national identities; Tajfel, 1979). These themes of needing to belong and social identity speak to the social nature of humans and can also explain why individuals are so very attuned to, and affected by, their social environments.

Indeed, one of the consistently striking (and sometimes surprising) tenets of Social Psychology is the "Power of the Situation." For example, key findings in the literature show that one can engineer a situation where typical, everyday citizens agree to hurt a stranger if they are asked to do so by a perceived authority figure (Milgram, 1965; 1974); people will remain in a room that is filling with smoke if there are others in the room who seem unconcerned about the ostensible fire (Latané & Darley, 1968); or be willing to give what they know to be the wrong answer on a test if others around them are giving the wrong answer (Asch, 1955). These highly-cited and well-known findings within Social Psychology are instructive because they demonstrate the potency of our social environment on our

behaviour. However, although the argument for the power of the situation is compelling, it's clear that not everyone reacts in the same way to these situations. For example, although the majority of participants in the Milgram studies agree to administer electric shocks when directed to do so by an authority, some individuals refuse to administer any shocks at all. The variability in individuals' responses to strong contextual demands also speaks to the important influence of individual differences in determining our behaviour (Funder, 2008). Indeed, our reactions to social situations will vary depending on factors including personality traits (e.g., agreeableness, extraversion), biological factors (e.g., sex, stress reactivity), cultural factors (e.g., the country in which we were raised, our religious beliefs), and other individual differences (e.g., self-esteem, attachment orientation). Further, in addition to these trait differences, our thoughts, feelings, and behaviour can be powerfully affected by the transient states such as mood, cognitive fatigue, or whether specific concepts are cognitively activated at a specific point in time.

In this way, the interactionist perspective of Social Psychology assesses how these specific characteristics that we might call person variables (e.g., personality traits, individual differences, cultural factors, biological factors, and states) interact with (that is, act together with) situational variables to predict how we will think, feel, and behave. To illustrate, we will provide a specific example of an interaction of this sort. In an interesting study, Crocker, Thompson, McGraw, and Ingerman (1987) assessed whether self-esteem (a trait, or individual difference variable) interacts with group status (a situational variable) to predict in-group favouritism (a tendency to evaluate members of one's own group positively, and derogate members of an outgroup). They predicted that the effect of group status on the tendency to derogate outgroup members would be especially pronounced for individuals high in self-esteem, relative to those low in self-esteem. Sorority sisters at a large University in the United States agreed to participate in the study. In pilot testing, different sororities were rated as being high or low in prestige (status). Approximately half of the participants were from sororities that were rated as low in status, and about half of the participants were from sororities that were rated as high in status. Participants were asked to complete a series of measures including the Rosenberg Self-Esteem Scale (Rosenberg, 1965). They were also asked to rank "typical members" of each of six sororities (including their own sororities) on a number of positive attributes (e.g., attractive, friendly, talented) or negative (e.g., arrogant, boring, unintelligent). For the positive items, the authors found that sorority sisters high in self-esteem were more likely to show ingroup favouritism (that is, assign higher scores on the positive traits for a typical member of their own sorority, relative to typical members of other sororities). There was no effect of group status, and no interaction between self-esteem and group status.

For the negative items, however, a score of ingroup favouritism was derived by subtracting the mean value of negative trait ratings for a typical member of one's own sorority from the mean value of the negative trait ratings for a typical member of other sororities. In this way, the measure of ingroup favouritism for negative traits meant that participants rated members of other sororities more negatively than they rated members of their own sororities. Crocker and her colleagues found an interaction between self-esteem and group status, such that among those with low self-esteem, there was no difference between those from high or low-status sororities in terms of how much ingroup favouritism they exhibited. Among those with high self-esteem, however, those from low-status groups were more likely to exhibit ingroup favouritism than those from high status groups. The authors

state that individuals high in self-esteem may be more likely than their low self-esteem counterparts to react to threat by derogating outgroup members in an effort to maintain their own self-esteem (which is consistent with Social Identity Theory, Tajfel & Turner, 1986).

Here, we can see that a behaviour (ingroup favouritism) is dependent on both person variables (in this case, self-esteem, which is a trait) and situational variables (in this case, group status). An interaction is present, such that the relationship between one variable (group status) and the outcome (ingroup favouritism) is dependent on another variable (self-esteem). Put another way, the results of the study show that the answer to the question “does ingroup favouritism vary as a function of group status?” is “it depends.” It depends on self-esteem: If one is low in self-esteem, then there is no evidence for a relationship between group status and amount of in-group favouritism. However, if one is high in self-esteem, then those from low status groups are more likely to exhibit in-group favouritism than those in high-status groups (see Figure 7.1, below). This example illustrates the way that Social Psychologists can assess research questions by testing interactions between person variables and situational variables, thereby allowing them to understand how different factors combine in complex ways to influence our affect, cognition, and behaviour.

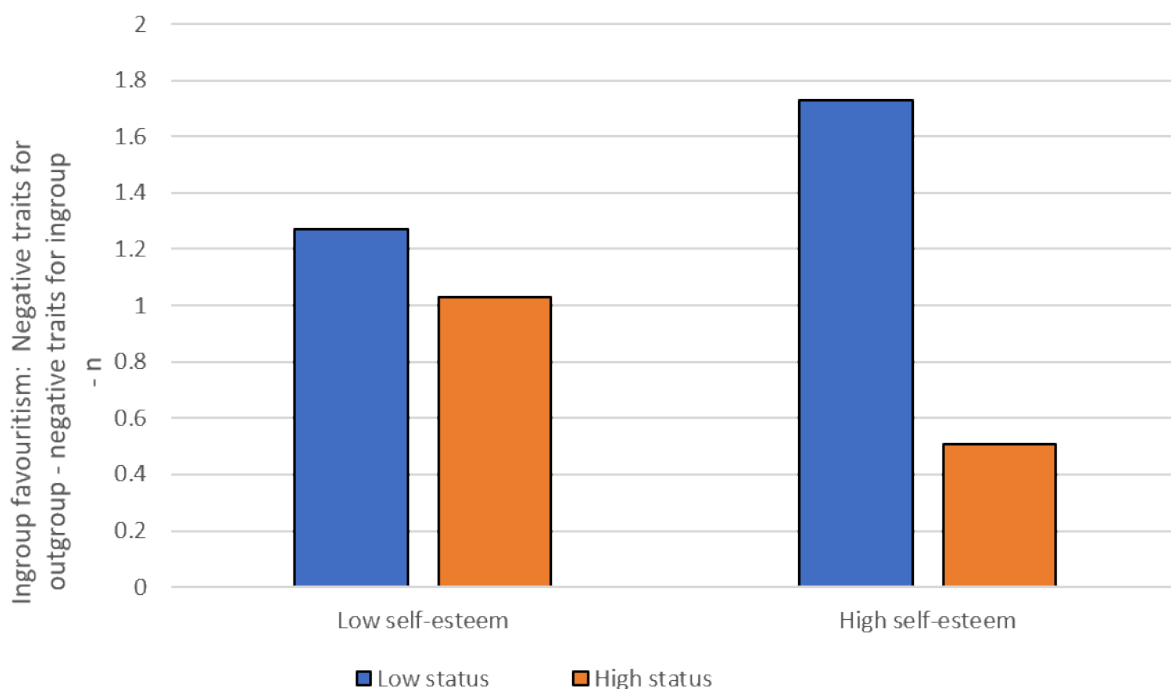


Figure 7.1: Interaction: Ingroup favouritism among sorority members as a function of self-esteem and group status; negative items (from Crocker et al., 1987)

METHODS IN SOCIAL PSYCHOLOGY

Social Psychologists use scientific methods to assess their hypotheses. While a complete review of methodology within Social Psychology would be beyond the scope of this chapter, we will introduce you to some of the primary distinctions among different methodologies used in Social Psychology.

One of the advantages of receiving an undergraduate education in Psychology is that students gain insight into the logic underlying research methodology. There is no “recipe” or step-by-step manual that will allow researchers to conduct a valid study. Instead, research methodology entails a series of decisions, and with every decision there will be some advantages and some disadvantages associated with that decision. Learning about research methodology helps students to understand the implications of these decisions, and how those implications will affect the conclusions that they can draw from their studies. Obviously, this is essential training for students who wish to go on to be scientists and conduct their own research. We argue, however, that an education in research methodology is important and beneficial for all students—for everyone will go on to be a consumer of information. In our everyday lives, we seek information from science. For example, if a family member is diagnosed with a medical condition, it is very common for people to turn to the internet to find out more about that condition. At times, the information can seem confusing or even contradictory. Having a solid grasp of research methodology will help individuals to assess and evaluate scientific research, allowing them to understand the implications of the research decisions that scientists made, which in turn provides a basis to make an informed decision about the validity of the claims reported, and the generalizability of the research to different contexts and populations.

Measurement

In all research, scientists need to measure the variables of interest in their study. The measurement of some variables is relatively straightforward. For example, if one wishes to assess how tall a person is, one would measure the person and record the person’s height in inches or centimetres. In Social Psychology, however, many of the variables we study are psychological constructs that are not directly observable. For example, people will likely agree that traits such as shyness, self-esteem, and intelligence vary amongst individuals (i.e., some people have high self-esteem, others feel more negatively toward the self) that affect our thoughts and behaviour. However, these constructs are not directly or readily apparent, and so researchers must find a way to measure these variables. There are a number of ways to do so. Very briefly, researchers can create a survey or measure to capture these traits (e.g., in 1965 Rosenberg created a 10-item scale to measure self-esteem that is still widely used today). In many cases, such self-report measures are appropriate to use. However, self-report measures can be biased (i.e., people may not want to accurately report their true beliefs, feelings, or behaviour). For example, if a researcher was interested in assessing attitudes toward academic integrity, and asked the question “Have you ever copied someone else’s work on a test or assignment?” students who have cheated in this way be reticent to admit it, either to avoid being viewed negatively by the researchers, or because they do not want to acknowledge this negative behaviour. This is sometimes called the “Social Desirability Bias.” Further, sometimes people may not be able to answer a self-report question because they simply lack access to the “true” answer. For example, if a student were asked, “What made you decide to study Psychology?” that person may be able to come up with answers that are true in the sense that they are credible reasons that the student believes influenced the decision, but that student may lack access to other factors that could have led to his or her decision to study Psychology (see Nisbett & Wilson, 1977).

If researchers choose not to employ self-report measures, there are a number of tools

at their disposal. First, they can choose to directly assess behaviour, or assess a variable that can serve as a proxy for behaviour. For example, if a researcher was interested in assessing condom use behaviour as a dependent variable, the researcher could choose to assess intentions to use condoms with a self-report question (e.g., "I intend to use condoms the next time that I engage in sexual intercourse"). If the researcher was concerned about the social desirability bias, that person could choose to employ a behavioural measure. Of course, it would be impractical (not to mention unethical!) to assess condom use behaviour in the lab. Instead, researchers can choose a proxy for behaviour. For example, Stone and colleagues tested whether inducing hypocrisy (asking participants to publicly stating reasons why condom use is important, and then prompting them to recall instances in the past when they did not use a condom) led to greater condom use than a control condition (who neither publicly stated reasons to use condoms or recalled instances where they did not use condoms), a publicly stating reasons to use condoms only condition, or a recalling instances where they did not use condoms only conditions (Stone, Aronson, Crain, Winslow, & Fried, 1994). For their dependent measure, they assessed condom purchasing behaviour: All participants were paid \$4.00 for completing the study, and were given the opportunity to buy condoms for 10 cents each (i.e., participants could choose to spend their earnings to buy condoms). Specifically, 140 condoms were placed in a large glass bowl and there was a plate with dimes in it so that students could "make change" if necessary. Importantly, participants were left alone in the room so that they would have privacy while they purchased the condoms. Consistent with predictions, participants in the hypocrisy condition were more likely to purchase condoms than participants in the other three conditions (control condition, stating reasons to use condoms condition, or recalling past instances where condoms were not used condition). Here, condom purchasing behaviour was used as a proxy variable for condom use behaviour.

In addition to self-report and behavioural/behavioural proxy measures, researchers can use measures that can make inferences about participants' cognitive processes. Many of these tasks operate under the assumption that if a concept or construct is accessible, we will be faster to recognize that concept, relative to when it is not primed. For example, in the lexical decision task (Meyer & Schvaneveldt, 1971), participants are presented with words on a computer screen (e.g., apple, fight) and non-words (e.g., lopat, gern), and are simply asked to classify them as words or non-words by pressing keys on the keyboard. Their reaction times to make these classifications are recorded (in milliseconds). The logic of the lexical decision task is if participants are "primed" with a concept, they should be faster to recognize words related to that concept than words that are unrelated to that concept. As a simple example, if participants are thinking about aggression, they should be faster to recognize the word "fight" than the word "apple."

Social Psychologists can use other techniques that employ reaction time data to make inferences about whether individuals hold positive or negative attitudes toward an attitude object using techniques such as the Associative Priming task (APT; Fazio, Jackson, Dunton, & Williams, 1995), the Implicit Attitudes Test (IAT: Greenwald, McGhee, & Schwartz, 1998), and the Affect Misattribution Procedure (AMP: Payne, Cheng, Govorun, & Stewart, 2005). The APT involves showing target images (photos or words) preceding exposure to positively or negatively valenced words. Participants then judge if the word presented was positive or negative. Response times are recorded, with the assumption that responses will be faster if the image and the word were affectively congruent and slower if the target and the words

are affectively incongruent. The IAT assesses relative associations between the pairing of a target (in this case, the partner) with positively and negatively valenced words and images, with the logic that if individuals hold a positive attitude toward a target, response speed should be facilitated when the target is associated with positive stimuli, and impeded when the target is associated with negative stimuli. The AMP assesses attitudes toward a target by briefly exposing participants to the target (photos or words) before exposure to ambiguous stimuli (e.g., Chinese characters for non-Chinese readers). Later, participants evaluate the ambiguous stimuli. It has been demonstrated that participants' attitudes toward the target will be misattributed to the ambiguous stimuli that were paired with the target, such that ratings of these ambiguous stimuli are influenced by their evaluation of the target object.

Sometimes, Social Psychologists are interested in assessing participants' physiological or neurological reactions to their environment. Put briefly, such measures can be relatively simple such as measuring heart rate or they can require laboratory analysis (e.g., assessing salivary cortisol levels) or complex technology (e.g., neuroimaging techniques such as electroencephalography (EEG, a technique that measures electrical activity in the brain) or functional magnetic resonance imaging (fMRI, a technique that measures changes in blood flow in the brain).

In general, Social Psychologists often use questionnaires or surveys to assess their constructs of interest. However, the answers participants provide on these explicit, self-report assessments are quite deliberative, and may reflect what the participant believes to be true at a reasoned, conscious level. Further, through the filters of self-report, one's answers may also reflect biases. For this reason, Social Psychologists can use other measures such as behaviour, proxies for behaviour, cognitive, or physiological measures as assessment tools.

Research Design

Although there are number of ways that one can classify research designs, we will focus on two main types of research methodology that are used in Social Psychology: Non-experimental and experimental research. Non-experimental research seeks to examine whether two (or more) variables are related. Here, variables are measured, and researchers assess the degree of relationship among the variables. For example, if two measures are positively correlated (e.g., higher scores on one variable are associated with higher scores on the other variable), we know that the measures covary such that as one increases, the other increases (e.g., higher self-esteem scores are associated with higher scores of optimism). In contrast, if two measures are negatively correlated, (e.g., higher scores on one variable are associated with lower scores on the other variable), we know that the measures covary such that as one increases, the other decreases (e.g., higher self-esteem scores are associated with lower scores on a depression inventory).

It is important to recognize, however, that in a non-experimental design, a correlation does not necessarily imply causation. Let's consider, for example, the correlation between playing violent video games (or violent online games) and aggression (see Anderson et al., 2010, for a review of this literature). An example of a non-experimental study might be to recruit a sample of children measure the frequency with which participants play violent video games (either through self-report measures, or programs that track computer activity) as the predictor variable, and measuring aggressive behaviour (for example, through asking teachers or parents to complete measures of aggressive behaviour exhibited by the children)

as the outcome variable. In this type of study, both variables (violent video game playing and aggression) are measured, and then researchers use statistics to assess the direction (positive or negative) and the magnitude (strength) of the statistical association between these two variables. Generally, in studies assessing violent video game playing and aggression, researchers find a positive correlation, indicating that the more violent video games that children play, the more likely they are to exhibit aggressive behaviour (Anderson et al., 2010).

What does a positive correlation tell us about the nature of the relationship between playing violent video games and aggression? It may seem that this tells us that playing violent video games causes aggression in children. This may be true, but importantly there are other plausible ways to interpret this relationship. It could also be true that children who are aggressive are more likely to choose to play violent video games than those who are less aggressive. This is another type of causal explanation, but posits that the causality is the other direction (aggressive tendencies lead to greater violent video games). Further, it could be a bi-directional relationship, where both types of causality are true (kids who play violent video games become more aggressive, and kids who are aggressive are more likely to play violent video games). Another possibility is that there is no causal relationship between violent video games and aggression, but that both are linked to a third variable (i.e., the relationship between playing violent video games and aggression is spurious). For example, it could be that compared to children who are more engaged in social activities, those who spend more time alone are more likely to play violent video games, and more likely to engage in aggressive behaviours. If the design of the study is non-experimental (again, this means that the variables are measured, and the researcher assesses the direction and magnitude of the association between the variables), one cannot know whether (a) playing violent video games causes more aggression, (b) kids with aggressive tendencies choose to play violent video games, (c) both causal directions are true, or (d) there is no causal relationship in either direction, but both violent video game playing and aggression are associated with another variable. Students with an education in methodology are trained to evaluate whether the design of a study is non-experimental, and recognize that causality cannot necessarily be inferred.

In experimental research, the goal is typically to identify a causal relationship. Researchers manipulate the independent variable (the presumed causal variable), while holding everything else constant to see if it exerts a change on the dependent variable (the outcome variable). For example, a researcher could select a sample of students from a larger population (e.g., a group of Introductory Psychology students at a University) and recruit them to participate in an experiment. Participants would then be assigned to an experimental condition that allows the researcher to isolate and manipulate the independent variable of interest (in this case, playing violent video games). In this experiment, the researcher might choose to manipulate the independent variable by asking half of the participants play a violent video game, and the other half of the participants to play a non-violent video game. In an experiment, the researcher would be sure to isolate the independent variable by manipulating only the type of video game (violent or non-violent), while holding everything else constant (e.g., all participants would play in the same room, be greeted by the experimenter in the same way, play the video game for the same amount of time). To be sure that it is truly type of video game (and not anything else) that exerts a difference in the dependent variable, the researcher needs to ensure that the only difference

between the violent video game condition and the non-violent video game condition is the type of game played.

A second critical feature of experiments is that participants are *randomly assigned to condition*. Indeed, in our hypothetical experiment, if we gave participants a choice about which game they wished to play, it could be that those who choose to play the violent game are more aggressive than those who choose to play the non-violent game, which would make it impossible to tell whether playing the video game caused differences between the groups, or the groups varied on some other dimension that caused differences between the groups. Instead, through random assignment (where participants are randomly put in one of the two conditions, using a random numbers generator, or some other technique such as flipping a coin to determine which condition the participant will be assigned to), researchers can assume that at the outset of the experiment (i.e., before the manipulation of the independent variable, in this case the type of video game played), the two groups of participants were comparable on all dimensions prior to the experimental manipulation (in this case, playing a violent or non-violent video games), so any difference in the dependent variable observed after the manipulation can be attributed to the independent variable. That is, if we randomly assign students to condition, we can assume that they are comparable on all aspects (including tendency toward aggression) at the start of the experiment. Then, if we manipulate what type of video game they play (half of our sample is randomly assigned to play violent video games, and half of our sample is randomly assigned to play non-violent video games) and hold everything else constant, and we find a difference in our dependent variable, then we can infer that playing violent versus non-violent video games causes an increase in aggressiveness.

In this hypothetical study, the researchers would choose a dependent variable that would measure aggressive behaviour. Here, researchers are faced with an interesting challenge: They need to choose an outcome that is a valid operationalization of aggression that can be measured in a realistic and ethical way. Researchers can use self-report measures (such as the Conflict Tactics Scale, Straus, 1979), or scenario completion measures, where participants read about a hypothetical situation and are asked what they would do if faced with that scenario. These types of self-report measures are well-suited for some types of dependent measures, but as discussed above, in the case of aggression, people may be unwilling to say that they would respond with aggression because of the social desirability bias. Instead, researchers may choose to engineer a social situation in the laboratory that allows for the assessment of aggressive behaviour (for reviews see DeWall et al., 2013; McCarthy & Elson, 2018). Social psychologists studying aggression have employed techniques including administering (fake) electric shocks to a partner (e.g., Berkowitz & LePage, 1967; Taylor, 1967), administering blasts of loud noise to a partner (e.g., Anderson & Dill, 2000; Bushman & Baumeister, 1998), choosing how long a partner must hold their hand in a tub of very cold water (e.g., Pederson, Vasquez, Bartholow, Grosvenor, & Truong, 2014), choosing the difficulty level of yoga poses a partner must hold and the amount of time in these poses (e.g., Finkel, DeWall, Slotter, Oakten, & Foshee, 2009), choosing how much hot sauce to put on mashed potatoes that a partner must eat (e.g., Lieberman, Solomon, Greenberg, & McGregor, 1999; Warburton, Williams, & Cairns, 2006), or counting the number of pins that participants stick in a doll that represents a partner (e.g., Voodoo doll task, Slotter et al., 2012). Some of these tasks might seem far-fetched at first glance, but many have been demonstrated to be valid and reliable measures of aggression; for example, DeWall and

colleagues (2013) conducted nine studies demonstrating that the Voodoo doll task correlates with measures of trait aggression, self-reported history of aggression, other accepted laboratory measures of aggressiveness such as administering louder and more prolonged blast of noise, and is reasonably consistent over time. Thus, DeWall and colleagues have used scientific method to demonstrate the validity of using this task to measure aggression.

To review, we have focused on how two principles of experimentation, *isolation and manipulation of an independent variable* and *random assignment of participants to experimental condition*, allow researchers to determine whether one variable (the independent variable) causes a change in an outcome variable (the dependent variable). It is important to note that finding that a variable causes a change in the dependent variable does not necessarily imply that reverse causality is not true as well. It could be that the causal direction works in both ways. Further, even if researchers do show that one independent variable causes a change in the dependent variable, it is important to note that this does not imply that the independent is the *only* cause of the dependent variable—there may be many potential variables that can cause a change in the dependent variable.

We have also commented on the challenges posed to researchers as they seek to measure constructs that cannot be directly observed, and as they attempt to manipulate variables in the laboratory. Some variables cannot be experimentally manipulated, because it would not be possible to manipulate the construct of interest. For example, if a researcher is interested in assessing a trait variable such as extraversion as a predictor variable, it is not possible to randomly assign people to be high or low in extraversion. Further, if a researcher is interested in assessing whether the individuals with siblings are more communicative than only children, one cannot randomly assign people to the sibling or non-sibling conditions—we either have siblings or we don't. In other cases, it isn't ethical to randomly assign people to condition; for example, there are many restrictions in place about administering potentially harmful substances to participants (e.g., some universities do not allow any study involving the administration of alcohol, those that do allow it have procedures and restrictions in place to ensure that the administration is safe). When it is impossible or unethical to manipulate an independent variable, social psychologists rely on non-experimental research, but are careful not to draw conclusions about causality.

Students of Social Psychology often enjoy learning about the clever and creative ways that researchers operationalize very dynamic “real-world” experiences in a way that can be concretely and ethically manipulated in the laboratory. As just one example, psychologists have conducted research assessing the profound ways that experiences of ostracism and social rejection affect our mental and physical health (for reviews, see Williams, 2001; DeWall & Bushman, 2011). Most people would agree that empirically studying the effects of social rejection on outcomes is a worthwhile goal. However, how can Social Psychologists manipulate rejection in a way that is (a) powerful enough to simulate the experience of rejection in the “real world” and (b) ethical, so that participants are treated with respect and there is no lasting harm? Researchers have developed a number of clever paradigms to manipulate rejection, so that participants can be randomly assigned to a rejection or non-rejection condition, allowing researchers to assess the extent to which rejection exerts a change in the dependent variable. In one commonly employed paradigm called “Cyberball” (Williams, Cheung, & Choi, 2000; Williams & Jarvis, 2006), participants are led to believe that they are playing an online game of “catch” with two other participants who are represented by avatars. Participants are told that when they receive the ball, they can

choose who to “throw” it to by clicking on the avatar of the intended ball recipient. In reality, they are not actually playing with real people, but are interacting with a computer program. In the non-rejection condition, participants receive and throw the ball approximately one-third of the time, so they receive equal time with the ball, relative to the other two (computer-generated) “players”. In the rejection condition, however, participants initially receive the ball, but over time, the other two “players” start to exclude the participant from the game, tossing the ball only to each other, thereby ignoring the participant. Interestingly, idea of the Cyberball paradigm originated with an actual experience that the creator of the paradigm, Kip Williams, had when he started playing Frisbee with two strangers, but then was excluded from the game. At first glance, one might assume that any rejection that one might experience by being excluded by two strangers during an online ball-toss game would be so mild as to be inconsequential. However, the experience of exclusion and rejection in the Cyberball paradigm is quite powerful, and there is evidence showing that relative to the non-rejected Cyberball condition, those in the rejection condition exhibit outcomes such as lower levels of self-esteem, more negative mood states, poorer performance on a cognitive task, greater susceptibility to social influence techniques, and more aggression (for reviews, see Gerber & Wheeler, 2009; Hartgerink, van Beest, Wicherts, & Williams, 2015). This provides an example of a powerful, “real world” phenomenon (rejection and ostracism) that can have been distilled to an experimental manipulation that can be readily employed in the lab (participants can be randomly assigned to condition). Although the short-term effects of Cyberball are impactful, it is an ethical design to use, as the participants can be easily debriefed (informed of the purpose of the study, and any deception that occurred during the study) and told that they were not actually being excluded.

APPLICATIONS OF SOCIAL PSYCHOLOGY

One of the reasons that the scientific study is so appealing and exciting is that what students learn is so readily applicable to their own lives. Students of Social Psychology gain insight into processes and factors affecting our thoughts, feelings, and behaviour. It is intriguing and instructive to learn about why we systematically (and repeatedly!) make errors in our judgments, attributions, and predictions (how many times do we underestimate how long it will take us to complete a task such as writing an essay?) (Buehler, Griffin, & Ross, 1994). Students can usually relate to examples of how they have been influenced by compliance techniques (Cialdini, 2009), such as the scarcity principle, which is when items seem more valuable when they are viewed as rare or hard to get (e.g., becoming more interested in purchasing a product when told “Act now, they are selling out fast!”). Further, social psychology can often provide students with theoretical frameworks that give insight to their own social behaviours. For example, learning about adult attachment orientations (see Hazan & Shaver, 1987; Mikulincer & Shaver, 2012) can help students to understand their own tendencies to react in specific ways within the context of their romantic relationships, and potentially use this increased understanding to improve their own relationships (e.g., understanding how attachment can influence conflict behaviour can help students recognize problematic patterns and respond more constructively when conflict arises). Finally, there is some research assessing the effects of “enlightenment” on future behaviour; meaning that learning about findings in Social Psychology can influence how we react to situations in our daily lives. For example, there is evidence to suggest

that learning about the Milgram obedience study can lead to greater cognitive moral development among university students (Sheppard & Young, 2007).

Social Psychology is also very useful in its application to society. Much of the basic research that is conducted can have practical benefits. For example, if scientists understand factors that predict a pattern of behaviour, and then identify the mechanisms underlying the relationship between predictors and outcomes, this knowledge can be applied to help encourage positive behaviours (e.g., increasing the efficacy of campaigns designed to encourage people to vote, volunteer, recycle, or exercise) and prevent harmful behaviours (e.g., reduce the likelihood of workplace aggression, bystander apathy, drinking and driving, or academic dishonesty). Social Psychology can be applied to a variety of contexts including the workplace (e.g., what variables predict employee commitment to their organization?), the classroom (e.g., how can teachers motivate students to persevere when they face challenges?), sports and athletics (e.g., when is a team most likely to exhibit the 'home-field advantage?'), and the military and government (i.e., what types of leadership is most effective in different contexts?). Again, a thorough review of all of the possible applications of social psychology would be beyond the scope of this chapter, but we will provide you with some illustrative examples (see also Gruman, Schneider, & Coutts, 2016; Myers, Spencer, & Jordan, 2018).

Social Psychology and Health

There are many ways that Social Psychological principles can be applied to health behaviours. For example, understanding persuasion and social influence can be applied to helping public health associations frame their messages so that their campaigns will be effective in encouraging healthy behaviours. This type of "Social Marketing" expertise is used to apply principles of persuasion and compliance in a way that will benefit individuals and society. For example, researchers have studied individual difference and contextual variables that influence the efficacy of framing a health behaviour in a way that emphasizes promotion (e.g., "eating fruits and vegetables can help maintain good health") or prevention (e.g., eating fruits and vegetables can help prevent various types of cancers"; see Rothman & Salovey, 1997).

Further, many widely applied theories in Health Psychology are based on core findings in Social Psychology. For example, the Theory of Planned Behaviour (Ajzen, 1991) is a theoretical model that can be used to predict a variety of behaviours, including health behaviours. It states that one's behavioural beliefs (whether we think our behaviours will produce certain outcomes, and our evaluation of those outcomes), subjective norms (whether we think that others will approve or disapprove of our behaviour, and our motivation to comply with their preferences), and perceived behavioural control (whether we think it is likely that we will be able to enact the behaviour) combine to form our intentions. Our intentions then predict our behaviour. This theory is readily applied to decisions to engage in a wide range of health behaviours, such as starting an exercise program, quitting smoking, or eating a more healthy diet. The Theory of Planned Behaviour also speaks to social influences on our decision-making, by positing that subjective norms are one of the three primary factors that influence our intentions to engage in behaviours.

Other researchers have applied Social Psychological principles to factors that promote

mental health. Students of Social Psychology often find it amusing when they learn about biases, or “Positive Illusions” that individuals tend to hold about themselves (Taylor & Brown, 1988; Taylor, 1991). Indeed, researchers have established that non-depressed individuals make systematic errors when they make judgments about themselves. For example, individuals tend to rate themselves more positively than most other people would rate them (e.g., most people think that they are a better than average driver), they overestimate the degree of control they have over their environments, and they make unrealistically optimistic predictions about their futures (e.g., long it will take them to complete tasks, how long their romantic relationships will endure). Taylor and her colleagues have shown that these “illusions”—these consistent errors in judgment that we make about ourselves and our daily lives—are correlated with greater self-esteem, well-being, and health. In contrast, being realistic about our standing on various attributes or our chances of success is sometimes referred to as “depressive realism” (Alloy & Abramson, 1979).

Other Social Psychologists have investigated the extent to which health is associated with the presence of, and quality of, our close relationships. There is much evidence to support the hypothesis that people who feel connected to others and report high levels of satisfaction with their close relationships are likely to enjoy better mental health, better physical health, and longer lives (House, Landis, & Umberson, 1988). Interestingly, relative to those who have close and rewarding relationships with others, those who are lonely or isolated are more likely to exhibit poorer self-reported health (Fees, Martin, & Poon, 1999), increased risk of heart attack (Case, Moss, Case, McDermott, & Eberly, 1992), worse blood pressure regulation (Uchino, Cacioppo, & Kiecolt-Glaser, 1996), poor sleep efficiency (Cacioppo et al., 2002), worse cardiovascular functioning (Hawkey, Burleson, Berntson, & Cacioppo, 2003), and worse immune functioning (Kiecolt-Glaser et al., 1984). As an illustrative example, Pressman and colleagues (2005) invited 83 healthy first-year university students to participate in a study. They completed a variety of self-report measures to assess loneliness, depression, neuroticism, and health behaviours. They were also given a flu shot. The mechanism behind a flu shot is that a dormant version of the virus is injected, and in response, the immune system “kicks in” and produces antibodies, which will then be in place should a person contract the flu virus. Individuals with more healthy immune systems produce more antibodies in response to a vaccine than those with less optimal immune functioning. To test immune function, participants returned to the lab 1 month and 4 months after receiving their flu shot, and their blood was tested for flu antibodies. There was a negative correlation between loneliness and antibodies present in the blood, such those who reported more loneliness had fewer flu antibodies relative to those who were less lonely. Interestingly, the correlation between loneliness and flu antibodies was still evident after controlling for the effects of depression, health behaviours and neuroticism. Studies such as these demonstrate the importance of social relationships for not just our mental health, but our physical health as well. Further, social and health psychologists have worked to identify the mechanisms underlying the association between satisfying relationships and physical health.

Social Psychology and the Legal System

Social Psychology can be readily applied to many aspects of the legal system. First, many cases are often tried by jury. A jury is a group of citizens tasked with reviewing

evidence presented by both the prosecution and the defense team, and deciding whether a defendant is guilty. Many times, the jurors do not initially agree on a verdict, but after deliberation, about 95% of juries agree (Kalven & Zeisel, 1966). Social psychologists study relevant concepts such as majority influence (a common phenomenon when a numerical majority can persuade a numerical minority) and minority influence (a less common phenomenon such that when specific conditions are met, a numerical minority can persuade a numerical majority). Indeed, the classic movie “12 Angry Men” (Fonda, Justin, Rose, & Lumet, 1957, a movie which depicts a lone juror eventually persuading his 11 fellow jury members to reconsider their initial decision) is often shown in classes as a demonstration of the processes underlying minority influence.

Eyewitness testimony is when people who witnessed an event describe what they remember, and this is presented as evidence to the court. Social psychologists study processes such as how our attitudes and expectations can influence what we notice about an event, how we interpret an event, and what we remember about an event. There are many factors that can cause individuals to make errors at each step in this sequence (attention, encoding, and retrieval), and psychologists have studied factors that influence the veracity of eyewitness testimony. Interestingly, the cues that jurors use to make decisions about the credibility of eyewitnesses are sometimes unrelated, or even inversely related, to their accuracy. For example, Wells and Leippe (1981) found that jurors deem witnesses who can provide extensive details of background variables of the crime scene to be more credible than witnesses less able to provide such descriptions. However, in reality, witnesses who can describe background details have been found to be less accurate at identifying a perpetrator than those who cannot recall background details.

Social Psychology and the Workplace

Social Psychology is closely related to Industrial-Organizational Psychology, which is a field where researchers study workplace behaviour. Principles of Social Psychology can be applied to benefit the organization (e.g., assessing factors associated with increased productivity, efficiency, and employee commitment and loyalty) and the employees (e.g., assessing factors associated with workplace satisfaction, group morale, and the physical and mental health of employees). Further, the study of personality and individual differences can be applied to employee recruitment and personnel selection.

Many workplaces involve working collaboratively with other individuals or on teams. As such, core topics in Social Psychology such as social influence, conformity, group decision-making, interpersonal relationships, altruism, and aggression can all be applied to the goal of making workplaces effective, satisfying, and safe. For example, social Psychologists have studied topics such as Social Loafing (the tendency to work less hard on a group task relative to the effort that is expended when people work individually; Latané, Williams, & Harkins, 1979), Group Polarization (the tendency for groups to make decisions that are more extreme than the individual members’ starting position; Moscovici & Zavalloni, 1969) and Groupthink (the tendency for individuals in groups to be concerned with agreeing with the group, instead of raising disparate opinions; Janis, 1971). Importantly, Social Psychologists have not only studied these group processes that can potentially undermine organizational efficiency, but they have studied ways to mitigate and prevent these processes.

Most workplaces employ leaders or managers at different levels who are responsible for

motivating their teams to work productively and achieve goals, facilitating communication and positive relationships among group members, and provide performance feedback to their group members. Industrial-Organizational Psychologists assess factors that make a good leader, different leadership styles (i.e., task leadership, transactional leadership, and transformational leadership) and the types of leadership that are most effective depending on the context (e.g., contingency leadership; Fiedler, 1967). In the workplace, this research can be applied to leadership training and promotion decisions.

Interestingly, some of the core theories that have been advanced in the Interpersonal Relationships literature can be applied to the workplace. For example, the Investment Model (Rusbult, 1980) was introduced to the literature to explain commitment to a romantic relationship. Specifically, Rusbult posited that commitment to a relationship is determined by three predictors: Satisfaction, Investments, and Alternatives. Satisfaction refers to the presences of positive aspects, and the absence of negative aspects in our relationship, such that we are more likely to stay in a relationship if we find it satisfying. This seems straightforward, but we can all think of examples where people stay in romantic relationships even though they do not seem satisfied. Why might this be? The other two factors can explain why people would remain in relationships that aren't making them happy. Investments refers to intangible or tangible things that we have put into a relationship that we will not recover if the relationship were to end (e.g., resources such as money, time put into the relationship, sacrifices we have made for the sake of the relationship). People who have invested more in their relationship are more committed. Finally, alternative refers to what we think our life would be like without the relationship (e.g., being single, being with a new (unknown) partner, or being in a relationship with a specific person that we think would be a potential new partner). If people believe that their current relationship is better than other relationships that they are likely to find (or being single), then they are likely to stay committed to the relationship. Interestingly, these same factors can be applied to whether we stay committed to our workplaces (Farrell & Rusbult, 1981; Oliver, 1990). When making stay or leave decisions, we consider our satisfaction with the workplace (e.g., "do I like coming to work? Am I fulfilled by this job"), the investments we have made (e.g., "will I lose my pension if I leave? Can I walk away from a place I have worked for 20 years?"), and the alternatives that we have (e.g., "Can I afford to be unemployed for a while? Will I be more fulfilled by taking this new position that has become available?").

CAREERS IN SOCIAL PSYCHOLOGY

The scientific study of how our thoughts, feelings, and behaviours are influenced by our social situations can help us understand, and relate to, others. Moreover, students with an undergraduate degree in Psychology typically receive strong training in research methodology and statistics, which are highly transferrable skills. Further, the study of Psychology entails not only rigorous methodological and statistical competencies, but higher-order conceptual and analytical skills. In particular, psychology students are taught to evaluate findings and observations from larger theoretical frameworks, to question underlying mechanisms for observed relationships, and identify the core underlying principles that guide our thoughts and behaviours. In other words, students of psychology are able to leverage a conceptual understanding of human behaviour, in addition to more

specific research-related skillsets. For these reasons, psychology students are ideal candidates for a number of critical industry positions that require an understanding of industry-relevant human behaviour or functioning, using sound methodologies and analyses.

There are number of entry-level positions for students with an undergraduate degree in Psychology. Just a few examples include research analyst, policy analyst, research or lab assistant, and organizational development assistant/human resources advisor.

Research Analyst

A number of industry and governmental agencies (e.g., marketing, health) require research analysts to help them conduct research relevant to their field and organizational mandate. Analysts may either assist the research activities of more senior analysts, or may organize and conduct their own research activities including survey development, data collection, data analysis, report writing, and producing or delivering presentations. This may include an assessment of the organization's internal database, or the collection of data external to the organization. Analysts may be asked to use their findings to make policy or program recommendations, depending on the nature of the research, the organization, and one's position.

Policy Analyst

The research skills of psychology graduates can also be used to inform policy (e.g., education and health sectors). Policy analysts use evidence-informed research to develop short-term and long-term policies and procedures for the relevant agency. Some of these duties would overlap with those of a research analyst, but with the additional tasks of using research to inform policy development, which could include training materials and guides that support those policies.

Research or Lab Assistant

Students with an undergraduate degree in Psychology can apply their research skills by working in a lab as a research assistant at a university, hospital, or research agency. Research assistants typically work with graduate students and researchers by recruiting participants for research studies, collecting data, analyzing data, and helping to summarize the research for presentations or publications.

Organizational Development Consultant/ Human Resources Advisor

There are some positions within human resource departments that don't require an advanced degree, and that utilize many of the skills and competencies acquired by undergraduates in psychology. In particular, psychology students can work as consultants in a human resources department in industry, or within an organizational development firm. Organizational development as a field involves the application of social psychological principles to help improve employee and organizational performance and effectiveness. Specifically, organizational developers help to produce change in an institution's systems, structures and processes, including the employees working within those systems. The process of organizational development typically includes a diagnosis of organizational

problems and current functioning through collection and analysis of data, designing and implementing interventions for change, and evaluating the effectiveness of those interventions afterwards (Cummings & Worley, 2009). Human resources advisors involve the application of research and statistical competencies in the recruitment and selection of personnel, employee training and development, and performance assessment and management (Boxall, Purcell, & Wright, 2007).

Polling Firms

As part of an undergraduate education in Psychology, many students learn about survey design and test construction. This skill set can be applied to work at Polling firms (e.g., Gallup, Ipsos, Angus Reid), where employees plan and design surveys and test instruments, conduct research to assess the psychometric properties of the instruments, collect data, and then analyze and summarize the data for presentation to the client. In this way, working at a polling firm is specific type of consulting, specializing in test and survey construction, validation, and analysis. Similar types of jobs can also be found in Provincial and Federal levels of Government (e.g, Statistics Canada).

Market Research

Market researchers use their research training to help companies become more productive and profitable by making sound economic, political, and social decisions. They monitor and forecast sales trends, and collect data about customers. For example, they may design surveys or conduct focus group research to assess customer satisfaction, marketing strategies, corporate branding, or factors that affect customer loyalty. They analyze these data, summarize their findings, and prepare reports to inform businesses how to best market their products or services.

Consulting Careers

Consultants use their skills, expertise, and knowledge to help individuals or organizations with a specific goal. One can work for a large consulting firm as a consultant or project manager (e.g., Bain, Accenture, Ipsos). It is also possible to specialize further to a specific type of consulting work. There are examples of specific people who work in consulting (and their education and career trajectories) available online via the webpage of the American Psychological Association (www.apa.org). Specific examples of consultants include (but are not limited to) Trial Consultant, Media Consultant, Medical Error Consultant, Market Consultant, Executive Search Consultant, and Organizational Development Consultant.

Further Education in Social Psychology and Related Fields

Students who obtain an undergraduate degree in Psychology are eligible for a number of training paths that would require further education. For example, students with a background in Social Psychology can go to professional schools, such as law school or business school.

In addition to these professions, students can also pursue graduate training in Psychology or related disciplines. Students with an undergraduate degree in Psychology can go on to attain a Master's of Science (M.Sc.), Master's of Arts (M.A.) or Doctoral degree (PhD)

in Psychology. Typically, at the graduate level, students will specialize in a specific field or subdiscipline within Psychology (e.g., Social Psychology, Clinical Psychology, Developmental Psychology, Cognitive Psychology, Organizational Psychology, Neuropsychology, etc.). With a background in Psychology, it is also possible to seek graduate training in closely related programs outside of Psychology (e.g., graduate degrees in Education, Social Work, Counselling, Public Health, Public Policy, Epidemiology, or Marketing).

CAREER PATHS FOR THOSE WITH MA/MSC/PHD IN SOCIAL PSYCHOLOGY

Academic Positions

Many students who graduate with a PhD in Social Psychology go on to work as a Faculty member or Lecturer at Colleges or Universities. Faculty members (professors) conduct and publish research to advance the field of social psychology, supervise graduate and undergraduate student research activities, teach at the undergraduate and graduate levels, and are responsible for administrative duties. Lecturers typically focus on teaching duties, by utilizing their knowledge of research methods and social psychological principles to teach courses at the undergraduate and graduate levels. Although many individuals with graduate training in Social Psychology go on to work in academic positions within Psychology Departments, others hold Faculty or Lecturer positions in other departments, such as Business Schools, Education, Health Studies, Political Science, and Policy Studies

Research Positions Outside of Academia

Graduate training in Social Psychology can prepare students for a wide variety of research jobs outside of universities or colleges. Some examples are described below.

Defence Scientists

Defense Scientists work for governmental agencies like the Department of National Defence or Defence Research and Development Canada. They conduct research on the Canadian Armed Forces including their well-being and operational effectiveness. Defence scientists have the opportunity to address a variety of operational problems with their research, and see the real-world impact their research has made on the lives of CAF personnel and decision making within the Department of National Defence. The use of theoretical frameworks, in addition to quantitative methodological and statistical competencies, can be appealing and very relevant for this type of research, making social psychology students desirable candidates for such positions.

Further, all of the examples of career paths described as possible trajectories for individuals with an undergraduate education in Psychology (e.g. careers in Consulting, Policy Analysis, Market Analysis, Polling, Research Analysis, or Organizational Behavior) are also very good options for those with advanced degrees in Social Psychology. A graduate degree makes it possible to apply for positions that are higher than entry-level jobs, so a greater degree of options in these exciting career paths are available to those with a graduate degree.

Growth Careers in Social Psychology

There is a good reason to be optimistic about the job market for students with a degree in Social Psychology. Understanding how people are influenced by their social environments, combined with the excellent training in research methodology and statistics, makes students with expertise in Social Psychology attractive to a number of different types of employers, such as those mentioned above. Further, according to the American Psychological Association (www.apa.org), there will be career sector growth in related fields such as program evaluation, working with older adults, the military, and the government.

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[8]

DEVELOPMENTAL PSYCHOLOGY

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1. WHAT IS DEVELOPMENTAL PSYCHOLOGY?

As a human progresses through life, they transition from a zygote to a crying infant, from a babbling toddler to a curious kindergartner, from a quick-learning grade school student to a broody adolescent, from an independence-seeking emerging adult to a mature adult, and later, to an elderly senior. Across the lifespan, there are numerous physical, cognitive, and social changes. The field of developmental psychology is focused on observing these changes and elucidating their underlying mechanisms.

People with training in developmental psychology have learned how to be scientists. Like all scientists, they know the key theories of their field, and importantly, they recognize how those theories came to be. They can create empirical research methodologies to test new hypotheses, and they analyze the resulting data. They know how to critically evaluate claims and effectively communicate findings to other scientists as well as the broader community. Depending on their chosen career and level of education, people trained in developmental psychology may apply some or all of these skills in their work.

The specific area of interest for any one developmental psychologist may differ greatly from the interests of other developmental psychologists. It is arguably the most interdisciplinary of the traditional areas of psychology, as individuals may focus on development in relation to sensation and perception, cognition, reasoning and behaving in the social environment, personality, and brain systems. Within these topics, developmental psychologists may focus on what we think of as normative development, as well as atypical development.

Because of this diversity, the questions that developmental psychologists ask can seem disconnected from each other. Take a look at a typical introductory textbook on the topic, and you will likely see research questions as wide-ranging as: When do infants perceive physical depth? How do children learn the meanings of words? How does moral reasoning change from early to later childhood? Is the development of theory of mind in humans different from that of other species? How do bullying experiences in childhood affect later victimization in adulthood? How do cultures differ in pedagogical practices? What is the role of parents in the development of emotion regulation? How does gender identity develop?

The thread that connects these diverse topics, though, is the approach that developmental psychologists take. There is a shared interest in understanding the mechanisms of change by examining the interactions between nature (our genetic inheritance) and nurture (the physical and social environment). Within this framework, species-typical developmental paths can be observed, but intriguing individual differences may also be uncovered.

Perhaps one of the best ways to picture the general context of development is by considering Urie Bronfenbrenner's seminal Bioecological Model (Bronfenbrenner, 1979; Figure 1). This model considers the multi-directional impact of environmental factors on a child's physical, social, emotional, and cognitive development. In the model, there are a series of nested systems, with the child (including his or her particular combination of genes, temperament, age, health, physical appearance, etc.) at the center. The systems interconnect, and themselves exist within the 'chronosystem', which considers circumstances that change over time.

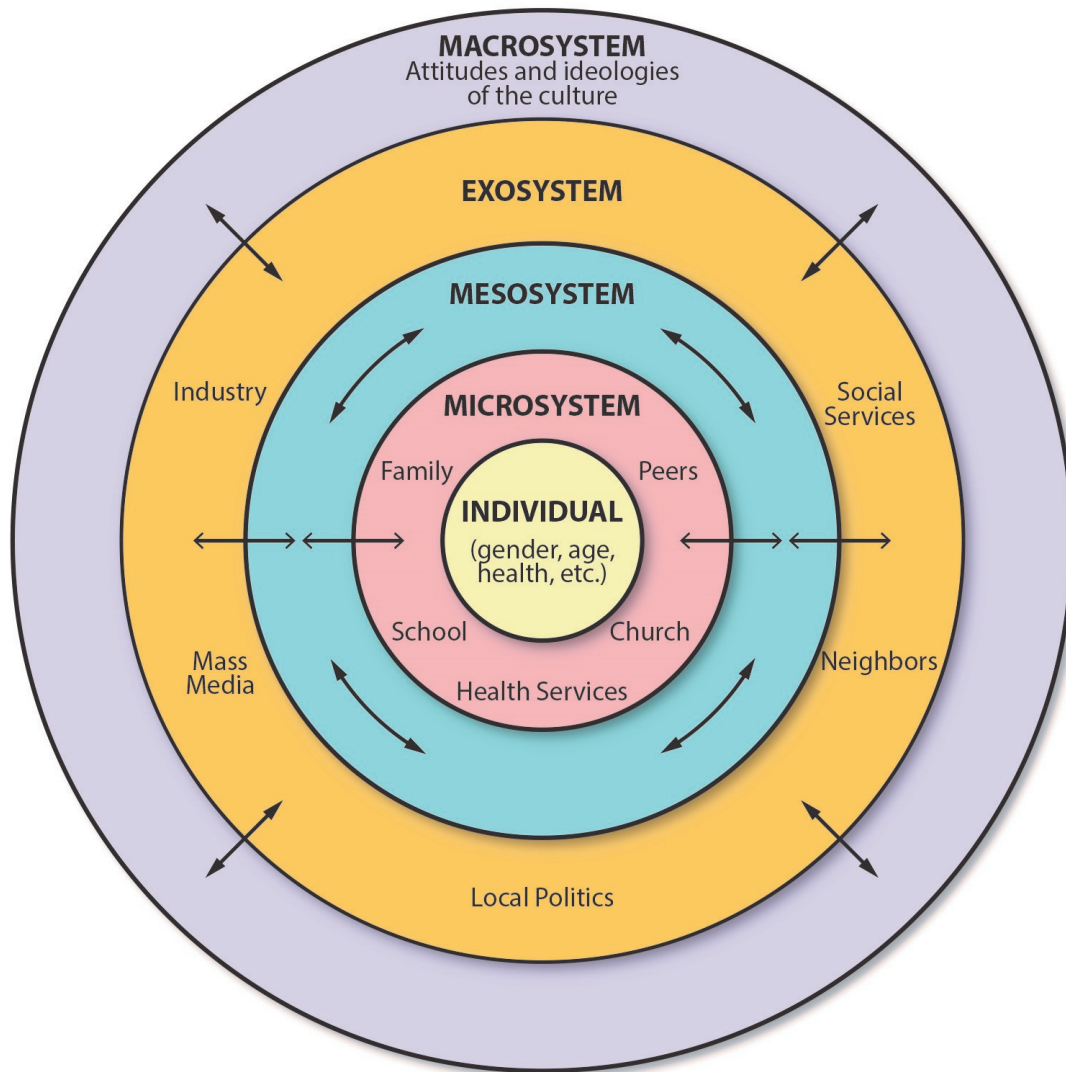


Figure 1. Bronfenbrenner's Bioecological Model considers the child's environment as a nested series of interconnected systems. [Image modified from Wikipedia: https://en.wikipedia.org/wiki/Ecological_systems_theory]

Figure 1. Bronfenbrenner's Bioecological Model considers the child's environment as a nested series of interconnected systems. [Image modified from Wikipedia: https://en.wikipedia.org/wiki/Ecological_systems_theory]

When you consider this complexity, as well as the various domains of development that psychologists examine, it may not be surprising that the methods used by developmental psychologists who are actively involved in research are quite varied. Some methods share commonalities with other areas of psychology: surveys, naturalistic or structured behavior observation, verbal interviews, genetic assays, and neuroimaging with fMRI and electroencephalography, among others. A primary consideration within developmental research, though, is the age-appropriateness of the methods. This is particularly evident

when testing infants who are not yet speaking and have limited motor ability, but applies to all ages to some extent.

Another consideration is how *development* is to be examined. For example, does the research question pertain to whether an ability is present at a certain age? If so, researchers might focus on one time point (e.g., 5 months of age). Alternatively, is a comparison to be made between certain ages? In this case, researchers may use a cross-sectional approach, comparing different groups of children of different ages, or they might create a longitudinal design in which they follow the same children over a period of months or years. Yet another approach is the microgenetic design, in which researchers attempt to gain an in-depth understanding of the mechanisms of change. In a microgenetic design, the focus is on children who are thought to be on the cusp of a particular change, and researchers make observations during a number of sessions over a short period of time.

SECTION RECAP

People trained in developmental psychology have learned the historic and current theories of developmental science and have a critical understanding of how to conduct and interpret research. One individual's specific focus may differ greatly from another's (e.g., the development of numerical understanding versus gender development), but they will share a common interest in uncovering the mechanisms of change. In turn, these mechanisms are considered within the complex interactions between nature and nurture.

In the last section of this chapter, some of the many careers and educational paths related to developmental psychology are presented. Before getting there, though, you will see examples of research and how it has been (and continues to be) extended and applied. These sections are divided into two areas of developmental research: social and cognitive. The lines separating the areas may at times seem 'fuzzy'; for example, a researcher interested in the development of a cognitive process will likely consider the role of the child's social experience (e.g., how is information being presented to the child by others?). Yet, the divisions provide an organizational scheme for presenting important themes and research methods within the larger field of developmental psychology.

2. SOCIAL DEVELOPMENT

The earliest social experiences for humans occur soon after birth, often with the immediate family. In typical development, for example, newborns show a marked attention to faces and soon are able to recognize the individual faces of those around them (e.g., Bartrip, Morton, & de Schonen, 2001). This early interest in people is thought to start us on a developmental path toward the complex sociality that characterizes our species.

This section will begin by considering what developmental psychologists have discovered about social experiences during infancy and early childhood. Focus will then turn to the development of social relationships, including the child's own social identity. Throughout, examples will be presented of how this knowledge has been extended and applied. The

topics and examples are, of course, limited, but the aim is to present major themes and directions.



Figure 2. A young infant looks at a caregiver's face.

EARLY SOCIAL EXPERIENCES

Our species has a relatively long period of vulnerability; we are born helpless and unable to survive without a caregiver. To ensure infants' survival, and by extension, the survival of the species, infants and caretakers have developed a complex system of behaviours that fosters a strong relationship and motivates adequate caregiving (Simpson & Belsky, 2008).

It was relatively recently, though, that we started to have a more complete understanding of the necessary features of human caregiving. Observations of children who were separated from their parents during World War II showed that these children were emotionally disturbed, even those who were in institutions that provided good physical care (e.g., Bowlby, 1953). What appeared to be missing, it was argued, was the opportunity to

create socio-emotional bonds with caregivers. Relatedly, research by Harry Harlow in the 1950s demonstrated that infant rhesus macaque monkeys preferred to spend time in contact with a cloth-covered apparatus than a metal wire apparatus, even though the latter provided milk. In fact, the infant monkeys with access to a ‘cloth mother’ showed more species-typical behaviour, exploring the world and then returning to the soft apparatus as if it were a secure base.

Together, these findings formed the initial basis of Mary Ainsworth and John Bowlby’s *attachment theory*. The ideas were expanded through studies suggesting that infants’ early experiences with primary caregivers shape their social and emotional development. Through the interactions with a sensitive caregiver, infants form a ‘working model of attachment’, a mental representation or schema of positive social relationships. Without these early experiences — or with experience with an insensitive caregiver — children’s social development can be compromised (Please see Box 1 for more on this topic).

Since this initial research, developmental psychologists have continued to expand our understanding of the significance of early social experiences. For example, there is evidence for both cultural universals and cultural variations: though the importance of attachment security appears to be universal, securely attached children in different cultures may differ in how often they are in close physical proximity to their mothers (e.g., Posada et al., 2013). Additionally, the research in this area has provided us with a foundation for creating interventions to improve parent-child interactions. Developmental psychologists work with clinical psychologists and health care professionals to design and evaluate programs that focus on sensitive parenting behaviour. As one example, nursing professionals at Toronto Public Health in Ontario, Canada, joined with clinical and developmental psychologists to elaborate and evaluate the ‘Make the Connection’ parenting program. When compared to a control group, this program was found to increase sensitive caregiving behaviour and improve parental attitude in at-risk mothers through in-class activities that included reflective discussion while watching video of their interactions with their infants (O’Neill, Swigger, & Kuhlmeier, 2018).

Developmental psychologists have further applied the research on early social experiences to questions about the impact of nonparental childcare. For many families, parents hold jobs by necessity or choice, and children may spend time with other caregivers. A large-scale study in the U.S.A., as well as other smaller-scale studies, suggested that when childcare is high quality (e.g., low turnover of caregivers and a low number of children per caregiver), children can still form secure attachments with their mothers when their mothers show sensitivity in their time together. Further, high-quality childcare can even compensate when children experience unresponsive parenting from their mothers (e.g., NICHD Early Childcare Network, 1997).

BOX 1. ROMANIAN ADOPTION STUDIES

As you have just read, throughout the 1900s developmental psychologists increased our understanding

of the role of sensitive caregiving in early social development. It may come as a surprise, then, to learn that as late as the 1980s and 1990s, many children in Romania lived in institutions with relatively little contact with caregivers, as demanded by the political dictatorship at the time.

When the political power shifted, children were adopted by families in different countries. Across a series of studies, the development of these children was examined, often in comparison with both Romanian and non-Romanian children who had been adopted early in infancy (e.g., Nelson et al., 2007; Rutter, O'Connor, & The English and Romanian Adoptees (ERA) Study Team, 2004). The studies found that Romanian children who were adopted at an older age (e.g., 12 to 24 months and 24 to 42 months) often showed atypical physical, social, and cognitive development as compared to children who had been adopted at a younger age, even after years of living in a loving and supportive environment.

These findings were important for the information they provided on the significance of early social experiences in human development and for the implications for public policy (Rutter et al., 2009). Also notable, though, was the consideration of the ethics of the research, with consideration of the potential for exploitation, the risk/benefit ratio, and cultural sensitivity (Zeanah et al., 2006).



Figure 3. An Institute in Romania, shown here in 1992. Used with permission from Tom Szalay.

DEVELOPMENT OF THE SELF

It may seem strange to read about the development of ‘the self’ in a section on social development. Yet, one’s self-concept develops through interactions among all the systems in Bronfenbrenner’s model (refer back to Figure 1), including, importantly, our interactions with others.

Early in development, an emerging sense of self can be seen when infants recognize that they have agency and are able to control their environment (to some extent!). For example, at 2 to 4 months of age, infants show excitement when they can cause a mobile to move via a string attached to their kicking foot (e.g., Rovee-Collier, 1999). In the toddler years, children come to realize that when looking in the mirror, they are looking at an image of themselves. The sense of self continues to become more elaborate during the preschool years, and 3 to 4 year olds will describe themselves in terms of their physical features (*I have brown hair*) as well as their social relationships (*I have a brother*). During the elementary school years, children increasingly engage in social comparison (*Other kids at school do better in math*; e.g., Harter, 1999), and in adolescence, the importance of social acceptance by peers is strong (e.g., Damon & Hart, 1988).

Developmental psychologists now have amassed a rich body of research on the development of the self, including focus on topics such as ethnic, sexual, and gender identity. In many cases, the research aims to be cross-cultural, as identity formation is influenced by the opportunities children and adolescents have, which are, in turn, impacted by economic and historical status, among other factors. The research is continually being applied with the aim of improving health and well-being (see Box 2 for an example in relation to gender identity).

Focus has also turned to one particular element of self concept: self esteem. How we evaluate ourselves is related to life satisfaction, and low self esteem in childhood and adolescence is associated with negative outcomes such as substance abuse, depression, and withdrawal from social interactions (e.g., Donnellan, Trzesnieswski, Robins, Moffitt, & Caspi, 2005). Receiving praise can typically help to increase self esteem, but developmental psychologists have suggested that inflated praise (*You are the best at drawing!*) can actually have detrimental effects for children with low self esteem. In one study, children who were visiting a museum drew a picture and were told that it would be evaluated by a painter (there was no actual painter, only the experimenters). Some children received inflated praise (*You made an incredibly beautiful drawing!*), while others received either no praise or non-inflated praise. Children with low self esteem who received inflated praise were less likely to take on a new challenge than other children, suggesting that the inflated praise actually backfired, perhaps because it set high standards that these children did not feel they could meet (Brummelman, Thomaes, Orobio de Castro, Overbeek, & Bushman, 2014). Discussion of this research has been valuable in educational settings, as praise in relation to participation rather than achievement has become more common.

BOX 2. GENDER DEVELOPMENT IN TRANSGENDER YOUTH

Gender identity is typically defined as an individual's awareness of themselves as male, female, or transgender. The term is thus different than terms such as sexual identity or sexual orientation, which typically refer to the sense of oneself as a sexual being and one's romantic attractions (or lack thereof). Though there has been much research on gender development in children who identify with their natal sex, less is known about other children.

The TransYouth Project, led by developmental psychologist Dr. Kristina Olson, examines transgender children's gender development. At the time of this writing, it is an ongoing longitudinal study of transgender children from North America (ages 3 to 12 years at the start of the study), though some early findings have been published (for a summary, see Olson & Gülgöz, 2018). These children have socially transitioned (e.g., they are referred to by a pronoun not traditionally used for their natal sex) and thus have significant parental support of their gender identities. Because of this, the researchers are cautious in generalizing the findings beyond similar samples.

The TransYouth Project is the first of its kind, researching gender development in transgender youth using quantitative empirical methodologies. The research thus far has examined the continuity and discontinuity of gender identity, researcher biases in assessing gender, and the implications of social support and transitioning on well-being in transgender and gender diverse youth. One finding thus far is that socially transitioned children's gender development is quite similar to gender-typical peers and gender typical siblings. There are future research directions planned too, including larger and more diverse samples with children who have and have not socially transitioned.

PEER RELATIONSHIPS

Developmental psychologists have long claimed that relationships with peers are integral to children's development. The interactions with similarly-aged 'equals' often allows the free exchange of ideas and criticisms, which can lead to the development of new concepts about how the world works. Cooperation with peers helps children develop social and emotional skills valued in the culture.

Among the different types of peer relationships, the study of friendship – and how the concept of 'friend' changes during development – has provided a large body of research. Having close, reciprocated friendships as a child is linked with positive outcomes even into young adulthood (e.g., Bagwell, Newcomb, & Bukowski, 1998). That said, friendships with individuals who promote dangerous or unhealthy behaviours can be costly (e.g., Simpkins, Eccles, & Becnel, 2008).

For some children and adolescents, peer relationships can include aggression, harassment, and violence, in person or online (i.e., cyberbullying). The consequences of being bullied are broad and include academic difficulties, stress-related illness, loneliness, biological changes within the brain, and suicide. By some accounts, 30% of children and adolescents in North America are bullied occasionally, with 7-10% bullied on a daily basis. Further, 75% of people say that they have been affected by bullying (www.PREVNet.ca).



Figure 4. Social exclusion and peer rejection can impact health and well-being.

Developmental psychologists have been working with organizations to connect science to practice and practice to science, in turn creating and evaluating programs that promote positive relationships. For example, PREVNet (Promoting Relationships & Eliminating Violence Network; Figure 5) is a network of 130 Canadian research scientists, 183 graduate students, and 62 national youth-serving organizations (e.g., the Boys and Girls Club of Canada) that began in 2006. PREVNet focuses on education, assessment, intervention, and policy.

Initially, Canadian youth-serving organizations had few resources and opportunities to connect with each other and engage with researchers. Organizations like PREVNet, though, can bridge the gap between academic research, public policy and practices by connecting university researchers with organizations and communities. Indeed, since PREVNet began in 2006, the proportion of students in Canada who report bullying others has decreased by 62%, and the proportion of students who report both bullying others and being victimized has dropped by 44%. This decrease is likely in part a result of the work of all members of PREVNet and its cumulative impact across the country.



PROMOTING RELATIONSHIPS & ELIMINATING VIOLENCE NETWORK
 Canada's authority on research and resources for bullying prevention



- HOME
- BULLYING
- RESEARCH
- RESOURCES
- #SPREADKINDNESS
- PARTNERS
- NEWS
- BLOG
- EVENTS & CONFERENCES
- ABOUT

Welcome to PREVNet

Canada's authority on bullying
 PREVNet is a national network of leading researchers and organizations, working together to stop bullying in Canada. It is the first of its kind in this country and a world leader in bullying prevention. Through education, research, training and policy change, PREVNet aims to stop the violence caused by bullying - so every child can grow up happy, healthy and safe.

[Learn more about PREVNet](#)



Understanding How Educators Can Reduce the Impacts of Being Bullied

Learn more about psychosocial and biological factors that can influence the health and well-being of youth in our latest *Safe and Accepting Schools Newsletter for Educators*. Featuring research from Dr. Tracy Vaillancourt, this issue offers practical strategies for creating positive classroom communities that promote healthy relationships and social connectedness. [Learn more](#)

Bullying - What You Can Do



Bullying is a major problem for Canadian children and one we cannot afford to ignore. If we change the way we view relationships, we can stop bullying for good. We all have the power to keep kids safe. Bullying should never be a part of anyone's childhood.

Here's what you need to know...

[Kids](#)

[Teens](#)

[Parents](#)

[Educators](#)

[Cyberbullying](#)

Upcoming Events

International Society for Research on Aggression 2020

July 20, 2020 to July 24, 2020

Bullying Policy & Legislation

The law on bullying in Canada and your rights and responsibilities.

[Learn more](#)

Research

Read summaries of PREVNet's comprehensive research on bullying and our understanding of it as a relationship problem. Find useful resources, tools, books and videos and learn more about how to create a world free from bullying.

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Playing sports this summer? There are lots of ways parents can help create positive sporting experiences for youth, ...
twitter.com/web/status/1...

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The Latest from PREVNet

Wisdom2Action LGBTQ2+ Report on Youth and Gender-based Violence

News / July 22, 2019 / General

Our partners Wisdom2Action have just launched a first-of-its-kind report highlighting over 500 LGBTQ2+ Canadian youth and their experiences with gender-based violence. [Read more](#)

The 2019 PREVNet Conference in Toronto, Ontario

Blog / June 17, 2019 / General

A recap of the 10th Annual PREVNet Conference [Read more](#)

[News](#)

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Figure 5. PREVNet is a network of scientists and organizations that aims to decrease the prevalence of bullying and promote positive relationships. The network provides resources via its website www.PREVNet.ca [Screen capture August 2019]

BOX 3. EMOTION REGULATION

In developmental psychology, the study of emotions occurs at many levels: neural responses, physiological responses such as heart rate, the subjective feelings associated with emotions, the recognition of others' emotions, and the cognitive processes that can influence these different levels (e.g., Siegler et al., 2018).

Here, we highlight one aspect of emotional development: the ability to regulate one's emotions. Though we have situated this 'box' within the social development section of this chapter, the topic actually bridges social and cognitive development. Regulating emotions can entail cognitive processes, including inhibitory control, reassessment of goals, and creation of new behavioural strategies. But, emotion regulation can also occur in a more social context, such as the *co*-regulation that can occur with parents or peers.

Emotion regulation plays an important role in well-being, with implications for anxiety and depression. Researchers in both developmental and clinical psychology often work together to apply research findings in the creation of interventions. One example is the use of video games that allow children with moderate to high levels of anxiety to practice controlling their stress. The game *MindLight*, created by developmentalist Dr. Isabella Granic along with a team of researchers and game designers, lets children virtually explore a dark mansion with a light that becomes brighter as they relax. Because the game is fun and engaging, children get repeated experience controlling their own anxious emotions as they play. Evaluating the effectiveness of the game is ongoing, and comparisons are being made to existing interventions including traditional cognitive behavioural therapy (e.g., Schoneveld et al., 2016; Wols, Lichtwarck-Aschoff, Schoneveld, & Granic, 2018).



Figure 6. A still image from the video game, *MindLight*. <https://gemhlab.com/games/mindlight/>

SECTION RECAP

This section has provided a brief summary of social development, with emphasis on early interactions with caregivers, the development of a sense of self, and peer relationships. In each case, examples of how research findings have been applied — in various contexts (e.g., education, parenting) and with various goals (e.g., public policy) — have been presented.

Underlying our social interactions, though, are cognitive processes that support our interpretation of others' behaviour and guide our decision-making. In the next section, we will provide an overview of some major research areas of cognitive developmental psychology and give examples of applications of the work.

3. COGNITIVE DEVELOPMENT

In a general sense, cognitive developmental psychologists study how our abilities to acquire, store, and process information develop. A more specific definition of 'cognition', though, is the "mental processes and activities used in perceiving, remembering, thinking, and understanding, and the act of using these processes" (Ashcraft & Klein, 2010, p. 9). Cognitive processes, therefore, are internal, occurring inside the brain. Because of this, cognition is typically inferred from behavioural or neural measures during carefully designed experiments.

This section will provide examples of research on cognitive development, noting how

the findings can apply to other areas of the field of psychology as well as other disciplines and nonacademic communities. That said, many cognitive developmental psychologists conduct ‘basic science’, remaining agnostic with regard to any application to, for example, health or education. Indeed, the basic science underlying any effective application or intervention will take many years to complete, and the potential applications may only be realized after a large body of findings have been amassed and interpreted. Knowing this, it is important to approach the claims that specific toys or videos will make children ‘smarter’ with a dose of healthy skepticism (e.g., Schellenberg & Hallam, 2005).

PERCEPTION AND EARLY COGNITIVE DEVELOPMENT

Decades of research with humans and nonhuman animals have led to the conclusion that the wiring of a species-typical brain is, in part, a result of experiences within a species-typical environment (e.g., voices, movement, three-dimensional objects). The brain is thus thought to ‘expect’ certain input from the environment to fine-tune itself by strengthening or pruning synapses. This *experience-expectant plasticity* has benefits (other areas may be able to take over when localized damage occurs), but it also has costs. If the ‘expected’ environmental information is not there, then development can be compromised.

Findings from infants who are born with cataracts that obscure vision demonstrate a cost of experience-expectant plasticity. Developmental psychologists have found that children who have cataracts medically removed later in development have greater visual impairment than those who have them removed earlier (see Maurer, 2017, for review). Research such as this has led to modern practices of early removal of cataracts when surgery is possible, with the aim of providing the infant visual system with the experiences that are important for development.

But, how do we even know what infants see when they cannot verbally communicate to us about their perceptions? Though there are many methodologies that capitalize on different infant behaviours such as reaching or sucking, there has been a long history of measuring infants’ looking behaviour. Experimental procedures using a habituation/dishabituation design, for example, capitalize on infants’ initial interest in new things, as well as their waning interest over time. In a typical set up, a visual stimulus (e.g., a striped object) is placed in front of an infant repeatedly. For the first few minutes, infants spend the majority of the time looking at the stimulus, but over time, they habituate to the stimulus and begin to look elsewhere more and more. When this looking-away behaviour reaches pre-determined criteria, a new stimulus is presented (e.g., a differently patterned object). Increased looking to this new stimulus is called dishabituation, and suggests that an infant is able to differentiate between the two stimuli. Using this type of methodology, cognitive developmental psychologists have been able to examine early perception and cognition in relation to objects (e.g., infants’ early sense of number, Box 4) and people.

A common methodology that is used to examine infant auditory discrimination is known as the conditioned head-turn procedure. At the start, infants are trained that when a change in an ongoing sound occurs, a fun toy appears to their side. When they learn this association, they readily turn their head in the direction of the upcoming toy if they

hear the change. Using this procedure, developmental psychologists have examined how infants discriminate among different speech sounds. For example, 7-month-old infants growing up in English speaking households would turn their head when a speech sound common in English changed to a speech sound common in Salish, a language from coastal British Columbia, Canada. Intriguingly, 1-year-olds and adults with no experience with Salish find it very difficult to differentiate these sounds (e.g., Werker & Tees, 1984). Thus, there appears to be a time in early development in which our auditory perception allows for this discrimination, but with increased exposure to the predominant language in our environment, we narrow our perception. Although this may seem detrimental – and perhaps the opposite of how we usually think about *development* – the narrowing and focus may underlie the attainment of expertise.

BOX 4. NUMBER AND MATHEMATICS

What does cognitive developmental neuroscience have to do with mathematics education? A lot, actually. Many developmental psychologists have been focusing their research on how children learn about numbers using both behavioural and brain-imaging methods.

Young infants (and many nonhuman animals) can notice the difference between an array of, say, 8 dots and an array of 4 dots. We are capable of estimating numerical magnitude and discriminating between magnitudes, even at a very young age. (To try an adult version of this task in which both arrays are presented together, quickly look at Figure 7 without explicitly counting the dots. Are there more yellow or blue dots?)

Of interest to many researchers is the role these early representations play in the acquisition of symbolic number, such as Arabic numerals and number words (e.g., Feigenson, Libertus, & Halberda, 2013; Sokolowski, Fias, Ononye, & Ansari, 2017; Xenidou-Dervou, Molenaar, Ansari, van der Schoot, & van Lieshout, 2007). Does, for example, the development of basic magnitude processing impact the development of arithmetic skills? If so, what might this mean for mathematics education?

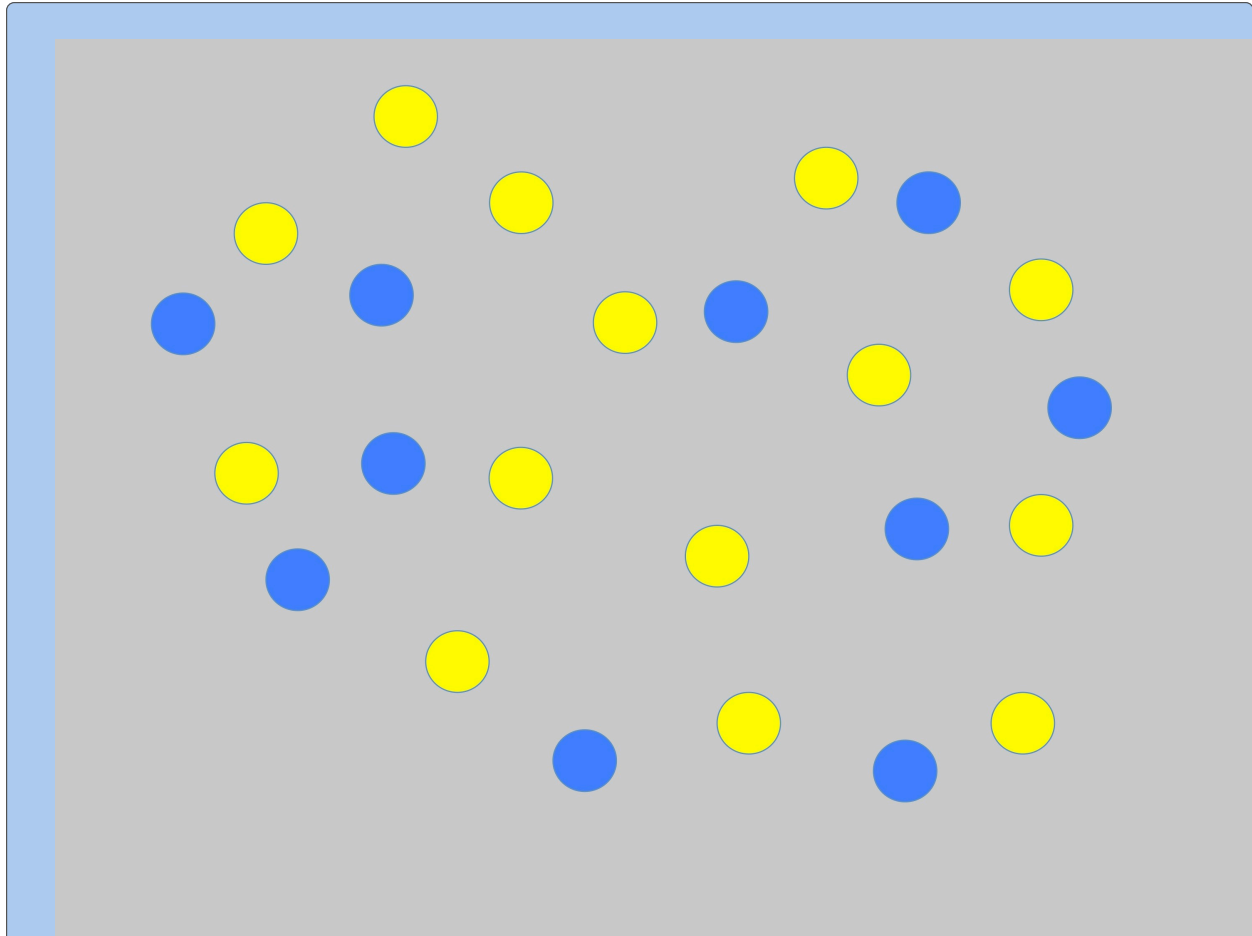


Figure 7. Without counting, can you tell if there are more yellow or more blue dots? Humans and other animals are able to discriminate between numerosities – like the yellow and blue dots here — using a nonsymbolic, approximate sense of quantity.

Developmental psychologists are also examining children who have severe difficulties with arithmetic (*developmental dyscalculia*). For example, Dr. Daniel Ansari uses behavioural and functional neuroimaging methods to study the causes and neural correlates of developmental dyscalculia (e.g., Bugden & Ansari, 2016). By partnering with educational psychologists, he aims to apply research findings to the classroom. For more information about the project, see: <http://www.numericalcognition.org/media.html>

LANGUAGE DEVELOPMENT

Developmental psychologists have a long history of studying language development, considering important aspects such as the perception and discrimination of speech sounds and the ways in which children learn the meanings of words. Related research focuses on how children learn to read. The area is broad, and entire university courses can be designed to introduce the topic. Here, we will focus specifically on the role of adults in children's language learning and critical periods within development.

Perhaps counter-intuitively, adults do not actively teach language as much as you may think. Parents, for example, do not often explicitly teach grammatical rules. Instead, much

of the learning comes from exposure to language. Parents will use infant-directed speech (higher pitch, with exaggerated intonation) when talking to an infant, and the speech emphasizes words for objects in the environment. During these ‘conversations’, children will also pay attention to the speaker’s focus of attention (via eye gaze, pointing, etc.) and use these pragmatic cues to determine what object the speaker is likely labeling.

Imagine, however, if a child does not have any exposure to language. Fortunately, such a situation is rare, but there are documented cases of abused children who were not exposed to language with any consistency. Children who were rescued from abuse later in development did not successfully learn language, even after living in a social and loving household. Similar findings also come from situations in which there was no abuse, yet children were not diagnosed with deafness and, thus, there was no exposure to sign language until later childhood. There appears to be a critical period within the first 4-5 years of life in which exposure to language is integral to language development.

The study of bilingual children and adults further supports the importance of a critical period. Adults who were exposed to a second language during their first three years of life show brain activation patterns to the second language that are similar to the patterns in monolingual adults who are listening to their native language. Those who learn a second language later, however, show different patterns (e.g., Weber-Fox & Neville, 1996).

But, how do children manage to learn two languages at once? A classic, but now unsupported view was that learning more than one language would negatively impact learning more generally. While it is the case that children learning two languages may learn each more slowly than children exposed to only one, the developmental ‘lag’ quickly disappears with age. These findings are important to policies around bilingual education, suggesting that immersion programs will not hinder learning (e.g., Holobow, Genesee, & Lambert, 1991).

UNDERSTANDING OTHERS

Many topics already covered in this chapter relate to children’s developing understanding of the people around them. Attention to faces in early infancy, forming attachments to parents, and perceptual systems that parse the sounds of human language all support our ability to make sense of others’ behaviour and predict their future behaviour. The importance of these and other social cognitive abilities can perhaps best be appreciated when we consider how hard it is to navigate human society when the abilities are limited, as is thought to be the case for individuals with autism spectrum disorder (Box 5).

Key to our mature understanding of others is the seemingly human-unique suite of social cognitive skills that researchers refer to as *theory of mind*. Theory of mind is our understanding that the behaviour of other people is caused by their internal mental states, such as their intentions, desires, and beliefs. We cannot directly see others’ beliefs, but we can infer them based on the context, past behaviour, and current behaviour. You will likely predict, for example, that a friend will look for his book on his desk where he left it, even if

you borrowed it when he was away and left it on your own desk. You know that his belief as to the location of the book is different from your own knowledge.

This type of inference undergoes a major change in the preschool years, and developmental psychologists have found that many social, cognitive, and neurodevelopmental factors shape the timeline of theory of mind development. Some studies, for example, use electroencephalography (EEG), a procedure that measures electrical activity of the brain over time using electrodes placed on the scalp, to assess ways in which brain maturation might be specifically related to developments in preschoolers' theory-of-mind (e.g., Sabbagh, Bowman, Evraire, & Ito, 2009). Related research considers the role of neurotransmitter systems (e.g., dopamine) in shaping children's social cognitive development (Lackner, Sabbagh, Hallinan, Liu, & Holden., 2012).

Our brains develop within our social and cultural environments, though, as you have likely recognized throughout this chapter. Thus, theory of mind research also considers how brain maturation interacts with relevant, everyday social experiences. For example, parents' use of mental state talk with their young children is correlated with children's later theory of mind development (e.g., Ruffman, Slade, & Crowe, 2002). It is possible that mental state talk provides them with fact-based knowledge about mental states, and it might help children to start to take the perspective of others by using their own perspectives as a comparison.

As noted, the ability to reason about others' mental states is integral to efficiently navigating our social world. There are, thus, direct applications of the study of theory of mind to the study of autism, but the applications can extend far more broadly. For example, those studying how children learn from others (social learning) consider how children differentiate knowledgeable from ignorant individuals (e.g., Poulin-Dubois et al, 2016), and researchers who are characterizing the factors that encourage or discourage bullying and prosocial behaviour consider underlying social cognitive reasoning (e.g., Dunfield & Kuhlmeier, 2013). As a further example, clinical psychologists work with developmental psychologists to examine the role of theory of mind in the etiology, pathology, and phenomenology of depression in adolescents and adults (e.g., Zahavi et al., 2016).

BOX 5. AUTISM

Autism Spectrum Disorder (ASD) usually emerges in the first three years of life. It is a developmental disorder, and as such, it is particularly important to diagnose and treat ASD early in life (though there is currently no 'cure').

One characteristic of ASD is a difficulty and disinterest in engaging in social interactions. Many researchers have suggested that this key feature of ASD has foundations in early infancy. Whereas typically developing infants attend to faces and biological motion, infants who later are diagnosed with ASD show deficits in attention to social stimuli (e.g., Klin, Lin, Gorrindo, Ramsay, & Jones, 2009; Osterling & Dawson, 1994). This inattention may derail subsequent experiences, leading to inattention to higher-level social

information. In this way, development is driven to more severe dysfunction, and deficits are ultimately seen in additional domains, such as language development.

Developmental psychologists have been working for many years to find reliable predictors of ASD during the first year of life. New findings from the study of typical cognitive development are often considered in relation to children who are at risk of developing ASD (e.g., siblings of already-diagnosed children). Until we have reliable predictive tests, though, diagnosis cannot occur until behavioural symptoms emerge in later toddlerhood. Treatment is often delayed, potentially missing a developmental period in which intervention may be particularly successful in mitigating some of the impairments seen in ASD.



Figure 8. Developmental psychologists work with clinical psychologists and medical doctors to develop treatments that help children with ASD have more intensive

SECTION RECAP

This chapter has thus far been divided into two areas of developmental research: social and cognitive. As you likely noticed, the lines separating the areas are at times ‘fuzzy’, yet there has been a tradition in developmental psychology to loosely organize around these two areas. This is not to suggest that the work occurs in two separate silos. For example, even research on children’s developing understanding of objects, including their understanding about the number of objects, will also consider the social environment. Learning about objects relies on not only on children’s perceptual development and recognition of physical causality, but also on how they learn from knowledgeable others about an object’s function and name. Number cognition develops within cultural systems that have symbolic count words, artifacts such as calculators and the abacus, and mathematics notation.

Perhaps in part due to the breadth of developmental psychology as a field, there are

many relevant career paths that incorporate its theory and methodology, either directly or indirectly. In the next section, we provide examples of these careers, as well as some of the educational paths students can take.

4. EDUCATIONAL PATHS AND CAREERS

Most of the studies and the applications of research findings described in this chapter are the result of projects led by developmental psychologists who have completed a doctorate (e.g., Ph.D.) degree. The basic science underlying any novel application or intervention can take many years to complete (indeed, basic science is often completed with no application in mind). Along the way, though, the work is only possible through the combined work of many individuals with many different types of educational backgrounds and job experience.

Before discussing different educational and career paths relevant to developmental psychology, it is important to consider a distinction that will often confuse students early in their undergraduate training: How do developmental psychologists differ from child clinical psychologists? In fact, before reading this chapter, some students might have reasonably, though incorrectly, thought that only clinical psychologists consider applications of psychological research.

Developmental psychologists are interested in understanding the mechanisms of change by examining the interactions between nature (our genetic inheritance) and nurture (the physical and social environment). They are often interested in species-typical developmental paths, but intriguing individual differences may also be uncovered. Clinical psychologists tend to emphasize the individual differences, particularly those relevant to psychological health and well-being.

Many child clinical psychologists are primarily practitioners and see clients, which requires specialized training. Developmental psychologists typically do not have the requisite training to be registered as this type of “Psychologist” and instead engage in specialized research training. That said, some child clinical psychologists are scientist-practitioners and collaborate closely with developmental psychologists in research settings.

With this distinction in place, we can now consider the educational and career paths relevant to developmental psychology. As in most disciplines, the career opportunities will differ based on the level of education completed, so undergraduate training is presented separately from graduate training in this section. Also, similar to many disciplines, there are not many ‘hard and fast rules’; remember that there are many routes possible to reach your goals.

UNDERGRADUATE TRAINING

In North America, undergraduate degrees in psychology are not typically specialized in a particular area like developmental psychology (it is a general degree in *Psychology*), though psychology majors and other majors may choose to emphasize this coursework in their training. Many colleges and universities have courses that cover the field in general

(*Developmental Psychology*) and courses that provide specific focus (*Language Development, Infancy, Social-Emotional Development, Cognitive Developmental Neuroscience*).

Knowledge gained from developmental psychology courses provides good preparation for graduate training in psychology, social work, speech-language pathology, occupational therapy, teaching, law, and public policy, among others. Some students take developmental psychology courses to complement their undergraduate and graduate training in education and even computer science (e.g., educational software development). Of course, some careers may be started without further training in graduate school – it is never too early to start looking at job advertisements and reading the professional profiles of people who have a career that interests you.

Resources for students can typically be found on their college or university campus, but online resources are also available from reputable organizations. Both the Canadian Psychological Association (CPA) and the American Psychological Association (APA) have subsections specific to developmental psychology, for example.

GRADUATE TRAINING

Those who apply to graduate school in developmental psychology typically hold an undergraduate degree in psychology, but it is not uncommon to have a background in neuroscience, biology, philosophy, linguistics, or another related field. Prospective students start their search by considering *who* they want to work with: Is there an individual or team whose research you find particularly relevant to your career goals? The next consideration is often the school itself: What resources (collaborators, funding, professional development, etc.) does the university provide?

In many programs, graduate students earn a master's degree before continuing on to the Ph.D. degree. A master's degree can prepare students well for some of the types of graduate training described above; for example, a master's degree could be attained before or after law school with the goal of practicing family law. Individuals who earn a Ph.D. are considered experts in their field and have strong research, data analytic, and critical thinking skills that can be applied to many different settings.

Graduate training is perfect for people who enjoy discovery and problem-solving. Perhaps an underemphasized trait, though, is having an entrepreneurial spirit that motivates you to create the career you want. Developmental psychologists have created careers within both the academic and nonacademic sectors, using their skills in various ways, including the following:

RESEARCH AND TEACHING (*typically with a Ph.D.*)

- Colleges/Universities
- Government
- Medical Centers

APPLIED/CONSULTING (*typically with a Master's or Ph.D.*)

Software Development
 Online Content Curation
 Marketing
 Youth Service (NGO's)
 Child Welfare Agencies
 Education: Curriculum & Content
 Education: Children's Museums
 Science Writing
 Toy Design

SECTION RECAP

Developmental psychologists are well-versed in the key theories of their field. They can create empirical research methodologies to test new hypotheses, and they analyze the resulting data. They know how to critically evaluate claims and effectively communicate findings to other scientists as well as the broader community. In some cases, research findings become relevant to the development of new programs and interventions, which themselves must be evaluated empirically before implementation and policy change. Depending on their chosen career and level of education, people trained in developmental psychology may apply some or all of these skills in their work.

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[9]

NEUROSCIENCE AND CAREERS

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WHAT IS NEUROSCIENCE?

Neuroscience is a highly interdisciplinary science that explores the relationship between the nervous system, behaviour, cognition, and disease. While the study of the nervous system harkens back to Egyptian times, modern neuroscience combines aspects of physiology, anatomy, psychology, biology, and mathematics to explore how the nervous system works at the cellular, molecular, cognitive, and societal level (Squire et al., 2012). Broadly, neuroscientists are interested in understanding how cells in the brain (primarily neurons and glia) communicate with one another, how they are organized to form circuits, how external and internal stimuli influence these circuits, and how they might go awry in the context of disease or trauma. Recent technological innovations in the 20th century with regard to both molecular biological and neuroimaging techniques have led to significant advancements in our understanding of brain function. However, despite these advances, exactly how the brain combines external and internal signals to create a perceptual reality remains elusive.

The last 50 years has seen a massive increase in Neuroscience research, incorporating expertise from a wide range of scientific disciplines. To begin to understand the current state of neuroscience, it is useful to briefly review some of the major milestones across the history of research into the nervous system.

HISTORY OF NEUROSCIENCE: SIGNIFICANT SCHOLARLY FINDINGS

PRE-18th CENTURY

The study of the brain dates back through millennia (see Kandel, Schwartz, Jessell, Siegelbaum, & Hudspeth, 2013). The earliest written record referring to the brain dates

from the 17th century BC, with an Ancient Egyptian medical text called the Edwin Smith Papyrus, which describes the symptoms associated with head injuries in two patients. Early descriptions of basic neuroanatomy have been found in Egyptian texts from the 3rd and 4th centuries BC, including reference to the cerebrum, cerebellum and ventricles. The idea that the brain was the physical location of the mind was suggested as early as the 5th century BC by the Greek philosophers Alcmaeon of Croton and Hippocrates. This relationship between brain and mind was not universally accepted however, with Aristotle (4th century BC) believing that the brain acted to cool the blood, with intelligence instead located in the heart. The importance of the relationship between the brain and body was highlighted by the Roman physician Galen in the 2nd century AD, who correctly identified 7 of the 12 cranial nerves, proposing that these nerves carry fluid from the brain towards the rest of the body. While further detailed characterization of the anatomy of the central nervous system would take place over the next 1500 years, including the contributions in 14th century by de Luzzi and da Vigevano, in the 15th-16th century by da Vinci, Vesalius and in the 17th century by Willis, substantial advancements in understanding the detailed functionality of nervous tissue would not be seen until the late 18th century.

18th TO MID-19th CENTURY

Luigi Galvani (1737–1798) was an Italian physician who first discovered the link between electricity and activity of the body. By applying static electricity to a nerve in the leg of a dissected frog he revealed that electrical stimulation could produce contraction of the leg muscles. These experiments represent the origin of the discipline of electrophysiology. Demonstration that the brain and not the heart was the physical location of the ‘mind’ was not achieved until the 19th century, in part through the work of the French physiologist Jean Pierre Flourens (1794-1867). Working with rabbits and pigeons, Flourens lesioned areas of the brain and found impairments in sensory and motor skills. His work however was consistent with the prevailing view at that time that the brain was a unitary and indivisible organ, and that specific functions were not localized to specific brain areas. This view was ultimately challenged by explorations of linguistic deficiencies in humans. In the mid-19th century, the French neurologist Paul Broca described a patient who has suffered stroke resulting in specific impairments in his ability to speak, although his ability to understand language was seemingly unaffected. Following the death of the patient, Broca undertook a post-mortem examination and identified a specific region of the left frontal lobe that was damaged. Further studies of a total of eight similar individuals with similar impairments and similar patterns of damage led Broca to the conclusion that specific functions, such as language, are associated with specific areas of the brain.

LATE 19th CENTURY

A few decades later, work from the Italian biologist Camillo Golgi (1843-1926) would produce a watershed in our conceptualization of the organization of tissue in the brain. In the 1870s, Golgi invented a procedure for staining brain tissue with silver chromate salts. This technique, still widely used today, has the remarkable effect of completely staining a small subset (1-5%) of neurons in the brain. There is still no clear explanation for why some cells take up this stain while others do not. This technique was employed extensively by

Santiago Ramón y Cajal beginning in 1887, allowing him to detail the shapes of hundreds of individual neurons across many different parts of the brain. This led Cajal to various conclusions including that brain tissue was a network of individual cells, with individual cells varying dramatically in their shapes and complexities depending on their location within the brain. Despite this morphological variability, neurons all seemed to have a cell body to which were connected two types of process, with many branching dendrites providing the input to the neuron, and a single axon providing the output from the neuron. These observations were used by Cajal to strongly support the neuron doctrine, that the neuron is the fundamental unit of signalling in nervous systems. Golgi and Cajal were awarded the Nobel Prize in Physiology or Medicine in 1906, for their pioneering contributions to understanding of the fine anatomy and organization of neural tissue. The legacy of these early microscopic anatomical studies is still clearly visible in neuroscience textbooks today, most of which still carry drawings of cells made by Golgi or Cajal, and invariably include images of Golgi-stained cells.

In the late 19th century, Emil du Bois-Reymond, Johannes Peter Müller, and Hermann von Helmholtz demonstrated that these neurons were electrically excitable and were therefore likely to be the cells carrying those signals that were first identified by Galvani. Furthermore, they found that electrically excited neurons were able to create changes in the electrical states of other nearby neurons.

20th TO EARLY 21st CENTURY

The question of exactly what caused the transmission of electrical activity from one neuron to another was finally answered in 1921 by the German pharmacologist Otto Loewi (1873-1961). In what has become a very famous experiment, Loewi took a frog heart which was bathed in a saline solution and electrically stimulated it via the vagus nerve, causing the heart to beat more slowly. He then took some of the surrounding solution and applied it to a second heart that had not been electrically stimulated and found that this caused the second heart to also beat more slowly. He concluded that electrical stimulation of the heart caused the release of a chemical into solution, and this chemical by itself was sufficient to stimulate the second heart to beat more slowly. The chemical was later identified as acetylcholine, which was the first of many neurotransmitters that would ultimately be identified. For this research, Loewi was awarded the Nobel Prize in Physiology or Medicine in 1936, together with Sir Henry Dale who was able to demonstrate that the active chemical from Loewi's experiments was indeed acetylcholine. Subsequent work by Sherrington found that these chemical messengers were usually released at small specialized structures called synapses, where chemical messages allowed one neuron to either excite or inhibit another; research for which Sherrington was awarded the Nobel in 1932.

By the 1930s, an emerging picture of the central nervous system had thus been established. The brain was the physical location of the mind, and controlled thought, sensation and movement. Brain tissue was composed of individual neurons each of which had an input and an output. Information was transmitted along neurons in the form of electrical impulses, with intercellular communication mediated by chemical messengers which we now call neurotransmitters. The last century has built upon this foundation with extraordinarily rapid advances in our understanding of the nervous system. Any summary of these advances will by its nature be very incomplete. We here choose to review progress

by focusing exclusively on those neuroscientists whose research has been awarded the Nobel Prize in Physiology or Medicine. Names and dates of Nobel prize awards are indicated in parentheses below after “NP”. See www.nobelprize.org for all awards.

The 20th century saw enormous advances in our understanding of neuronal communication, both in terms of how information is transmitted along an individual cell, and also between different cells. New techniques that allowed visualization and recording of electrical signals were developed in the 1920, and different neurons were shown to transmit electrical signals at different speeds, depending on the thickness of the neuron (NP: [Erlanger & Gasser, 1944](#)). These tools led to an elegant series of experiments by Hodgkin and Huxley that elucidated the molecular basis of electrical signaling. Using the giant axon of the squid they were able to record electrical potential across the neuronal membrane. By manipulating the ionic solution in which the neuron was bathed, and the electrical potential across the membrane, while recording the magnitude of current flowing across the membrane, they developed a model of how an electrical impulse is produced and propagated along neuronal axons, mediated by the flow of different types of charged ions both along and through the membrane. Eccles extended these findings by describing how electrical activity at the synapse could lead to excitation or inhibition of adjacent cells (NP: [Eccles, Hodgkin Huxley, 1963](#)). Elucidation of the properties of individual ion channels that underlie changes in electrical currents across neuronal membranes was finally achieved through development of the patch-clamp technique, which allowed recording of electrical activity across microscopically small areas of cell membranes (NP: [Neher & Sakmann, 1991](#)).

In parallel with the detailed characterization of electrical properties of neurons, other neuroscientists were focused on understanding the basis of the chemical signals that mediated communication between neurons at the synapse. Building upon the earlier work of Loewi and Dale which identified acetylcholine as the first neurotransmitter, von Euler and Axelrod described a second neurotransmitter norepinephrine, which functioned (in part) to regulate blood pressure, and made the important observation that some antidepressants acted by blocking the reuptake of the neurotransmitter at the synapse. Katz demonstrated that neurotransmitters were stored in small vesicles in one neuron, with vesicles released into the synapse following electrical stimulation, in a mechanism that required changes in intracellular calcium signalling (NP: [Katz, von Euler, Axelrod, 1970](#)). The complex process of vesicle release was carefully elucidated by Südhof, Rothman, Schekman (NP: [2013](#)). Many additional neurotransmitters were also identified by other researchers including dopamine, the deficiency of which was associated with Parkinson’s disease, leading to novel therapies for the disorder. Synaptic signalling was further refined with an understanding that while some neurotransmitters result in electrical changes in target cells, others change the chemical signalling environment of their targets, including mediating changes in synaptic strength as a form of learning and memory (NP: [Carlsson, Greengard, Kandel, 2000](#)).

The above studies describe how signals move along neurons, and between closely adjacent neurons. However, signals can also be transmitted across much larger distances, in some cases by hormones that are released by the brain and that act on neuronal and non-neuronal targets throughout the body. Guillemin and Schally identified the specific factors that were released by the brain that cause the release of hormones from the pituitary gland at the base of the brain. To allow the effects of such hormones to be characterized, Rosalyn Yalow developed a technique that combined radioactive isotopes with highly specific antibodies to track levels of such hormones in the body (NP: [Guillemin, Schally, & Yalow, 1977](#)). In

addition to hormones released by the brain acting on non-neuronal tissue, extensive work characterized the effect of other factors released by non-neuronal tissue on the brain. For example, Levi-Montalcini identified nerve growth factor (NGF) – a substance isolated from tumours in mice that would cause growth of the nervous system in chick embryos. This formed the basis of detailed characterization of the role of various growth factors in the development and adaptation of the nervous system (NP: [Cohen & Levi-Montalcini, 1986](#)).

Beyond understanding the functionality of individual molecules and cells of the nervous system, other neuroscience pioneers explored various systems, including sensory systems by which the brain receives information from the outside world, and motor systems by which the brain acts on and interacts with the outside world. As an example of motor systems, early work on anesthetized cats revealed that weak electrical stimulation of the hypothalamic region of the brain could produce complex behavioural responses including both defensive and aggressive behaviours (NP: [Hess & Moniz, 1949](#)). For sensory systems, Nobel prizes have been awarded for the elucidation of both visual and olfactory systems. Collectively, Granit, Hartline and Wald pioneered research that enhanced our understanding of the operation of the retina, including characterizing chemical changes that resulted from exposure to photons of light, the presence of different types of photosensitive cells resulting in colour vision, and how signals received by nearby retinal cells are compared within the retina to highlight contrasts in our visual fields (NP: [Granit, Hartline, & Wald, 1967](#)). In the following decades, Hubel and Wiesel explored how these retinal signals were then processed by the brain, with separate processing streams focused on different aspects of the visual input such as movement, contrast, and linear orientation (NP: [Hubel & Wiesel, 1981](#)). Research on the olfactory system was awarded the Nobel in 2004, for research demonstrating that the rich diversity of smells that are detectable are the result of the combined actions of hundreds of different chemical receptors called olfactory receptors, which in turn are the product of hundreds of different olfactory receptor genes. Individual smells are the result of the combined signalling of different odorants across a wide spectrum of different receptors (NP: [Axel & Buck, 2004](#)).

Other advances of the last century that led to receipt of the Nobel Prize include an understanding of functional differences between the left and right hemispheres of the brain (NP: [Sperry, 1981](#)), characterization of prions as agents of infectious disease (NP: [Blumberg & Gajdusek, 1976](#); NP: [Prusiner, 1997](#)), and an understanding of how specific cells (termed place cells and grid cells) in the hippocampus and nearby entorhinal cortex contribute to the brain developing an internal map of the surrounding environment, and one's location within that environment (NP: [O'Keefe, Moser, & Moser, 2014](#)).

The above description of neuroscience advances represents the research of a small number of exceptionally talented and celebrated neuroscientists, and of course represents a small fraction of the research output for the discipline. For example, each year, >20,000 neuroscientists meet at the annual Society for Neuroscience conference to discuss their recent finding and celebrate our discipline. While much of the research is not considered directly applied, basic research can potentially lead to various societal changes, both in the present and anticipated for the future.

BRANCHES OF NEUROSCIENCE

Modern neuroscience can be broadly organized into several major branches:

- 1) Cellular and Molecular neuroscience
- 2) Systems Neuroscience
- 3) Cognitive and Behavioural Neuroscience
- 4) Social and Translational Neuroscience.

CELLULAR AND MOLECULAR NEUROSCIENCE

Cellular and Molecular neuroscientists are focused on understanding how cells of the nervous system express and respond to molecular signals. These scientists typically employ techniques and concepts of molecular biology to study how the brain develops, how cells communicate with one another, how genes and the environment might influence these processes, and how the brain can change and adapt (“neuroplasticity”) over the course of one’s lifetime.

SYSTEMS NEUROSCIENCE

Systems Neuroscience is a branch of neuroscience focused on understanding how different cell groups in the nervous system work together to create circuits, or pathways that have a functional outcome. For example, a systems neuroscientist might ask how specific anatomical regions and/or cell groups are involved in the higher order cognitive processes of learning and memory, or sensory functions such as vision. One branch of systems neuroscience is neuroethology, which involves the study of non-human model organisms to explore how certain sensory or cognitive functions exist in other species. By contrast, neuropsychologists explore how specific neural substrates may be implicated in human behaviour (and how damage to specific brain regions may yield unique deficits in cognition or behaviour).

COGNITIVE NEUROSCIENCE

Cognitive neuroscience is the third major Neuroscience branch and emerged out the fields of psychology and computer science. Cognitive neuroscientists are interested in understanding how specific brain circuits may relate to higher order psychological functions such as learning and memory, language, and thought. The field of cognitive neuroscience has benefited greatly from advances in neuroimaging techniques such as functional magnetic resonance imaging (fMRI), positron emission tomography (PET) and diffusion tensor imaging (DTI), in addition to electroencephalography (EEG). Behavioural neuroscientists (also known as physiological or biological psychologists) employ basic techniques of biology and chemistry to study the function of the nervous system, with a specific application to how cells and cell circuits relate to all aspects of behaviour. Most of the experimental literature has employed model organisms such as rodents or non-human primates, with more recent research using molecular biological techniques to explore how genes and/or epigenetics may modulate behaviour.

SOCIAL AND TRANSLATIONAL NEUROSCIENCE

Social and translational neuroscience are the most recently developed fields of

neuroscience. Social neuroscience borrows heavily from social psychology and seeks to understand how specific brain substrates, circuits, signals, and / or genes are related to behaviour, with an emphasis on domains of social behaviour. As humans are primarily a social species, this field has a focus on how higher order cognitive domains such as language and thought, as well as pathological conditions such as depression, may influence, and be influenced by, social behaviour. Related to social neuroscience, translational neuroscience is a field of study which translates study and knowledge of neuroscience to clinical applications. Translational neuroscientists are interested in applying technological advances in the field of neuroscience to address various societal needs, including novel treatments or therapies for neurological and psychiatric disease.

METHODS IN NEUROSCIENCE

Neuroscientists working within each of the major branches would typically apply a different set of techniques to answer questions about the brain (See Table 1 for a summary of some of the more common techniques). For example, while neuroscientists in general may be concerned with determining the neural basis for clinical depression, molecular-, systems-, cognitive-, and social-neuroscientists will employ differing techniques and methods to explore how proteins, cells, circuits, and brain regions may each be implicated in the aetiology of the disease.

CELLULAR AND MOLECULAR NEUROSCIENCE

A molecular neuroscientist may focus heavily on the application of molecular biology to the nervous system to answer questions regarding the pathophysiology of depression. For instance, they might be interested in identifying key changes in gene expression that are associated with depressive symptoms. This could be achieved by analysing expression levels of thousands of genes in various regions of the human brain using post-mortem tissues derived from individuals with and without depression. If the expression level of a specific gene was consistently higher or lower in the brains of depression patients compared with controls, that suggests that the gene may have a functional role in depression. These genetic profiles can also give us hints as to which proteins may be increased or decreased, and in which specific area of the brain. Furthermore, finding a biomarker that strongly correlates with depression has high diagnostic value in research and in medicine – a biomarker is an easily detectable molecule in our body that is correlated with, and used to predict the presence of disease, infection, symptom, or toxic exposure. To be useful, the biomarker must be detectable in tissues that can be easily obtained from patients (typically saliva, urine or blood). There are extensive interactions between the central nervous system and the periphery – our bodies can tell us numerous things about our brains. As such, a molecular neuroscientist might be interested in searching tissues outside of the central nervous system for candidate biomarkers for the diagnosis of depression.

A major component of molecular neuroscience involves the *manipulation* of genes within model organisms (rats, mice, zebrafish) in order to understand the function of that gene, including potential functions in the development of disease. Manipulations include changing the amount of gene product, changing the timing or location of gene expression, or changing the actual protein product that is generated by the gene. Molecular

neuroscientists might therefore be interested in studying one of the differentially expressed genes identified through gene expression studies. Potential research questions might include, “What is the importance of this gene during development?”, “If we restore this gene back to ‘normal’ levels, what does it do to depressive-like symptoms?”, or “If we change gene expression levels in a similar manner to those that were observed in gene expression studies, does it induce depressive-like behaviours?”. Answering these questions requires the genetic engineering of non-human animals, a technique which had grown in prevalence over the last two decades as the technology becomes increasingly sophisticated, reliable and affordable.

While genetic manipulations can alter the amount, location, or sequence of a protein, there are other methods for manipulating protein functions within cells. Pharmacological manipulations can include the use of competitive agonists (which activate proteins), competitive antagonists (which inactivate proteins), and neutralizing antibodies that interfere with the ability of specific molecules to bind to their specific receptors. Whether by genetic-engineering, or pharmacological manipulation, molecular neuroscientists are concerned with the molecular and cellular changes that underpin diseases. Other techniques in the arsenal of the molecular neuroscientist include using radiolabelled tracers to visualize, in real-time, the movement of neurotransmitter-containing vesicles down an axon. Use of fluorescent or bioluminescent markers to visualize specific interactions between individual molecules (the fluorescence resonance energy transfer [FRET] or bioluminescence resonance energy transfer [BRET] techniques), such as for measuring the recruitment of receptors to the membrane, the coupling of a ligand to its receptor, the coupling of two or more receptors, and the change in conformation of an existing receptor. Researchers use microdialysis to measure the concentration of a specific molecule in the synapse between two neurons or use retrograde and anterograde tracers to determine the physical pathways linking one neuron to another. Ultimately, cellular and molecular neuroscientists interested in depression might employ a broad range of tools to understand how proteins and cells are implicated in disease, and whether these changes may represent either the cause or consequence of the disorder.

SYSTEMS NEUROSCIENCE

Questions about individual cells and molecules may also be of interest to a systems neuroscientist, but they would typically be exploring how cells and molecules modulate the function of brain regions, or circuits composed of multiple anatomical and functional components. One example to illustrate the systems neuroscience approach would be to investigate the hypothalamic-pituitary-adrenal (HPA) axis, which regulates the release of the stress hormone cortisol in humans (corticosterone in rodents) and has been heavily implicated in the aetiology of depression. Release of the stress hormone is mediated by a cascade of signalling factors released from various organs including the brain and regulated in a manner that involves multiple different brain regions. As an example, a systems neuroscientist might explore signalling interactions between the hippocampus and the hypothalamus (the hippocampus senses levels of stress hormone and suppresses any further release of the hormone from the hypothalamus). To that end, they may manipulate hippocampal function in one of many possible ways (including through using a transgenic animal model, or ablation, or by stereotaxic delivery of a drug to the hippocampus, or

through electrical stimulation; see table 1 for details) and measure consequent changes in hypothalamic hormone release. This could be followed by post-mortem analyses of brain tissues by immunohistochemistry to determine whether patterns or levels of expression of specific proteins has altered in several interconnected brain regions. In the context of depressive disorders, any or all the above could be explored in the context of how these manipulations also impact depressive symptoms in model organisms.

COGNITIVE AND BEHAVIOURAL NEUROSCIENCE

In the study of depression, a cognitive neuroscientist could ask questions regarding how depression might affect activity levels of different regions of the brain, by for example using imaging techniques to search for changes in metabolic processes of specific brain regions between depressed patients and healthy controls. Cognitive neuroscientists heavily rely on modern neuroimaging techniques such as functional magnetic resonance imaging (fMRI, to measure cerebral blood flow), or positron emission tomography (PET, to measure the metabolism of glucose within brain regions). While MRI technologies have been used in diagnostic medicine since the 1970s, novel analysis of MRI sequences using specialized software developed by computer scientists allows for alternative forms of MRI such as diffusion tensor imaging (DTI) which allows high resolution mapping of the major connections that link and allow communication between different regions of the brain.

Electroencephalography (EEG) is another technique that can be used to measure the electrical activity of the brain. EEGs are an inexpensive means of measuring brain activity in awake humans. A cognitive neuroscientist might use EEG to explore differences in the patterns of electrical activity between depressed individuals and healthy controls while they are engaged in specific cognitive tasks that are designed to assess processes such as attention, inference, reaction time, working memory, or cognitive flexibility.

Behavioural neuroscience, wherein researchers are concerned primarily with physiological, genetic, and developmental mechanisms of behaviour, investigates the influence depression has on behaviour, and often involves use of animal models (such as rodents or zebrafish). Animal models could be generated by various methods including selective breeding for a desired trait (such as anxiety or aggression), by genetic mutation (such as metabolic diseases), or conditioning an animal to elicit a desired behaviour (such as social defeat paradigms and the production of a socially anxious animal). Behavioural neuroscientists have developed a wide array of behavioural paradigms to explore different aspects of depressive-like behaviour including measures of learned helplessness (to model despair), sucrose preference (to model hedonic feeding), food intake, or locomotor activity.

SOCIAL AND TRANSLATIONAL NEUROSCIENCE

Social neuroscientists are fundamentally interested in how the brain mediates social interaction; behaviours that are meaningful, elicited by one individual agency, directed towards another individual agency, and receive a response. Most applicable to depression, social neuroscience could explore how social behaviours such as work-place deviance manifest in the neurological condition. Alternatively, social neuroscientists might be interested in how specific gene polymorphisms influence individual vulnerability to depression following exposure to bullying – both in humans or non-human animals.

Translational neuroscientists apply basic neuroscientific research relating to structure and function of the brain in a clinical setting. For example, basic research might indicate that cerebral stimulation has a significant positive effect on depression. A translational neuroscientist might thus investigate the use of a transcranial magnetic stimulator (TMS) as a viable means for brain stimulation to decrease depressive symptoms, and determine the precise stimulation procedure (electrical frequency, duration, etc.) that generates the best results in patients. Alternatively, translational neuroscientists might explore new pharmaceutical drugs for the treatment of psychiatric or neurological disease, determining appropriate dose and duration of the drug to maximize efficacy. Neurorehabilitation is another area encompassed in translational neuroscience, wherein researchers develop, test, and optimize sensory prostheses for the implantation into humans suffering from sensory loss.

Animal Ethics in Neuroscience Research.

The use of animals in experimental research has always been a point of controversy. However, the use of animals in research is highly regulated, with usage most carefully controlled for animals with higher sentience (primates, then other mammals, then other vertebrates and certain molluscs). As such, research that induces suffering in any capacity (e.g., pain, adverse changes in psychological states, stress) must be stringently justified, and will often not be approved. That is, the expected benefits from the proposed research must outweigh the potential suffering of the animal. Governing the subjective nature of such decision-making is an institutional animal care committee composed of both scientists and members of the non-scientific community that decides whether or not the research merits the use of animals. In Canada, the federal government does not have jurisdiction to legislate animal experimentation but does exert influence through the Criminal Code of Canada, Health of Animals Act (1990), and the Canadian Food Inspection Agency. In order for institutions to be federally funded for animal research they must receive accreditation from the Canadian Council on Animal Care (CCAC), which is the national peer-reviewed organization that oversees and implements standards for animal ethics and care. Institutions that are accredited are eligible to receive funding from federal granting agencies, such as Natural Sciences and Engineering Research Council (NSERC) Canadian Institute for Health Research (CIHR), and the Social Sciences and Humanities Research Council of Canada (SSHRC). In addition, provinces in Canada have legislated their own animal-welfare protection acts, and similarly operate provincial-level regulatory agencies similar to the national CCAC body. Because of such system, each research project that includes the use of animals must first have their proposal approved by their institutions committee, and such proposals must abide by the standards set out by the CCAC.

Table 1: Examples of common techniques in Neuroscience

Name of the technique	Description/Purpose of the technique
Imaging and Microscopy	
Magnetic resonance imaging (MRI)	Use of strong magnetic fields and electrical currents to visualize brain structure in a non-invasive manner
Functional magnetic resonance imaging (fMRI)	Form of MRI that measures changes in blood flow to brain regions, from which localized brain activity can be inferred
Diffusion tensor MRI	Form of MRI that reveals major pathways of communication between regions of the brain
Computerized tomography (CT)	Use of X-rays to visualize brain structure in a non-invasive manner
Cerebral angiogram	Use of X-rays and an injected iodine tracer to visualize blood vessels in brain
Positron emission tomography (PET)	Use of injected radioactive tracers combined with imaging techniques to measure metabolic activity in brain
Electroencephalography	Use of external electrodes on the scalp to measure electrical activity of the cortex
Light microscopy	Visualize microscopic brain structure (i.e., neurons, glia)
Fluorescence microscopy	Visualize microscopic brain structures that have been tagged with a fluorescent marker, allowing the location of specific known molecules to be seen
Electron microscopy	Visualize microscopic brain structures at considerably higher magnification than is possible through light microscopy
Rodent behavioural paradigms	
Rotarod	Measure of coordinated movement
Vertical pole test	Measure of balance
Visual cliff assay	Measure of visual acuity
Morris water maze	Measure of cue-associated spatial learning and memory
Radial arm maze	Measure of spatial learning and memory
Novel object recognition	Measure of non-spatial learning and memory
Social approach/avoidance	Measure of social behaviours
Open field test	Measure of anxious behaviour

Name of the technique	Description/Purpose of the technique
Elevated plus maze	Measure of anxious behaviour
Forced swim test	Measure of disparity
Tail suspension assay	Measure of learned helplessness
Sucrose preference test	Measure of anhedonia
Surgical manipulations	
Stereotaxic surgery	Surgery that reproducibly targets a very specific region of the brain
Cannulation	Introduction of a cannula into a specific region of the brain to allow for controlled delivery of drug or electrode
Microdialysis	Continuously samples extracellular fluid from the brain allowing concentration of specific molecules to be determined in real time
Ablation	Removal/destruction of a specific brain region to investigate normal function of that region
Manipulation of cells and tissues	
Cell culture	Living cells are grown <i>in vitro</i> , allowing various manipulations to be tested in controlled living systems
Electrophysiology	Use of electrodes placed on or in cells to manipulate and record electrical activity, to explore factors that affect excitability of neurons
In situ hybridization	Labelled nucleic acid sequences are used to visualize the location and concentration of RNA molecules generated from specific genes
Immunohistochemistry	Labelled antibodies are used to visualize the location and concentration of specific proteins in slices of tissue
Immunocytochemistry	Labelled antibodies are used to visualize the location and concentration of specific proteins in cells
Anterograde and retrograde tracers	Use of chemicals that travel along cells in the same direction or opposite direction compared to the flow of information, in order to determine anatomical connections between cells
Molecular biology, genetics and genomics	
Southern/Northern/Western blots	Semi-quantitative methods to detect specific molecules of DNA/RNA/proteins
Immunoprecipitation	Use of an antibody to precipitate a specific protein out of solution, concentrating the solution, and potentially identifying other molecules to which the target protein binds
Enzyme-linked immunosorbent assay	Detection and quantification of peptides, proteins, hormone, and antibodies

Name of the technique	Description/Purpose of the technique
Selective breeding paradigms	Selectively breeding animals over many generations to enrich for genetic variants that may underlie specific traits
Genetic modification of animals	Model organisms have specific genes modified, inserted, or removed, in order to determine the function of the gene
Viral vector-mediated gene transfer	Use of viruses modified to contain specific genetic sequences, in order to introduce gene expression changes into animal tissues
Optogenetics	Insertion of light-sensitive receptor into membrane of neurons. Give experiment control over neuron excitation/inhibition
Genome-wide association studies (GWAS)	Analysis of DNA variation across the genome to screen for genes that associate with specific diseases or characteristics
Whole genome sequencing	Sequencing of the entire genome to screen for mutations, or genetic variations that associate with specific diseases or characteristics
Bisulphite sequencing	Modified DNA sequencing paradigm used to detect epigenetic (methylation) signatures on DNA molecules
Polymerase-chain reaction (PCR)	Amplification of DNA and RNA molecules
Real-time PCR	PCR-based quantification of DNA/RNA (commonly used for determining levels of gene expression)
RNA-seq/whole transcriptome sequencing	High-throughput sequence analysis of RNA extracted from tissues, to determine amounts of all genes expressed in those tissues

The above techniques were often developed in the context of academic research and remain used in that setting. However, neuroscientists use these and other techniques while working in a range of different career paths.

NEUROSCIENCE AND CAREERS

WHAT DO NEUROSCIENTISTS DO?

Neuroscientists are scientists who are engaged in activities that seek to improve our understanding of the nervous system and its relationship to behaviour and/or disease. Neuroscientists who are principle investigators (and who therefore determine their own research directions) have typically followed a training path consisting of an undergraduate degree in Science (B.Sc.) or Arts (B.A.), usually followed by a Master's degree, then a Ph.D. in Neuroscience or a related discipline. For those wishing to pursue an academic career, it is common to complete one or more post-doctoral positions, typically at an internationally reputed laboratory. Postdoctoral positions (commonly referred to as postdocs) involve working in the research lab of a principle investigator and leading individual research projects. Post-doctoral fellows also typically take on supervisory responsibilities for other members of the research lab, including graduate students. However, unlike undergraduate

or graduate studies, post-doctoral positions do not involve any course work. Instead, the focus is on acquiring techniques and publishing research. An academic, tenure-track appointment at a university is the typical desired outcome for people who have pursued each step of this pathway. However, these jobs have been [relatively scarce in the past decade](#).

In a university environment, neuroscientists may be spread across many different academic units, and departments fully dedicated to the discipline of Neuroscience are relatively rare in North America. For example, neuroscientists may be housed in a department of Psychology, Biology, Pharmacology, Cognitive or Computer Science. From a programmatic perspective, this can be challenging, as students who wish to obtain a degree in Neuroscience often may find that their degree has no ‘home base’, and instead consists of courses that may have a focus on neuroscience, but are housed in multiple, related units. Further compounding this issue is that neuroscience is not commonly taught in high school but may sometimes be included as part of a Biology curriculum. As such, many students graduate from high school not being aware that neuroscience does exist as a discipline of study. That said, neuroscience has been [growing over the last few decades](#), and is becoming more defined as a stand-alone discipline.

COMMON MISCONCEPTIONS ABOUT WHAT NEUROSCIENTISTS DO

There are several common misconceptions regarding what neuroscientists do. For example, it is common to confuse a doctoral (PhD) degree with a medical (MD) degree. However, neuroscientists (who have earned a PhD) are not trained to deliver therapy and they do not treat patients with medicine (as would someone with an MD). Neurologists are specialized medical practitioners who have earned an MD followed by residency training in neurology. Neurologists treat individuals with neurological disorders such as stroke, epilepsy, and Parkinson’s disease. Neurosurgeons have earned a medical degree followed by residency training in neurosurgery; as a surgical profession, neurosurgeons would operate on patients with any damage or trauma to their nervous systems, e.g., tumor excision.

Similarly, there are branches of psychological practice that often are confused with neuroscience: Clinical Neuropsychologists are individuals who have earned a PhD in Clinical Psychology, followed by, or with a specialization in neuropsychology. These individuals have the training to do both research and clinical practice, though they do not have training in medicine. Moreover, they are specialized to assess, diagnose, and treat patients with either congenital or acquired brain injury. Although a fundamental understanding of how the nervous system works is a key component of each of these above-mentioned disciplines (and indeed, it is common for someone interested in pursuing one of these careers to complete a Master’s in Neuroscience prior to completing an MD or Clinical Psychology PhD), it is important to emphasize that research neuroscientists do not treat or provide therapy to patients.

COMMON CAREERS IN NEUROSCIENCE

UNDERGRADUATE DEGREES

Students graduating with an undergraduate degree in Neuroscience will have developed a range of technical and analytical skills, and the ability to synthesize and communicate

research findings in an effective manner. For example, they have developed investigative and research skills in the collection, organization, analysis and interpretation of data, use of appropriate laboratory techniques, application of logical reasoning and critical/analytical thinking, proficiency in computing skills, familiarity with a wide range of scientific/lab equipment, and extensive oral and written communication skills. They are creative thinkers, can work effectively both as individuals and as part of a team, and they have advanced time-management skills. As with most university degree programs, neuroscience is not a vocational program – it does not lead directly into a specific and defined career. Instead, training received as an undergraduate provides students with an excellent foundation for a range of possible careers.

Based on our experience over the last decade, over half of students who graduated with an undergraduate degree in Neuroscience have secured employment in either a scientific research setting, in health care, or are in continuing education. Common research paths for Neuroscience graduates include coordinating clinical research trials or working as research scientists and research technicians in the government, academia or industry. While many graduates are therefore directly employed in a scientific environment, other students chose to pursue graduate degrees in neuroscience or a related discipline (including psychology, biology, biochemistry, pharmacology, ethics).

GRADUATE DEGREES

Graduate degrees can lead towards careers within academia or increase a student's opportunities of employment in non-academic environments. Health care professions are very popular with Neuroscience graduates. Many students wish to pursue medicine, though being a doctor is just one of many career options in health. Neuroscience graduates have successfully pursued continuing education to train in a variety of professions including psychologists, speech pathologists, occupational therapists, medical assistants, nurses, or polysomnographic technicians. While science, healthcare, and future education are the main career paths pursued by neuroscience graduates, almost as many of our graduates have followed alternative routes following graduation, including training as school teachers, working for government funding agencies, regulatory agencies, or the civil service, working in knowledge brokerage, law, or following careers as emergency responders (police, ambulance, firefighters).

TAILORING DEGREES WITH MINORS

In some cases, undergraduate students who have specific career interests are able to tailor their degrees in a manner that facilitate employment in those areas, such as obtaining a degree in Neuroscience with a Minor in Law, or a Minor in Social Work, if these specializations fit their individual career aspirations. In this way, an education in Neuroscience opens the door to many possible careers, without restricting graduates to a limited number of career options. While it is impossible to predict the major growth areas in terms of neuroscience career paths, some of the more promising areas for future expansion are described in detail in the following section.

APPLICATIONS OF NEUROSCIENCE IN SOCIETY

MEDICAL

Over 1000 neurological and neurodegenerative diseases affect the lives of almost 100 million people in the USA alone (Gooch, Pracht, & Borenstein, 2017), and neuroscience research has led to a diversity of therapeutic approaches to the treatment of diseases including mood disorders, chronic pain, neurodegeneration, stroke, and addiction. Many of these treatments are pharmacological, with widespread use of drugs including antidepressants, anti-anxiety medication, attention deficit hyperactivity disorder medication, etc., though non-pharmacological treatments have also been supported by neuroscientific research, including behavioural/lifestyle modification or external brain stimulation.

Unfortunately, many of the pharmacological interventions have been successful in only a subset of patients, with individuals often having to try several different treatment paths before finding one that is successful. This may be due to many disorders being commonly diagnosed through somewhat imperfect tests, often including self-report measures. A specific disease, defined by a collection of symptoms, may not be a unitary condition but instead a spectrum of related disorders, which collectively have a diversity of different potential origins and associated cellular and molecular signatures. While symptoms may be similar across individuals, the best route for treatment may be very different. Current research attempts to better define subsets of patients for various diseases, to facilitate more efficient targeting of specific treatment to the individual. Understanding the specific cellular and molecular deficits in an individual may be informative as to which molecules would be the best targets for pharmacological treatment.

PUBLIC HEALTH: RECREATIONAL DRUGS

Outside of drug development for medical purposes, there is a need for still more neuroscience research on recreational drugs. Use of legal means to control the misuse of recreational drugs (i.e., the ‘war on drugs’) has been of limited success, with a growing interest amongst some nations including Canada towards tolerance and education. We are continually exposed to the use in society of drugs that alter brain activity including some drugs that are common and largely accepted (e.g., nicotine, caffeine, alcohol), drugs prescribed to patients but for which dependency develops (e.g., our current opioid crisis), classical illegal drugs that stimulate our reward systems (e.g., cocaine, heroin) or alter consciousness (e.g., amphetamine, MDMA), drugs used to improve performance (e.g., Ritalin and Adderall for exam performance), or drugs that have been weaponized and used widely (including the date-rape drugs GHB or rohypnol). An important part of any strategy to deal with drug use and misuse is to understand the biological effects (both in the short and long terms) of these various drugs, for which additional neuroscience research and outreach to the community is required.

PUBLIC HEALTH: MENTAL ILLNESS

On a related topic, one of the most compelling (and difficult to measure directly)

applications of neuroscience on public health has been the impact of increased understanding of the role of the nervous system in psychiatric and neurological disease. Indeed, over the last 50 years, we have made great strides in our understanding of how key neural circuits and signals are disrupted in several disorders, including (but not limited to) depression, anxiety, schizophrenia, substance use disorders, attention deficit hyperactivity disorder, and dementias such as Alzheimer's and Parkinson's Disease, among others. These advances have led to not only the development of pharmacotherapeutics for the treatment of these disorders, but also, crucially, the de-stigmatization of mental health. More specifically, when we educate the public around the role of brain (dys)function underlying psychiatric disorders, it can lead to increased awareness and knowledge, and reduced blame for mental illness (Corrigan & Watson, 2004).

NEUROSCIENCE AND TECHNOLOGY: NEURAL INTERFACE DEVICES

In addition to pharmacological interventions, neuroscience research is likely to result in growth in the number, efficacy and complexity of neural interface devices. Devices are being developed that both enhance existing sensory inputs (including replacing deficiencies in inputs) or enhance/replace motor outputs. The range of applications is diverse, from the purely medical, to military, to recreational. Neurobionics, a rapidly advancing subfield of neuroscience, explores bionic therapies for sensory and motor impairments.

One example of bionic therapy is for blindness, which affects millions of people worldwide, with a subset of that population suffering from complete retinal degeneration. Among potential treatment options is sensory substitution, wherein an inoperable sensory organ is replaced with an artificial sensor. Most recently, cortical prostheses have taken a leap forward, featuring arrays that are upwards of 192 electrodes in size that are moulded to the occipital lobe of experimental subjects. Miniaturized computers connecting the electrode plates to light-sensing glasses worn by the subject can simulate a small, but promising, degree of vision (Maghbami, Sodagar, Lashay, Riazi-Esfahani, & Riazi-Esfahani, 2014). There are currently several groups of researchers actively engineering and developing visual prosthetics to better the quality of life for those suffering from blindness, Groups such as the Artificial Retina (University of S. California, University of California), The Boston Retinal Implant (Massachusetts Institute of Technology, Massachusetts Eye and Ear Infirmary), C-Sight (Shanghai Jiao-Tong University), Polystim (University of Montréal), Japanese Consortium for an Artificial Retina (Osaka University), and Optoelectronic Retinal Prosthesis (Stanford University) each demonstrate unique and successful efforts to enhance vision for those impaired. Many of these projects combine an external visual processing source (i.e., a camera attached to the frames of glasses), a processor that breaks down visual images into similar bits of information that the brain uses to construct visual images, and a transducer that turns such bits of information into patterns of activation on the microarray of electrodes which then stimulates the visual cortex. Other prostheses exist that are also integrating neural interfaces, such as prosthetic hands that give amputees a functional hand, or cochlear implants that restore function back to the deaf and hearing-impaired.

NEUROSCIENCE AND THE LAW

The legal and ethical ramifications of current and future research in neuroscience are

likely to be diverse, from which a few examples will be introduced. In criminology, identification of structural and/or functional correlates of criminal behaviour will lead to questions of free will and determinism, and debates about the concept of criminal responsibility. Remaining with the judicial system, neuroscientific research of memory has clear implications for reliability and accuracy of witness testimony. Within pharmacology, there is limited and contentious evidence to support the efficacy of current brain-enhancing drugs (termed “nootropics”) such as Ritalin and Adderall, yet such drugs are widely used in college campuses to improve performance. If the efficacy of these, or other drugs, was clearly demonstrated, it may lead to the need for drug testing analogous to that employed in competitive sport, especially in the context of examinations that are viewed as a component of competitive entry to certain career or funding opportunities.

The last decade has seen dramatic proliferation of wearable biometric technology. Most of our cell phones are quietly collecting information about our daily activity. Some phones can sense when you are looking directly at the screen. Our watches may be constantly collecting data on our heart rate, while we may be inputting data on our sleep patterns, our meditation routines, and/or our patterns of eating and drinking, to name a few. There are important ongoing conversations around the ownership, privacy and security of these data. The coming decades are likely to see growth of biometric inputs to incorporate limited neural data – data that, as with heart rate, we are often unaware of inputting to our devices.

FUTURE CONSIDERATIONS FOR THE DISCIPLINE OF NEUROSCIENCE

The discipline of neuroscience has clearly grown and thrived over the last number of decades. Recent announcements of international, federal and local funding opportunities related to neuroscience and brain health suggest that the study of the nervous system and its application to several branches of society will continue to grow. For example, the Human Brain Project, an ongoing initiative from the European Union, was the winner of one of the largest European scientific funding competitions, with an estimated cost of \$1.19 billion euros between 2013-2023. Similarly, the White House BRAIN initiative, announced in 2013, saw an initial investment of over \$100 million dollars (US) in the development of neurotechnologies. Despite the dramatic advances in our understanding of the nervous system over the last century, we are just starting to make sense of the enormous complexity that underlies the structure and function of the human brain and how it underlies all thought, behaviour and perception.

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[10]

INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY

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If you have ever held, or applied for, a job, you are already acquainted with the subject matter of Industrial/Organizational (I/O) psychology. Since the beginning of the 20th Century, Industrial/Organizational psychologists have been studying, and working with, individuals and organizations on various aspects of the employment relationship. For most of us, paid employment will be one of the defining roles of our lives – affecting both our individual health and well-being (see Kelloway & Day, 2005; Warr, 1987) as well as the quality of our experience in other roles such as spouse or parent (e.g., Barling, 1990). Every one of us who works also has an employer – some individual or organization who pays for our services and has a legitimate interest in ensuring that we work effectively and efficiently.

The Canadian Society for Industrial/Organizational Psychology (CSIOP), defines I/O psychology as:

Industrial-Organizational Psychology is a field of both scientific research and professional practice that aims to further the welfare of people by: understanding the behaviour of individuals and organizations in the work place; helping individuals pursue meaningful and enriching work; and assisting organizations in the effective management of their human resources. (Kline, 1996, p. 206)

There are two critical aspects of this definition. First, as noted above I/O psychology is focused on both individual (i.e., helping individuals pursue meaningful and enriching work) and organizational (i.e., effective management of human resources) goals. Kline (1996, p. 206) suggests that I/O psychologists might be involved in:

- carrying out task analyses,
- determining the knowledge, skills, abilities and personal characteristics needed for certain jobs
- providing recommendations on how to assess potential employees or actually

conducting the assessments,

- providing guidance on how to train employees,
- assessing work performance and motivate employees,
- determining group effects on work performance,
- examining communication within and commitment to the organization,
- understanding the human-machine system and the complexities of their interactions.
- assisting in the selection and training of competent leaders,
- assisting in career assessment and career development
- assisting in changing the organization to become more effective, and
- assisting in managing relationships between employees and managers

Although the distinction is a bit arbitrary, these tasks correspond to a traditional distinction between industrial – or personnel – psychology (e.g., task analysis, employee selection, training) and organizational psychology (e.g., leadership, group dynamics, organizational change) that emerged as a result of the historical development of the field (see below). In practice, individuals may specialize in one or more areas, but training standards adopted by both the U.S. based Society for Industrial/Organizational Psychology (SIOP) and CSIOP ensure that I/O psychologists are trained in all of these areas.

Aside from this content focus, one of the most important aspects of the CSIOP definition is that it defines I/O psychology as comprising both professional practice and scientific research. This perspective is known as the scientist-practitioner model. As psychologists, we are trained as social scientists who draw on, and contribute to, the theories and methods of psychology. Most I/O psychologists have extensive training in scientific research and research methodology. At the same time, many of the questions addressed in I/O psychology (e.g., how do we hire the best employees? How do we stop workplace bullying? How can we reduce job stress?) are immensely practical.

Individuals can choose to enact their role as scientist-practitioners in a variety of ways. For example, I/O psychologists who work as faculty in universities may emphasize “science” – focusing their efforts on research and publication. Those who work in Human Resource departments or as consultants may be more attuned to the concerns of practice and less involved with research and publication. Still others in the field, consciously adopt a boundary spanning role attempting to engage in professional practice while continuing to do research. However one chooses to enact the role, all I/O psychologists share a common body of knowledge that includes both science and practice.

THE HISTORY AND CONTEXT OF I/O PSYCHOLOGY

Given this scientist-practitioner perspective, it is not surprising that I/O psychology developed as an outgrowth of two sets of influences. First, the growth of industrialization

(particularly in the U.S.), and the practical questions it gave birth to, shaped the direction and focus of I/O psychology. Second, the development of psychology and the experimental method inevitably contributed to, and shaped, I/O psychology.

It is not at all coincidental that the first two books in I/O psychology were entitled *Increasing Human Efficiency in Business* (Scott, 1911) and *Psychology and Industrial Efficiency* (Munsterberg, 1913). In the early 1900's, economic, and social trends (Viteles, 1932) resulted in a glorification of industrialization and progress. Any field that claimed to advance the interests and tenets of capitalism was widely accepted. Psychology itself was undergoing a similar revolutionary change. The growth of the experimental method and a focus on individual differences paved the way for much of what would subsequently be called I/O psychology. Science was increasingly seen as the answer for all problems, and the application of the scientific method to more practical problems was only a matter of time.

One of the great early experimentalists was the German psychologist Wilhelm Wundt. His lab was to be the starting point for most of I/O psychology. Emil Kraepelin, for example, trained under Wundt and in his own research became interested in the study of work performance and fatigue (1896). Wundt also trained Walter Dill Scott and Hugo Munsterberg, two figures who are often seen as the first I/O psychologists.

After earning his PhD in the Wundt lab in 1900, Walter Dill Scott moved back to the United States, where he became a professor at Northwestern University. He did research on a variety of practical problems including the application of psychological principles to advertising and personnel selection. Eventually he became the first person in North America to receive the title of professor of applied psychology (Vinchur & Koppes, 2007).

Hugo Munsterberg was both a physician and a psychologist who trained in Wundt's experimental psychology lab. As a professor at Harvard University he became the most noted promoter of applied psychology, writing more than 20 books on the topic between 1906 and 1916. His book *Psychology and Industrial Efficiency* (Munsterberg, 1913) is often cited as the first text for I/O psychologists.

As Koppes and Pickren (2007) note, many other individuals at the same time were becoming interested in problems of industry. Walter Bingham (the founder of the Carnegie Tech applied psychology program), Arthur Kornhauser (a graduate of Carnegie Tech who pioneered the study of job stress and mental health), Louis Leon Thurstone (a pioneer in measurement theory and statistics but who also worked in selection and vocational guidance), and James McKeen Cattell (the founder of The Psychological Corporation, the first I/O consulting firm) were all interested in applying psychology to work.

America's entry into World War I dramatically boosted interest in applying psychology to practical problems. The American military needed to select an unprecedented number of applicants and to place them into jobs in the most efficient way possible. Robert Yerkes, then president of the American Psychological Association and a professor at Harvard, worked with the military to develop a new test – Army Alpha – based on the newly developed practice of standardized intelligence testing. An alternate version of the test – Army Beta – was developed to accommodate recruits who could not read or write. In addition to being the training ground for many who would become well-known I/O psychologists, the success of the Army testing program convinced many of the value of selection tests. When military commanders hung up their uniforms and returned to industry, they continued the practice of selection testing in their civilian jobs.

After the war, research and practice in I/O psychology was focused on selection and

placement – this was to change with the conduct of a series of studies at the Hawthorne Works of the Western Electric Company (Highhouse, 2007). The Western Electric Company wanted to demonstrate that their lamps (that produced more light than did those of their competitors) would benefit industry. They conducted a series of experiments that varied illumination levels to see if productivity would also change. Although it is difficult to determine the exact details of the studies (Highhouse), the researchers found that productivity improved regardless of the change in the level of illumination. If the factory was made brighter, productivity went up. If they made the factory darker, productivity also went up!

One explanation of this puzzling set of results became known as the Hawthorne effect -i.e., do anything and it works. Simply by paying more attention to the workers, the researchers may have inadvertently produced an increase in productivity. The existence of Hawthorne effects continues to be debated (Adair, 1984) but the most important outcome of the Hawthorne studies is that researchers were led to think about other aspects of the workplace – including small group dynamics, stress and job attitudes. These new research foci became the basis of organizational psychology and eventually would merge with industrial psychology (i.e., selection and personnel practices) to form the field of industrial/organizational psychology.

During World War II psychologists again were active in selection for the military, but they also became involved in a host of other activities. The design of training and training techniques, as well as the optimal design of workplaces and equipment, were also foci of enquiry. Samuel Stouffer (1949) summarized much of this work in his book *The American Soldier*, which included consideration of topics that would be familiar to any modern-day organizational psychologist—job satisfaction, motivation, perceived justice, and group cohesion.

The end of World War II again meant that many people returned to their civilian jobs with the memory of psychological techniques and interventions that had proven successful in dealing with many human resource issues. As industry flourished, so did I/O psychology. In 1945, Division 14 (Industrial and Business Psychology) of the American Psychological Association was formed, and by 1950, the field of industrial/organizational psychology was firmly established.

The passage of the Civil Rights Act of 1964 in the United States was a major impetus to the further development of the field. The Act prohibits discrimination in employment on a variety of grounds and I/O psychologists were instrumental in devising means of [a] showing that such discrimination existed and [b] developing ways to implement nondiscriminatory practices. Around the same time, individuals began to demand more meaningful work, and psychologists such as Frederick Herzberg argued that there was an economic logic to the demand, suggesting that “happy workers were productive workers.” Although this hypothesis is still being debated today (Cropanzano & Wright, 2001), it led to an explosion of job satisfaction research. Indeed, by 1976, Locke had identified more than 5,000 empirical articles dealing with the topic of job satisfaction.

In 1965, Kornhauser published *The Mental Health of Industrial Workers*, one of the first major investigations into job stress. Subsequent research verified his findings and led the U.S. Secretary of State to commission the widely influential report *Work in America* (1974). These key studies led to the formation of the new field of occupational health psychology (Sauter

& Hurrell, 1999), in addition to leading organizational psychologists to focus on issues of job stress.

In 1973, the APA division dealing with Industrial Psychology was renamed the Division of Industrial and Organizational Psychology to reflect the growth of the field. In 1982 a new autonomous organization – the Society for Industrial/Organizational Psychology (SIOP) formed. Although the APA division continues to exist, SIOP has become the major professional association for the field with over 6000 members internationally.

I/O-EH? CANADIAN I/O PSYCHOLOGY

Although the development of I/O psychology in Canada lagged that in the United States, it followed the same general pattern. Prior to World War II, I/O psychology in Canada consisted of a handful of professional psychologists working in isolation (Bois, 1949). The Canadian I/O story really begins with the formation of the Canadian Psychological Association in 1938 – just prior to World War II. In anticipation of the war, psychologists from the University of Toronto, Queen's and McGill met with the government to discuss how psychologists could contribute to the war effort. This was the beginning of a longstanding and productive collaboration between Canadian I/O psychology and the military (MacMillan, Stevens, & Kelloway, 2009), as well as initiating the formation of the Canadian Psychological Association.

As in the U.S., these initial collaborations focused on the development of selection tests for the military including a unit focused on pilot selection for the Royal Canadian Air Force (RCAF), which operated primarily out of the University of Toronto. A second group developed the “M” test for selection and placement of Army officers and soldiers. Psychologists were also involved in numerous other activities related to the war effort including the establishment of day care centres that allowed women to enter the workforce to replace the male workers who had been called up to active service (Wright, 1974).

I/O psychology as a distinct profession in Canada has its roots in the work of Ed Webster who joined the faculty of McGill after doing morale research during World War II (Rowe, 1990). Webster made at least three substantial contributions to the field. First, he was one of the first to do research on the employment interview and his 1964 book *Decision Making in the Employment Interview* is considered a classic in industrial psychology. Second, Webster wrote the report of the Couchiching conference which established standards for graduate training in psychology – these standards were widely adopted by graduate programs in Canada. Finally, Webster was a professor who supervised his own graduate students. One of these – Patricia (Pat) Rowe was to play a major role in Canadian I/O psychology.

After her graduation, Rowe accepted a position at the University of Waterloo, where she founded and singlehandedly ran what is the most long-established I/O graduate program in Canada. Rowe supervised many of the I/O psychologists practicing and teaching in Canada today. She based the Waterloo program on a scientist-practitioner model and established links with consulting firms and other major employers in Canada.

By the 1980s, several other graduate programs had developed, many of which were based on the Waterloo model. Programs at the University of Calgary, University of Western Ontario, and Queen's University (the I/O program is now defunct) all offered graduate programs leading to a PhD in some area of I/O psychology. Saint Mary's University and the University of Guelph both offered a terminal master's degree, although both now offer PhD

programs. Other universities offer graduate education in organizational psychology under the auspices of their programs in applied social psychology (e.g., University of Saskatchewan, University of Windsor).

Although there are as many I/O psychologists practicing in Quebec as there are in the other provinces of Canada, English and French I/O psychology continue to exist as the “two solitudes” in many respects (Forest, 2007). For example, in contrast to the definition and competency areas of I/O psychology described earlier, the Quebec association defines I/O psychology in terms of five major areas of practice (i.e., (a) testing and evaluation, (b) organizational development and diagnosis, (c) training and coaching, (d) career management and reassignment and (e) employee assistance programs and psychological health (Forest). There is growing recognition of the benefits of Anglophone and Francophone I/O psychologists working together, yet language remains for now a formidable challenge to collaboration (Bonaccio et al., 2013). Efforts to overcome this hurdle have been, to date, sporadic and have not resulted in substantial agreement on ways in which the two groups of Canadian I/O psychologists can work together.

THE DISCIPLINE TODAY

I/O psychology continues to flourish, both in Canada and internationally. It is consistently identified as an area of employment growth with graduates having little difficulty in finding employment either within the Human Resources department of major organizations, as a consultant in a consulting firm or, of course, as an academic researcher working at a university or research center. Consistent with the scientist-practitioner model that continues to dominate the field, individuals often move back and forth between these roles. Academics often do consulting work “on the side”. Consultants move into HR roles or collaborate in academic research. Many consultants and HR professionals do some teaching “on the side” and in so doing bring a practitioner perspective to the teaching of I/O psychology.

TRAINING REQUIREMENTS

Although we have been using the term “psychologist” loosely, any discussion of training requirements in I/O psychology needs to recognize some legal constraints. In most jurisdictions of Canada, the term “psychologist” is a restricted term and refers to individuals who have registered with their provincial board or college of psychology. With few exceptions, the only people allowed to identify themselves as “psychologists” are those who have gone through the registration process. Because the title is regulated provincially, these restrictions may not apply to Federal employees and jurisdictions may make exceptions for some cases (e.g., professors of psychology at universities).

Although people who work in I/O psychology are eligible for registration, the majority opt not to register – seeing it as an expensive and burdensome process that is more oriented toward clinical practice than the work performed in I/O Psychology. The Canadian Society for Industrial/Organizational Psychology (CSIOP – the I/O section of the Canadian Psychological Association) advocates a policy of voluntary registration – suggesting that registration should not be mandatory for I/O psychologists but that they should be allowed to register if they so choose.

So why is this important? In many jurisdictions registration requires the individual to hold a PhD in psychology and if an I/O psychologist wanted to register then he/she would have to meet that standard. If you wanted to work in I/O and wanted to register as a psychologist, then you would be well advised to ensure that you complete your PhD and a school that is recognized by the provincial authority as providing adequate training. The established I/O programs in Canada (as well as some that offer I/O training in other areas such as applied social) generally meet that standard but it is a question that any prospective graduate student should ask. Similarly, teaching at university typically requires PhD level training from a recognized university.

If one is not concerned with registration, then it is also possible to do a PhD in management and still stay within the content domain of I/O psychology. Indeed, many of the best known I/O psychologists in Canada teach in business schools rather than psychology programs (for example Julian Barling at Queen's University, Rick Hackett at McMaster University, Gary Latham at the University of Toronto) and the content of these programs overlaps significantly with programs in I/O psychology. Graduates of business programs can teach in both business and psychology programs (just as graduates of psychology can also teach in business) although a business PhD would not typically be eligible for registration as a psychologist.

Having said that, it is quite possible and, indeed common, to work in I/O with a master's degree. In my program (Saint Mary's) for example, we generally find that about 50% of our M.Sc. students will leave after completing their masters to work as a consultant or in industry. The other 50% go on to PhD studies (some of who will also go into consulting and industry). They work for consulting firms, research firms (e.g., market research), in human resource departments or teaching in community colleges.

Employment in the field is generally limited to those who have graduate level training. Indeed, many universities do not offer undergraduate courses in I/O psychology and, if they do, there is often only one general course providing an introduction to the field. Universities with graduate programs in the field are more likely to offer a range of courses related to I/O (e.g., Personnel Psychology, Organizational Psychology, Occupational Health Psychology, Organizational Development). There is a great deal of overlap between the content of these courses and similar courses taught in a business school (e.g. Human Resource Management, Organizational Behavior) and some universities will offer a Certificate in Human Resource Management as part of an undergraduate degree. Although the Certificate may not allow you to claim to be an industrial/organizational psychologist, it often opens the door to a career in human resource management.

RESEARCH METHODS

The foundation of research and practice in I/O psychology is an interest in very practical questions. How do we hire the best employees for a job? How do we motivate those employees? How do we manage conflict in the workplace? How should organizational leaders behave? To answer these questions we draw on a wide range of research methods. Although there are certainly interesting examples of qualitative research in I/O psychology (see for example, Scales, Kelloway & Francis, 2014; Wright & Barling, 1998), consistent with our roots in experimental psychology, I/O researchers have focused on quantitative

methods. But because we focus on practical problems in real organizations, research and practice in I/O psychology can be complicated by both practical and scientific concerns.

McGrath (1981) suggested that any research design should achieve three things: [a] precision, [b] generalizability, and [c] existential realism. Precision is achieved when we can control the variables in the study and other aspects of the research setting. Generalizability is when the findings from a study can be assumed to apply to other populations. Can, for example, the results of a study of undergraduates generalize to all Canadians? Finally, existential realism is the extent to which the design uses “real” or “artificial” tasks. McGrath goes further to suggest that these considerations form a “three horned dilemma” for researchers. Attempts to maximize one of the three criteria inevitably come at the cost of at least one of the other two. Central to McGrath’s argument is the notion that it is impossible to maximize all three criteria in one study. Therefore, researchers need to use multiple research designs to ensure that all three criteria are met.

Laboratory experiments are, in many ways, the gold standard for research in psychology. Laboratory experiments allow considerable control over the variables and environment and allow us to identify causal processes. Kirkpatrick and Locke (1996), for example, were interested in whether having a charismatic leader would create higher levels of performance than having a non-charismatic leader. To do so they recruited undergraduate students to come into the lab and complete a complicated binder editing task. Students were given a stack of binders filled with paper and pages of instructions (e.g. in each binder replace p. 23 with the new page provided; change the pages from the red section of the binder to the blue section of the binder etc.). The researchers hired an actor to give participants the instructions following a script for either charismatic (speak positively, talk about the purpose of the task) or non-charismatic (read the instructions in a dull monotone) leadership. The design allowed the researchers to claim with considerable confidence that charismatic leadership did result in better performance on the task. However, one might ask whether the design had existential realism (do employees only have one “boss” who only speaks to them for 5 minutes? is the binder task a reasonable approximation to all kinds of work? Similarly, there are concerns about generalizability – student participants were not employees, and it is not clear that these results have any implications for organizations. As Kelloway and Day (2014) note, these concerns may be overstated. The available data suggest that study findings often do generalize beyond the lab (Locke, 1986; Mitchell, 2012) and experiments in I/O psychology tend to generalize better than experiments in other areas of psychology (Mitchell). Practically, however, it is difficult to convince a CEO to implement an expensive leadership training program based on a study of 40 undergraduates putting binders together and, as a result, lab experiments are rarely used in I/O psychology.

Field Experiments duplicate the logic of a true experimental design but attempt to do so in a realistic setting using real employees. For example, Barling, Weber & Kelloway (1996) conducted a field experiment in which bank managers were randomly assigned to either a leadership training program or a no-training control condition. They conducted employee surveys both prior to – and after the training and collected data on the financial performance of each branch. They showed that the employees of the trained leaders were more committed to the bank and that three of the four financial indicators increased as a result of the training. This design attempted to maximize precision (although one cannot possibly control for everything going on in an organization such as a large bank) while at the same time maximizing existential realism – these were real employees and managers doing

real jobs. However, the study was conducted in only one bank and whether the results would generalize to other banks or other industries (e.g., manufacturing, healthcare) could not be addressed in this study. Field experiments are difficult to conduct in organizations and their use in I/O psychology is still limited.

Correlational methods are much more widely used in I/O psychology research. For example, a great deal of research has been directed toward answering questions about the predictors of job performance. Researchers collect data on some hypothesized predictor (e.g., they have employees complete standardized measures of intelligence) and then correlate these responses with an outcomes such as annual performance ratings. This type of study is a test of the validity of the predictor.

Organizational surveys are widely used in I/O psychology. Many companies conduct an annual or bi-annual attitude or morale survey. The purpose of the surveys is to “take the temperature” of the organization – assessing whether employees are generally satisfied with their jobs and working conditions. In many organizations, executive compensation will be tied to the survey results (e.g., executives will receive a bonus if 80% or more of their employees are satisfied). I/O psychologists are frequently involved in the design and analysis of these surveys.

Correlational methods maximize generalizability (because data are collected from the actual employees of the firm) and have some degree of existential realism (because we ask employees about their working conditions. However, surveys typically lack precision. Although we can ensure that we are measuring the right things, we have little control over the many factors that might influence employee responses to the surveys. Indeed, Brief, Butcher, & Roberson, (1995) reported that employees who received a cookie while completing an employee attitude survey reported higher levels of job satisfaction than those who did not get a cookie! Increasingly, I/O psychologists are trying to improve survey designs by incorporating longitudinal data analysis (Kelloway & Francis, 2013). By examining relationships between variables over time – or how scores on the survey change over time – we can get a clearer idea of how employee attitudes influence outcomes of interest.

THE PRACTICE OF I/O PSYCHOLOGY

It is difficult to give a meaningful overview of how I/O psychologists work in organizations because they assume so many roles. However, some of the main areas of practice involve selection and assessment, executive coaching, job design and analysis and employee wellbeing. In practice, I/O psychologists may either specialize in one of these areas or work in several areas.

Selection and assessment

As you will recall, an early focus in I/O psychology was how to select and assign military recruits to jobs. Selection and assessment continue to be major areas of practice within I/O psychology with many practitioners focusing their work in this area. Typically, for example, I/O psychologists might assess candidates for a position using a variety of psychometric instruments (e.g., tests of cognitive ability, personality etc.) and interviews. Based on the assessment, the psychologist might make a recommendation to the company about who to

hire – or might suggest how a given candidate would be likely to perform under different conditions.

This intensive level of assessment is typically limited to executive or professional positions as it is a typically a very expensive process. I/O psychologists also design selection systems for organizations that are designed to be used for all employees. For example, many firms use short, computer-administered tests of cognitive ability, personality and integrity as part of their hiring process. Although I/O psychologists may not be directly involved in administering and scoring the instruments – they have typically been involved at an earlier stage in the process – making recommendations to the company as to what tests to use and how to combine results.

Executive coaching

Many I/O psychologists provide executive coaching services in which they work one-on-one with an individual to help him achieve his/her goals. Executive coaching may begin with assessments of the individual's abilities and preferences. It may also include 360-degree feedback in which data are collected from the clients, superiors, peers and subordinates. These data may then provide the focus for the individual to either attempt to correct weaknesses in performance or to build on existing strengths. As coaches, I/O psychologists draw on their extensive knowledge of organizational and interpersonal dynamics to help individuals to achieve their goals.

Job analysis and design

Job analysis – the systematic analysis of jobs to identify job duties and requirements is fundamental to many areas of human resource management. Typically, job analyses serve as the basis for performance assessments, training, selection criteria, and compensation structures. I/O psychologists have expertise in conducting job analyses in both small and large organizations. Although rarely undertaken as a stand-alone activity, job analysis is typically followed by the development of a selection system, performance appraisal instrument or some other human resource management tool.

I/O psychologists also work in the area of job design – trying to make jobs either more efficient or more engaging for employees. Again, the process begins with a job analysis and then the psychologist makes recommendations for restructuring tasks or providing more feedback to individuals.

Employee Wellbeing

Stress and wellbeing are an increasingly large aspect of work in I/O psychology. Indeed, a new subfield – occupational health psychology – has emerged reflecting widespread interest in this area. Most individuals interested in occupational health psychology have some affiliation or training in the broader field of I/O psychology. In Canada, there has been increased interest in workplace wellbeing and, more specifically, in mental health in the workplace (Kelloway, 2017). One landmark event was publication of a National Standard for Psychological Health and Safety (CSA1003-2013). This is a voluntary standard – although organizations are not required to follow it, an increasing number of organizations see considerable value in implementing the standard in their workplace. The standard is based

on four general principles, requiring organizations to have a corporate commitment to improving psychological health and safety, to have leadership commitment to the issue, to involve employees in the identification of workplace issues and the design of workplace programs, and to ensure the confidentiality of individuals. Assisting organizations in these areas is a task particularly well-suited to the skill sets of I/O psychologists.

Although I have highlighted four areas of practice, this is really only scratching the surface of what I/O psychologists do in practice. I/O psychologists also help organizations in designing and improving team processes, designing training programs, and improving conflict management processes. Given extensive training in research design, many I/O psychologists provide program evaluation services – assessing whether programs or policies in the organization are having their intended effect. Psychologists also advise organizations on policies and procedures to prevent discrimination in hiring and promotion decisions, to manage and prevent workplace bullying and violence and to prevent sexual harassment in organizations. Indeed, it does not go too far to claim that I/O psychologists are involved in virtually every aspect of organizational functioning.

ILLUSTRATIVE FINDINGS

In this section, I present some illustrative findings from the research literature in Industrial/Organizational Psychology. In doing so, I focus on two areas that have garnered extensive research attention and have considerable practical implications for organizations; hiring and leadership.

HOW DO WE HIRE THE BEST PERSON FOR THE JOB?

Recall that one of the earliest applications of I/O psychology was the selection of soldiers during World War I. This interest in selection – how we get the best person for a given job – has remained a large part of the practice of I/O psychology and there are decades of research focused on one or more aspects of the hiring procedure. Hiring is a complex process and is highly regulated by labour and human rights legislation – for our purposes we will focus on the psychological aspects of the hiring process.

To an I/O psychologist, hiring somebody is a problem of prediction. What information can we collect now that will give us an accurate prediction of how a job candidate might perform the job? If we have multiple candidates, then our task will be to rank order the applicants in terms of their predicted performance and then hire the ones with the highest predicted performance. This presumes that we know [a] what tasks and responsibilities are involved with the job, [b] what effective performance of those tasks looks like. I/O psychologists use a process called job analysis to identify the major duties of a job and begin to identify the qualities and characteristics necessary for effective performance. The end result of a job analysis is often a job description – a concise written summary of the position and its requirements (Kelloway, Catano & Day, 2011). The job analysis will typically identify specific skills, certifications and training required for the job – during the hiring process we can assess whether candidates have those skills and certifications.

Perhaps the most common way to assess a candidate's skills and certifications is with a resume. Resumes typically describe both your education and your previous job history. Unfortunately, Hunter and Hunter (1984) found that resumes were not very good predictors

of performance. The problem, as you might guess, is that people frequently lie or exaggerate on their resumes.

Resumes typically are used to select the individuals who will be invited to a screening interview. We have all participated in such interviews – interviewers typically review your resume asking about specific jobs and often throw in vague questions (“what is your greatest weakness as an employee?” “where do you see yourself 5 years from now?”). Recently some companies have advocated the use of “brainteaser” questions (e.g., how would you estimate the number of fire hydrants in San Francisco?) – claiming that they identify candidates who are creative. Google – for many years the main proponent of such questions, has recently concluded that they add little to the hiring process (Nilsen, 2015). This conclusion is consistent with the academic literature that suggests that these unstructured screening interviews do not give a very good prediction of future job performance (Wiesener & Cronshaw, 1988).

So, what does predict performance? One way to see if someone has the skills needed to do a job is to get them to actually do the job for you. These are called work sample tests, or simulations – if you need to hire someone to drive a vehicle then a driving test might be in order. If you are hiring for keyboarding skills, then a typing test might fit the bill. If you are hiring someone to teach a university class, have them teach a class as part of the hiring process. These work sample tests can provide a very good idea of whether or not someone can do the job (Hunter & Hunter, 1984).

The interview can also be improved by adding structure (Wiesener & Cronshaw, 1988) as well as by incorporating elements of a work sample test. Interviews are structured when every candidate is asked the same questions and there is a pre-determined scoring scheme for the answers (much like a test or an exam). We can mimic a work sample by asking candidates about their previous performance (e.g., “Tell me about a time when you had to deal with a difficult customer”). Asking about prior performance in similar situations in this way is the basis of behavior descriptive interviewing (Janz, 1982, 1989). When candidates might not have the experience, we can ask about a hypothetical situation (Latham & Saari, 1984; Latham, Saari, Pursell, & Campion, 1980) – e.g., “Imagine you are dealing with a customer who is angry because the product she bought is defective What would you do?”. Both behavioral and situational interviews have been shown to be good predictors of on-the-job-performance. Hypothetical situations can also be asked about in a paper-and-pencil test with multiple choice answers and these “situational judgment tests” are also good predictors of performance (Weekley & Ployhart, 2006). Typically, such tests might present more than one correct answer and the candidates are asked to choose the “best” answer from the provided alternatives.

Beyond the skills required for the job, researchers have also identified personal characteristics that might predict job performance. One of the earliest and most researched predictors is general cognitive ability – across a wide variety of occupations, general cognitive ability positively predicts job performance – the more cognitive ability you have the higher your job performance is likely to be (Gottfredson, 1997; Ree & Carretta, 1998). As Kelloway et al. (2011) note, cognitive ability tests can also result in discrimination against some groups and, therefore, their use in selection is still somewhat controversial.

Personality tests may also give useful predictors of future job performance. The “Big Five” dimensions – conscientiousness, emotional stability (also known as neuroticism), openness to experience, agreeableness, and extroversion – have all been found to predict job

performance (Barrick & Mount, 1991; Tett, Jackson & Rothstein, 1991) as well as other behaviors important in organizations (Darr & Kelloway, 2016).

WHAT DO EFFECTIVE LEADERS DO?

There is no doubt that leadership is critical to organizations (Barling, Christie & Hopton, 2011). Leaders are often tasked with ensuring that organizations achieve their goals and the way in which leaders treat employees has direct implications for attitudes and behavior including outcomes such as job satisfaction (Judge & Piccolo, 2004), turnover (Bycio, Hackett, & Allen, 1995), health and safety (Mullen & Kelloway, 2011), as well as individual (Kirkpatrick & Locke, 1996), group (Bass, Avolio, Jung, & Berson, 2003) and the organization's financial performance (Barling et al., 1996). It is important, then, for us to understand what effective leadership really means.

The first approach to understanding effective leadership was based on the notion that the history of the world was shaped by “great men [sic]¹” (Carlyle, 1907). It was thought that we would learn about successful leadership by reading biographies of leaders such as Alexander the Great or Julius Caesar. Biographies of successful business leaders (e.g., Welch & Byrne, 2003) are still popular ways of learning about leadership although no longer considered a research technique. The “great man” approach did lead to a focus on leadership traits – relative enduring characteristics of individuals. For example, both height (Judge & Cable, 2004) and intelligence (Judge, Colbert & Ilies, 2004) are related to leadership as are the traits comprising the “Big 5” model of personality (i.e., agreeableness, conscientiousness, openness to experience, extraversion, neuroticism, Judge et al., 2002).

One of the most influential approaches to leadership emerged just after World War II in a series of studies known as the Ohio State Studies (e.g., Kerr, Schriesheim, Murphy, & Stogdill, 1974). These researchers identified two aspects of leaders' behaviour – “Consideration” behaviors focused on people rather than on tasks. In contrast, “initiating structure” comprised behaviours that were focused on the task – establishing clear guidelines and procedures for how the work was to be done. Judge et al. (2004) found that there is good evidence that consideration is moderately to strongly correlated with morale and employee attitudes whereas initiating structure is associated with task and group performance.

Identifying behaviors that characterized effective leaders led to the hypothesis that leaders should change their behaviors under different circumstances. Both Fiedler (1967) and House (1971) proposed influential theories of what became known as situational leadership theory that reflected this notion. There is fairly good evidence for the idea that different leader behaviors are more effective under different circumstances (e.g. Peters, Hartke, & Pohlmann, 1985; Wofford & Liska, 1993).

Situational theories have been supplanted by what may be termed the modern theories of leadership. Although there are several such modern theories, the most influential and intensely researched (Barling et al., 2011; Judge & Bono, 2000) is transformational leadership theory.

Transformational leadership (Bass, 1985; Bass & Riggio, 2006) is based on four forms of behaviour sometimes referred to as the “four I's” of transformational leadership. Leaders

1. Historically, a strong gender bias excluded the consideration of “great women” although a great deal of research now speaks to the leadership effectiveness of both men and women in organizations.

demonstrate *individualized consideration* when they recognize individual strengths and weaknesses and pay attention to followers as individuals. Coaching, mentoring, and supporting individuals are all characteristic of individualized consideration. *Intellectual stimulation* involves challenging existing beliefs and encouraging employees to think for themselves to generate solutions to long-standing problems. Adopting a questioning stance, encouraging creativity and facilitating independent thought are all characteristics of leaders who demonstrate intellectual stimulation. *Idealized influence* occurs when leaders are concerned with what is best for followers and the organization (i.e., doing the “right” thing rather than taking the easiest course of action). Leaders who act in this way create a sense of shared mission and build trust and respect among their followers because they can be counted on to go beyond self-interest to do what is right. Finally, *inspirational motivation* is evidenced by leaders who set high but achievable standards and who encourage followers to achieve more than they thought. Telling stories and using symbols are integral to inspirational motivation, which is aimed at increasing employees’ sense of motivation and self-efficacy.

There is a great deal of evidence supporting the effectiveness of transformational leadership behaviours. When leaders engage in these transformational behaviors, they are seen as more productive, elicit better performance from their followers at the individual, team and organizational levels, and have followers who are more satisfied with their jobs and their leaders (Judge & Piccolo, 2004). Importantly, there is also evidence that transformational leadership can be taught to managers (see, for example, Barling, Weber & Kelloway, 1996; Kelloway, Barling & Helleur, 2000; Mullen & Kelloway, 2009) and that when leaders learn and demonstrate transformational leadership, employees demonstrate improved attitudes and performance (Barling et al., 1996; Mullen & Kelloway, 2009).

CONCLUSION

For over 100 years now I/O psychologists have been working to make organizations more efficient while, at the same time, improving the lives of working people. Adopting a scientist-practitioner model that values both research and working in applied settings, I/O psychologists have focused on broad range of topics. How to hire the best employees and how to be an effective leader are just two of the important questions asked by I/O psychologists. New questions continually emerge (e.g., the effects of new technology on organizational behavior, Day, Scott & Kelloway, 2010) and this is just one of the reasons that I/O psychology is listed as one of the fastest growing professions of the decade (Shellenbarger, 2010) and the second most attractive occupation in science (U.S. News & World Report L.P., 2018).

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[11]

PSYCHOLOGY AND THE LAW IN CANADA

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PSYCHOLOGY AND THE LAW IN CANADA

Russell Williams was a model member of the Canadian military. Joining the Canadian Forces in 1987, he quickly became a respected pilot and officer at postings, such as CFB Portage la Prairie, CFB Shearwater, and in Ottawa. Posted to CFB Trenton in 2004, he became base commander in 2009. On January 28, 2010, 27-year-old Jessica Lloyd was reported missing from an area near the base. Police, while investigating, noticed distinctive tire tracks in the snow. A police officer canvassing the area for witnesses noticed similar tracks on Williams' SUV. On February 7th, 2010, Williams was interrogated by police and confessed to Lloyd's murder. He ultimately described more than 80 crimes, including break-ins, thefts, sexual assaults, and another murder. Williams' crimes followed an escalation from fetish burglaries, to sexual assault to sexual homicide. Williams painstakingly documented his actions, with photos, copies of newspapers reports of the crimes, and items he had stolen from his victims. He was sentenced to two concurrent life sentences without the possibility of parole for 25 years. Interested readers are encouraged to consult Brankley, Goodwill, and Reale (2014) for a more in-depth psychological perspective on the case.

THE INTERSECTION OF PSYCHOLOGY AND THE LAW

Russell Williams' crimes and their aftermath left a lasting impression on many people – how could such a respected individual, with all the success he had enjoyed, be driven to commit these crimes, and then be able to cover them up for so long? Was there any evidence

that linked Williams to earlier cases, or did he really display no evidence of violence prior to his officially documented offences? Why would someone keep such detailed records of their crimes? How was it that his sexually violent behaviours stayed hidden for so long? This case illustrates some of the many ways in which psychology and the legal system interact. These are just some of the issues that psychologists and psychological researchers deal with when psychology and the legal system interact.

DEFINITIONS & HISTORY

Forensic psychology (and the field of psychology and the law, more broadly) can be defined as the application of psychological theory, research, methods, and practice to the legal system. In many ways, forensic psychology is not a new field. Discussions of the link between psychology and the legal system goes back to the 1800s. The first documented consideration of psychological issues and the law dates back to Hugo Münsterberg's 1908 book *On the Witness Stand*. He touched on many topics, including crime detection, eyewitness testimony, false confessions, and even how to prevent crime. He urged the courts to make use of the burgeoning field of experimental psychological research to improve the accuracy of legal decisions. Münsterberg got a lot right, but in many ways, he was ahead of his time. The research was not yet where it needed to be to effect change within the legal system. Indeed, his work was widely criticized (e.g., Wigmore, 1909; 1940) and research in the area was quiet for approximately 50 years.

The 1950s and 1960s saw a resurgence in the field, and the role of psychology in the legal system became a serious area of academic research. Clinicians, researchers and academics began to be sought as experts in court, and this increased throughout the 1970s and 1980s. These psychologists and academics covered many topics, including basic issues in legal process, impacts on memory and decision-making, and clinical issues such as corrections, insanity defenses, and the role of mental illness as a mediator in criminal behaviour. Since the 1990s, the integration of psychology and law has become more defined; it is common now for courts and law enforcement to look to experts to help develop policy and process (see Roesch, Zapf, Hart & Connolly, 2013, for a review).

LICENSURE

A large proportion of forensic psychologists are licensed psychologists. Licensure in Canada is provincially regulated (<https://www.cpa.ca/accreditation/PTlicensingrequirements/>), however, each province's rules are consistent with the Canadian Psychological Association (CPA) standards (e.g., CPA, 2012). CPA has suggested that all licensed psychologists have a PhD. In addition to an appropriate degree, trainees need to have completed 2-6 years of supervised clinical practice and must pass a comprehensive standardized test (currently the Examination for Professional Practice in Psychology, or EPPP). Some provinces have additional requirements (e.g., in Ontario you complete a jurisprudence exam).

A FEW WORDS ON ETHICS

Regardless of whether they are licensed, psychologists are bound by a code of ethics

for their research and practice. For clinicians, all professional behaviour must follow provincially mandated ethical guidelines, which are based on international standards (see CPA, 2017). Violation of these ethical guidelines can lead to censure, loss of professional privileges, and even loss of employment. Psychologists must work within their scope of practice (i.e., work only within their area of expertise), avoid multiple roles (e.g., cannot treat a family member or someone with whom they have a close personal relationship), and must maintain confidentiality and security of privileged information (CPA). There are also additional guidelines that influence the work of forensic psychologists, such as the forensic speciality guidelines (American Psychological Association, 2013).

Psychological researchers also have the requirement that their research abide by the Tri-Council Ethical Guidelines (see <http://www.pre.ethics.gc.ca/eng/education/tutorial-didacticiel/>). These guidelines mandate that researchers ensure participants give informed consent, that they be truthful in their interactions with those participants, use deception only if necessary, protect people from harm, maintain confidentiality, and debrief their participants. All professionals are themselves responsible for ensuring that they have comprehensive knowledge of their respective boundaries of practice.

Now that we have covered the basics of forensic psychology, how it came to be, and who works in the area, we will delve into some specific topics within the field, and how professionals work in these areas. We will explore forensic assessment in criminal and civil domains, correctional psychology, police psychology, police investigations, and the role of psychology in legal decision making.

FORENSIC ASSESSMENT IN CRIMINAL AND CIVIL DOMAINS

Forensic assessment is a highly specialized form of psychological assessment (see Clinical Psychology Chapter for further information on psychological assessment) that involves sharing an informed opinion on a legal issue. Forensic assessments differ from typical psychological assessments in several ways, with arguably the most important distinction being the nature of the referral question. Forensic assessments are narrowly focused on specific legal matters and are most useful to parties to a legal proceeding or legal decision makers who must consider several factors when rendering a legal decision (e.g., considering how a person's past behaviour might impact future behaviour). In the following section, we will briefly review some of the more commonly requested assessments in criminal and civil contexts with a specific focus on the Canadian context.

CRIMINAL DOMAINS

There are several different types of forensic assessments that can be useful to parties in the Criminal Justice System. In these assessments, forensic psychologists will use a wide variety of general and more specialized forensic assessment tools (Heilbrun et al., 2003; Heilbrun & Brooks Holliday, 2013). In the current section, we briefly review forensic mental health and risk assessment.

Forensic mental health assessments are conducted by professionals who provide clinical assessment information to legal decision makers or litigants (Heilbrun, 2001). Two commonly ordered forensic mental assessments are *fitness to stand trial*, and *not criminally responsible on account of a mental disorder* (NCRMD). According to the Canadian Criminal

Code (1985) for someone to be fit to stand trial they must be able to understand the court process, the consequences of the court proceedings, and communicate with their lawyer. For NCRMD, the first question that must be answered is whether the accused has a mental health disorder and, if present, if it impaired their ability to appreciate the nature of their acts or to know that their acts were wrong (Canadian Criminal Code). Given that these assessments often involve questions about mental health, when psychologists are involved, they fall under the purview of Clinical-Forensic Psychology.

Forensic psychologists can be involved in fitness and NCRMD assessments, which are often conducted by a multidisciplinary team. The role of the psychologist in these assessments varies (e.g., providing psychological testing, providing a second opinion on the ultimate legal issue) depending on where the assessment takes place. A recent position paper released by the Canadian Psychological Association has advocated for psychologists to be explicitly identified in the Criminal Code as being able to perform these assessments independently, as psychiatry often takes the lead role on these assessments (see Hessen Kayfitz et al., 2017 for further information).

Another major role of forensic psychologists is risk assessment. Risk assessment is a comprehensive information gathering process that involves the identification of risk factors, the synthesis of information into a determination about risk to reoffend (recidivism), recommendations about evidence-based approaches to manage risk, and communication about this information to the referral source (Mills, Kroner, & Morgan, 2011). Risk assessment has evolved in large part due to the work of psychologists (many of whom are Canadian) from being a relatively unstructured and imprecise method to a highly structured process in which assessors use specialized risk assessment tools to help them reach informed decisions about risk to reoffend (e.g., Mills et al.).

Best practice in risk assessment involves the inclusion of static (generally historical and unchangeable, such as criminal history) and dynamic (changeable factors, such as substance use) risk factors, as dynamic risk factors add incrementally to the predictive validity of static risk factors (e.g., Wilson, Desmarais, Nicholls, Hart, & Brink, 2013). Dynamic risk factors also represent important targets for risk management, as they are modifiable, whereas static risk factors are not. More recently, there has been a movement to include protective factors (factors that decrease the likelihood of recidivism) in risk assessment (e.g., Structured Assessment of Protective Factors for Violence Risk; de Vogel, de Ruter, Bouman, & De Vries Robbe, 2009). Despite this development, there is disagreement about the conceptualization of a protective factor and their value in risk assessment (e.g., some have argued that a protective factor is just the inverse of a risk factor; e.g., Harris & Rice, 2015). Some research has shown that when protective factors are incorporated into violence risk assessment that they add to the predictive validity of traditional risk assessment tools (e.g., de Vries Robbe, de Vogel, & de Spa, 2011).

Forensic mental health and risk assessments can occur with special populations (e.g., youth, offenders with intellectual disabilities). One special population is young offenders (in Canada these are youth between the ages of 12 and 17) and separate legislation has been developed to address criminal justice proceedings with youth (Youth Criminal Justice Act, 2003). A medical or psychological report can be ordered at various times during these proceedings if there are questions about the presence or a mental disorder, the person has repeatedly been found guilty, or the youth has committed a serious violent offence

(YCJA). As a result, forensic psychologists are often involved in conducting a comprehensive assessment that involves a mental health and risk assessment.

Importantly there are also specialized sentencing options for youth. Eligibility for these sentencing options could hinge, in part, on the results of a forensic assessment. For example, a specialized sentencing option for youth is Intensive Rehabilitative and Conditional Supervision (IRCS). An IRCS sentence allows the youth to first receive intensive therapeutic support while in custody and then be released under conditional supervision. There are different eligibility criteria for an IRCS sentence, including the presence of a mental disorder and the presence of a treatment plan that could reduce risk (YCJA, 2003).

CIVIL DOMAINS

Traditionally forensic assessment has been focused on criminal law, but there is a compelling case for the utility of forensic psychology in civil litigation (Greene, 2003; Morgan & Palk, 2013). In civil matters, there are several legal issues where forensic psychologists can offer an opinion that would assist the courts, such as psychological injury, professional malpractice, wrongful termination, and parental capacity. Forensic psychologists can be retained by either side in civil proceedings. For example, they can be retained by the plaintiff to examine the impact of an event on the plaintiff or hired by the defense to evaluate the claims of the plaintiff or a report submitted by another expert (Gottlieb & Coleman, 2012). Given the number of contributions forensic psychologists can make to these proceedings, the involvement of forensic psychologists in civil litigation has increased over time (Greene, 2009).

One example of civil litigation where a forensic assessment can be useful is personal injury assessment (this term includes psychological injuries). According to Ackerman (2010), civil litigation on personal injury involves the determination of damages that stem from an injury and a determination of who is liable for those damages. Forensic psychologists are often involved in the determination of damages, though there are occasions where they will assist with determination of liability, particularly when the cases involve liability on the part of a medical professional. Although there are many challenges to civil litigation cases involving psychological injuries (see Vallano, 2013 for a review), forensic psychologists may be particularly useful in assisting the courts to understand the psychological injury that is the focus of the proceedings, its cause, the influence of pre-existing psychological injuries, and the likely prognosis. Forensic psychologists can also contribute specialized testing that not only assesses for the presence of mental health disorders, but also considers the impact of response style (e.g., is the person exaggerating reported psychological symptoms) on the results of the assessment.

Forensic assessments can also be useful in family law, for example in custody disputes. Forensic psychologists who conduct custody assessments should have competency in a wide variety of areas including, but not limited to, an understanding of the research literature on divorce and child custody, an understanding of developmental and family psychology, and knowledge of the family court system (Gindes, 1995). Psychologists may fulfill different roles in these proceedings and these assessments address a myriad of complex issues, such as child abuse and domestic violence allegations, the presence of mental illness, and issues specific to child development (Gottlieb & Coleman, 2012). Child custody evaluations are a contentious

area of practice, as psychologists who conduct these types of assessments are subject to a high number of ethics complaints (Bow, Gottlieb, Siegel, & Noble, 2010).

CAREER PATHS

For students who are interested in pursuing a career that involves forensic assessment there are several settings where these assessments might be conducted, such as hospitals, correctional institutions, youth facilities, private practice, or police agencies. Given the diverse settings in which forensic assessors are employed, it would be expected that the job requirements would differ depending on the setting (e.g., whether one needs to be a licenced psychologist).

It is important to note that in many jurisdictions forensic assessment closely intersects with other disciplines, such as Developmental Psychology, Clinical Psychology, or Counselling Psychology. For example, since many of the forensic assessments involve broader clinical issues (e.g., NCRMD assessments), practicing forensic psychologists are often required to be registered with their local regulatory bodies in the areas of Clinical or Counselling Psychology as well as Forensic Psychology. For those interested in pursuing a career path in forensic assessment, it is recommended that they investigate graduate schools where faculty can provide forensic research training and where there are also ample opportunities for forensic placements.

CORRECTIONAL PSYCHOLOGY

Psychology can be applied to correctional settings in multiple ways, including assessment, crisis intervention, staff training, administrative consulting, and group and individual therapy with individuals involved in the criminal justice system. A correctional psychologist is a specialized clinical psychologist who conducts psychological assessments and provides psychological treatment in jails, prisons, and other correctional settings; see the Clinical Psychology Chapter for further information on psychological assessment and treatment. Psychologists play a key role in Canadian corrections, with the Correctional Service of Canada (CSC) being the largest single employer of psychologists in Canada (CSC, 2014a). The following section will review non-clinical applications of psychology to correctional contexts, focusing on Canada's correctional systems.

CORRECTIONS IN CANADA

With a mandate to keep the public safe, the corrections system is responsible for supervising individuals who have been arrested, charged with, or convicted of a criminal offence. Canada's federal correctional system (i.e., CSC) has jurisdiction over adult offenders sentenced to two years or longer, while provincial or territorial correctional systems have jurisdiction over adult offenders serving custodial sentences that are less than two years, individuals who are being held while awaiting trial or sentencing (remand), offenders serving community sentences (e.g., probation), and youth offenders. Sentencing decisions are made by judges to achieve the goals of deterrence, denunciation, separation of the offender from society, rehabilitation, reparation for harm done to victims or the community, and to promote a sense of responsibility in offenders. Psychologists have played an important

role in determining whether current sentencing practices in Canada achieve the goals of deterrence and rehabilitation (Motiuk & Serin, 2001). Through this research, forensic psychologists have influenced correctional policies.

OFFENDER MANAGEMENT

Forensic psychologists have also affected correctional policy through their contributions to offender management and treatment and Canadian researchers have led the way in establishing principles related to effective correctional intervention. The Risk-Need-Responsivity (RNR) model was developed to serve as a guideline for assessing and treating offenders (Andrews & Bonta, 2010; Bonta & Andrews, 2017). These guidelines suggest that correctional programming should match the risk and needs of the offenders, and the mode and style of the program should match the learning style (e.g., factors, behaviours, and attitudes that facilitate learning) and abilities of the offender (Bonta & Andrews). Specifically, higher risk offenders require higher intensity programming, which generally means increased program hours. Additionally, targeting an offender's specific criminogenic needs (e.g., pro-criminal attitudes, substance abuse) reduces recidivism (Andrews & Bonta). Finally, RNR's responsivity principle suggests that cognitive social learning methods be used to influence behaviour, specifically cognitive-behavioural interventions that consider the offenders' strengths, learning style, personality, and motivation (Bonta & Andrews). It is not uncommon for offenders to have low levels of verbal ability, low levels of personal insight, and low willingness to engage in treatment work. Effective programming for offenders often includes a very active style of delivery, with a predominance of role-play and other interactive exercises to increase responsivity. Much of correctional programming worldwide is based on RNR principles (e.g., Matthews, Feagans, & Kohl, 2015; Ternes, Doherty, & Matheson, 2014).

Adherence to the RNR model has led to a number of opportunities for practitioners to apply psychology to the correctional system. For example, to determine which correctional programs an offender should be placed in, it is necessary to assess his or her criminogenic needs. In CSC, all offenders undergo needs assessment within 90 days of admission. Needs assessments are conducted by parole officers using the Dynamic Factors Identification and Analysis-Revised (DFIA-R), which assesses for needs in the areas of employment/education, marital/family, associates, substance abuse, community, personal/emotional, and attitude (Stewart et al., 2017). Results of these assessments are used for case management, for profiling offenders, and for predicting risk. Risk assessment (reviewed above) is relevant at various points in the criminal justice process to help with correctional decision-making. For example, results of risk assessment are considered pre-trial, at sentencing, for custody classification, for parole hearings, and pre-release.

One of the goals of incarceration is to rehabilitate offenders to prepare them to reintegrate into the community upon release. This goal is generally accomplished through correctional programming. Effective correctional programs typically follow the RNR principles by matching the offenders' needs and risk (Bonta & Andrews, 2017; Smith, Gendreau, & Swartz, 2009). Programs that target multiple criminogenic needs seem to be the most effective since most offenders have several criminogenic needs (Gendreau, French, & Taylor, 2002). In line with this, CSC currently offers the Integrated Correctional Program Model to meet various criminogenic needs (Motiuk, 2016). This model uses cognitive-behavioral and social

learning-based approaches to help offenders change their attitudes, beliefs, and behaviours (CSC, 2014b).

Community Supervision

Most offenders are supervised in the community through bail, probation, or parole. Probation is a provincial sentence served by the offender in the community. Parole is a conditional release from federal prison intended to facilitate an offender's reintegration into the community. While on probation or parole, offenders are required to abide by certain terms and restrictions, such as mandatory treatment, under the supervision of a probation officer or parole officer. Violation of these terms may result in imprisonment or new charges (for probation) or return to custody (for parole).

PAROLE DECISIONS

In Canada, generally, an offender must serve the first third of their sentence, or the first seven years, whichever is less, before being eligible for parole (Parole Board Canada, 2018a). Parole decisions are usually made after a public, formal hearing where the members of the parole board question the offender and his or her parole officer. When determining whether to grant parole, the parole board considers the risk the offender might present to the community upon release based on factors such as criminal history, risk assessment measures, psychological reports, information from victims, information indicating evidence of change and insight into criminal behavior, program participation, and the feasibility of the offender's release plans (Parole Board Canada, 2018b). To assist parole board members in making their parole decisions and to increase the likelihood that they consider the most relevant factors, forensic psychologists have developed a tool that acts as a framework for making these decisions (Gobeil & Serin, 2010). The framework lists factors that are relevant to release decisions and provides a basic scoring mechanism that suggests how the factors should be considered in the overall assessment of risk. Using this framework results in fewer release decision errors than traditional parole decision making (Serin et al., 2016; Yesberg, Scanlan, & Polaschek, 2014).

ISSUES IN CORRECTIONS

Segregation

Over the past several years, specific issues have become known in corrections that have highlighted the importance of psychology in this context. For example, the media has focused much attention on the issue of placing offenders with mental illness in solitary confinement. This issue gained public notoriety when 19-year-old Ashley Smith died by suicide alone in a segregation cell in Grand Valley Institution for women in Kitchener, Ontario, while officers looked on via video monitors (Office of the Correctional Investigator, 2014). During her incarceration, Ms. Smith had been moved between institutions 17 times and had spent her entire time in federal custody (almost one year) in segregation. She had also been the subject of 150 security incidents. Although Ms. Smith's mental health needs were well-documented, she had never been provided with a comprehensive mental health assessment or treatment plan.

This tragic incident led researchers and policymakers to look closely at the consequences of segregation. Although research has not provided conclusive evidence that segregation results in negative mental health consequences (Glancy & Murray, 2006; Morgan et al., 2016; O’Keefe et al., 2013), it has been suggested that longer periods of segregation (i.e., more than 14 days) might be harmful due to mental deterioration (Arrigo & Bullock, 2008; U.S. National Research Council, 2014). This has led to changes in policy related to administrative segregation. For example, CSC now prohibits administrative segregation for inmates with serious mental illness or those actively engaging in self-harm (CSC, 2017). Recently, the Ontario Superior Court and the British Columbia Supreme Court ruled that indefinite solitary confinement in Canadian prisons is unconstitutional (British Columbia Civil Liberties Association v. Canada, 2018; Corporation of the Canadian Civil Liberties Association v. Her Majesty the Queen, 2017). Several correctional psychologists, experts in segregation, provided expert evidence in these hearings. With the Canadian government appealing these decisions (Paperny, 2018) and similar lawsuits ongoing in other Canadian jurisdictions (McMillan, 2018), it is clear that research and policy modifications will be ongoing. The input of psychology will be imperative in these efforts.

Correctional staff stress

The extreme stress that correctional staff workers experience on the job has also recently been highlighted in the media. Correctional officers deal with a multitude of stressors on the job, with the most severe stressor probably being daily contact with potentially volatile inmates. An investigative report conducted by CBC found that one in twenty employees at federal penitentiaries had been diagnosed with stress injuries (MacIvor, 2017), and the Union of Canadian Correctional Officers (UCCO) has suggested that most correctional officers experience psychological distress, which they directly attribute to their work (UCCO, 2016). This is in line with Canadian research that has found high rates of mental illness among first responders, with paramedics, Royal Canadian Mounted Police (RCMP), and correctional workers being the most affected (Carleton et al., 2017). These findings highlight the need for improved training for new recruits, better support systems for correctional workers, increased psychological services for those who have experienced trauma, and more research into the issues surrounding trauma symptoms in correctional staff. Again, psychology can make an important contribution to these issues (Lambert & Hogan, 2018).

CAREER PATHS

For students interested in pursuing a career that applies psychology to correctional settings, there are many options, both in and outside of the prison environment. Some of these careers require advanced graduate school training, while others do not. For those interested in working in the correctional environment directly with incarcerated offenders, there are opportunities to work as correctional psychologists or social workers, which would require graduate-level degrees in clinical or counselling psychology for the former position and a degree in social work for the latter position. Other institutional jobs where an undergraduate degree in psychology would be considered an asset include correctional officer, primary worker, parole officer, correctional program officer, and social program officer. Those working in these roles are responsible for helping offenders with their

correctional plan and encouraging them along the path to successful reintegration. For more information on employment opportunities within corrections, CSC has provided information on its website (<http://www.csc-scc.gc.ca/careers/index-eng.shtml>).

For those interested in working in corrections, but not in an institution, there are opportunities to work as a correctional psychologist, probation officer, or parole officer in the community. There are also opportunities at CSC's national and regional headquarters for staff trainers. For those interested in directly influencing correctional policy, there are research and policy positions within provincial departments of justice, within Canada's Department of Public Safety, and within the Office of the Correctional Investigator. CSC's national headquarters has many opportunities for those interested in researching or implementing public policy, including opportunities in the mental health branch, the public health branch, the research branch, the program evaluation branch, the women offenders branch, and correctional operations and programs. Generally, for these positions, an undergraduate degree in the social sciences would be required and a graduate degree in psychology would be considered an asset, although higher-level positions may require advanced degrees.

POLICE PSYCHOLOGY

Psychology can play a significant role in many aspects of police work, including the selection of recruits, law enforcement officer training, and the evaluation of police performance. Ultimately, psychology can contribute to improving law enforcement procedures. This section will outline some of the ways in which psychology can support policing in Canada.

POLICING IN CANADA

Law enforcement in Canada is structured under the three levels of government: federal, provincial, and municipal. The Royal Canadian Mounted Police (RCMP) enforce federal laws and serve as the police force for all provinces and territories, except for Ontario and Quebec. Although some municipalities have their own police departments, many smaller municipalities contract their policing out to the provincial governments and the RCMP. In 2017, there were almost 70,000 law enforcement officers in Canada and almost 30,000 civilians employed with police forces in Canada (Conor, 2018). With a mandate that includes preventing and investigating crime, maintaining peace and order, and enforcing laws, policing is an important and challenging job, and a job where psychology can contribute.

POLICE SELECTION

Police work is demanding, stressful, and potentially dangerous and there are likely certain individual characteristics that are compatible with being a good police officer. Through police selection, we can increase the chances that those accepted for a police position have the highest potential for success. Selection practices are covered more comprehensively in the Industrial/Organizational chapter of this volume. The present section focuses specifically on issues related to police selection.

Through decades of research, psychology researchers have explored the individual traits

most important to policing. Early efforts at police selection focused on assessing applicants' intelligence (Terman, 1917), using personality tests to predict police performance (Humm & Humm, 1950), and psychiatric screening (Reiser, 1982). Although these factors are still considered important in police selection, more recent selection practices are more formalized and extensive, and usually include a formal selection interview, along with background checks, medical exams, drug tests, polygraph tests, situational tests, and tests of personality, cognitive ability, and physical agility (Cochrane, Tett, & Vandecreek, 2003). The RCMP uses tests specifically designed for police selection, including the RCMP's Police Aptitude Test and the Six Factor Personality Questionnaire (RCMP, 2016). Overall, the knowledge, skills, and abilities determined to be essential for policing include honesty, reliability, sensitivity to others, good communication skills, high motivation, problem solving skills, and being a team player (Sanders, 2003). While the selection process is usually administered by police personnel, psychologists have played an important role in designing selection instruments and evaluating the selection process.

Evaluations of the selection process have examined how accurately various selection tools (e.g., interview, cognitive ability tests, personality tests) predict job performance. Results have been mixed, with interviews and most personality tests showing low predictive validity, although the Inwald Personality Inventory, which was developed to be used with law enforcement, appears to be more predictive of police performance (e.g., Aamodt, 2004; Cortina, Goldstein, Payne, Davison, & Gilliland, 2000). Moreover, cognitive ability tests are predictive of performance at the police academy but are less effective at predicting on-the-job performance (Aamodt). It is clear that more research in this area would be helpful in improving selection practices.

POLICE TRAINING

Police departments generally offer training to their new recruits and provide training to all officers on a yearly basis. Training covers a wide range of topics, including defensive tactics, investigations, use of force, the criminal code, and the psychology of criminal behaviour. Training is generally offered at specialized colleges, such as the Canadian Police College or the Justice Institute of British Columbia but may also be offered at traditional post-secondary institutions. For example, Memorial University in Newfoundland offers a Diploma in Police Studies, which is intended for any students with an interest in policing or criminal justice, for police officers with educational and training needs, and also fulfills the post-secondary educational qualification for admission to the Royal Newfoundland Constabulary's police cadet program (Memorial University, 2018).

Training is often delivered by police officers who have become experts in the relevant topic through training or experience. Academics may also work as trainers for certain topics, such as responding to individuals with mental illness (Morrissey, Fagan, & Cocozza, 2009) or negotiating with terrorists or hostage takers (e.g., Augustin & Fagan, 2011). Psychologists may also design the curriculum for training police officers. For example, in recognition that policing may be affected by racial bias, the training program "Fair and Impartial Policing" was developed, based on social psychology principles, to help police officers become aware of their unconscious biases and how they may affect police work (Fridell, 2016).

Psychologists may also work with the police to evaluate a training program to determine whether it is consistent with police responsibilities or to determine whether it had the

intended impact. For example, to assess the impact of investigative interview training, Cederborg, Alm, da Silva Nises, and Lamb (2012) evaluated the post-training interviews of criminal investigators. They found that the interviews improved after training, suggesting that the training was effective.

POLICE STRESS

Similar to working in a correctional environment (mentioned above) policing is considered one of the most stressful occupations (Carleton et al., 2017). In addition to the danger associated with police work, research suggests that police officers have much difficulty balancing their work and home life (Duxbury & Higgins, 2012). The increased stress is associated with poorer work performance, poorer physical health, and poorer mental health.

Most police agencies now recognize the negative consequences of the stressful police work environment and have set up programs to prevent and reduce stress among police officers. These programs tend to be secondary interventions, focused on improving individual responses to stress, and include informal support networks, physical fitness programs, relaxation training, professional counselling services, and debriefing after critical events (Patterson, Chung, & Swan, 2014). These types of interventions show limited effectiveness in reducing stress symptoms but are more feasible for use within law enforcement organizations than primary interventions, which require organizational change to prevent stressful conditions from occurring. It is clear that improvements can be made in training for new recruits, as well as better support systems and increased psychological services for police officers who are experiencing stress. More research into ways to reduce police officer stress and developing more effective stress reduction methods would help guide police agencies in providing these interventions. Psychologists can work with law enforcement to address these issues.

CRIMINAL OR PSYCHOLOGICAL PROFILING

Criminal profiling is sometimes used by police forces to aid their investigations. Criminal profiling involves constructing a description of the perpetrator of a crime based on characteristics of the crime scene, statements from victims and witnesses, autopsy and other relevant reports, and knowledge of criminal behaviour (Doan & Snook, 2008; Snook, Eastwood, Gendreau, Goggin, & Cullen, 2007). This description can be used to develop a strategy to apprehend the unknown criminal and, if applicable, to link a series of similar crimes.

Despite the high level of interest in criminal profiling, there are few criminal profiler positions in North America. Those who work in these positions do not usually have graduate training in psychology; rather they have advanced through the ranks of law enforcement or have received advanced training specific to criminal profiling. Overall, there is little empirical support for the usefulness of criminal profiling to criminal investigations, with critics maintaining that it relies on a weak standard of proof. Indeed, Snook et al.'s (2007) review and meta-analysis concluded that trained expert criminal profilers were no better than laypeople at constructing criminal profiles, and that research needs to show that it is reliably precise before considering it a scientific technique that is useful to policing. Despite

these criticisms, there is a concerted effort among researchers to conduct quality research on offender profiling and improve its application (e.g., Goodwill et al., 2013).

Psychological profiling may provide a larger contribution to legal investigations through psychological autopsies. Psychological autopsies, an examination of a deceased person's mental state prior to his or her death, are relevant in determining a decedent's testamentary capacity, in evaluating a claim of self-defence, and in determining whether a death was homicide, suicide, or accidental (La Fon, 2008; Ogloff & Otto, 1993). For example, an insurance company might be interested in determining whether a car crash was an accident or suicide. Because these autopsies are based on psychological theory, police officers and others in the legal system may call on psychologists and other mental health practitioners to conduct these investigations.

CAREER PATHS

A background in psychology would be beneficial to anyone interested in becoming a police officer. Students interested in applying their psychological education to law enforcement may also find civilian opportunities with the RCMP or other police organizations. For example, the RCMP hires civilians to work in criminal intelligence and wellness and safety. For these types of jobs, an undergraduate degree in psychology would likely be considered an asset.

A graduate degree in psychology (or another social science) would likely be required for developing training curriculum or assessments to be used for personnel selection. Similarly, evaluations of police training or other police practices would likely be conducted by someone with a graduate degree in the social sciences. Those involved in this kind of work are often affiliated with an academic institution but may work directly for the police force.

Law enforcement agencies may also request assistance from those with advanced, graduate-level training on issues related to police procedures and investigations. For example, police agencies may consult with psychologists for duties related to negotiating with hostage takers or crime prevention initiatives. More information regarding police investigations is provided in the following section.

Finally, there are many research opportunities with police agencies. The RCMP and many smaller police agencies have research divisions. These research divisions, often composed of both civilians and police officers, conduct research to aid police operations. The Canadian Society of Evidence Based Policing brings together police practitioners, academic researchers, and public policy makers to conduct and share high-quality research to advance policing in Canada. This inter-disciplinary society holds workshops and shares research, and is open to academic researchers, including students, who are engaged in policing-related research and activities (<http://www.can-sebp.net>).

EYEWITNESSES, INTERROGATIONS, AND CONFESSIONS

On the 23rd of December, 1981, Tom Sophonow, then 29, was arriving back to his home town of Winnipeg from the west coast, where he was living. His plan was to visit his daughter, but when his ex-wife refused to allow it, he instead got his brakes fixed at a Canadian Tire and bought some Christmas stockings to give away to kids at a local hospital. Nearby, in a donut shop in St. Boniface, a 16-year-old counter server was murdered,

presumably during a robbery. The crime was a major news story, and pressure to find the killer was intense. Several witnesses came forward, and police identified Sophonow as the prime suspect. After an intense interrogation where Sophonow was told his fingerprints were at the scene (a lie) and five witnesses had identified him (another lie) he confessed to the crime (though he later recanted this confession).

Sophonow was depicted in the press dressed as the perpetrator (i.e., in a cowboy hat, with a “Fu Manchu” moustache), creating conditions for a biased line-up procedure. After seeing the media coverage, witnesses identified Sophonow as the killer. Jailhouse informants later testified that he confessed to the murder while in jail (he had not; but one informant was rewarded by having 26 fraud charges against him dropped).

It took three trials and four years in prison before Sophonow was ultimately exonerated. In an inquiry after the third trial, it was determined that the police had used deeply flawed (but perfectly legal) procedures that had biased the process against Sophonow and had created a situation where a perfectly innocent man could be convicted of murder.

THE RELIABILITY OF EYEWITNESS TESTIMONY

As the Sophonow case demonstrated, eyewitnesses make mistakes. It is not clear what proportion of identifications are errors, but we do have some evidence that can give us a sense of the situation. In the US, the Innocence Project (innocenceproject.org) has resulted in the exoneration of over 400 people convicted of crimes that we now know, due to DNA evidence, they did not commit. In over 70% of those cases, the individual was convicted, in part, due to the testimony of a mistaken eyewitness (Time, 2017). We also know that in staged crimes, eyewitness error rates are often 50% or more (e.g., Bornstein & Zickafoose, 1999; Smith, Lindsay, & Pryke, 2000; Smith, Lindsay, Pryke, & Dysart, 2001). Importantly, incorrect eyewitnesses are typically just as confident as incorrect eyewitnesses, and confident eyewitnesses are convincing witnesses in court (e.g., Wells, Memon, & Penrod, 2006).

But why do eyewitnesses make errors? There is often a perception in the general public that our memory is a “wax tablet” and that events are etched upon that tablet and can be retrieved, intact, at a later time. However, this is simply not the case – our memories are malleable – they change over time. We construct our memories based partly on what we actually saw, but also based on what we expected to see, our attitudes, our beliefs, and our biases. We also know that stress and emotional arousal have an impact on our ability to process incoming information into memory (e.g., Morgan et al., 2004).

THE ROLE OF POLICE INTERVIEWS

New information, acquired after an event, can also change memories. In a series of classic studies, Elizabeth Loftus (e.g., Loftus et al, 1978) demonstrated that asking misleading questions, or providing misleading or incorrect information, led to errors. For example, the wording used when questioning witnesses (e.g., “saw the ‘Yield’ sign” when in fact they saw a “Stop” sign) changed how they reported what they saw; importantly, it also changed their *actual memory* for the event.

It is vital that police officers are well versed in how to effectively interview witnesses without providing new information or asking leading questions. For example, when interviewing witnesses after a reported armed robbery, it would be better to ask “What did

you see?” rather than “Did you see the man with the gun?” It is exactly this principle that has led to the development of the Cognitive Interview (Fisher & Geiselman, 1992) which has been demonstrated to be an effective technique to increase correct recall for events without introducing errors or extraneous information (Köhnken, Milne, Memon & Bull, 1999).

The Cognitive Interview allows witnesses to give an uninterrupted description of what they saw, incorporating probing question to jog memory (e.g., “was there anything unusual about his appearance?”). The Cognitive Interview procedure also specifies to interview witnesses alone so that the recollections of other witnesses do not influence the witness’ responses.

POLICE LINEUP PROCEDURES

As noted in the Sophonow case, police used flawed lineup procedures that resulted in his false identification. Psychology researchers have been interested in how to reduce the likelihood of error in eyewitness identification for almost 50 years. Researchers have identified two main factors for consideration in the construction of a fair lineup procedure: a) the construction of the lineup itself, and b) the instructions given to eyewitnesses.

Although not always implemented, best practice is clear (see Yarmey, 2003; Wells et al., 2006) – witnesses should be shown photos one at a time (i.e., sequentially) and not all at once (i.e., simultaneously). There should always be at least six photos shown to eyewitnesses, and witnesses should not know how many they are going to see. In the photoset, there should only be one suspect, with the other photos containing “foils” (individuals known to be innocent). The person conducting the lineup should not be the investigator working on the case, in order to reduce the chance of bias. Consciously or unconsciously, if the person sitting with the witness knows who the suspect is, they give verbal or non-verbal cues as to who should be selected as the criminal (Yarmey).

Further, photos (mug shots) should be selected based on the description the witness gave of the criminal, and not how similar in appearance the photos are to the suspect. The person constructing the lineup must be careful to ensure that there are no cues either in the photos or the setting of identification that increase the likelihood of one photo being selected over the others (e.g., lighting differences, clothing cues, unique physical or facial features, tattoos). Finally, witnesses need to be instructed that the criminal may not be in the lineup. When all of these factors are combined, errors can be reduced by as much as half (Wells et al., 2006). This is important, because once an error is made, it is almost impossible to diagnose (Smith et al., 2000; 2001).

Demonstrating the failure to apply best practice, in Sophonow’s case, he was asked at one point in the investigation to put on a cowboy hat, similar to the one the witnesses had described, and his photo was taken. That photo was then shown to witnesses who identified him as the criminal (though they were likely just identifying his hat and moustache). Next, he was placed in a police lineup and was identified again by the eyewitnesses. Eyewitnesses were thus seeing him for a second time, and again selected the man they had recently identified rather than the criminal that they had seen at the scene of the crime.

CONFESSION EVIDENCE

You will recall (from above) that among the Innocence Project cases, about 70% of the time

the wrongful conviction involved a mistaken eyewitness. However, it is also true that in about a quarter of those cases – *where we know the suspect was actually innocent* – they also confessed to the crime. This is simply shocking to the average person – how can an innocent person confess to a crime they did not commit? The answer is illustrated by the Sophonow case.

Under Canadian law, although suspects have the right to consult a lawyer, they do not have the right to have one present during questioning (e.g., Patry, Connors, Adams-Quackenbush, & Smith, 2017). In addition, police are trained in tactics to pressure suspects into confessing. Known as the “Reid Technique” (e.g., Kassin, Appleby, & Perillo, 2010) this 9-step process focuses on core issues of befriending the suspect, minimization of the severity of their crimes, and eventually breaking them down to confess to the crime. The Reid technique claims up to a 90% success rate (John E. Reid & Associates, Inc., 2014) when performed correctly. There is evidence that the technique and its principles will increase confessions from guilty suspects. The problem is that it also increases confessions from innocent suspects, and indeed, there is evidence that innocent suspects may be particularly susceptible to its procedures (Kassin et al, 2010a). This is particularly true for suspects who are under the influence of drugs or alcohol, have developmental or mental health issues, or are adolescents. The psychological pressure on people being questioned is intense, and as humans, we tend to focus on short term outcomes rather than longer term ones (Kassin, et al., 2010a). In these cases, the short-term goal (getting out of the unpleasant interrogation situation) outweighs the long-term consequence (confessing to a crime you did not commit). However, most people do not understand the power of the underlying psychological processes, thus this is one situation where psychological researchers can provide important insight to the public and the legal system.

CAREER PATHS

Given the breadth of areas where psychology and the law intersect in the areas of police investigations, there are perhaps not surprisingly, several opportunities for careers in this area. Many psychological researchers provide expert witness testimony. As noted in the first section of the chapter, experts can provide briefs or reports to triers of fact, or to one side or another during a trial. Although expert witness testimony is relatively rare in Canada (as compared to the US, where it is quite common), psychological researchers can and do provide expert testimony on topics such as eyewitness identification and confession evidence. Typically, the people who are consulted as experts in these areas are academics and researchers.

THE ROLE AND COMPOSITION OF JURIES

Under Canadian law, the accused has the right to trial. Certain crimes are judge only (where maximum punishment is less than 5 years in prison), whereas others may be by judge and jury (e.g., when the maximum punishment is more than 5 years) but many lawyers choose not to have juries. Thus, in Canada, juries are typically not required and are relatively rare in criminal cases (Vidmar & Schuller, 2011).

Jury selection is under the jurisdiction of both federal and provincial law. In Canada, the number of jurors on a jury varies from as low as 6-8 for civil cases and up to 12 in criminal cases. Alternate jurors are sometimes selected in the event that a juror has to recuse

themselves for any reason (this is more typical in long trials). Juries provide verdicts, but do not give advice on sentences except in very rare circumstances. Anyone who is over 18 or 19 (depending on the jurisdiction), who does not work in the legal profession, and who does not have a criminal record, may be called to serve on a jury. Different provinces have different restrictions (e.g., in New Brunswick medical practitioners are not eligible to serve on juries) but typically the eligibility requirements are minimal.

The next step in jury selection is *voir dire* which is the questioning of jurors to establish suitability. Potential jurors are disallowed for hardship or partiality reasons (e.g., they know of the crime, have made a decision on guilt, know someone involved). This is where the opposing attorneys have the opportunity to influence the composition of the jury. There are two types of challenges the Crown (prosecution) or defense can use: *Peremptory challenges* – where they can dismiss jurors without providing a reason; and *Challenge for cause* – where counsels can ask jurors specific questions to establish suitability. As we will discuss below, it is at this time that trial consultants can play a significant role in the outcome of trials.

The study of juries emerged directly out of research on group dynamics. Early work (e.g., Kalven & Zeisel, 1966) showed that two thirds of juries do not initially agree on a verdict, but by the end of their work 95% of juries come to consensus, in that they unanimously agree on a verdict. Although 90% of jury decisions will agree with the original tendency of the jury (i.e., the initial vote) there is a significant amount of discussion and persuasion that occurs in that context before a final verdict is reached.

PRE-TRIAL PUBLICITY

There are many factors that can influence a jury. One that has received a great deal of attention, and which is considered by the courts regularly, is pretrial publicity. The basic idea is that media exposure to information about the case can reduce impartiality. For example, the Robert Pickton trial in 2006 (a serial murderer in BC, charged with the murder of 20 women; though he may be responsible for dozens more) came after years of publicity about the crimes, and more than 4 years of pre-trial (post arrest) publicity. More than 600 potential jurors were called to establish a jury.

In cases such as these, courts have the option to invoke publication bans, limiting what the press can publish about the case; however, in making these decisions, the court must balance the right of the accused to a fair trial (which publicity may undermine) and freedom of the press (which is a fundamental right under the *Charter*). There are also clear practical limits to bans – Canadian courts have no jurisdiction on foreign publications, and in an age of the internet, there are no limits as to where Canadians can get their news. If someone is determined to find out about a high-profile case, they will. The courts also have the ability to enact a change of venue, which can move the court to a new jurisdiction which would (presumably) allow for a more unbiased pool of potential jurors.

PHYSICAL ATTRACTIVENESS OF THE DEFENDANT

The “what is beautiful is good” stereotype is a well understood social psychological phenomena. Whether we like it or not, attractive people get more dates, are more successful, get better jobs, are liked more, and make more money (see e.g., Myers, Jordan, Smith & Spencer, 2018, for a review). Research has also suggested that this extends to the courtroom.

For example, Wiseman (1998) conducted a large study presenting evidence of a purported burglary case to BBC Television viewers and asked them to call in with a verdict. Interestingly, he was able to vary the attractiveness of the criminal the viewers saw. Of the 64,000 people who called in to give a verdict, those that saw an attractive photo voted for conviction 31% of the time. The less attractive defendant was convicted 41% of the time.

THE JUDGE'S INSTRUCTIONS

In a typical criminal trial, jurors receive two types of instructions: 1) instructions regarding the law; and 2) instructions regarding potential verdicts. Given the fact that jurors, by definition, are not legal professionals, both types of instructions are reasonable and necessary for the jury. Unfortunately, to ensure accuracy and to protect verdicts from appeals due to error, judges often use very technical legal jargon that most jurors (at best) struggle to understand (e.g., Daftary-Kapur, et al., 2010). Judges regularly instruct jurors to disregard pieces of evidence that have been presented at trial (Fleming, Wegener & Petty, 1999; Steblay, Hosch, Culhane, & McWethy, 2006). Although jurors indicate they will disregard the information, and may even believe they can, they do not, and the inadmissible information can result in biased verdicts.

CAREER PATHS

Given the importance of juries in legal proceedings, it is not surprising that there is a role of trial consultants in this area. Indeed, there is a significant industry for jury consulting, particularly in the US and in civil cases, where there is a potential monetary outcome. Academics and researchers have been using juries to understand group decision making for some time, and this is why these researchers can provide important insights into the process.

It is the job of the jury consultant to understand what factors (attitudes, beliefs, socio-economic factors) can help a jury reach the verdict that is preferred by their client. The consultant, once they understand the context of the case and the desired makeup for the jury, can help the crown or defense use their peremptory challenges and challenges for cause to shape the jury in a way that creates the most favourable outcome potential for their client.

CONCLUSION

As you can see from the preceding sections, psychology and the law interface in many ways. These interfaces are broad ranging and provide opportunities for academics, consultants, and clinical psychologists to engage. Most of these professionals have advanced degrees, and many need to have provincially governed certifications, but there are opportunities for influence at multiple levels. Perhaps more importantly, the legal community increasingly understands the value of collaborating with trained professionals in the psychology field to improve and enhance the outcomes of the justice system in Canada.

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[12]

SPORT PSYCHOLOGY

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OVERVIEW

Sport and exercise psychology is the scientific study and application of human behaviour in the sport and exercise contexts (Gill & Williams, 2008). Sport and exercise psychology is often studied with one of two objectives in mind: 1) to understand the psychological impact on human performance and 2) to understand how sport and exercise participation impacts an individual's psychological development and health (Weinberg & Gould, 2015). Exploring psychology from this framework has allowed for many significant discoveries including the development of theories and models which aim to account for the effects of variables including stress and exercise on outcomes including health and performance.

There are many careers related to sport and exercise psychology. Perhaps the most common career identified by students is "sport psychologist." In Canada, professionals working in the field of sport and exercise psychology providing direct services to athletes and teams work under the title of Mental Performance Consultant (MPC). Although overlapping in some regards, MPCs and clinical psychologists have different scopes of professional practice.

This chapter will provide a brief overview of common methods and significant findings in foundational aspects of sport and exercise psychology. It will also explore more recent developments within the field of sport and exercise psychology, as well career paths, scopes of practice, and educational training paths for professionals working in this field.

INTRODUCTION TO SPORT AND EXERCISE PSYCHOLOGY

Sport and exercise psychology is a relatively young scholarly discipline in comparison to other areas of study in psychology: it has its beginnings in the latter part of the 19th century when Norman Triplett (1898) wanted to understand why athletes sometimes performed better in groups than when alone (Weinberg & Gould, 2015). Since that time, the field has grown tremendously. For the purpose of this chapter, we will focus primarily on the 'sport' aspect of psychology while acknowledging that the 'exercise' aspect is highly related but can also be considered a separate field of study. There are now evidence-based graduate programs throughout Canada, the United States of America, and across the globe. There are also multiple national and international societies and organizations supporting the research and practice of sport and exercise psychology (e.g., Canadian Society for Psychomotor Learning and Sport Psychology; International Society of Sport Psychology) as well as national and international applied certification bodies either established or in development (e.g., Canadian Sport Psychology Association; Association of Applied Sport Psychology). Such growth in research and practice demonstrates that there is demand for knowledge and service in these areas of expertise.

Particularly in the context of sport performance, increased media attention along with the recognition and acceptance of sport psychology as a performance-enhancing tool has led to increased numbers of athletes, coaches, and sport organizations seeking out MPCs for their expertise and services. For example, MPCs are now commonly found practicing in sports such as golf. More recently, sport psychology has become integrated into sports including American football. For example, the Seattle Seahawks of the National Football League (NFL) have employed Dr. Michael Gervais, a clinical psychologist known for his work in sport and performance psychology. Indeed, he was a part of their team staff during their Super Bowl winning season of 2013.

Demand for the integration of sport psychology into the sport environment is evident as professional development opportunities are now often included in both coach and support staff training. For example, the Canada's National Coaching Certification Program (NCCP) includes modules on sport and performance psychology. Sport medical professionals including athletic therapists, sport medical physicians, nutritionists, physiotherapists, and sport chiropractors can also often take sport psychology courses as requirements or electives during their training. Both MPCs and related sports professionals serve an integral part of integrated support teams (ISTs) in the Canadian amateur sport system. ISTs include coaches, MPCs, strength and conditioning specialists, nutritionists, and medical staff, among other experts whose purpose is to help support and provide resources for athletes and coaches. An MPC can also have a unique role within the IST. Like the other professionals, they support the athletes and coaches through education and skill development (mental skills in this case). However, their training also enables them to assist and provide expertise in the functioning of the IST itself, helping bring professionals from differing disciplines together by enhancing communication and team dynamics. Additionally, they can support other professionals in their work by providing guidance on topics such as the psychology of injury rehabilitation, and coach-athlete management.

In recent years, increased conversations and visibility surrounding mental health and athletes has increased awareness of the field of sport and exercise psychology in areas that go beyond sport performance. Importantly, research has examined the link between sport

and exercise participation and their relationship to mental health, and the impact of physical activity on the prevention and treatment of mental health challenges and conditions (see Schinke, Stambulova, Si, & Moore, 2017). In addition to research, well-recognized and successful athletes such as Clara Hughes, Michael Phelps, and DeMar DeRozen have openly discussed their challenges with mental health. This has created an opportunity for athletes to express and discuss their own mental health experiences. Although clinical mental health issues are often beyond the scope of practice amongst most MPCs (detailed in the section titled Applications of Sport and Exercise Psychology below), it remains an important topic of research, discussion, and practice for those interested in the field of sport and exercise psychology. Demonstrating the importance of sport and mental health, the Canadian Centre for Mental Health and Sport, a not-for-profit organization was developed to support the mental health and performance of competitive and high-performing athletes and coaches in Canada (<https://www.ccmhs-ccsms.ca/>).

SIGNIFICANT RESEARCH FINDINGS

Although there is a myth that sport psychology is only applicable to elite sport performers, research and applications from this field have far-reaching impact. For example, there is significant recent research exploring the psychological impact of early specialization in youth sport. Research demonstrates that young children will not benefit from early sport specialization in the majority of sports, and may have a greater risk of overuse injury and burnout from concentrated participation (e.g. LaPrade, et al., 2016). Research in sport and exercise psychology has also demonstrated positive benefits of sport and physical activity participation in adults. For example, military veterans with a disability have shown to have a greater sense of independence and choice when engaging in quality physical activity experiences (Shirazipour et al., 2017). Perhaps gaining more mainstream attention, research has importantly demonstrated that sport-related concussions may be associated with increased risk of mood disturbances and depression (Covassin, Elbin, Beidler, LaFavor, & Kontos, 2017). Consequently, it is important to recognize that the study of sport psychology is relevant to many contexts and setting beyond the competitive field of play.

Further demonstrating the widespread applicability of sport and exercise psychology, there is a substantial body of evidence to support the notion that physical activity (including sport participation) can both help prevent and treat some forms of mental health challenges and illness. For example, a systematic review conducted by Mammen and Faulkner (2013) found a significant, inverse relationship between physical activity at baseline and depression at follow-up in 25 of 30 longitudinal studies. Furthermore, their results suggested that any level of physical activity might help prevent depression. Moreover, an earlier and well-cited longitudinal study by Camacho, Roberts, Lazarus, Kaplan, and Cohen (1991) found a relationship between inactivity and the incidence of depression over the course of almost 20 years.

Recently, more attention has been focused on the impact of physical activity, including sport participation, on the treatment of mental health challenges such as depression and anxiety. Rebar and colleagues (2013) conducted a meta-meta-analysis examining the effect of physical activity on depression and anxiety in a non-clinical population. They found that across eight meta-analyses, physical activity had a moderate effect on the treatment of depression such that physical activity reduced depression, and a small effect on the

treatment of anxiety such that physical activity reduced anxiety. Using a clinical population, Rosenbaum and colleagues (Rosenbaum, Tiedemann, Sherrington, Curtis, & Ward, 2014) conducted a systematic review of studies using physical activity interventions. They found that physical activity reduced symptoms of depression in people with mental illness, and also found a reduction of symptoms associated with schizophrenia and improvements in other physical health markers in people diagnosed with schizophrenia.

More recently, White and colleagues (2017) examined the impact of domain-specific physical activity on mental health. That is, does the context in which one performs a physical activity (e.g., leisure versus work-related physical activity) have an impact on one's mental health. Using a meta-analytic approach, they found that leisure-time physical activity and transport physical activity both had a positive relationship with mental health. They also found that leisure-time physical activity and participation in school sport had an inverse relationship with mental ill-health (the greater the participation, the lower levels of ill-health). However, work-related physical activity had a positive relationship with mental ill-health: if an individual's main sources of physical activity was performed at the work place, it may have a negative impact on one's mental health.

In the following sections, common frameworks and approaches to research in sport and exercise psychology are reviewed.

COMMON FRAMEWORKS FOR RESEARCH IN SPORT PSYCHOLOGY

Weinberg and Gould (2015) state that the ultimate goal of psychological skills training is self-regulation. They define self-regulation as the ability to work toward your goals by monitoring and managing your thoughts, feeling, and behaviours. They also describe psychological skills training as the systematic and consistent practice of mental skills for the purpose of enhancing performance, increasing pleasure and satisfaction in sport participation (Weinberg & Gould, 2015, p. 248), thus leading to greater abilities in self-regulation. The field of sport psychology has examined and shown support for a number of basic psychological skills to enhance performance and overall satisfaction. The following section briefly describes these skills, and some significant findings that support the implementation of these skills.

Goal setting

Goal setting is one of the most commonly used strategies across the behavioural sciences (Bar-Eli, Tenenbaum, Pie, Btsh, & Almog, 2007). Goal setting is commonly used to improve motivation, focus, and thus performance. Generally, goal setting in sport typically involves helping athletes to identify and set defined goals (i.e., outcome, performance, and process goals), and to identify and set goals for varying contexts (i.e., practice and competition goals) appropriate to the athlete's performance expectations. Effective goal setting involves setting both long term (e.g., this year) and short term (e.g., today or this week) goals, and also includes goal setting evaluation (e.g., did I achieve my goals?).

Overall, goal setting has shown to be an effective technique for increasing the likelihood of achieving one's goal (Kyllo & Landers, 1995). Research examining the relationship between various types of goals and performance across a variety of contexts generally indicates that goals associated with moderate to high levels of difficulty are linked to better performances

(see Weinberg, 2000, 2004 for reviews). Goal setting also seems to be most effective on simple tasks rather than those that are very complex (Burton, 1989).

Stress/arousal management

A significant amount of research in sport psychology has theorized about and examined the impact of arousal on sport performance. Arousal is the combination of physiological and psychological activation that ranges from deep sleep to intense excitement (Weinberg & Gould, 2015). A variety of theories and models attempt to account for the impact of specific physiological and cognitive states/traits on performance. Such states and traits include stress, anxiety, and excitement. For the purpose and scope of this chapter, we will refer to one's level of arousal or activation.

Many theories and models have been developed to explain the relationship between arousal and performance, and to discuss them all in sufficient detail for accuracy would be beyond the scope of this chapter. Instead, to provide broad conceptual overview, we discuss those theories and models that have received significant attention in the field, and we will focus on the broad concept of arousal/activation rather than the specific state(s) or trait(s).

One of the first theories proposed to account for the relationship between arousal and performance was drive theory (Spence & Spence, 1966). This theory describes the relationship between arousal and performance in a positive linear fashion where a greater level of arousal leads to a greater level of performance. Although drive theory may be suitable for some tasks (e.g., power lifting), most sport psychology researchers were dissatisfied with its ability to predict most performances across a variety of tasks. The field thus turned to the inverted-U hypothesis that posits that both low and high levels of arousal elicit poor performances, and a moderate level of arousal results in optimal performance levels (Landers & Arent, 2010).

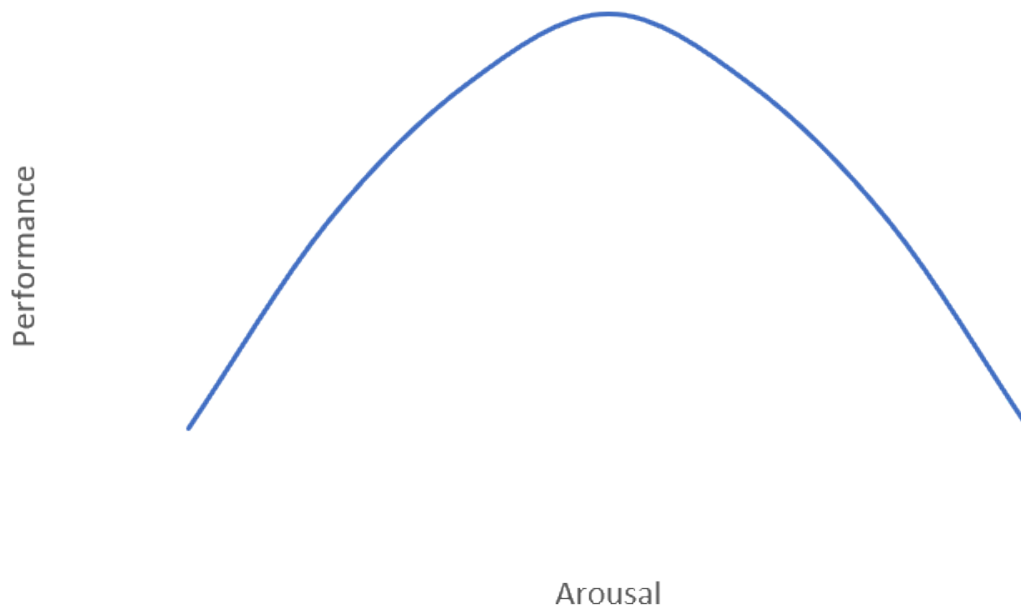


Figure 12.1. The inverted-U hypothesis posits that arousal increases, so too does performance. However, once arousal reaches a certain limit, performance is expected to decrease. Very high and very low levels of arousal are associated with poor performance, whereas moderate levels of arousal are associated with optimal performance.

Although a more inclusive model, the inverted-U hypothesis lacks the ability to account for individual differences, and differences across sport or tasks. That is, moderate levels of arousal may be optimal for hockey, but perhaps not for archery or sprinting. This challenge of accounting for individual and situational variations lead to Hanin's (1997) model of individualized zones of optimal functioning (IZOF). Simply stated, this model posits that each individual has their own zone of optimal functioning where anxiety levels can vary from one individual to another. Outside of this zone, athletes perform poorly. Hanin's IZOF model was unique in that an athlete's 'zone' did not have to be at a moderate level of arousal for optimal performance to occur. For example, Athlete 1's optimal zone could be at a high level of arousal, where Athlete 2 would be a low-moderate level of arousal. Hanin also suggested that the optimal arousal level was not simply a point on a scale, but more of a zone or bandwidth. This model has been supported in the research with regards to its relationship with performance. However, it is criticized for having a lack of theoretical support. That is, answering *why* the IZOF model is supported (Gould & Tuffey, 1996).

Through understanding how arousal impacts one's performance, MPCs can educate and support athletes in managing arousal and stress levels so that the athletes can achieve optimal performance in a variety of circumstances. In order to achieve this, MPCs first assist the athlete to become aware of their levels of arousal and activation during training and performance (Weinberg & Gould, 2015). MPCs have a number of techniques to assist with arousal management. These techniques are often categorized into either *physiological* arousal or anxiety reduction techniques, and *cognitive* arousal or anxiety reduction techniques. Physiological techniques for arousal and stress management include, but are not limited

to, breath control, progressive muscles relaxation, and biofeedback. Cognitive techniques for arousal and stress management include, but are not limited to, relaxation response and desensitization (Weinberg & Gould, 2015). There can be some overlap in the techniques whereby engaging in physiological techniques may also impact one's level of cognitive arousal. For example, when an individual engages in breathing exercise aimed at managing physiological arousal, it can also have a positive impact on an individual's cognitive arousal.

Research conclusively supports that arousal and stress management can result in better performance. In particular, Rumbold, Fletcher, and Daniels (2012) conducted a review of 64 intervention studies where the goal was to reduce stress and increase performance. They found that 81% of the studies showed improvement in stress management, and 77% of the studies found improvements in performance. It also seemed that multimodal approaches (using more than just one strategy) were more effective than single modalities.

Imagery

In our work as MPCs, we often hear from athletes that imagery, also referred to as visualization, is a tool they often use. As a spectator, you may have observed athletes engaged in imagery, or you, yourself, may use imagery as a tool for enhancing performance (or using day dreaming as a distraction!). The premise of imagery is the creation of an image in our minds, either by recalling actual events, or by constructing our own images of events we hope, or want to avoid, happening. The term imagery is often preferred to visualization as it is not restricted to simply one sense, as would suggest the term visualization. Imagery can include, in addition to vision, one's auditory sense (the sounds of the crowd), one's sense of smell (the smell of chlorine at the swimming pool), one's sense of touch (the feel of the ball in your hands), one's kinaesthetic sense (the feeling of one's limbs while executing a dive from the platform), and even one's sense of taste (the salty taste of sweat while running long distances). Imagery is also a tool that can be used to rehearse performances mentally, whether the goal is learning a new routine (learning a new gymnastics floor routine), or helping to manage emotions in a high-pressure situation (imagining a large crowd at the championship game).

Research examining the effectiveness of imagery can be complex, particularly because it is not possible to actually *see* what the athlete is imagining. However, some case studies have shown that the use of imagery enhances performance and other psychological variables such as confidence and the ability to cope with anxiety (Evans, Jones, & Mullen, 2004; Post, Muncie, & Simpson, 2012).

Confidence

Research has indicated that confidence is the most consistent factor for differentiating between the most and least successful athletes (Jones & Hardy, 1990). In sport psychology, self-confidence is defined as the belief that you can successfully perform a behaviour (Weinberg & Gould, 2015). Vealey and Chase (2008) further describe sport self-confidence as a social cognitive construct. They differentiate between state self-confidence (e.g., how confident you feel today, before a particular competition) and trait self-confidence (e.g., how you generally feel in the day-to-day), and suggest that sport self-confidence can be viewed more as a trait than a state, depending on the context. Closely related to sport confidence as defined by Vealey and Chase (2008) is the concept of self-efficacy. Bandura (1997) defines

self-efficacy as the perception of an individual's ability to successfully perform a task. Thus, one could consider self-efficacy to be situation specific self-confidence. For the purpose and scope of this chapter, we will combine these constructs in discussing relevant research.

Confidence has been shown to impact other sport-related psychological factors. For example, confidence can impact how an athlete interprets their level of anxiety. Specifically, when an athlete is high in confidence, they are more likely to interpret anxiety as facilitative, as compared to when an athlete is low in confidence (Jones & Swain, 1995). Confidence has also been shown to influence perceptions of effort: athletes high in confidence, when compared to athletes low in confidence, tend to perceive that they expend less effort on a particular task (Hutchinson, Sherman, Martinovic, & Tenenbaum, 2008). Most importantly, confidence has also been shown to influence performance: athletes higher in confidence tend to perform better than those lower in confidence (Feltz, 1984; Moritz, Feltz, Fahrback, & Mack, 2000). Because confidence can be considered as more of a psychological trait or a modifiable state depending on the context (as opposed to a skill), MPCs will often use tools such as goal setting and imagery in training over time to enhance self-confidence, and thus impact performance.

Focus

The ability to focus—to ignore distractions, and pay attention to relevant cues at the correct time, is one of the most important skills an athlete can possess. Perhaps even as a student, you have had difficulty focusing on the task at hand while being distracted by your electronic devices, the environment around you, or even your own thoughts. In sport psychology, we use the terms focus, concentration, attention, and managing distractions interchangeably as they all refer to the same skill of being able to direct our attention to the appropriate cue at the appropriate time.

Individuals may often report that they have trouble paying attention, or concentrating. However, the reality is that we are always paying attention to *something*. If we find ourselves distracted or having difficulty focusing, it usually means we are not focusing on the appropriate cues. Nideffer (1976) and colleagues (Nideffer & Segal, 2001) described attentional focus along two dimensions: width (i.e., broad or narrow) and direction (i.e., external or internal). A broad attentional focus would be beneficial when an athlete has to be aware of and react to many changing cues in his or her environment. A narrow attentional focus would be helpful when an athlete must only focus on one or two cues, such as a target or finish line. An external focus of attention refers to attention focused on an external cue such as an object in the environment. Lastly, an internal focus of attention refers to attention focused inwardly such as one's own thoughts and feelings.

<u>Direction</u>		
<i>External</i>	<i>Internal</i>	
Assess the environment	Analyze a situation	<i>Broad</i>
Focus on one target	Focus on your breath	<u>Width</u>
		<i>Narrow</i>

Figure 12.2. Four types of attentional focus and relevant examples

To assess an individual's attentional style (i.e., a person's typical attentional disposition), Nideffer (1976) developed the Test of Attentional and Interpersonal Style (TAIS). Some research has supported the idea that focused attention is most beneficial when it is directed externally as compared to internally. Indeed, Wulf's (2013) review found that an external focus of attention was more beneficial across a number of tasks including speed, endurance, and accuracy types of tasks than an internal focus of attention. Ways to train and improve concentration skills include using simulations, pre-determined cues, establishing good habits, routines, and competition plans, and overlearning skills (Weinberg & Gould, 2015).

Team Dynamics

A significant number of sports are not played alone – athletes often compete as a member of a team. Even in individual sports such as athletics, athletes may compete as an individual but are members of a larger team all competing for points, in addition to individual medals. The study of groups, or teams, has been a popular area of research in sport psychology just as it has been in related fields such as organizational psychology and social psychology. These disciplines indeed share many theories and models in their study of group performance.

There are a variety of approaches to group dynamic research in sport, but areas that have received significant attention, both in research and practice, are cohesion and collective efficacy. Cohesion in sport has been defined as a dynamic process in which a team has a tendency to stick together and stay united in pursuit of its goal and/or for the satisfaction of its members (Carron & Eys, 2012). Widmeyer, Brawley, and Carron (1985) developed the Group Environment Questionnaire to measure cohesion in sport and in doing so conceptualized group cohesion into two major categories: group integration (i.e., perception of the group as a unit) and individual attraction to the group (i.e., a member's personal attraction to the group or team). Further, each of these categories can then be divided into either task or social aspects leading to a four-factor model of group cohesion. A meta-analytic review including 46 studies examining the relationship between group cohesion and performance in sport found a moderate to large effect size such that increased group cohesion is associated with increased performance outcomes (Carron, Colman, Wheeler, & Stevens, 2002).

Collective efficacy is a "group's shared belief in its conjoint capability to organize and execute the courses of action required to produce given levels of attainment" (Bandura, 1997, p.477). Essentially, collective efficacy reflects a team's level of confidence. Research has

demonstrated that collective efficacy has a positive impact on team performance and that prior team performance can also have an impact on collective efficacy (Feltz & Lirgg, 1998; Myers, Feltz, & Short, 2004; Myers, Payment, Feltz, 2004).

CONTEMPORARY METHODS AND DEVELOPMENTS

Mindfulness

Have you ever noticed yourself getting distracted during a task and then felt feelings of upset like anger, guilt, or frustration *because* you got distracted? This type of experience is a common one. While thoughts and events can distract a person from their point of focus (studying, communicating, performing a known skill), the evaluations or judgements that follow the distraction can become even more distracting. Researchers have theorized that these evaluations and judgements can lead to lowered performance in sport because of a focus on task-irrelevant thoughts (Gardner & Moore, 2004; Kaufman, Glass & Arnkoff, 2009). They highlight the importance of bringing the focus of attention back to what is most important now: your task.

The practice of mindfulness can help in moments of distraction, improving performance in daily tasks and athletic pursuits alike. Some may think of being mindful as simply having a calm demeanour in stressful situations, but it is much more than this. Being mindful involves being present with one's circumstances intentionally and without judgment (Kabat-Zinn, 1994). Despite the simplicity of the mindfulness concept, its practice can be challenging. For those who do learn to be more mindful, the rewards can be numerous, including the potential to improve sleep and focus (MacDonald, Oprescu, & Kean, 2018), reduce stress (Lundqvist, Ståhl, Kenttä, & Thulin, 2018; Vidic, St. Martin, & Oxhandler, 2018), and improve performance (Zhang et al., 2016).

Originally popularized in North America by Jon Kabat-Zinn (1994), mindfulness is defined as “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (p. 4). This definition is based on Kabat-Zinn's personal study of Buddhism, but he maintains that mindfulness based interventions need not promote or necessitate the practice of Buddhism, although some may find this helpful (Kabat-Zinn, 2017). Early research on the benefits of mindfulness began mostly outside of sport, looking at the use of a mindfulness practice alongside traditional medical treatments (Kabat-Zinn, 1982). An approach to facilitate mindfulness, known as Mindfulness Based Stress Reduction (MBSR), was developed with a primary goal to help relieve the suffering and stress of patients not fully responding to traditional medical treatment. A goal of MBSR was to create a model for other hospitals to implement with patients. The reach of MBSR has now gone beyond hospitals, and variations of MBSR have been incorporated into the areas of education, business, military, and sport (Kabat-Zinn, 2017). MBSR is an eight-week intervention that attempts to cultivate a greater ability to notice a patient's inner and outer world (Kabat-Zinn, 1990; Santorelli, 1999). Sport-focused approaches to mindfulness have largely been adapted from this model.

Mindfulness as an approach to improving sport performance is a relatively recent development in the field of sport psychology compared to more traditional psychological skills interventions. While Kabat-Zinn, Beall and Rippe described the first known use of mindfulness with athletes in 1985, the 1990s showed little uptake in the use of mindfulness

in sport. Beyond the early 2000s, however, research and use of mindfulness-based interventions in sport have grown substantially. Evidence now exists that supports a moderate improvement in sport performance for those athletes employing mindfulness techniques, and this is especially true in sport tasks based on precision (Bühlmayer, Birrer, Röthlin, Faude, & Donath, 2017).

Mindfulness to enhance performance and well-being has been taught to athletes through two main interventions: Mindfulness-Acceptance-Commitment therapy (MAC; Gardner & Moore, 2012) and Mindful Sport Performance Enhancement (MSPE; Kaufman, Glass & Arnkoff, 2009). Currently more robust evidence exists for the ability of MAC to improve performance, but research on MSPE is in its infancy.

Mindfulness-Acceptance-Commitment therapy (MAC)

The MAC intervention was developed by Gardner and Moore (2004) and is influenced by Kabat-Zinn's definition of mindfulness (1994), combined with acceptance and commitment therapy approaches used in counselling psychology (Hayes, Strosahl, & Wilson, 1999). In MAC, mindful awareness is accompanied with acceptance of the current experience as it is, and commitment to value or goal driven behaviour (versus emotion-driven behaviour). The commitment component of the MAC approach requires a prior knowledge and understanding of the athlete's values and goals, and of the behaviours that help their performance. Thus, self-awareness and knowledge of their sport is required in order to make full use of this approach in performance improvement.

In their rationale for the use of mindfulness to improve sport performance, Gardner and Moore (2004) acknowledged that although improvement can be detected in use of a mental skill (e.g., imagery, positive self-talk), most mental skills used in interventions with athletes show inconsistent results regarding performance improvement. They argued that this might be because of inaccurate assumptions regarding what leads to excellent performance. Traditional mental skills training focuses on control of internal states by managing thoughts, images and emotions (Gardner & Moore, 2004; Moore, 2009). Moore argues that these control-based techniques are built on the assumption that there is an "ideal state" that leads to excellent performance, and that an athlete must experience that ideal state in order to perform their best. Anecdotally, many athletes know this to be incorrect, at least some of the time, as many athletes can think of a time that they performed well while experiencing a host of negative emotions and sensations. Gardner and Moore (2012) argue that a mindful approach to sport performance is effective for maintaining or improving performance by increasing the proportion of thoughts or present-moment observations that are applicable to the task at hand.

There are seven modules in the MAC intervention that are completed in order, and a coach or leader must ensure athlete comprehension of each module before continuing (Gardner & Moore, 2007). Because of this focus on mastery of content, the length of the MAC intervention can vary, but it will last at least seven weeks.

Mindful Sport Performance Enhancement (MSPE)

In contrast to MAC, the MSPE approach focuses less on values and value-driven behaviour, and more on the progressive practice of non-reactive attentional control (Kaufman, Glass, & Pineau, 2018). MSPE uses the terms *concentration*, *letting go*, *relaxation*,

harmony and rhythm, and *forming key associations* (finding personal cues that bring you back into the moment) to describe the focus of the approach. The progression of practice begins with quiet settings and watching the breath or scanning the body. Over the course of the intervention, athletes are encouraged to practice these skills at home and log their experiences for later discussion. An acronym used to integrate mindfulness into life outside of sport and the training sessions is STOP: stop, take a few breaths, observe, and proceed (Kaufman et al., 2018).

Mindfulness in sport takes a different approach to performance improvement when compared to traditional mental skills training. That being said, it can be used in conjunction with traditional mental skills as described earlier in this chapter. There is evidence of improvement in athlete performance, mental health and well-being through the application of positive self-talk, imagery, goal setting, relaxation or activation. As with any mental, physical or social skill, proper and consistent practice is key to improvement and ease of use.

NEUROFEEDBACK AND BIOFEEDBACK TRAINING FOR OPTIMIZING SPORT PERFORMANCE

Psychophysiology is defined as “the scientific study of the interrelationships of physiological and cognitive processes” (Schwartz & Olson, 2003, p. 5) and two types of psychophysiological interventions utilized in sport include neurofeedback training (NFT) and biofeedback training (BFT). The training process involves the measurement of physiological or neurological activity that is then fed back to the athlete in real time in the form of audio or visual cues that enable the athlete to develop greater self-awareness and ability to voluntarily regulate physiological and neurological processes (Blumenstein & Hung, 2016; Schwartz & Andrasik, 2017).

Biofeedback training (BFT)

BFT equipment measures and feeds back physiological information associated with the stress response (e.g., heart rate, respiration rate and depth, heart rate variability, peripheral body temperature, and electrodermal activity) and has been identified as “one of the most powerful techniques for facilitating learning of arousal-regulation” (Bar-Eli, Dreshman, Blumenstein, & Weinstein, 2002, p. 568). Fundamentally, when the sympathetic nervous system is activated, the body responds physiologically by increasing respiration rate, heart rate, electrodermal activity, and muscle tension, and by decreasing peripheral body temperature, in order to prepare the body to *‘fight or flee’* the stressful situation (e.g., Filaire, Alix, Ferrand, & Verger, 2009). During BFT athletes observe their physiological data on the computer screen and train the ability to actively alter the various responses. For example, if under stress an athlete may tense his or her muscles, he or she would be encouraged to observe the tension level and attempt to lower it.

Neurofeedback training (NFT)

NFT also known as electroencephalography (EEG) biofeedback, involves the measurement of cortical activity (Schwartz & Andrasik, 2017). During NFT, electrodes are placed at specific locations on the surface of the scalp and measure minute electrical signals, which appear in five major frequencies: delta, theta, alpha, beta, and gamma (Cacioppo, Tassinari, & Berntson, 2016). For a comprehensive review on the relationship between cortical frequency

and sport see Cheron et al. (2016). During NFT, relevant components of the athlete's EEG are extracted and fed back in the form of audio and/or visual cues that indicate when they have met the predetermined threshold (Vernon, 2005). This feedback loop (generally considered operant conditioning) allows athletes to see their brainwaves visually, and based on reward contingent feedback, gives them the ability to progressively alter their brainwaves (Hammond, 2011; Schwartz & Andrasik, 2017). For example, sensorimotor rhythm (SMR) – a specific frequency within the low beta range that is correlated with alert but calm mental state (Thompson & Thompson, 2015) – has been shown to enhance golf putting performance in golfers (Cheng et al., 2015).

In sum, BFT/NFT helps athletes to learn how to effectively self-regulate physiological arousal and focus in the competitive environment. BFT and NFT have been shown to reduce anxiety (Gevirtz, 2007), improve attention (Gruzelier, Egner, & Vernon, 2006), develop self-efficacy (Davis & Sime, 2005), and ultimately enhance performance (e.g., Blumenstein & Hung, 2016; Mirifar, Beckmann, & Ehrlenspiel, 2017; Morgan & Mora, 2017; Xiang, Hou, Liao, Liao, & Hu, 2018)

APPLICATIONS OF SPORT AND EXERCISE PSYCHOLOGY

Sport psychology is a relatively new and rapidly expanding field. As a result, several graduate training pathways and career options have become available to those wishing to work in this area. There have traditionally been two streams within the discipline of sport psychology: research and professional practice. Although each is associated with different training paths (Fitzpatrick, Monda, & Butters Wooding, 2016), there is considerable crossover between research and professional practice, as both undeniably inform one another. This has unsurprisingly led to calls for more interdisciplinary training (see Careers section below; Wylleman, Harwood, Elbe, Reints, & De Caluwé, 2009). This section of the chapter will address both research and professional practice streams, and highlight career and graduate training opportunities available in Canada.

THE PROFESSION OF SPORT PSYCHOLOGY IN CANADA

To provide some context, it is valuable to first situate the profession of sport psychology in Canada. From a professional practice standpoint, sport psychology and more specifically, mental performance consulting, is overseen by the Canadian Sport Psychology Association (CSPA). The CSPA was developed in 2006 by Drs. Natalie Durand-Bush, Penny Werthner, and Tom Patrick, based on the initial Canadian Mental Training Registry (CMTR) established by Dr. Terry Orlick. The CSPA specifies education and training requirements to provide mental performance consulting services in Canada, and recognizes professionals who possess minimum competencies to work in this field. Notably, individuals must have (a) a Master's degree in sport psychology or related field, (b) demonstrated understanding of foundational disciplines such as human kinetics/kinesiology, psychology, and counselling, (c) extensive consulting experience and hands-on experience in sport, and (d) favourable supervisor and client evaluations (CSPA, 2018; <https://www.cspa-acps.com/about>).

The CSPA offers professional, student, and academic membership, and provides mentoring and supervision opportunities for students and young professionals aspiring to become professional members. It is noteworthy that within its professional membership, the

CSPA distinguishes between mental performance consultants and registered psychologists. According to the CSPA (2018, p. 2):

Mental Performance Consultants (MPCs) are extensively trained in the area of sport sciences and have acquired fundamental knowledge in psychology and counselling through university undergraduate and graduate coursework. MPCs provide individual or group consultations geared towards improving sport performance and well-being related issues. They do not diagnose or treat mental health issues. Psychologists working in the area of sport are extensively trained in clinical or counselling psychology and have acquired fundamental sport science knowledge through university undergraduate and graduate coursework. They provide individual or group consultations geared towards improving sport performance and diagnose and treat a range of mental health issues such as addictions, eating disorders, depression, and anxiety.

All in all, the CSPA is an important reference for those interested in pursuing a career and completing requisite training in the field of sport psychology in Canada. The Canadian Psychological Association also provides information for psychologists wishing to add sport and exercise as an area of practice (Canadian Psychological Association, 2018), however this information is limited.

SPORT PSYCHOLOGY CAREERS AND TRAINING PATHWAYS IN CANADA

In order to provide a comprehensive description of career and graduate training opportunities to work in the field of sport psychology in Canada, the profiles of current professional members of the CSPA were examined to identify their credentials, educational and training background, and professional roles and affiliations. This data also served to identify alternative career paths outside of traditional professional practice and research. Furthermore, building from Durand-Bush and McNeill's (2016) chapter on the history of sport psychology in Canada, graduate training programs within Canada's 97 publicly funded universities (Universities Canada, 2018) were also examined to locate any new education and training opportunities for students pursuing graduate studies in this field. These programs were limited to those in which students can specialize in sport psychology within a kinesiology, human kinetics, or physical activity/education department. Finally, literature related to sport psychology career paths and graduate training in Canada was reviewed. Given the lack of information specific to the Canadian context, literature targeting the United States and Europe was considered.

CAREER PATHWAYS

Careers in sport psychology typically involve two streams: research and/or professional practice (i.e., mental performance consulting). While some professionals train and work exclusively in one stream, many pursue both. For instance, a review of the public profiles of CSPA professional members illustrates that several of them perform both scholarly and applied work, and actively engage in this dual role. This reinforces the research-practice orientation of the field of sport psychology in Canada (Schinke & McGannon, 2014).

Research-focused careers

In terms of research-focused careers, a prominent option for those who have completed a doctoral degree in sport psychology is an academic position in a post-secondary institution (e.g., Assistant Professor) in Canada or abroad (Fitzpatrick et al., 2016). Such positions can be held in research-intensive universities where there is an expectation for scholarship and supervision of undergraduate and graduate students, or in teaching-intensive universities where teaching and student mentorship are prioritized. A typical academic position in a research-intensive university in Canada involves teaching (e.g., lecturing, supervising students), research (e.g., securing grants, preparing peer-reviewed publications), and service (e.g., serving on committees, performing administrative tasks; Gravestock & Gregor Greenleaf, 2008). Generally, work expectation of a tenure-track professor in most Ontario universities is, “40% time/effort allocation to teaching, 40% to research, and 20% to service” (Jonker & Hicks, 2014, p. 7).

There are also research-oriented careers outside of academia. Such positions can be found within the sport domain to conduct research and program evaluation for organizations such as the Coaching Association of Canada and the Canadian Olympic Committee. Outside of sport, positions have been offered within the government (e.g., Department of National Defense) and healthcare (e.g., Canadian Medical Association) sector to investigate, for example, resilience and well-being in military personnel and physicians.

Careers in professional practice

There are two types of careers related to professional practice in sport and exercise psychology, depending on practitioners’ education and training. As highlighted by the CSPA, practitioners can work as an MPC or a licensed mental health professional (e.g., registered psychologist, certified psychotherapist, or counsellor) in the context of sport. It is important to note that in Canada, there is no official title of “sport psychologist” either with the Canadian Psychological Association or the CSPA. The correct title for those who are licensed to work as a psychologist in their respective province or territory is registered psychologist (R. Psych.; Wall, 2016). Both types of practitioners can become professional members of the CSPA and/or AASP (Association of Applied Sport Psychology—a comparable organization to CSPA in the USA). Specific course work and supervised practice is a requirement no matter the educational background of the professional (see Training section, below). Moreover, as the CSPA and AASP plan to unify their procedures and certification standards within coming years, it is likely that Canadian and American practitioners will be able to follow similar certification procedures and adopt the credential of “Certified Mental Performance Consultant” or “CMPC ®” (Association for Applied Sport Psychology, 2018; Schinke et al., 2018).

The MPC role is that which most students have in mind when working towards professional practice in the field of sport psychology. The goals of a MPC are to teach, guide, and support individuals in their practice and development of psychosocial skills for optimal performance, day-to-day living, and well-being. In order to clearly define the role of sport psychology practitioners, AASP conducted a Job Task Analysis and identified:

[Six] 6 domains of practice (e.g., Goals, Outcome, and Planning), 21 tasks/discrete work activities (e.g., identify personal and systematic resources and barriers related

to the achievement of goals and desired outcomes), and 38 underlying knowledge statements (e.g., intervention research and its application) related to the competent and effective practice of certification-level professionals in sport psychology” (AASP Interim Certification Council, 2017).

In particular, effective MPCs work in an interdisciplinary fashion and can provide services to a range of performers in diverse contexts in order to address specific sport/performance issues as well as more general well-being affecting daily functioning in life.

Those pursuing careers as registered psychologists, counsellors, or psychotherapists may choose to apply their work specifically in the context of sport and complete additional training in sport sciences to fully understand and navigate the competitive sport environment. They may also seek the designation of MPC within the CPSA, provided they meet the registration criteria (see Training section below). While these practitioners may consult on sport performance concerns, they can also focus on diagnosis and treatment of clinical symptoms and mental disorders such as addictions, eating disorders, and depression. Although there are distinctions between the career paths of MPCs and registered psychologists, the need for collaboration between these two types of practitioners has been emphasized by the CSPA and CPA (Canadian Psychological Association, 2018) in order to more comprehensively tend to the needs of athletes. The new Canadian Centre for Mental Health and Sport (CCMHS, 2018) has as its mandate to provide interdisciplinary services for competitive and high-performance athletes and coaches experiencing mental health challenges and mental illness. The collaborative sport-specialized mental health care team indeed includes MPCs, registered psychologists, psychotherapists, counsellors, and psychiatrists. Having all of these important practitioners working in unison to determine athletes and coaches’ needs and mental health care plans while respecting their performance goals and sport culture will arguably lead to better experiences and outcomes.

A career as a sport psychology practitioner (e.g., MPC, MPC-CCC, MPC-R. Psych.) is dynamic and multifaceted. Given the developing nature of the field of sport psychology, many professionals take on a mixture of full- and part-time contracts with sport organizations, teams, and individual clients, as well as multi-roles that combine administrative duties with mental performance consulting. Practitioners endeavouring to develop and sustain a private practice can benefit from additional know-how in business management, finance, and marketing. Unfortunately, these are topics that still require attention in most graduate training programs (Wylleman et al., 2009).

Practitioners also work in various related, but non-sport-specific fields to provide mental performance consulting in domains such as healthcare, education, and the workplace. Some adopt multiple roles by combining academic and leadership/management positions with their own sport psychology practice. For example, individuals have concurrently worked as an MPC, registered counsellor, adjunct professor, and sport centre director.

Other career options for those who have studied sport psychology include sport-related roles (e.g., High Performance Advisors) within organizations such as Own the Podium and the Canadian Paralympic Committee. Moreover, training in this field is highly relevant for intervention, consultation, and program development in professions pertaining to health, education, and high-risk management (e.g., military, fire fighter, police, paramedic). Examples of such careers include (a) counselling within Canadian university student services centers to support students’ academic success, (b) providing mental performance services

within the Canadian Special Operations Forces Command to enhance the morale, welfare, and operational readiness of military personnel, and (c) providing resilience training in hospitals to help children and families cope with cancer.

EDUCATIONAL PATHS AND TRAINING

Although research and professional practice career paths in sport psychology intersect, the training requirements to successfully pursue these careers tend to be more distinctly delineated. One study showed that graduate students in this area often feel that they cannot gain the “best of both worlds” by completing a single educational program and thus have to make an explicit choice between pursuing an academic research position and professional practice (Fitzpatrick et al., 2016). As such, those who wish to combine both aspects in their work may need to seek additional training opportunities outside of their program requirements. That said, some graduate programs in Canada provide the opportunity for students to combine research training with applied consulting work and supervision, such as the Master of Human Kinetics (MHK) program offered at Laurentian University (i.e., includes an optional internship course as part of the thesis-based, research program).

Training for research

Research careers related to sport psychology, whether in post-secondary institutions or outside of academia (e.g., in the public sector) typically require graduate research training acquired in thesis-based Master’s (e.g., MA, MSc) and/or doctoral (i.e., PhD) degrees. For students who pursue non-thesis-based Master’s degrees (see Professional practice section below), additional coursework (e.g., in research methods) and research experience can prepare them for research careers. Faculty members in Canadian universities normally hold a doctoral degree in their field of study; however, given the competitive nature of the field, it is not uncommon to pursue post-doctoral training (e.g., a post-doctoral fellowship) to obtain an academic position. Those who conduct research outside of higher education (e.g., in industry or the public sector) often acquire the research competencies necessary for their roles by completing a Master’s degree, although a doctoral degree may be required for more senior research positions (e.g., Research Associates).

Canada has a history of vibrant scholarship in sport psychology, and over the past few decades, there has been a proliferation of high quality graduate programs in the field (Durand-Bush & McNeill, 2016). Therefore, many opportunities exist for students who wish to acquire research training in sport psychology. According to Durand-Bush and McNeill, approximately 25% of Canadian public universities offer graduate programs in which one can specialize in sport psychology. These programs are housed within sport science departments (i.e., kinesiology, human kinetics, physical activity/education) and offer students the possibility to study psychological aspects of sport with faculty members who conduct research in sport psychology. A graduate degree in psychology (e.g., experimental, clinical, counselling) with a research focus on sport is another pathway to an academic or research career in the field, however, coursework and training in sport psychology tends to be limited in psychology programs (Stewart, 2017).

Overall, as the discipline continues to grow, and as recent doctoral graduates enter faculty positions, so too do the research training opportunities for students in Canada. In addition

to the 24 programs listed by Durand-Bush and McNeill (2016), students can also specialize in sport psychology research in graduate programs at Nipissing University (MSc, MEd, PhD), Lakehead University (MSc), Dalhousie University (MSc, PhD), University of Lethbridge (MA, MSc), and the University of Prince Edward Island (MSc). Given the diversification of the field of sport psychology and its interdisciplinary nature, research within graduate programs may focus on a variety of topics, depending on the interests of thesis supervisors. Examples include psychological skills training, life skill development, concussion management, injury rehabilitation, mental health and well-being, motivation and emotion, leadership and group dynamics, and physical activity promotion. These topics could be researched within different contexts in (e.g., youth, elite, disability sport) and outside of sport (e.g., business, performing arts, military, medicine).

While pursuing thesis-based graduate degrees, students can expect some coursework related to sport psychology, but given the interdisciplinary nature of these programs, they may also complete coursework within the broader field of sport sciences. Importantly, these programs involve completing a Master's thesis or doctoral dissertation, in which students conduct novel research in order to make new contributions to the sport psychology literature. Master's degrees generally require two years of full-time study, while doctoral degrees typically span four years or more. However, students are encouraged to consult the specific requirements of the programs in which they are interested and should take note of the additional research training that may be required to achieve their career goals.

Training for professional practice

In comparison to Canadian research-oriented sport psychology programs, graduate programs preparing students for professional practice are limited (Durand-Bush & McNeill, 2016). That said, some programs geared toward applied careers in the field do exist. Two programs offer students the opportunity to gain both applied experience and research skills in the field, without the requirement of a traditional Master's thesis. The University of British Columbia offers a course-based (i.e., without a thesis) Master of Kinesiology degree. This one-year program provides training in different areas of study (i.e., Socio-Managerial, Natural/Physical Science, Behavioral Science, and Coaching Science), with the most popular being the Coaching Science stream (Durand-Bush & McNeill). Students are required to complete coursework, a research paper, and have the option to carry out an additional directed field study. Another unique course-based program is the Master of Human Kinetics in Applied Human Performance (Internship Option) at the University of Windsor. Over the course of 16 to 24 months, students complete coursework and a 360-hour Kinesiology internship, as well as a research project. This internship program option is meant to provide students with both field-work and research experience, and students are required to complete a research project in order to receive credit for their applied internship work.

For those wishing to pursue a career as a sport psychology practitioner, graduate training will depend on their desired scope of practice (e.g., MPC, Certified Counsellor, Registered Psychologist). Students should examine the professional membership requirements of the CSPA, CPA, and/or Canadian Counselling and Psychotherapy Association (CCPA) to help guide their training pathway. The general criteria for CSPA professional membership includes a Master's degree in sport psychology (or a related field), coursework in sport

psychology, sport sciences, counselling, and psychology, a 400-hour supervised internship, and favourable evaluations from supervisors and clients from sport and related settings. A review of CSPA professional membership profiles revealed that many members have extensive competitive sport experience as an athlete or coach (e.g., at varsity, national, and/or Olympic level) and/or as a sport professional (e.g., kinesiologists, athletic trainer). Competencies and experience in sport are requirements for professional membership with the CSPA (CSPA, 2018), as well as for certification with AASP in the USA (AASP, 2018).

Presently, the Master's of Human Kinetics at the University of Ottawa is the only professional graduate program in Canada geared toward preparing students to meet CSPA professional membership requirements. In this four-semester, course-based Master's program, students complete coursework in counselling, sport and exercise psychology theory, mental skills training and quality of life, professional ethics, and analysis and enhancement of consulting interventions. They may also complete courses in research methods, statistics, organizational behaviour, and sport law, as well as engage in a semester-based directed study if they desire research experience. Their coursework is complemented by an extensive 400-hour supervised internship in sport, physical activity, health, education, business, and/or performing arts contexts. Students who complete thesis-based graduate degrees in sport psychology can, nonetheless, achieve professional membership with CSPA by seeking out supervised practical experiences and additional coursework outside of their academic program.

Individuals who wish to work in the field of sport psychology as registered psychologists or related vocations such as registered counsellors or psychotherapists should refer to the specific requirements for licensure within their respective province or territory. It is important to note that formal opportunities to study sport psychology within clinical/counselling psychology departments is limited (Stewart, 2017). However, some professors who are professional members of the CSPA have academic appointments within psychology departments (e.g., Simon Fraser University, University of Regina, University of Manitoba). There are also professors conducting research in the field of sport psychology within programs that offer clinical psychology training in Canada (e.g., University of Ottawa, Université du Québec à Montréal). Thus, while these programs do not offer specialization in sport psychology, students could potentially pursue a doctoral degree in clinical psychology (e.g., PhD, PsyD) while conducting research on topics in sport psychology (e.g., motivation, coping, passion in sport).

Programs housed in psychology departments have coursework that is focused on psychology, and these programs tend not to have courses in sport science. Thus, in order to learn about the field of sport psychology, it is likely that students would need to seek out additional courses in sport sciences and sport psychology outside of their department (Wall, 2016). This is particularly important for those wishing to become professional members with CSPA or obtain CMPC© certification through AASP, as coursework in sport psychology and sport sciences is a requirement for professional membership. Additionally, students would need to find field placements that meet both clinical psychology and sport criteria in order to develop competencies specific to sport performance that satisfy CSPA or AASP requirements. Thus, while students who pursue graduate studies in psychology programs can go on to pursue careers in applied sport psychology, this trajectory involves completing additional coursework and clinical work related to sport outside of their department. This reinforces the notion that students from all training pathways need to take a self-directed

approach to develop the necessary competencies to work as a professional sport psychology practitioner (Wall).

CONCLUDING REMARKS

In summary, there are several careers and training paths available to those wishing to specialize and work in the field of sport psychology in Canada. Both research and professional practice are meaningful endeavours to pursue and a combination of these two options is often an ideal choice for those seeking to play multiple roles. Canada is home to several diversified sport psychology graduate programs directed by world-leading scholars and practitioners. Students can therefore find an educational program that meets their personal needs and interests. They equally have the option to complete additional training to meet the requirements of research and/or professional practice organizations that will open doors for future employment.

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[13]

ENVIRONMENTAL PSYCHOLOGY

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INTRODUCTION

Have you ever wondered whether playing music while you study helps you to focus? Why some people bicycle, recycle, or turn down the heat in winter – while others do not? Do people become more aggressive when it's hot outside? Would playing in a park, as opposed to a paved playground, help children with ADHD focus their attention better? These are examples of questions that environmental psychologists answer.

OVERVIEW OF ENVIRONMENTAL PSYCHOLOGY

Environmental psychology is the study of how we, as individuals and as part of groups, interact with our physical settings — how we experience and change the environment, and how our behaviour and experiences are changed by the environment. In environmental psychology, *environment* includes both natural and built settings, such as parks, natural landscape, homes, workplaces, and public spaces. Environments can vary in scale from the immediate space surrounding us to the room, the building, the neighbourhood, the city, the wilderness, or the globe.

In most fields of psychology, behaviour seems to be considered as occurring in a vacuum. The physical environment is often treated in research as mere “noise,” something to be controlled for in studies. Environmental psychology embraces the physical world in which we experience life. Environmental psychologists consider any human activity to be situated along three dimensions at the same time: the person (e.g., age, gender, personality, culture), the place (e.g., home, classroom, workplace, park, nature), and the psychological process of interest (e.g., socializing, working, learning, playing, exploring). Change over time can be

an important dimension as well. Behaviours in a particular physical environment can be influenced by social-psychological contextual factors such as the presence of others or one's role in the group, and these are also part of environmental psychology (Gifford, 2014).

Environmental psychology is a relatively new field — about 60 years old now — that has grown rapidly in response to the degradation of the natural environment and the need to design buildings that better meet the needs of their users. Like most areas of psychology, environmental psychology has a theoretical side as well as an applied side. Some environmental psychologists focus their efforts on developing knowledge, whereas others work as consultants to answer practical questions; a few aim to make their work serve immediate, practical goals as well as to contribute knowledge for others to build on (Stokes, 1997).

The goal of environmental psychologists who focus mainly on research is to understand individuals' transactions with their environments. They study fundamental psychological processes as they relate to the physical environment, including environmental perception, spatial cognition, appraisals of environments, and personality, child development, and social interaction as they relate to the environment. They ask: How do humans mentally represent their spatial surroundings? What are some common attitudes toward energy consumption? Which physical variables affect learning in the classroom?

At a broader level, environmental psychologists examine how transactions with our work, home, and natural environments are related to our satisfaction and productivity, well-being, and mental health. For example, do crowded cities contribute to depression? Does better lighting on sidewalks encourage people to go out at night? Does indoor air quality associate with better performance at the office? How is climate change affecting mental health (Gifford & Gifford, 2016)?

In the long run, many environmental psychologists aim to use the knowledge generated by their research to influence built and natural environments in positive and constructive ways. This can be done by contributing to government policies or programs that help to promote sustainable behaviour. It could also be done through influencing the architecture and construction industries by informing design guidelines or by offering recommendations to city planners about how to encourage place-making and create urban spaces that are psychosocially healthy.

Other environmental psychologists work as consultants with goals to solve a practical problem brought to them by someone with a need to solve that problem. Such issues are likely to be local, specific, and pressing. When a client is less interested in the theoretical aspects of the problem, then effective, quick, and evidence-based action is called for. For example, when city officials are interested in establishing a food recycling program, their main concern could be to increase the number of people who participate in their program. They expect the environmental psychologist they hire to know the theories and the body of research well in order to translate this knowledge into practical recommendations that will result in more food recycling in the city.

The work of an environmental psychologist is interdisciplinary in nature. Depending on the area of focus, the successful researcher-practitioner will know something about architecture, organizational behaviour, health, natural resources management, and other related disciplines. Knowing how to work with other specialists is important, as is understanding the needs of users (or potential users) of the setting that is being planned, constructed, or renovated. Often, projects involving environmental psychology will be

important to community leaders, volunteers, and policy-makers who may use research findings to formulate or change government regulations and guidelines. In short, environmental psychologists:

- Seek to improve our stewardship of natural resources and help mitigate climate change, including how best to adapt to it;
- Understand how to increase the habitability of the built environment;
- Study everyday settings in relation to human attitudes, emotions, and behaviours;
- Recognize that we actively cope with, and shape, environments; we do not passively respond to environmental forces; and,
- Work in conjunction with other disciplines.

A BIT OF HISTORY

Psychologists have conducted research on the built environment since the 1920s. In the earliest studies (as cited in Gifford, 2014), researchers investigated the effects of noise and heat on work performance, classroom seating on student grades, and lighting on work performance in the infamous Hawthorne studies — studies you might have heard about in some of your courses.

The modern intellectual roots of environmental psychology can be traced back to the middle of the 20th century. Egon Brunswik (1943) argued that psychologists should focus on an organism's environment as much as the organism itself. Like Brunswik, Kurt Lewin (1946) viewed the environment as an essential influence on behaviour. He also emphasized that research should be driven by real-world problems and applied to solve real-world social problems. Roger Barker (1968) developed the concept of behaviour settings: small ecological units, such as the corner store and the high school basketball game. Barker observed remarkable consistency in the pattern of activity for occupants in a given role in relation to the physical-spatial aspect of the behaviour setting.

The 1950s experienced an increase in research in “architectural psychology,” which focused on human interactions with the built environment. The primary goal of these studies was to improve human well-being and satisfaction by designing or altering built environments. A key example is the redesign of parts of a large, fortress-like mental hospital, as they were called in the 1950s. A team consisting of a psychiatrist, a psychologist, and an architect carefully considered the particular needs and behaviours of the patients in the redesign of the hospital at Weyburn, Saskatchewan (Osmond, 1957). This project might have been the very first time in which environmental psychology was consciously applied to the design of a building, and we will revisit this project below.

The 1960s saw rapid growth in environmental psychology. In a time of increased societal awareness and concern about the health of the natural world, researchers began to study environmental issues such as how human activity negatively influences the biophysical environment and how human-caused problems (e.g., noise and pollution) affect human health and well-being. These topics soon became an essential part of what environmental psychologists do.

In the late 1960s, environmental psychology became a named, distinct field (e.g., Proshansky, Ittelson, & Rivlin, 1970). Today, the field encompasses the study of environmental and architectural concerns. Environmental psychologists around the world

tend to focus on research areas of specific concern to their country or region. Most large national and international psychology organizations have a section or division that is devoted to environmental psychology.

CURRENT ENVIRONMENTAL PSYCHOLOGY RESEARCH TOPICS

Based on the authors' experience as editors and editorial board members of journals in the field, and upon our knowledge of our own and colleagues' work, here is a list of current topics that environmental psychologists study:

- Ecological consequences of human actions
- Sustainability and climate change
- Psychological aspects of resource management
- Psychological and behavioural aspects of people and nature
- Place attachment and place identity
- Environmental risks and hazards: perception, behaviour, and management
- Personal and group-based perceptions and evaluations of buildings, and natural landscapes
- Design and evaluation of workplaces, schools, homes, public buildings, and public spaces
- Cognitive mapping, spatial cognition, and wayfinding
- Leisure and tourism behaviour in relation to their physical settings
- Stress related to physical settings
- Social space: crowding, privacy, territoriality, personal space

The interests of environmental psychologists continue to reflect the environment we live in, building upon the past and adapting to new conditions (e.g., the creation of virtual reality expands the notion of “environment”). The 21st century is an era of digital communication and artificial intelligence as well as of ecological threats (e.g., Stokols, 2018). How do advances in new technologies change our experiences and relationships with our physical environment? Is the workplace or the school still a relevant conception of place when people can work, learn, shop, sight-see places around the world, or consult with a therapist, from just about any physical setting? How will we perceive, think, and behave in virtual reality, augmented reality, and “smart” buildings and cities? These will be the subjects of inquiry for environmental psychology in the near future.

RESEARCH METHODS

Environmental psychologists use both quantitative and qualitative approaches, choosing one that best fits the research question, or using multiple methods if resources allow. Many of the methods are commonly used in psychology and, thus, are introduced in most undergraduate research methods textbooks. Other techniques are specific to research in environmental psychology. The environmental psychologist's job is to know which methods

of gathering information will yield quality answers to the questions at hand, and to use these methods well.

Research methods and techniques commonly used in environmental psychology include:

- Self-reports, such as questionnaire surveys, attitude and other rating scales, and interviews
- Experiments conducted in a laboratory
- Field studies and quasi-experiments conducted in everyday physical settings
- Analyses of archival data, such as census data, police crime reports, park visitors logs
- Naturalistic observation and recording of behaviours in an unobtrusive and systematic manner
- Physiological measurements (e.g., cortisol level, skin conductance to measure stress level)
- Case studies of particular places
- Content analyses of documents and messages (e.g., media reports)

Some techniques used specifically (or more often) in environmental psychology are:

- Behaviour mapping (i.e., keeping a visual record of people's behaviours in a space; for example, where visitors are distributed in an art gallery at a particular time)
- Cognitive mapping (i.e., drawing an individual's mental representation of a place in a sketch map)
- Analyses of physical traces, including accretion (i.e., the deposit of material, such as litter) and erosion (i.e., the selective wear of material, such as floor tiles)
- Environmental simulations, ranging from static photos to videos, physical mock-ups, computer-generated images, to computer games and virtual reality applications. These simulations are particularly useful for studying the responses of future users to environments that are yet to be built.
- Needs assessment (architectural programming, before the project is built) and post-occupancy evaluation (did the building design work as planned?)

Each of these methods and techniques has strengths and weaknesses. In most cases, using multiple methods and techniques that complement one another in order to gain a comprehensive picture of the person-environment transaction under study is the wisest approach. As in any research involving human participants, the researcher has the responsibility to address any ethical concerns and to weigh the potential social benefits against the social costs of the research. Two advanced guides to research methods and techniques used in environmental psychology research are the books written by Zeisel (2006) and edited by Gifford (2016).

SOME SIGNIFICANT RESEARCH STUDIES IN ENVIRONMENTAL PSYCHOLOGY

Several pioneers of environmental psychology have focused on our use of social space. The early work of Robert Sommer (e.g., his book *Personal Space: The Behavioral Basis of Design*, 1969) emphasized our need to keep particular, varying interpersonal distances (personal space) when we interact with different sorts of others, in different sorts of situations. He

also examined the negative consequences that follow when others invade that space. In his book *The Environment and Social Behavior: Privacy, Personal Space, Territoriality, and Crowding* (1975), Irwin Altman described how we use our personal space, the territories we claim and maintain, and environmental and other means to maintain control over our interactions with other people (i.e., privacy). These concepts and principles have been influential to user-centred design.

Recall the mental hospital redesign project described earlier in the section about the history of environmental psychology. Based on the idea developed from that project, Robert Sommer formulated the concept of *social design* (Sommer, 1983). This approach to architectural design involves (a) working with people who use, or will use, the building rather than for them, (b) involving these people who will use the building in planning and management of the spaces around them, and (c) educating them to use the environment wisely and creatively to achieve a harmonious balance between the social, physical, and natural environments.

The key benefit of this approach is serving the needs of the building occupants or potential users first. Architects often view their designs differently from laypersons (Gifford, Hine, Muller-Clemm, & Shaw, 2000), and the paying client (e.g., a school board) often does not communicate with those who occupy or will use the building (e.g., teachers and students). Social design emphasizes building users as active agents in the design process.

Post-occupancy evaluations are then conducted to provide feedback to the architects and the paying client as to the effectiveness of the design. In the end, architects and paying clients could benefit as well by avoiding mistakes that would be costly to remedy over the building's life (Reizenstein, 1982). However, some resistance to this approach occurs because of the extra effort of involving users and occupants, unrealistic expectations about the effectiveness of social design, and conflict among principal players. Those who take the longer-term view of the building's effects on employees for many years argue that these initial costs and efforts are well worth making (Brill, Margulis, Konar, & BOSTI Associates, 1984).

Significant contributions have been made to our understanding of what it is like to be living and working in extreme environments, including at both the Arctic and the Antarctic regions (Suedfeld, 1991). People in such environments experience not only extremely hostile physical conditions, but also psychological feelings of isolation and confinement with others in close quarters. Difficulty with communication and interpersonal conflicts may occur, depending on the duration of stay. Preventive measures to minimize these problems might include selecting through vigorous physiological and psychological testing, capsule design, and countering boredom. Individuals who can do the required tasks, are emotionally stable, and are "sociable introverts" may be most suitable.

Capsule designs that incorporate color and variety, and some means for personalization and privacy, can help to reduce psychological stress. Individuals use different methods to fill unstructured time, injecting novelty into and reducing monotony in their lives in the capsule environment; some focus on the capsule or its surrounding environment (e.g., sunrise), whereas others focus on re-creations of their far away home (e.g., a birthday party) (Suedfeld & Steel, 2000). These research findings have spurred an interest in investigating the possibilities for human habitation in space and other planets, and environmental psychology has contributed to such endeavours (Gifford & Lacombe, 2006; Suedfeld & Steel, 2000).

For a long time, the study of climate change was the territory of the natural sciences.

However, in the last decade or so, social scientists have been successful to an increasing extent in convincing natural scientists and the public that they can play an important role in helping solve the problem. Both human solutions and technological solutions are necessary. After all, it is primarily human activities that have devastated much of our natural environment and as a result, it is our duty and responsibility to mitigate that impact through our individual and collective actions. Several environmental psychologists (Swim et al., 2011) served on the American Psychological Association's Task Force on Climate Change, which compiled a report to guide future actions.

Robert Gifford (2011) has identified almost 40 psychological barriers that limit climate change mitigation and adaptation which he calls the "Dragons of Inaction." These dragon "species" fall into several "genera," such as (a) Change Unnecessary, (b) Conflicting Goals and Aspirations, (c) Interpersonal Relations, (d) Lacking Knowledge, (e) Tokenism, (f) Limited Cognition, (g) Government and Industry, and (h) Discredence (Lacroix, Gifford, & Chen, 2019). Understanding which barriers are strongest for which sorts of people is the basis for crafting interventions that will help people overcome their barriers.

HOW ENVIRONMENTAL PSYCHOLOGY MAKES A DIFFERENCE

Environmental psychologists help to improve the world in a variety of ways. Sometimes this impact is dramatic. Other times, it is more subtle. In this section, we celebrate a few of the ways in which environmental psychology has changed the world for the better.

PROMOTING SUSTAINABILITY

One of the most important challenges that environmental psychology is helping to overcome is to apply psychological knowledge to help preserve the natural environment. Many threats to environmental sustainability are caused by human behaviour, and so targeting human behaviour that has harmful effects is paramount for protecting nature and natural resources.

Among other activities, environmental psychologists identify behaviours that can and should be changed to improve environmental quality, determine which factors affect these behaviours, and develop and evaluate interventions to change them.

Most people have some concern for the environment, and this concern stems in part from egoistic, altruistic, and biospheric environmental values (e.g., Schultz, 2001). Knowing what individuals value helps environmental psychologists develop intervention policies: If a person or group's primary concern is egoistic, for example, interventions can be implemented that emphasize the personal benefits of caring for the environment, such as lower electricity bills. Some people hold hedonic values, favouring their immediate experiences (Steg, Perlaviciute, van der Werff, & Lurvink, 2014): For such individuals, interventions that focus on their own improved comfort or enjoyment might be most effective.

To add to the challenge, many individuals rebound from their pro-environmental behaviours. For example, people who reduce energy consumption in one area sometimes compensate by increasing consumption in another (Otto, Kaiser, & Arnold, 2014). Environmental psychologists seek not only to alter behaviour, but to ensure that this altered

behaviour leads to real and lasting results. Studying how, and how much, rebound occurs is an area of active research with important policy implications (Santarius & Soland, 2018).

These are just a few ways in which environmental psychology intersects with conservation research and environmental policy change. Consider reading the reviews by Steg and Vlek (2009) for an in-depth review about how to encourage pro-environmental behaviour, or the chapter by Gifford (2002) that describes many ways that environmental psychology has already made a difference in the world.

ENVIRONMENTAL IDENTITY AND NATURE

How individuals think about themselves can be an important predictor of pro-environmental behaviour. Those who identify as pro-environmental tend to engage in more pro-environmental behaviours (Whitmarsh & O'Neill, 2010). Environmental psychologists use this knowledge to help influence pro-environmental actions, such as using marketing strategies that encourage greener identity.

Emotional connection to the natural world is also an important predictor of well-being and ecological behaviour (Nisbet, Zelenski, & Murphy, 2009). By helping people develop bonds with nature, environmental psychologists promote sustainable behaviour and overall well-being.

RESTORATIVE ENVIRONMENTS

Another key point of interest in environmental psychology is the effects of natural settings on people. A growing number of environmental psychologists specialize in restorative environments, places that help people recover from day-to-day psychological overload. Nature walks, for example, can lead to stress reduction, improved attention, and decreased anger (Hartig, Evans, Jamner, Davis, & Gärling, 2003). Similarly, children whose homes feature nearby nature show fewer ill-effects from stressful life events (Wells & Evans, 2003). This research reveals the importance of preserving accessible green areas, and has implications for how we structure cities and homes.

PLACE ATTACHMENT

Place attachment is the bond between a person and a place. It is a complex reciprocal association involving cognition, affect, and behaviour (Lewicka, 2011; Scannell & Gifford, 2010). The bond can exist at very small scales (e.g., one's own room) through to neighbourhoods, parks, cities, regions, nations, and the globe.

With the rise of globalization and mobility, place attachment has become of particular interest as person-place bonds have become increasingly tenuous. This, in turn, can influence the perceived safety and pleasantness of an environment, and can lead to people being less protective of these places. Because of this, and because place attachment is associated with environmental risk perception, place attachment is important for understanding pro-environmental behaviour.

Place attachment can be a means of influencing behaviour in positive ways, for example by encouraging the use of public spaces such as national parks. Place attachment is also relevant for disaster psychology, and has been used to help understand and mitigate the

grief experienced by those forced to relocate or, indeed, why people sometimes stay in a dangerous place when, rationally speaking, they should leave (e.g., Billig, 2006).

WAYFINDING

Knowledge of how people find their way in the built and natural environment has a wide range of applications. For example, psychologists have used this research to help catch criminals (Canter & Larkin, 1993) and locate persons lost in urban areas and the wilderness (Heth & Cornell, 1998; Cornell & Hill, 2006). It has also been used to discover ways to more quickly evacuate dangerous areas, such as a burning hotel (Kobes et al., 2009) or a smoky railway tunnel (Cosma, Ronchi, & Nilsson, 2016). Wayfinding research has also helped to develop head-mounted displays that can aid firefighter navigation in emergencies (Wilson & Wright, 2009).

ENHANCING BUILDING DESIGN

Environmental psychology first started making its mark in the world of architecture. For decades, environmental psychologists have been working to improve buildings by focusing on the human dimensions of building design. Here are a few examples of how environmental psychologists have improved the lives of users in several types of built settings.

Offices

Offices have been a popular setting for environmental psychologists to study because many people work in them and because they are comparatively accessible sites for field research that are relatively easy to simulate in a laboratory setting (Sundstrom, 1987; Veitch, 2012). Organizations probably benefit from paying greater attention to the behavioural effects of workplace conditions on employees because the costs of employees make up approximately 80% of workplace expenses, whereas the building and its operation consume approximately 8% (e.g., Brill et al., 1984). Poorly designed environments can trigger ill effects such as excess fatigue and psychological distress (Evans, Becker, Zahn, Bilotta, & Keese, 2012). Conversely, for example, greater well-being in the form of satisfaction with one's performance, and fewer physical symptoms at the end of the workday, have been associated with working under lighting conditions that one appraises as comfortable (Veitch, Newsham, Boyce, & Jones, 2008).

Long-term care centres

Environment-behaviour researchers (who encompass people with professional training in a variety of related social sciences, architecture and design, whose interests overlap) have played a role in the planning and evaluations of long-term care facilities for elderly residents with Alzheimer's disease.

For example, in five home-like residential care facilities in Canada and the US, environmental gerontologist Milke, Beck, Danes, and Leask (2009) observed that the activity patterns did not conform to the architects' expectations. Residents in each house did not

form a “household” as the architects had thought but, instead, small groups gathered for eating and other activities based on naturally formed friendships and other factors. Demonstrating how unexpected “other” factors can influence use of space, the central common area between houses in one facility where the residents had lower-level functioning was used for meal-serving because the staff wanted to keep an eye on the residents.

In another assisted living treatment residence, the facility was designed to ensure that residents were safe from wandering and that they could function on their own and maintain their sense of self through the incorporation of familiar images, events, and sensory stimuli (Zeisel, 2006).

Health care facilities

Environmental psychologists have conducted research to evaluate the physical design of health care facilities, including hospitals and the doctor’s office, in order to improve the health care experiences of patients. The physical surroundings of these settings can include any space from the parking lot, to the layout of exam rooms, to waiting rooms and furnishings. Some research in this area has explored the effects of positive distractions in the doctor’s office (Devlin, 2014). In a multi-site study of five hospital units, the more favorable the design features in a hospital room, the less stress patients reported experiencing after surgery. The physical environment of a hospital room can provide the patient with greater sense of control (e.g., adjustable temperature), facilitating social support (e.g., chair for visitor), and providing distractions (e.g., TV; Andrade, Devlin, Pereira, & Lima, 2017).

Alternative floor numbering systems (floors below ground numbered as “Sub 1” and “Sub 2” rather than simply Floors 1 and 2) can make hospitals easier to navigate for patients and visitors (Carpman, Grant, & Simmons, 1983). In smaller healthcare settings, the impression given by a doctor’s waiting room matters. College students and seniors rated the quality of care provided by a doctor as higher when the waiting room was nicely furnished, well-lit, warm in appearance, and containing artwork than when the waiting room was dark and cold in appearance, had outdated furnishings, and contained no artwork or poor-quality reproductions (Arneill & Devlin, 2002).

Classrooms and learning spaces

Researchers have conducted research in learning spaces in educational settings. Sommer and Olsen (1980) designed a “soft classroom” by adding semicircular, cushion-covered bench seating, adjustable lighting, carpeting, and fabric wall decorations to a university classroom. The addition of these features significantly increased student participation. Interestingly, the soft classroom continued to facilitate increased student engagement even after 17 years despite wear-and-tear on the furnishings (Wong, Sommer, & Cook, 1992).

Researchers have also examined how acoustics affect students using informal learning spaces in universities. In one study, students perceived that spaces with lower background sound levels (e.g., from ventilation systems), higher people-generated sound levels, and more reverberation (which presumably provides greater conversational privacy) were more suitable for engaging in such activities as small-group discussions and socializing than other spaces (Scannell, Hodgson, Jorge, & Gifford, 2016).

Teachers are also affected by the physical environment in schools. For example, changing

a traditional library design toward a more social and technologically-focused “learning commons” model can affect the perceptions and behaviours of teachers using these spaces in secondary schools (McCunn & Gifford, 2015).

Daycare centres and playgrounds

Preschoolers and school children spend much time in daycare centres and playgrounds. The design, layout, and the type of ground surface, in open areas of a daycare can influence the physical activity level of preschoolers. Hard surfaces and curvy pathways are conducive to such physical activities as running and playing with wheeled toys. By contrast, soft, sand-covered ground surfaces in playgrounds inhibit higher levels of physical activities (Cosco, Moore, & Islam, 2010). As noted by Cosco et al., this has important implications for playground design. Ground coverings are often chosen for safety, but it could be that associated levels of physical activity should also be considered when selecting a ground covering.

The design of playgrounds can influence not only the development of motor skills, but also the social and emotional skills of school children. Because different children use different parts of a playground for different activities, and at different times, a good playground should have a wide variety of equipment, open areas, and play structures (Ledingham, 1998). The design of playground equipment can also facilitate different types of play. When outdoor playground equipment has enclosed spaces,, nodes and connector spaces, and stage-type spaces, preschool children tend to engage in fantasy play. When children are able to use loose parts to construct their own spaces (constructive play), they are more likely to engage in dramatic play (e.g., “play house”) as well (Maxwell, Mitchell, & Evans, 2008).

Galleries and museums

Stephen Bitgood has studied visitors’ behaviours in exhibition centres (museums, science centres, and zoos) extensively. Which types of exhibits (e.g., interactive, text-based) do visitors pay attention to, and for how long? How do visitors circulate among the exhibits? Based on his findings, Bitgood has offered practical advice to museum professionals about how to increase the impact of exhibits on the visiting public (e.g., by increasing readability of exhibition texts), how to arrange exhibits in a way that lessens visitor crowding and maximizes circulation, and how to assess whether changes to exhibits influence patterns of visitor behaviour (Bitgood, 2011).

Retail environments

Why do we keep going back to a particular store? Mehrabian and Russell (1974) proposed that the relations between aspects of a physical environment (e.g., the décor, music played in a store) and behavioural responses (e.g., approach versus avoidance tendencies) are mediated through three emotional states: pleasure, arousal, and, to some extent, dominance. Their model caught the attention of marketing researchers and has been applied extensively to the study of *store atmospherics* in retail environments (e.g., Michon, Chebat, & Turley, 2005).

Correctional environments

For thirty years, Richard Wener has researched jail and prison environments, beginning with evaluations of new jails created by the US Bureau of Prisons. The novel design involving decentralizing management of functional living units of smaller groups of inmates was intended to provide a non-traditional and safe environment for pre-trial inmates. Interviews with staff and inmate populations, the relative absence of weapons, and increased interaction between staff and inmates point to the success of this design.

In his environmental and contextual model, Wener (2012) described the ways in which the environment influences the chance of violence occurring in correctional settings. The non-institutional design of the living units (e.g., colour, lighting, furnishings) can affect inmates' mood and communicate the expectation of no vandalism. Reducing crowding, isolation, and noise helps to lower stress, tension, and the chance of aggressive behavior occurring. Easier access to important resources (e.g., toilet paper, TV lounge, telephones) reduces competition that may lead to aggression.

The openness of the design, the presence of staff, and consistent staff-inmate contact increase the chance that any assaults will be noticed and attended to by staff. All of these factors help to communicate the expectation of non-violence within the correctional setting. Wener's book *The Environmental Psychology of Prisons and Jails* (2012) serves as a guide to best practices for professionals in the fields of architecture and design, social work and psychology, and criminal justice and criminology.

Cities

Modern planners and city officials are often keen to understand why people use urban spaces in particular ways so that public dollars can be used wisely. Environmental psychologists have emphasized that city and community planning should be approached from psychological and public health perspectives, citing extensive evidence that the physical environment, and its organization, influence attitudes, health, and well-being on large and small scales (McCunn & Gifford, 2014; Wells, Evans, & Yang, 2010). For example, noise has well-understood effects on cardiovascular health and on children's reading acquisition, and this evidence should be taken into account when planning the locations of hospitals and schools in relation to roads with heavy traffic and railways.

Environmental psychology can also improve the habitability of buildings and enhance urban neighbourhoods and parks. One classic example is the application of cognitive mapping principles to the urban design of Ciudad Guyana, a planned Venezuelan city that was created to centrally amalgamate several existing small towns (Appleyard, 1976). More recently, McCunn and Gifford (2017) found associations between feeling a sense of place in urban settings and the various navigational strategies that city dwellers use to find their way around their town. When recalling settings for which they felt a strong sense of place, participants recalled cognitive paths through those settings more readily.

POLICY-MAKING

Environmental psychology researchers add to our understanding of people-environment relations; much of what they learn has practical applications. Sometimes this occurs by studying a specific building, examples of which are in the "Careers" section below. Often, it

is at the level of policy where the field can have a broader influence on society. For example, since the 1970s, environmental psychology has had an influence on US energy policy (Stern & Gardner, 1981) with both empirical and review papers contributing to public debate about how best to promote energy conservation measures.

Energy and environmental decision-making continue to be a focus of efforts to make public servants, politicians, and the public aware that by applying psychological knowledge, we can design programs that are more likely to achieve their stated goals (e.g., Weber, 2013). In rare instances, environmental psychologists quickly and directly influence government policy, as in the case of Christine Kormos' (2016) work on incentives for the acceptance of plug-in electric vehicles, which influenced government policy in British Columbia.

Another level at which psychologists can have influence is one that builds guidelines, standards, and regulations. The need for updated systems and guides to help the designers and operators of buildings to make good decisions has come along with the modern emphasis on energy efficiency. In North America, the most common of these sustainable building certifications is the Leadership in Energy and Environmental Design (LEED) system, in which points are awarded for using environmentally-friendly materials, environmental quality systems, and other design features (U.S. Green Buildings Council, 2018). Such buildings are labeled according to the performance level achieved (Certified, Silver, Gold, or Platinum).

Although the system is intended also to achieve interior environments that have comfortable temperatures, reduced levels of air pollutants, and access to daylight, environmental psychologists have shown that the evidence that occupants experience these environments as being better is mixed. Newsham et al. (2013) found that occupants in green buildings (which had been certified on one or another rating scheme) reported higher levels of overall environmental satisfaction, satisfaction with temperature, more positive moods, and higher levels of night-time sleep quality than did occupants of matched conventional buildings. However, McCunn & Gifford, (2012) evaluated buildings on an objective scale of green attributes and found no correlation between green attributes and employee engagement – and a negative correlation between general office impressions and green building attributes. Certification systems are complex sets of criteria, and each building has a unique combination of features leading to their certification. This can make it challenging to identify the connection between overall certification levels and multi-factorial outcomes like satisfaction.

Researchers who study these processes influence the LEED point system either indirectly, with their publications or conference presentations, or directly, by serving on volunteer committees that write the program requirements. Working directly on these committees can result in the programs explicitly including the environmental features that research shows to be best for occupants. These approaches have the potential to positively influence many buildings in many places.

CAREERS

Graduates of post-secondary environmental psychology programs work in different settings. Some possibilities include joining an established environment-behaviour consulting firm, starting one's own firm, joining a research institute or organization, a government department or agency that deals with regional, city, or building planning,

a non-governmental, non-profit, or international organization in some research capacity, becoming a facilities manager for an organization and, of course, teaching and researching as a professor.

Compared to some other applied subfields of psychology, such as clinical psychology, the number of positions is small. However, the number of environmental psychology graduates is also small. Because environmental psychology is still a relatively new discipline, finding a job and establishing a career depends more on one's ability and initiative. The good news is that employers, and the public, are becoming more aware of the contributions from environmental psychologists. Although some job advertisements explicitly request an "environmental psychologist," many positions open to environmental psychologists have other titles, such as facility planner, design programmer, or design researcher, and so on.

RESEARCH POSITIONS IN GOVERNMENT AND OTHER AGENCIES

The National Research Council of Canada is a federal government research and development agency devoted to work that addresses government priorities, supports business innovation, and adds to scientific knowledge. Its Construction Research Centre is devoted to studying the built environment, primarily from an engineering perspective. However, it has several environmental psychologists who study how the built environment influences us. Chapter author Jennifer Veitch has spent her professional career at the NRC.

Current NRC environmental psychology research topics include evacuation from emergency situations, how to use energy-efficient technologies in buildings to improve well-being, and risk perception of indoor air quality hazards. The research is funded by a mixture of funding from other government departments (federal, provincial and municipal), contracts with business, and internal NRC sources. The results are reported to the funders, published in journals, presented at conferences, and built into recommendations, guidelines, standards and codes by participation in these decision-making processes.

ARCHITECTURAL AND SUSTAINABILITY CONSULTING

In recent years, some architects and design professionals have advocated the use of evidence-based design. They strive to consider the best evidence from research and practice and include the client, and in some cases social scientists, in making critical decisions about each project (Hamilton & Watkins, 2009). Design professionals of health care facilities are particularly keen on this idea. Enterprising individuals might find a career path by joining such firms.

Even more enterprising individuals run their own consultancy companies. For example, for many years, Ben Barkow has offered consultancy services akin to what Robert Sommer called 'social design' through his firm in Toronto, Ontario. His team identifies and communicates the needs of users to architects, designers, and developers before construction, to ensure that a facility is suitable for its occupants and their purposes. Their services have been used for new or high-tech workspaces, public facilities (e.g., stadiums, concert halls, and parks), retail spaces, and many others.

On the sustainability side, Doug McKenzie-Mohr actively consults on fostering improved management of natural resources through his community-based social marketing firm.

Among his offerings are seminars that train individuals and organizations to use the principles of applied psychology to increase sustainability.

Of course, one might choose to combine an academic career with one as a consultant. Chapter author Robert Gifford has done this with his firm. Another author of this chapter, Lindsay McCunn, also began working for an architectural programming firm during her graduate studies in environmental psychology. She started her own firm soon after becoming a professor of psychology at a university.

As noted in the introduction, projects that call for an environmental psychologist are sometimes less theoretical and more practical and immediate. Depending on the project, and what the data will be used for, the environmental psychologist decides whether to use her expertise as a consultant to analyze data and provide recommendations through the firm or to take the work further as a scholar and contribute to academic journals with a more empirical approach.

For example, if an architecture firm asks for help to complete a post-occupancy evaluation on buildings it has designed, but no data exists from before construction to statistically compare how people think about or use the spaces after they have been built, that would be a consulting project intended to determine how the building performs in the eyes of its occupants. If meaningful comparison data exist, it might also be possible to take a more scholarly approach from which to develop generalizable knowledge. Both career options contribute to the body of knowledge in environmental psychology, but differ in the kinds of relationships formed among team members, communities, and organizations, as well as the ways in which a project's results are communicated.

EDUCATION AND TRAINING

As with all forms of applied psychology, undergraduate and graduate training are necessary to become an environmental psychologist. At the undergraduate level, a course in environmental psychology is very desirable. The name of the course might vary slightly: The obvious name is Environmental Psychology, but it might be called Environmental Problems or Psychology for Design, or something similar. Instructors' backgrounds and interests will influence how much emphasis they place on spatial cognition, human factors, social psychology, behaviour modification, and so on. However, one need not be overly concerned if one's college or university does not offer such a course because most graduate program supervisors are aware that students are often unable to take an undergraduate environmental psychology course. In any case, consider taking related courses such as urban geography, environmental sociology, introductory architecture, urban planning, human ecology, organizational behaviour, engineering, or environmental studies. Often, new graduate students take the environmental psychology course in their new school.

For graduate school, you will need good-to-excellent grades for entry into competitive psychology programs (and you must meet various other requirements, such as the Graduate Record Exam, depending on the school). Examine each school's website for program requirements and resources and consider the interests of individual professors to find the best match with your own interests. Check out the environmental psychology brochure at <https://tinyurl.com/BookletEP> for a list of prominent environmental psychology professors and their research interests.

You also need to decide what sort of program suits your interests. A few graduate schools

offer full programs in environmental psychology; that is, an entire set of prescribed courses, including several faculty members who specialize in environmental psychology or closely related disciplines, and classes with at least several other students. Many other graduate schools have only one or two faculty members who specialize in environmental psychology. In these schools, you and your supervisor design the “program” (courses to take, projects to complete, etc.) to suit your interests and needs. The few other graduate students with your interests are likely to be at different stages of their degree programs.

Both types of programs have their relative advantages. In a full program, one has the opportunity to gain from the expertise of several professors and numerous like-minded students. The individualized program offers more personalized education and may be the only way to study with that certain professor who was recommended to you, or whose work you admire.

Whether you enter a full or an individualized program, you will be in class for less time per week than in your undergraduate years, but you will do much more reading and research on your own. You will have a supervisor and a committee of two or three other faculty members who will officially monitor your progress. You will do major original pieces of research under the committee’s guidance: these are the Master’s thesis and, later, if things go well, a doctoral dissertation. You will also be encouraged to undertake additional research projects, either together with your advisors or on your own, and to submit this work for publication or presentation. This added experience will augment your skills and make you a more attractive job candidate, even for applied positions, because it demonstrates the breadth of your knowledge.

The oldest established environmental psychology program is at the Graduate Center of the City University of New York, dating from 1968. Some of the top full programs around the world include Colorado State University (USA), University of Surrey (UK), University of Groningen (the Netherlands), Lund University (Sweden) and University of Victoria (Individualized program).

Psychology departments that offer programs with some environmental psychology content include the departments of psychology at Carleton University, Vancouver Island University, and the University of Utah. A few architecture departments offer programs with an environment-behaviour focus: Université Laval in Québec, and University of California (Berkeley) and Georgia Institute of Technology in the United States. The Design and Environmental Analysis group at Cornell University is a prominent interdisciplinary graduate program. For a full list of programmes around the world, see the Resources section at the end of this chapter.

To prepare yourself for a non-academic career, try to gain relevant experience. If you can, take a work term as a co-op or summer student in a non-academic setting to learn first-hand about your career options. You might find opportunities to conduct an applied project or two in collaboration with officials at various levels of government, architecture and engineering firms, municipal urban planning departments, housing authorities, or non-profit organizations that focus on environmental issues.

These relationships offer opportunities to hone your skills in presenting to a general audience, writing a proposal for government officials, and working with researchers and specialists from multiple disciplines. Another strategy is to search out opportunities to sit on committees to get a sense of your local government’s leadership structure and get to know “who’s who” in your area. Finally, strong skills in social scientific writing, research

design, and statistics are important. Very likely, you will not work with colleagues with whom you can consult on these matters when you are the only environmental psychologist in an organization or on a project team.

CONCLUSION

Environmental psychology is a small field within the larger discipline of psychology, but its scope is broad and includes some of the most important problems that challenge humans in our time. If your career goal is to work with others to make a positive difference in the world, this may be the field for you. Indeed, there is no shortage of topics and problems that await your attention. As a recent major review of the field was titled, *environmental psychology matters* (Gifford, 2014).

ADDITIONAL RESOURCES

Suggested Readings

- Clayton, S. D. (Ed.) (2012). *The Oxford handbook of environmental and conservation psychology*. New York: Oxford.
- Gifford, R. (2014). *Environmental psychology: Principles and practice* (5th ed.). Colville WA: Optimal Books.
- Gifford, R. (2014). Environmental psychology matters. *Annual Review of Psychology*, 65, 541-580.
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- Steg, L., & de Groot, J. I. M. (Eds.) (2019). *Environmental psychology: An introduction* (2nd ed.). New York: Wiley.

SCHOLARLY JOURNALS

- The Journal of Environmental Psychology (the major journal in the field): <http://www.journals.elsevier.com/journal-of-environmental-psychology>
- Environment and Behavior: <http://journals.sagepub.com/home/eab>

GRADUATE PROGRAMS

- Graduate Programs in Environmental and Conservation Psychology. (2017). Retrieved April 15, 2018, from <http://www.apadivisions.org/division-34/about/resources/graduate-programs.aspx>

CAREER RESOURCES AND OVERVIEWS

- <https://tinyurl.com/BookletEP>
- <https://www.environmentalscience.org/career/environmental-psychologist> (US)
- <https://careersinpsychology.org/degree/environmental-psychology/>

- <http://www.eco.ca/career-profiles/environmental-psychologist/>

PROFESSIONAL ORGANIZATIONS

- International Association of Applied Psychology (IAAP), Division of Environmental Psychology (Global) <https://iaapsy.org/divisions/division4/>
- International Association for People-Environment Studies (IAPS) www.iaps-association.org
- American Psychological Association (APA) Division 34: Environmental, Population and Conservation Psychology www.apadivisions.org/division-34/
- Environmental Design Research Association (EDRA) www.edra.org
- Fachgruppe Umweltpsychologie (DGPS) (Germany) <http://fachgruppe-umweltpsychologie.de/>
- Association pour la Recherche en Psychologie Environnementale (ARPENV) (France) <http://arpenv.weebly.com/>
- Canadian Psychological Association, Section on Environmental Psychology (CPA) www.cpa.ca/aboutcpa/cpasections/environmentalpsychology/
- Man-Environment Relations Association (MERA) (Japan) www.mera-web.jp
- The Environmental Psychologists Global Census: A list of around 1000 researchers who identify partly or wholly as environmental psychologists. Check out their location and interests at <http://web.uvic.ca/~epcensus/page1.html>

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[14]

APPLICATIONS AND CAREERS IN COMMUNITY PSYCHOLOGY: PRACTICING IN SETTINGS, SYSTEMS, AND COMMUNITIES TO BUILD WELL-BEING AND PROMOTE SOCIAL JUSTICE

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Community psychology (CP) bases its action on the recognition that individuals' development, psychological functioning, and mental health are profoundly affected by their physical, social, cultural, political, and economic contexts (Hakim, 2010, Jason & O'Brien, 2018; McMahon, Jimenez, Bond, Wolfe, & Ratcliffe, 2015; Wolff, 2014). This chapter presents CP applications and careers in two sections. The first section provides an overview of important areas of intervention and practice in CP, starting with a brief history of the field, an introduction to its typical research methods, and highlights of significant scholarly findings. The second section presents a model of CP practice and describes career and training opportunities in CP.

INTRODUCTION TO COMMUNITY PSYCHOLOGY¹

WHAT IS COMMUNITY PSYCHOLOGY?

CP is concerned with individuals and their immediate interpersonal context and links

1. We thank Tom Wolff, Elizabeth Thomas and Cynthia Moore for their comments on early drafts of this chapter.

their well-being to broader social structures and dynamics (Arcidiacono 2017; Moane, 2003). Rooted in a scientific and empirical approach to understanding the world, CP uses the research process as well as scientific knowledge and intervention strategies to create social change and improve well-being at the individual, organizational, and community levels (Neigher, Ratcliffe, Wolff, Elias, & Hakim, 2011). CP draws attention to the importance of diversity, inclusion, and economic and social equity and highlights the power of preventing problems as well as treating them (Julian, 2006; Wolff et al., 2017). CP contributes to psychology in general by proposing a critical analysis of the social context that affects human well-being and highlighting the importance of working in partnership with the people most affected by social problems. Community psychologists analyse and intervene at the interface between individual and social factors, focus on complexity and systems, and hold prevention, advocacy, social justice, and systems change as core concerns (Arcidiacono, 2017; Dzidic, Breen & Bishop, 2013; Evans, Duckett, Lawthorn, & Kivell, 2017; Prillettensky, 1997; Rappaport, 1981).

Although the emphasis on social contexts is not unique to the discipline, CP is ultimately concerned about the effects of social context on human well-being, development and functioning, rather than on describing social and cultural systems for their own sake. CP is also distinguished by theoretical frameworks that emphasize aspects often neglected in more individualized approaches to human problems (Jason, Stevens, Ram, Miller, Beasley, & Gleason, 2016; Stein, 2007), such as ecological analysis (Bronfenbrenner, 1979; Hawe, 2017; Kelly, 1986; Neal, 2016), historical-material analysis (Montero, Sonn, & Burton, 2017), and social determinants of health (Montero, 2012). Certain values-based frames of analysis also tend to characterise the field and nourish its practice (Evans et al., 2017; Montero et al., 2017; Rappaport, 1981; Wolff et al., 2017). Diverse as they are, these theoretical and value-based frames of analysis provide conceptual tools for understanding social actors, their activities and positionality, and the patterns and determinants of constraints and opportunities that surround them and shape their possibilities.

Thus, the distinctive nature of CP is probably best characterised in terms of its unique constellation of principles, goals and values, frames of analysis, and methods for change. While the particular constellation and composition of these elements varies across countries and cultures (Francescato & Zani, 2013; Lykes, Terreblanche, & Hamber, 2013; Wolfe, Scott & Jimenez, 2013), community psychologists globally are unified by the goal of promoting well-being by working at the interface between people and their social contexts.

A BRIEF HISTORY OF COMMUNITY PSYCHOLOGY

CP emerged as a discipline across the globe throughout the mid-1900s, largely in response to political turmoil, skepticism regarding the dominant views of psychology, movements for social change, and a transformation of the mental health care system in many countries (Nelson, Lavoie, & Mitchell, 2007). Though in some countries CP is still relatively emergent, other regions have seen immense growth and development in the field since the 1970s (Reich, Riemer, Prillettensky, & Montero, 2007).

In Canada, events that led to the emergence of CP include the community health movement, alternatives to institutionalization, and a focus on prevention (Nelson, et al., 2007). Though the birth of the field of CP is often linked to the 1965 Swampscott Conference in the U.S., Pals (2000) links the birth of Canadian CP to the mid-1920s and Edward Bott,

the first chair of the psychology department at the University of Toronto, who with William Line and colleagues developed school- and community-based prevention projects (Nelson, Ochocka, Janzen, Trainor, Goering, & Lomotey et al., 2007). Line was the first to use the term *community psychology* while discussing primary prevention in the 1951 Royal Commission Report (Babarik, 1979). In the 1970s and 1980s, CP programs were established in several Canadian universities. Wilfrid Laurier University and the Université du Québec à Montréal started the first Canadian masters and doctoral programs, respectively, and the University of Manitoba assembled a national CP network, which led to the creation of the CP section of the Canadian Psychological Association in 1982 (Nelson, et al., 2007). In that same year, the *Canadian Journal of Community Mental Health* was created and allowed for interdisciplinary communication and cooperation concerning the promotion of community mental health (Walsh-Bowers, 1998). In the early 2000s, doctoral programs were developed at Laval University and Wilfrid Laurier University, further expanding the field in the academic realm (Aubry, Sylvestre, & Ecker, 2010). A wide range of focus areas is studied within CP, with recent social issues within the Canadian context demanding attention, such as the increasing demand for mental health services, integration for newcomers to Canada, housing security, and the social dismissal of Indigenous peoples (Nelson & Aubry, 2010).

METHODS IN COMMUNITY PSYCHOLOGY

Research methods in CP are both similar to and different from other fields such as social, clinical, and developmental psychology. Research is conducted using quasi-experimental, correlational, qualitative and longitudinal studies with interviews, self- or other surveys, reports, and observations. CP also uses case study, ethnographic, and phenomenological methods typical of disciplines such as sociology, economics, political science, and public health. Given that psychology students are typically introduced to the analysis of quantitative data early in their studies, many CP instructors emphasise qualitative and mixed methods in order to prepare students for the varied research approaches that are used to accomplish the twin goals of action and research. To conduct action-oriented research, additional methods include program evaluation, assets and needs assessment, and community-based participatory action research (CBPAR). CBPAR, for example, is a collaborative approach to research that involves community members directly affected by the problem being studied in all phases of a research project, from the definition of the initial research questions to the analysis of data, development of recommendations and diffusion of results. CBPAR begins from the concerns expressed by a particular community and uses research to support changes desired by the community (Burns, Cook, & Schweidler, 2011). These change-oriented research strategies realize the call by Martín-Baró for psychology research to reveal what “needs to be done” (1994, p. 6) by researching the process of change. Although there are many ways to examine change, the key to community research is to investigate how a community-driven effort impacts what that community has decided needs to be changed.

The choice of appropriate methods to be used in CP depends on the research questions and the researcher’s knowledge of many methods as well as personal values. As Campbell (2010) pointed out, when methods drive the research process, the questions must fit within the boundaries of what the method can address. However, when the research questions drive the research process, methods can be selected, modified or combined based on their

ability to provide answers. Community psychologists need to be well-informed about various methodological options in order to avoid letting the method drive the question.

Campbell concludes by reminding us, “By letting our research questions develop without the constraints of methods, and by allowing our values to have a voice in the research process, we can figure out what is right – for a given context” (Campbell, pp. 308-310).

A critical part of community research is developing the ability to communicate in multiple ways to different audiences to stimulate change. Methods for sharing research findings include oral presentations to research participants and professionals at conferences, publications in academic journals, reporting in policy briefs, workshops, interactive websites, and other interactive methods of knowledge exchange. Researchers have also developed and tested a method for evaluating the impact of knowledge mobilisation efforts (e.g., Hayward, Loomis, Nelson, Pancer, & Peters, 2011; Worton, Loomis, Pancer, Nelson, & Peters, 2017).

SIGNIFICANT SCHOLARLY FINDINGS

CP has contributed a number of significant findings to psychology and social science knowledge and practice; a comprehensive overview is available in Bond, Serrano-Garcia, Keys, and Shinn (2017a, 2017b). Here we highlight CP’s contributions to two significant research and practice movements: the community mental health movement and the current focus on prevention and health promotion.

Community mental health.

Until the mid-1900s, many individuals with mental illnesses were confined to psychiatric hospitals that were typically ineffective, dehumanizing, and unsanitary (Nelson, Kloos, & Ornelas, 2014). The deinstitutionalization movement within Canada began in the 1960s, resulting from limited funding for psychiatric hospitals as well as growing pressure for human rights and effective treatment within the community (Nelson, 2006). This movement led to many previously institutionalized individuals being released into the community even though few services were available to support individuals through this transition (Nelson, et al., 2014). Many of these individuals faced additional stressors upon release from psychiatric institutions, including unemployment, homelessness, poverty, discrimination, social isolation and a lack of psychosocial support, thus illustrating how mental illness often occurred in combination with other social issues not necessarily addressed by typical psychiatric treatment (Nelson, Kloos, & Ornelas).

Deinstitutionalization forced a shift in focus from the institutional-medical model to a community treatment approach. This shift resulted in the emergence of alternatives to psychiatric hospitalization (e.g., assertive community treatment, supportive housing, healing lodges, case management) and alternative types and views of support, such as consumer/survivor initiatives, and self-help groups (Nelson, Lord, & Ochoka, 2001).

This drastic change in mental health reform created a movement towards community mental health. Community mental health aligns with core CP values in examining the social, economic, and cultural factors influencing and maintaining mental illness (Fortin-Pellerin, Pouliot-Lapointe, Thibodeau, & Gagne, 2007). Community psychologists have continued to work in community settings to improve well-being and mental health among

populations since the overhaul of psychiatric institutions in the mid-1900s. For example, Canada was the first country to hold a self-help conference (Lavoie, Borkman, & Gidron, 1992). Just over a decade later, a longitudinal participatory action research evaluation of consumer-run self-help organizations found significant reductions of symptom distress, and significant improvements in quality of life, community integration, and employment among members of the self-help organizations compared to non-members (Nelson, Ochocka, et al., 2007).

Extensive research supports the adoption of the Pathways to Housing First (HF) model in the At Home/Chez Soi demonstration project as one of the most remarkable and effective community mental health initiatives in Canada (Tsemberis, 1999; Tsemberis, Gulcur, & Nakae, 2004). For individuals with a mental health diagnosis who are experiencing homelessness, At Home provides housing first and treatment second, rather than the inverse order that was ineffective in improving well-being (Aubry et al., 2016). The HF model involves providing choice over housing options, allowing a sense of agency and independence to participants, who are often referred to as consumers rather than clients to emphasise their agentic role in relation to their housing transitions (Nelson, Stefancic, et al., 2014). Individuals with serious mental illnesses experience unstable housing at a more prevailing rate than those without mental illness; thus, neighbourhood and housing environments are particularly important for this sample of the population (Kloos & Shah, 2009). Promising findings have emerged from evaluations of At Home/Chez Soi, including longer times spent in stable housing and higher ratings of quality of housing among individuals assigned to HF compared to participants in the treatment-as-usual condition, who had access to existing housing and support services within their communities (Aubry et al., 2016). Additionally, participants in the HF condition reported a higher quality of life and were assessed as having better community functioning than the treatment-as-usual condition (Aubry et al.). Further, participants receiving HF with previous criminal activity have shown a more significant reduction in new criminal offences post-intervention in comparison to those in the treatment as usual condition (Somers, Rezansoff, Moniruzzaman, Palepu, & Patterson, 2013).

Prevention and promotion.

CP has contributed significantly to highlighting the importance of prevention and health promotion as a complement to treatment. Caplan (1961) highlighted three types of prevention. Primary (universal) prevention targets entire populations to lower the rates of new cases of disorders; secondary (selective) prevention targets populations at risk of developing a disease or disorder, and tertiary (indicated) prevention targets populations who already have a disorder and focuses on lowering the intensity or duration of the disorder.

Dramatic increases in prevention awareness and efforts have taken place since the 1960s (Dalton, Elias, & Wandersman, 2007). Although prevention infuses and informs a number of disciplines, many authors highlight the contributions of early community psychologists to applying public health approaches to physical health to promoting the importance of a prevention focus in mental health.

One prevention program in Canada is *Better Beginnings, Better Futures* (BBBF), a research demonstration project for children and their families in disadvantaged communities. BBBF was initiated by the Ontario provincial government to address the limitations of other early

childhood programming including a narrow focus on the child with little to no regard for the impact of familial and community contexts (Gottlieb & Russell, 1989). BBBF engages residents in the creation and implementation of programs to address specific community needs to achieve three overarching goals: the promotion of well-being and healthy child development, the prevention of developmental problems, and the promotion of community development (Gottlieb & Russell). Evaluation research has shown significant changes in children, families, and communities. For example, at grade 12, youth who participated in BBBF had higher average grades, a higher proportion of involvement in regular exercise, and a lower proportion of special education service use, and lower rates of criminal behaviours than the comparison communities (Peters, et al., 2010). At the community level, significant improvements were seen in parental involvement in neighbourhood activities, greater use of both health and social services within the community, a strong sense of community involvement, neighbourhood satisfaction, and neighbourhood cohesion within the BBBF intervention group (Pancer, Nelson, Hasford, & Loomis, 2012), and greater neighbourhood attachment (Hasford, Loomis, Nelson, & Pancer, 2013). Cost-savings analysis indicated a return of \$2.50 CDN for every \$1.00 CDN the provincial government invested, mostly due to decreased use of special education services, social assistance, and disability support programming (Peters, et al., 2016).

Another significant prevention program involved the emergence of the first safer injection facility (SIF) in North America, *Insite*, located in Vancouver, BC (Kerr, MacPherson, & Wood, 2008). SIFs allow space for injection drug users to use pre-obtained illicit drugs in the presence of healthcare staff who may intervene in the case of overdose (Kerr et al.). *Insite* opened in September 2003, mainly in response to the HIV epidemic and increasing rates of overdose appearing in the downtown east side of Vancouver (Kerr et al.). In response to community concerns regarding the risk of increased drug activity and drug-related crime upon the opening of *Insite*, Wood, Tyndall, Lai, Montanero, and Kerr (2006) conducted a study. They examined crime rates the year before the opening of the SIF compared to the year post-opening and found no significant increases in drug trafficking, assault, or robbery and a significant decrease in cases of vehicle break-ins and theft. SIFs are an example of a successful prevention effort at the tertiary level, in that they are aimed at decreasing the risk of infection and overdose associated with injection drug use. Since 2016, SIFs have been approved in Alberta, British Columbia, Ontario, and Quebec (Government of Canada, 2018).

CAREERS IN COMMUNITY PSYCHOLOGY: ACTIVITIES, JOB TITLES & TRAINING

A MODEL OF CP PRACTICE: CORE WORK ACTIVITIES AND COMMON CP CHANGE STRATEGIES

Recent years have seen a lively discussion about the particular expertise and professional identity of community psychologists. CP practice has been described in many ways, such as: (1) the goals that community psychologists seek to achieve; (2) the values, principles and frames of analysis that typify the field; (3) the settings where community psychologists can find work; (4) the skills, competencies and techniques typify CP practice; and (5) the personal characteristics, beliefs and attitudes that individuals bring to their practice (Arcidiacono, 2017; Julian, 2006; Kelly, 1971; Society for Community Research and Action [SCRA], 2012).

Following Ramos (2007) and Lavoie & Brunson (2010), and inspired by a framework

developed by Foucher and Leduc (2008), this chapter presents a model of CP practice centered around six core *work activities* that community psychologists might participate in across diverse settings, as well as diverse *change strategies* that they might use as they conduct these activities (Figure 1). An activity-based approach seems consistent with CP's emphasis on settings and roles (Hawe, 2017; Seidman, 1988) and complements other descriptions of practice in CP and other fields (Leach, 2008; Reeves, Fox, & Hodges, 2009). We stress that these activities are not exclusive to CP and that the contribution of other professions, as well as individuals and groups involved in change initiatives, should be recognized (Akhurst, Kagan, Lawthorn, & Richards, 2016; Dzidic et al., 2013; Lavoie & Brunson, 2010). However, community psychologists offer novel contributions to this work with their unique set of training and skills, frames of analysis, and focus on ecological and systems factors. We present this model of CP practice by first discussing the six proposed core CP work activities and provide a brief overview of several typical CP change strategies (Table 1).

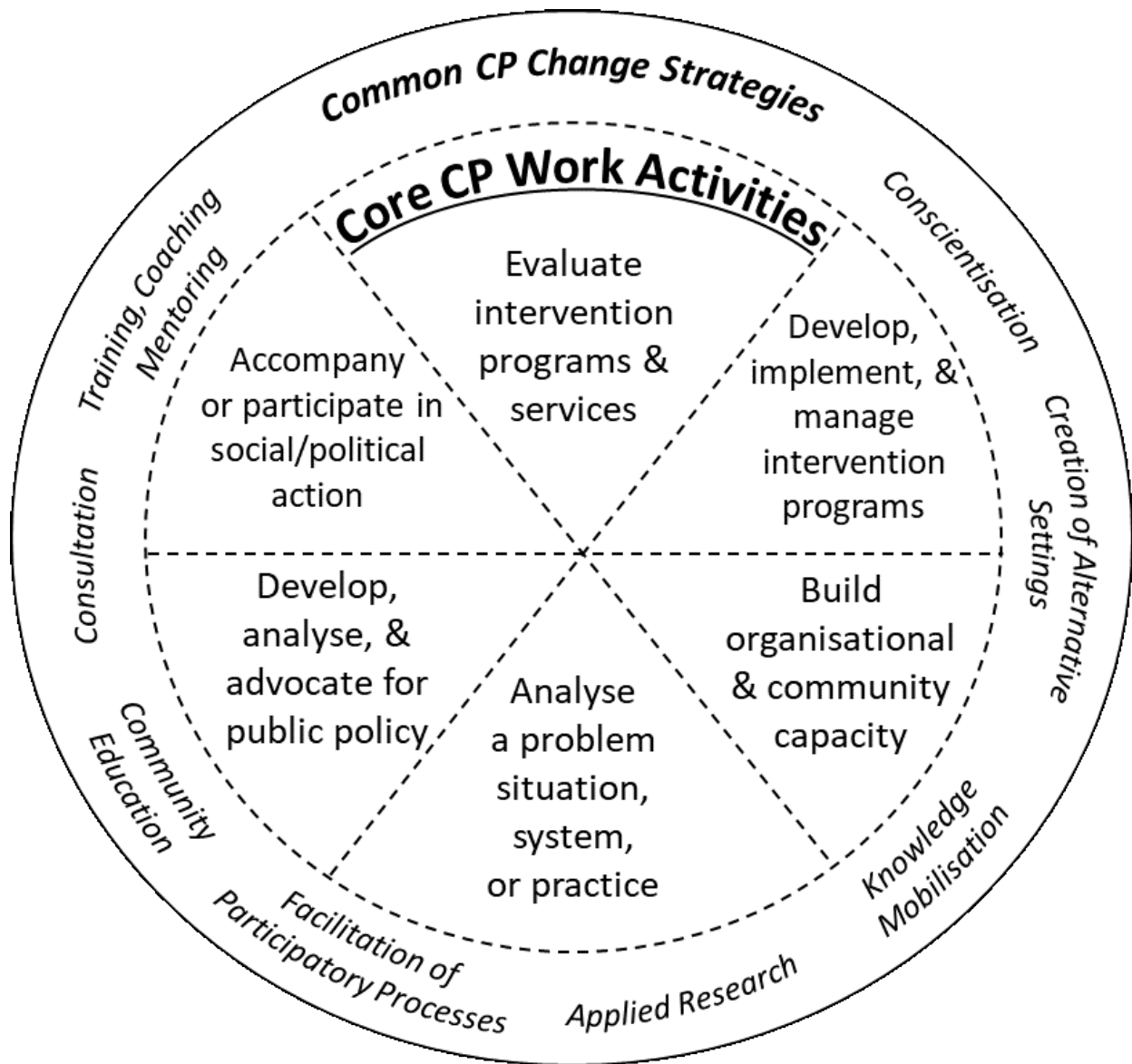


Figure 1: A Model of CP Practice: Core CP Work Activities and Common CP Change Strategies (Adapted from Lavoie, F., & Brunson, L.,. La pratique de la psychologie communautaire. *Canadian Psychology/Psychologie Canadienne*, 51(2), 96–105, 2010, published by the American Psychological Association. Adapted with permission. APA is not responsible for the accuracy of this translation.)

CORE CP WORK ACTIVITIES

Evaluate the Impact of Intervention Programs and Services.

A primary work activity for many community psychologists is to evaluate intervention programs, services, and systems change efforts. The goal of these activities is to collect information about the intervention's intended and unintended effects; the processes by which those effects are achieved; and possible avenues for improving the intervention. Evaluation makes programs more accountable to stakeholders and funders and assists decision-makers as they consider whether to maintain, expand or eliminate a program

(Cook, 2014; Wolfe, et al., 2017). It can also be considered a strategy for effecting social change and promoting social justice (Cook), with the goal of creating a more equitable, fair and just distribution of resources, opportunities, and privileges within society.

Evaluation objectives can be varied and are often broadly categorized in terms of outcome evaluations and process evaluations. The notion of outcome evaluation is probably most familiar. This involves documenting the impact of an intervention in relation to its stated objectives. Established, evidence-based programs may not always be successful in new contexts or populations, so outcome evaluations help to determine local impact. Process evaluation determines whether program components are actually being implemented as planned and if not, what barriers such as time or resource constraints might be getting in the way. Process evaluation can also address a program's fit with its local context, for example examining whether the program is actually diverting resources from other important activities, whether it duplicates existing efforts, and whether it can be sustainable over time (Wolfe, et al., 2017).

Community psychologists can play an important role in evaluation by carrying out assessments in consultation with relevant stakeholders, providing training that enables actors to appropriate techniques and the evaluation culture, and by developing the tools that facilitate evaluation work. An integrated and sustained CP approach to program evaluation over time might include conceptualizing the program's theory of change; planning activities and program components that have the best chance to produce desired changes; developing and executing a systematic plan to implement and support the program at multiple levels; ensuring the program fits local culture and context; evaluating whether the activities achieve their desired effects, and finding ways to ensure the sustainability of the program over time (Wolfe, et al., 2017). A CP approach to evaluation will also often include an analysis of benefits at a systems or community level, above and beyond the effects of individual change (Hawe, 1994).

Develop, Implement and Manage Intervention Programs.

Community psychologists are often called upon to develop, implement and manage intervention programs, especially those with prevention and health promotion goals (SCRA, 2012), and also programs for re-adaptation, crisis and trauma response, human resource capacity building, and the implementation of coordinated systems of care (Cook & Kilmer, 2012; Lavoie & Brunson, 2010; van de Hoef, Sundar, Austin, & Dostaler, 2011).

To find an appropriate intervention program, it is sometimes more efficient to identify an existing program and assess potential fit with the particular setting's goals and resources. In other cases, it is more appropriate to develop a program suited to the particular needs and goals of the setting and compatible with existing resources, structures and practice. For both existing and locally-developed programs, ensuring the continued success of a program over time involves supervisory, management, and human resources activities, as well as financial management, marketing and strategic planning (McMahon & Wolfe, 2017; SCRA, 2012). Implementing programs in a sustainable way in any local context involves issues of fidelity to core program elements and fit and adaptation to the local context (Castro, Barrera, & Martinez, 2004). It is vital to ensure a supportive organisational and community context and organisational support for the program at multiple levels (Blanchet-Cohen & Brunson,

2010) and creating the conditions and processes that ensure that effective programs continue to operate successfully and even expand their reach (Cook, 2014).

Community psychologists can organize a collaborative approach among multiple community actors to identify stakeholder goals and assemble a meaningful and coherent package of intervention activities. The dual role of community psychologists both as researchers and as stakeholders make it possible to consider multiple perspectives and values, identify models, distill the evidence base, and systematize the choice of objectives and activities. Their training in developmental psychology also prepares them to consider issues related to age (Lavoie & Brunson, 2010).

Build Capacity at Organizational and Community Levels.

CP practitioners frequently participate in organisational and community capacity building activities aimed at developing links among citizens and organisations, strengthening networks and communication, and aligning efforts and resources to accomplish common goals (Wolff, 2010; Wolff et al., 2017). Some essential components of this capacity-building process include the ability to identify and convene diverse stakeholders; facilitate mutual trust; promote collaborative decision-making with authentic buy-in from all stakeholders; and to work together to act in ways that surpass what an individual actor would be able to do alone (Aspen Institute, 1996; Wolff).

At the organisational level, capacity building enhances the capacity of an organization to attain its goals by introducing or improving organizational tools, policies, and processes (SCRA, 2012). This work may involve helping an organisation to develop an organizational vision, mission, and strategic plan; aligning stakeholders, resources, and organizational processes around these priorities; building a communications strategy; promoting organisational learning; or putting mechanisms in place to monitor efforts and results (Hawe et al., 2000; Norton, McCleroy, Burdine, Felix, & Dorsey, 2002).

At the community level, capacity building fosters collaborative relationships and concrete action among community members, groups, and organizations (SCRA, 2012). It may involve helping community actors to define a shared vision and engaging, energizing and mobilizing individuals and groups around an issue of shared importance (SCRA). Grassroots community organizing involves working collaboratively with community members to gain the power to improve the conditions affecting their community (SCRA; Speer & Hughey, 1995). Community coalition building creates networks of organizational and resident stakeholders who work together across organizational boundaries to address a common issue (Allen, 2005; Foster-Fishman, Berkowitz, Lounsbury, Jacobson, & Allen, 2001; Francescato & Zani, 2017; Wolff et al., 2017).

Many other professions and disciplines recognize the importance of secure networks, social capital and collaborative relationships. Community psychologists participate in and foster these efforts, bringing among other things an awareness of social justice and equity and the importance of involving people who are directly affected by the conditions being addressed as well as those with relatively less power and voice (Rappaport, 1981; Wolff et al., 2017). Community psychologists are particularly attuned to identifying and mobilising existing strengths that exist, but which may be under-recognized or underutilised in the community (Kelly, 1971). They are also knowledgeable about relevant research and practice that may be taking place elsewhere and can suggest ideas that have been successful elsewhere

(Dagenais, 2006; Lavoie & Brunson, 2010). A particular contribution of CP is the ability to use participation processes, such as participatory action research, participatory arts and theater, community forums, Delphi techniques, and small and large group facilitation techniques, to promote co-construction of knowledge and a positive climate for change efforts.

Analyse a Problematic Situation, System, or Practice.

The work of community psychologists sometimes involves making sense of an ambiguous and problematic situation in order to identify the problem better, create a shared and coherent understanding of the situation, and explore possible solutions. As Caplan & Nelson (1973) pointed out many years ago, what is done about a problem depends on how it is defined. If failure to obtain mental health care, for example, is defined in terms of individual characteristics and problems, such as lack of information or insufficient motivation, then person change intervention options are most logical and change efforts would likely focus on public awareness campaigns to diffuse information or increasing individuals' awareness of the importance of care. If explanations are situation focused, for example, if lack of access was attributed to a lack of providers, high treatment costs, duplication of effort, and competition for resources and recognition, then system change in the form of mobile clinics working with community organisations to offer low-cost care or coordinated efforts to create interorganizational links would be a more logical solution (e.g., Lundburg, Ignatio, & Ramos, 2011; Wolff, 2014).

The analysis of a problem, a situation, a milieu, or practices consists of taking a critical, analytical and contextualized look at a social issue or a social object such as a community program, organization or institution. It may involve naming and documenting a little-known problem and raising awareness about its existence. It might involve documenting and exploring different viewpoints held by various stakeholders involved in the situation (Juras, Mackin, Curtis, & Foster-Fishman, 1997). It could involve taking on the role of "critical friend," whereas a participant in the setting, the community psychologist tactfully confronts ways of thinking or acting that serve to maintain the status quo (Evans, Brown, de Schutter, & McGee, 2008). It helps to reveal how a group conceives a particular situation and suggests levers for change that might be created by introducing new mental models of the situation (Christens, Hanlin, & Speer, 2007).

Develop, Analyse and Advocate for Public Policy.

Community psychologists can be involved in efforts to influence public policy (Maton, 2016; Phillips, 2000). This type of work seeks to create change at the societal level by targeting the policies that govern its institutions and how they operate, the distribution of resources, and the structure of existing programs and services.

Community psychologists can play several public policy roles. They may provide research-based information on social problems and their possible solutions or work to raise awareness of an issue so that it becomes part of the political agenda. They can conduct policy analysis, examining the various policy options that are available and determining their actual or potential impact concerning a set of policy goals. They might participate in policy advocacy to influence decision-making processes and advocate for specific policies (Bouchard, 2001, 2010; McMahan & Wolfe, 2017; van de Hoef et al., 2011). Community

psychologists can collaborate within a community to encourage citizen participation in policy-making or strengthen the capacity of institutional leaders to reach out to and listen to their constituents (Brunson & Boileau, 2008; Chavis, 1993). Community psychologists might work directly in the political system as a political attaché or policy staff (Phillips, 2000; van de Hoef et al., 2011), or even hold a position as an elected official or as a ministry-level decision-maker (Bouchard, 2001, 2011; Starnes, 2004).

Becoming involved in politics and the political process is not always easy or comfortable for psychologists, in part because of the contested nature of the political process (Bernier & Clavier, 2011; Fafard, 2015; Phillips, 2000). The distinction between providing information as a researcher versus acting as a lobbyist or political activist can be challenging to manage (Bouchard, 2001; Francescato & Zani, 2017). Even when persuasive arguments are based on a solid research base, it can be difficult to accept that scientific knowledge is only one element among many in a political decision-making process (Bernier & Clavier; Bouchard; Fafard).

Although few CP training programs provide training on the process of public governance (Phillips, 2000), community psychologists bring to this field a broad knowledge of topics of interest to social policy planners (citizen participation, the influence of social networks, exclusion, etc.) and a broad ecological analysis of phenomena, including exo and macrosystem factors. They are skilled at building and sustaining working relationships and effective communication with a variety of stakeholders, and can apply these skills with policy makers, elected officials, governmental staff, and community leaders (SCRA, 2012).

Accompany and Participate in Social and Political Action.

CP typically works with disempowered groups in contexts that are constructed economically, politically and historically and proposes structural and contextualized understanding of these social situations. When these groups encounter social and economic interests that differ from their own, the work inevitably enters into the realm of politics and social action (Burton, Kagan & Duckett, 2012). Social action, defined as efforts to address inequities of power and privilege between an oppressed group and society at large, is an option for challenging these existing power relations in society (Le Bossé & Dufort, 2001; Lykes et al., 2003; Moane, 2003; Rothman & Tropman, 1987).

Community psychologists may engage in explicitly political commitment as experts with particular knowledge of the evidence base and the risks and harms involved in a particular situation. They might work with community groups to organize a protest movement, participate in a collective advocacy process, or conduct a grassroots community organizing with a rights-based focus. They can help to maintain positive group dynamics, a valuable contribution for small groups engaged in difficult campaigns (Burton, et al., 2012).

Taking a stand on social issues requires engaging in value debates and taking on political issues. As with policy analysis and advocacy, there can be tensions between acting as a practitioner/professional versus as a political activist (Lavoie & Brunson, 2010; Francescato & Zani, 2017). Some resolution of this dilemma can be found when community psychologists are also able to identify with a social movement as part of their civic and personal identity and to recognize their own and others' rights to act as fully enfranchised members of civil society (Burton, et al., 2012; Dzidic et al., 2013).

COMMON CP CHANGE STRATEGIES

Community psychologists use diverse strategies to promote change across different activities and settings. Table 2 briefly highlights a number of change strategies typical to CP practice that have been discussed in detail elsewhere (Bond et al., 2017b; Francescato & Zani, 2017; Lavoie & Brunson, 2010). Other strategies can certainly be added depending on the area of specialization.

Table 1. Common CP Change Strategies

Strategy Type	Description
Conscientisation	Creates a group process in which social relations and collective action lead to greater awareness of the social and political structures that limit and distribute power in society, and the possibility for change (Francescato & Zani, 2017; Montero 2012; Montero et al., 2017).
Alternative settings	Seeks to move completely out of the current system and create a new resource, challenging the established order instead of trying to change an existing service. Some examples include mutual aid groups, cooperatives, social economy enterprises, counterspaces (Case & Hunter, 2012; Cherniss & Deegan, 2000; Francescato & Zani 2017).
Knowledge mobilisation	Aims to reduce the gap between science and practice by involving practitioners and clients in creating knowledge and applying it in a particular context (Dagenais, 2006; Worton et al., 2017).
Applied research	Allows stakeholders to identify solutions to problems by gathering information, developing and testing hypotheses, crafting change processes adapted to a particular context, and evaluating their impact in that specific context (Juras et al., 1997; van de Hoef et al., 2011).
Participation	Seeks to understand and improve fair and diverse participation in work and life settings. Participatory action research promotes social change and quality of life for oppressed and exploited communities (Creswell, Hanson, Clark Plano, & Morales, 2007; SCRA, 2012).
Community education	Aims to educate members of the community and promote healthy behaviour change related to using social marketing and public awareness campaigns (SCRA, 2012; Gagné, Lachance, Thomas, Brunson, & Clément, 2014).
Consultation	Builds a collaborative process aimed at identifying and solving problems and identifying useful data and resources, takes place within the context of a specific mandate given by a group, organisation or community. In CP, consultation is envisaged as a tool for development and empowerment that often takes place in complex systems involving many stakeholders (Laprise & Payette, 2001, Meyers, 2002).
Training, coaching, mentoring	Develops individual and groups' abilities to work more effectively towards their goals and is especially effective when individual capacity building is supported by tools and processes that provide continuing support. Training in such skills as reflective practice or evaluation can be a crucial component in capacity building efforts (Lavoie & Brunson, 2010; SCRA, 2012).

JOB SETTINGS AND TITLES

As McMahon and colleagues (2015) have aptly pointed out, few job ads announce that they are looking for a community psychologist to fill the position! However, the training and experience that community psychologists acquire through academic programs and work experience typically equip them well to be employed in a wide variety of settings. Given its interdisciplinary focus and collaborative traditions, CP graduates often contribute their skills, knowledge and expertise to a specific problem area. This in fact creates a dilemma for the field: While other disciplines such as public health and social work have reserved job titles and a clear job market, Canadian CP does not currently have this level of infrastructure in place. Thus, unlike other fields that draw people into institutional structures that reinforce their professional identity, the “peculiar success” of CP has created centripetal forces which tend to limit graduates’ opportunities to identify with the field on an everyday level in their professional work (Neigher et al., 2011; Snowden, 1987). In this way, CP may be a victim of its success in promoting collaborative, interdisciplinary and power-sharing approaches to solving social problems and preparing its graduates for a wide variety of careers. It can therefore be difficult to highlight the variety of contributions of community psychologists.

Despite this dilemma, graduates of CP programs can be found working in many types of settings, including academic settings, philanthropic organisations and private foundations, health and human service agencies, municipal, regional, provincial and federal governments; medical centers, public health settings, comprehensive community initiatives, self-help groups, prevention organizations, community mental health centers, nonprofits, schools, community-based organizations, advocacy groups, religious institutions, and neighborhood groups. They work in organisations offering applied research, consultation and evaluation services, and community development, architectural, planning, and environmental firms. They may also be found in corporations or as researchers in community organizations, universities, think tanks, or government agencies (McMahon & Wolfe, 2017; Neigher et al., 2011; Wolff, 2014).

Community psychologists are well prepared to promote mental health and community well-being in a variety of roles. Some relevant job titles might include (Hakim, 2010; McMahon & Wolfe, 2017; Viola et al., 2017):

- community mental health worker
- grassroots organizer
- community development specialist or urban planner
- program or project director
- grant writer
- trainer
- director of a nonprofit or community-based organization
- research/evaluation consultant
- coordinator for a community coalition
- policy analyst

- governmental administrative staff or political attaché
- executive staff of a nonprofit or for-profit organization.

Interestingly, Franscscato and Zani (2017) describe how community psychologists in Italy were successful in advocating for and implementing positions of territorial community psychologists, who are mandated to conduct regional analyses to assess strengths and problems and analyse and coordinate the local network of institutions, associations and groups. For compelling descriptions of diverse career paths of individual community psychologists, see Bouchard, 2010; Chavis, 1993; van de Hoef et al., 2011; Wolff, 2014).

TRAINING IN COMMUNITY PSYCHOLOGY

At the undergraduate level, though there is no formal training in CP within Canada, there are numerous undergraduate courses on the topic offered at institutions across the country (see Table 2). Training in CP at the undergraduate and graduate levels is often pursued through supervision by professors with CP expertise who identify as community psychologists without necessarily being affiliated with a formal CP program. Indeed, formal graduate programs in CP are currently only available in three Canadian universities. Two stand-alone CP graduate programs are offered at Wilfrid Laurier University and at the Université du Québec à Montréal, and a clinical psychology program with a specialisation in CP is offered at the University of Ottawa. Specific postdoctoral training in CP is not yet offered within Canada, though many fellowships are available within the United States, including at Penn State University, Stanford Medical Center and Veterans Affairs, and the Center for AIDS Intervention Research in Milwaukee, Wisconsin.

Those who have been in the position of interviewing and accepting students into CP graduate programs have provided insights into the application process. Importantly, as CP is an action-oriented field, CP supervisors look for practical field experience in addition to research experience. Another essential component for applicants includes an understanding of CP and what makes each student passionate about it. For example, a student may see the value of a CP program in applying multiple levels of analysis to their topic of interest. A simple and accessible way to learn more about CP is to explore the free online resource [The Community Toolbox](#) (Center for Community Health and Development, 2019).

In considering graduate school in CP, it is also useful to note that a PhD in CP is not required to be active in the field. Community psychologists fill many different roles, and CP-specific training is not required for many of these positions. Individuals working in CP related positions hold varying degree levels, including undergraduate and master's as well as doctoral degrees.

Table 2: Academic Training in Community Psychology

Level	Degree Type	Institution
Undergraduate		
	–	Wilfrid Laurier University
	–	University of Windsor
	–	Cape Breton University
	–	McGill University
	–	University of New Brunswick
	–	Thompson Rivers University
	–	UQAM
	–	Saint Mary's University
Master's		
	Master of Arts in Community Psychology	Wilfrid Laurier University
	Master of Public Policy and Administration in Social Change	Adler University
Doctoral		
	PhD in Community Psychology	Wilfrid Laurier University
		UQAM
	PhD in Experimental Psychology – Social/Community	University of Ottawa
Other		
	Undergraduate Practicum	Carleton University

CONCLUSION

Community psychologists share many of the values, concepts and change strategies of other community-focused specialties, such as applied sociology, social work, community economic development, public health, applied anthropology, and prevention science. However, CP adds a particular constellation of perspectives on community change and intervention compared to other disciplines. CP practice is, among other things, fundamentally rooted in an empirical approach, using research not only to describe social problems but as a lever for change. CP is rooted in psychology and uses psychological and psychosocial knowledge to promote social change. Community psychologists often adopt a critical and analytical approach to environments and systems through the use of concepts

such as social regularities, person-environment fit, and ecological analysis. They hold a tolerance for ambiguity and the ability to legitimize multiple points of view. They seek out individual and group strengths and strive to identify levers for change that are already present in the situation. Community psychologists move beyond analysis towards action, by establishing a climate of mobilization and synergy and by promoting concrete possibilities for change (Laprise & Payette, 2001). These features of CP contribute to the wide variety of applications and careers that community psychologists can pursue.

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[15]

PSYCHOLOGY IN THE MILITARY

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INTRODUCTION

Applied psychology was first practiced in the Canadian Armed Forces (CAF) over 80 years ago when a group of Canadian psychologists met to discuss how they could contribute to the Second World War effort (see Anderson, 1991; Lamerson, 2002; Prociuk, 1988). What the Canadian military needed most at the time was an efficient way to select volunteers for the many occupations in the armed services. Psychologists have been involved in the selection of military personnel ever since (see McMillan, Stevens, & Kelloway, 2009), though applied psychology has expanded to a lot of other areas and has influenced many programs and policies in the CAF and the Department of National Defence.

This chapter provides an overview of psychology in the CAF and National Defence from three perspectives. In the first section, we look at social science from the perspective of career opportunities in defence. The three main careers in psychology are CAF personnel selection officers (PSOs), defence scientists, and clinical psychologists. In the second section, we look at the many kinds of applied personnel research that take place in the CAF and National Defence, and in the third we look at opportunities for education in applied military psychology.²

1. All three authors played a lead role in the compilation of this chapter, and are indebted to all those who contributed to this chapter (acknowledged in footnotes to each respective section; see list of contributors at the end of the chapter), including Waylon Dean for his review of the initial chapter drafts.
2. For a more in-depth overview of military psychology, please see Kennedy and Zillmer (2006), Laurence and Matthews (2012), and Gal and Mangelsdorff (1992).

SOCIAL SCIENCE CAREERS IN THE CANADIAN ARMED FORCES AND NATIONAL DEFENCE

Personnel selection officers³ (PSOs) are military officers who apply behavioural science in areas such as ethics, recruiting, retention, selection, leadership, performance appraisal, family and personal mental health and well-being research, and in other human resource domains (CAF, 2019).

Entry-level PSOs typically have an undergraduate degree in psychology when they join the CAF, and following completion of basic and occupation-specific military training, spend the first part of their careers working one-on-one with CAF members from recruitment through release from the military. PSOs conduct suitability screening for over 100 CAF occupations at recruiting centres with civilian applicants. The CAF has many internal programs that allow its members to pursue new careers, so members often change occupations. Junior PSOs assess the suitability of those interested in switching occupations by examining their aptitudes, personality traits, and work relationships (person–job fit) through psychometric tests and structured interviews, after which they write suitability reports. As part of this process, PSOs counsel CAF members on how to reach their career goals, explaining the educational programs or technical certifications they will need to work in specific fields.

PSOs provide a host of services to help retiring CAF members transition from military to civilian life. This can involve administering and interpreting a number of vocational interest inventories, going through a structured set of sessions to help members figure out their post-military careers or educational plans, conducting different types of transition workshops (e.g., resume writing, job search techniques), and providing them with other information they need to prepare themselves for returning to civilian life.

As PSOs progress in their careers, opportunities expand both professionally and academically. They become eligible for subsidized full-time education up to a doctorate in psychology. The CAF prefers that PSOs complete an industrial/organizational psychology program, given the emphasis on personnel selection. Once they have a master's degree, PSOs are normally employed to conduct applied research in three broad areas: personnel selection, personnel and family support, and operational and organizational dynamics.

Regardless of the type of research PSOs conduct, the work is dynamic and PSOs have a chance to travel across Canada to the CAF's many wings and bases and to travel internationally to collaborate with other military organizations. PSOs are also encouraged to develop research skills through conferences and workshops.

This strong research background and wealth of experience allows PSOs to do different jobs, such as teaching applied military psychology at the Royal Military College of Canada, conducting research, providing personnel selection guidance and advice to senior staff, and developing and maintaining personnel selection policy.

Defence scientists are not members of the military but civilian public servants employed by National Defence. Defence scientists have a broad range of academic backgrounds and work across various science domains, but those engaged in personnel research typically have graduate degrees in various specializations in psychology (e.g., cognitive psychology, industrial/organizational psychology, social psychology) or in sociology.

In the personnel research domain, defence scientists work alongside PSOs, to address people-related challenges; conducting independent and collaborative applied research for

3. Lieutenant Colonel Rob Morrow contributed to this section of the chapter.

their CAF and National Defence clients using a range of research methods (e.g., surveys, focus groups) and analytical techniques (e.g., qualitative thematic analysis, structural equation modeling). In addition to preparing internal reports and conducting oral presentations, defence scientists publish their research findings externally in books, conferences, and peer-reviewed journals, and they act as internal and external peer-reviewers of work in their research domains (e.g., ethics, family support, selection).

Most defence scientists' work is client-driven, but they can propose new research and analysis capabilities, and they are encouraged to collaborate with academia, industry, and other government departments (e.g., Veterans Affairs Canada) to realize their ideas. As defence scientists progress through their careers, they can join international collaborations, which are critical to ensuring the most current scientific research is being used to conduct military personnel research in Canada and to benchmark Canadian findings against similar research in allied nations. Some of these international collaborators include The Technical Cooperation Program, the NATO Human Factors and Medicine Research Task Groups, the International Military Testing Association, and the European Research Group on Military and Society.

Unlike most job classifications in the Canadian Public Service, the DS group is incumbent oriented. Advancement, following initial recruitment is based on merit and occurs within the context of the incumbent's own position. The seven facets of state of professional development include: knowledge and expertise, personal interactions and communication, creativity, productivity, impact, recognition, and responsibility. Advancement requires an assessment of state of professional development, which is then compared with professional development indicators that define each of seven characteristics at each of the DS levels. They chart their progress through an annual professional development plan, which can include participating in conferences, methods and analysis courses, and military familiarization exercises (e.g., visiting a base or spending time on a Royal Canadian Navy ship). Some defence scientists have had opportunities to voluntarily to deploy on overseas missions (e.g., Afghanistan), upon invitation by military allies, to present their work as subject matter experts in their field.

Being a defence scientist is a rewarding experience that provides graduates in psychology (and other disciplines) with the opportunity to learn and develop new skills, travel to interesting places, and make a difference in the lives of the men and women who serve their country.

Clinical psychologists⁴ in the CAF are not members of the military but civilians employed as public servants or contracted by National Defence. They typically have a master's or doctorate with a specialization in adult clinical psychology, though a few have degrees in counselling psychology. These psychologists work in military health care clinics and certain specialized units such as those with the Canadian Special Operations Forces Command (CANSOFCOM). The vast majority of psychologists work in the 31 military health care clinics located across Canada, which include seven Operational Trauma and Stress Support Centres and provide mental health services very similar to what is delivered in hospitals.

The CAF has a comprehensive mental health program for ill and injured members and psychologists work on multidisciplinary teams with psychiatrists, social workers, mental health nurses, addiction counsellors, chaplains, physicians, physician assistants and nurse practitioners. Psychologists assess CAF members in order to identify mental health

4. Dr. Susan Dowler and Dr. Sylvie Bourgeois contributed to this section of the chapter.

treatment needs. They do this by administering psychometric tests, conducting clinical interviews and, if warranted, making mental health diagnoses and treatment recommendations. Then they provide the psychological treatment interventions, all of which are guided by evidence-based best practices. Most of the time, the psychologists work with patients one-on-one but sometimes they deliver psychological interventions in a group format. Occasionally, they work with patients' families as well. Regardless of how services are delivered, psychologists are always involved in the constant evaluation of their treatment interventions through the use of outcome measurement practices.

The most common mental disorders that psychologists treat are depressive disorders, anxiety disorders, trauma- and stressor-related disorders (e.g., Posttraumatic Stress Disorder), and substance use disorders. In addition to these core duties, psychologists in military health care clinics may also participate in mental health research and they often sit on local, national, or international psychology working groups and committees.

Some clinical psychologists work in specialized units, such as the Canadian Special Operations Forces Command. These psychologists have responsibilities both in mental health and operational psychology. As subject matter experts in operational psychology, they conduct suitability and risk assessments of military members applying to these units, and provide recommendations to leadership as part of the selection process for high-risk duties. They also advise military leadership on psychological risk and mitigation strategies related to high-risk training, operations and initiatives, and on the psycho-social factors that affect members' psychological health, morale, and retention. In direct support of the mental health of members, they develop and deliver educational programs for psychological health and wellbeing and provide psychological intervention to members, including crisis intervention, diagnostic assessment and psychotherapy. Special operations psychologists are active in international psychology working groups and committees, and they collaborate with other operational psychologists from allied nations on professional practice issues and advances. They are also often asked to travel to perform their duties, sometimes on short notice.

APPLIED PERSONNEL RESEARCH IN THE CANADIAN ARMED FORCES AND NATIONAL DEFENCE

⁵Two scientific organizations in National Defence and the CAF, Defence Research and Development Canada and Director General Military Personnel Research and Analysis, conduct social science research as part of the Personnel Readiness Program, which supports the CAF's operational and strategic initiatives. These organizations provide senior leaders in National Defence and the CAF with timely scientific evidence grounded in an understanding of the defence context.

Research for the Personnel Readiness Program comprises a number of broad domains: recruitment, selection, training, career management, retention, and attrition; personnel and family support and quality of life for military members and their families; employment equity and diversity; and psychological health and operational and organizational dynamics, including ethics, military leadership, and organizational effectiveness. Teams of defence scientists and PSOs work on new and ongoing projects within these domains. Most of the data come from surveys of serving military personnel. In each of the following subsections,

5. Lieutenant Colonel Rob Morrow contributed to this section of the chapter.

we highlight examples of research by defence scientists and PSOs for the Personnel Readiness Program. We describe the challenge for the CAF and National Defence, how defence scientists and PSOs apply their social science knowledge to address the challenge, and the impact of these efforts on members and the organization.

MEASURING PSYCHOSOCIAL READINESS AND RESILIENCE⁶

The challenge.

Psychosocial hazards in the workplace can threaten employees' mental health and well-being, leading to absenteeism, turnover, and lower job performance. The CAF and National Defence have undertaken a number of initiatives to create and maintain a healthy workplace, but an effective tool to measure psychological hazards in the workplace has been needed for some time.

Applying social science.

The Canadian government enacted the *National Standard for Psychological Health and Safety in the Workplace* in 2013, which identifies 13 workplace resilience and risk factors that contribute to psychological health and safety at work. The list includes psychological and social support, organizational culture, clear leadership and expectations, civility and respect, psychological competencies and requirements, growth and development, recognition and reward, involvement and influence, workload management, engagement, work–life balance, and psychological protection and physical safety (from violence, bullying, and harassment). Using the standard as a guide, Ivey, Blanc, Michaud, and Dobрева-Martinova (2018) applied a job-demands resources framework to the 13 factors, and then set out to find validated scales in the academic literature to measure each factor. The result was a comprehensive survey battery called the Unit Morale Profile, Version 2.0, which was adapted to create the Defence Workplace Well-Being Survey. The survey was administered, in the spring of 2018, to a large sample of National Defence employees and CAF members to assess the psychosocial workplace.

The impact.

Data are still being analyzed by the research team, but the results will (a) establish a baseline for psychological health and safety in Defence, and (b) they will identify key risk and resilience factors that affect well-being, which in turn will inform organizational interventions. Moreover, the cutting edge techniques used have positioned DND as an international leader in the assessment of workplace well-being.

6. Lieutenant Colonel Cindy Suurd Ralph contributed to this section of the chapter.

CLIENT-REPORTED MENTAL HEALTH MONITORING IN CANADIAN ARMED FORCES HEALTH CLINICS⁷

The challenge.

In routine outcome measurement, mental health care providers use patient-report tools to monitor outcomes and adapt treatments to patients' needs. Inviting patients to complete questionnaires increases their involvement and provides data about treatment targets, tracks progress, and helps address gaps in service. In a range of clinical settings, routine outcome measurement has been linked with patient and provider satisfaction and improved mental health outcomes, such as reduced symptom profiles and enhanced quality of life (Krägeloh, Czuba, Billington, Kersten, & Siegert, 2015; Scott & Lewis, 2015; Steinfeld, Franklin, Mercer, Fraynt, & Simon, 2016).

In light of this research, Veterans Affairs Canada created the Client-Reported Outcomes Monitoring Information System (CROMIS; Canadian Armed Forces and Veterans Affairs Canada, 2017). CROMIS was implemented in phases at CAF health clinics across Canada in 2018 to support the use of measurement-based care with CAF members. CROMIS uses information technology to administer and interpret the brief Outcome Questionnaire (Lambert, 2007), which captures client feedback to improve their mental health outcomes.

Nonetheless, research has shown that several factors, such as provider attitudes (e.g., cost, time), and lack of training and staff engagement, can influence the implementation and adoption of evidence-based practices (McHugh & Barlow, 2012; Steinfeld et al., 2015). In particular, aspects of organizational culture and organizational readiness for change have been linked with barriers to implementation which limits achievements towards measurement-based care (Williams, Glisson, Hemmelgarn, & Green, 2017).

Applying social science.

National Defence researchers' objective was to identify key barriers and facilitators of CAF health clinic providers' use of CROMIS. In response, they adapted and administered the Organizational Readiness to Change Assessment tool, a 77-item questionnaire that assesses the following key organizational determinants of readiness for implementing evidence-based practice (i.e., CROMIS): the strength of the evidence base for the practice, the quality of the organizational context to support the practice, and the organizational capacity to support the practice (Helfrich, Li, Sharp, & Sales, 2009). The tool was administered to over 200 mental health care providers across 20 CAF health clinics.

The impact.

The findings have had important implications for mental health care in the CAF. Compared with the general population, CAF Regular Force members have higher rates of depression and generalized anxiety disorder (Pearson, Zamorski, & Janz, 2014). Combined with evidence that there are gaps in achieving expected outcomes in routine mental health care and in detecting deteriorating symptoms (Fortney et al., 2016), the CAF needs to engage clients in improving their care and to change the way mental health services are delivered. In particular, helping clinicians implement standardized outcome measures and abide by

7. Dr. Eva Guerin and Dr. Jennifer Lee contributed to this section of the chapter.

specific clinical practice guidelines will help achieve more tailored patient care, provide just-in-time recommendations for both clients and clinicians, and improve outcomes for CAF members (Canadian Armed Forces and Veterans Affairs Canada, 2017; Harding, Rush, Arbuckle, Trivedi, & Pincus, 2011).

PROMOTING AN ETHICAL AND RESPECTFUL MILITARY CULTURE⁸

The challenge.

In 2014, media coverage suggested that the incidence of sexual misconduct in the CAF was much higher than reported in CAF research (Davis, 2015). As a result, the Chief of the Defence Staff commissioned an external review, which identified numerous cultural practices and processes contributing to sexual harassment and sexual misconduct in the CAF (Deschamps, 2015). The external review led the Chief of the Defence Staff to initiate Operation HONOUR, the strategy to eliminate inappropriate sexual behaviour in the CAF (National Defence and the Canadian Armed Forces, 2015). Canada's defence policy, *Strong, Secure, Engaged*, also called for institutionalized culture change to promote a culture of leadership, respect, and honour that reflects high standards of ethical conduct (National Defence and the Canadian Armed Forces, 2017).

Applying social science.

National Defence researchers developed a comprehensive research plan to better understand the culture and leadership dynamics contributing to inappropriate sex- and gender-based behaviour in the CAF (Davis, 2015, 2016). Incorporating quantitative and qualitative methodologies, the research plan contained the following objectives, which drew on recommendations from the external review (Deschamps, 2015) and a later report by the Office of the Auditor General of Canada (OAG, 2018):

- *Measuring the incidence of sexual misconduct in the CAF.* The CAF contracted Statistics Canada to develop, administer, and analyze a survey to measure three forms of inappropriate sexual behaviour in the CAF: sexual assault (experienced), sexual harassment (witnessed or experienced), and discrimination based on sex, sexual orientation, or gender identity (witnessed or experienced). Knowledge of directives and programs related to sexual misconduct and perceptions of CAF responses to sexual misconduct were also examined. The survey was administered in 2016 and 2018, with another administration anticipated in 2021. Results from the survey are currently used to inform CAF policies, procedures, and programs aimed at addressing sexual misconduct in the CAF.
- *Victim support.* Using qualitative interviews, the goal of this project is to understand the experiences of serving and retired military members seeking support after being affected by inappropriate sexual behaviour in the CAF. Recently completed, the results will help identify existing gaps and challenges in seeking support, and improve training, programs, and policies aimed at supporting those affected by inappropriate sexual behaviour (Deschamps, 2015; OAG, 2018).

8. Dr. Krystal Hachey, Dr. Karen Davis, Dr. Deanna Messervey, Dr. Manon LeBlanc, and Dr. Stacey Silins contributed to this section of the chapter.

- *Bystander behaviour.* Using qualitative interviews, focus groups, and surveys, the goal is to understand psychological, social, and organizational factors that affect military members' responses to incidents of inappropriate sex- and gender-based misconduct. Results will help inform bystander training and organizational cultural practices and assumptions that discourage reporting (Deschamps, 2015; Davis, 2015).
- *Socialization.* Using qualitative interviews and focus groups, the goal is to understand the impact of gender-related values and conduct on socialization during entry-level and post-entry level training, and within military units and deployed operational units. The results are currently being applied to help identify informal cultural learning that shapes assumptions and behaviours during socialization (Davis, 2015).
- *Leadership dynamics.* Using qualitative interviews and focus groups, the goal is to understand challenges and barriers faced at and across different levels of leadership. As various phases of analyses are completed, the results contribute to an understanding of how different levels of leadership respond to sexual misconduct (Davis, 2015).
- *Measuring and monitoring culture change* (OAG, 2018). By examining current literature and ways to measure culture change, the goal was to identify the antecedents and impacts of sexual misconduct and other types of unethical behaviour in the CAF workplace climate and across dimensions of the culture. This work resulted in the development of a strategy to measure and monitor culture change in the CAF (Davis & Squires, under review), which will integrate a range of research initiatives across the Personnel Readiness Program.

In tandem with this research, the Defence Ethics Research Program supports National Defence and the CAF by examining the causes of unethical behaviour, ethical risk factors and outcomes in the organization, and evidence-based approaches to minimizing ethical risk. Drawing on social and organizational psychology, Director General Military Personnel Research and Analysis uses a variety of methods to answer research questions related to these issues. These methods include surveys and experimental research (Blanc, Warner, Ivey, & Messervey, 2018; Messervey & Davis, 2016; Messervey & Peach, 2014; Messervey & Squires, 2014; O'Keefe, Messervey, & Squires, 2018; O'Keefe, Peach, & Messervey, 2019).

The impact.

The research discussed above is integral to broader initiatives that support an ethical and respectful military culture, contributing to the Sexual Misconduct Response Centre and the CAF Strategic Response Team on Sexual Misconduct. This research additionally supports policy and prevention strategies, cultural change, and a more effective response to incidents of sexual misconduct. Ethics research by Director General Military Personnel Research and Analysis has also influenced ethics training and education internally (e.g., Defence Ethics Programme, Canadian Army Ethics Programme) and externally (e.g., Australian Defence Force, Carleton University, the United Kingdom's Ministry of Defence, the United States Army War College).

ASTRONAUT SELECTION⁹

The challenge.

The Canadian Space Agency (CSA) was about to launch a nation-wide recruitment campaign in 2016, with the aim of selecting two new astronaut recruits. CSA asked National Defence for its selection and fitness expertise to evaluate astronaut candidates. With 3,772 Canadians applying for just two positions, it was critical that the selection system be standardized, objective, and defensible.

Applying social science.

In developing a selection system, defence researchers first reviewed the previous job analysis from CSA's 2008 campaign. With long-range missions to Mars fast approaching and Chris Hadfield's explosive impact on social media, the job of an astronaut had changed enough to warrant an updated job analysis.

Selection experts conducted a focus group with current and retired astronauts to discuss the typical outputs and tasks of an astronaut, including the knowledge, skills, abilities and other attributes (KSAOs), as well as the physical requirements of the job (Klammer & Collins, 2016). Several researchers then grouped the KSAOs into 17 competencies. Given the large number of competencies required and the selection process's high visibility on social media, the system had to be flexible enough to assess multiple behavioural and physical attributes across a large number of applicants within a short time.

Defence researchers decided to use the assessment centre methodology, a process which includes the development and use of a variety of different tools (e.g., roleplay exercises, structured interviews) to assess attributes linked to successful performance in a particular job or role (Thornton & Rupp, 2006). In a typical assessment centre, candidates perform a variety of job-related exercises designed to simulate realistic situations faced by individuals working in the occupation (e.g., astronauts).

CSA reviewed all applications and selected 1,000 applicants for online testing, further reducing the number of applicants to the 100 who completed a medical screening. Simultaneously, National Defence selection experts developed definitions for each of the 17 competencies, along with behavioural anchored rating scales and exercises to assess the competencies. Two separate and complementary assessment centres were created (Klammer, Collins, Gagnon, & Walsh, 2018; Collins, Klammer, Gagnon, & Walsh, 2018). Seventy-two applicants who passed the medical screening were first invited to St. Jean, Quebec, where trained assessors observed the applicants in a variety of team exercises, physical fitness tests, and objective measures, such as a working memory test. Those who were successful ($n = 32$) went on to complete the second assessment centre, located in Halifax, Nova Scotia, where they underwent additional assessment which included leadership assessments and exercises with high fidelity to induce stress. Each candidate was presented to a selection board who decided on which applicants continued on in the selection process.

In both assessment centres, candidates received several realistic job previews—including

9. Major Lenora Collins contributed to this section of the chapter.

a session with a current serving astronaut—to give them a picture of the commitment required to become a Canadian astronaut.

The impact.

Following the two assessment centres, CSA conducted a further selection session on robotics, media assessments, in-depth medicals, and a final selection interview, which resulted in the selection of Dr. Jennifer Sidey-Gibbons and Joshua Kutryk.

JOINT TASK FORCE NORTH¹⁰

The challenge.

Members of the CAF are relocated from one base to another throughout their careers. Called “postings,” the number and frequency of relocations depend on the member’s occupation and rank. One posting is to Joint Task Force North (JTFN) in Yellowknife, Northwest Territories. Because JTFN is classified as an isolated posting, members have to undergo screening before being posted to this location. Despite this, personnel arriving at JTFN were not prepared for the realities of life in a northern environment, resulting in increased work stress, financial hardship, marital and family problems, and mental health issues. The Joint Task Force leadership was concerned that the unique challenges of living and working in the north were not well known to personnel posted to JTFN and that the unique stressors were not well understood by the personnel who conducted the screenings.

Applying social science.

Researchers suggested developing a realistic living conditions preview, an extension of the realistic job preview (Ebel-Lam & MacArthur, 2015), which would show the unique living conditions of the north as well as the realities of working in a highly operational unit. Focus groups with military members, National Defence employees, and military spouses were used to collect key themes about the living conditions at JTFN and the challenges and opportunities that come with a posting to Yellowknife.

The impact.

This research resulted in an education tool that provides military members with an honest view of the challenges and benefits of a posting to JTFN in Yellowknife. The tool provides a candid overview of postings in this location as well as advice from current Team North personnel on how incoming members can increase their chances of adjusting to (and thriving in) their new working and living conditions. Although subsequent research has not been conducted to assess the impact of the realistic preview, anecdotal evidence from support staff in this location indicates that there have been fewer issues with personnel adjustment and unmet expectations since this resource was implemented.

10. Major Lenora Collins and Dr. Anna Ebel-Lam contributed to this section of the chapter.

PROJECT HORIZON: EARLY CAREER RETENTION IN THE CANADIAN ARMED FORCES¹¹**The challenge.**

The effectiveness of any military depends on its success in recruiting individuals to a variety of occupations. Thus, the retention of military personnel during the early career period has been a long-standing interest of the CAF's. The current personnel retention strategy focuses on addressing job dissatisfiers and creating a positive work environment to foster long-term commitment and retention of CAF members. This is typically done through the development of personnel programs and policies that promote quality of life, job satisfaction, and employee recognition (Chief of Military Personnel, 2009). Psychological research into factors influencing personnel commitment and retention informs these programs and policies.

Applying social science.

One particular research initiative, called Project Horizon, focused on early career retention (i.e., retention within the first few years of enrollment in the military). Following a review of various research methods (e.g., Day, Bourgeois, & Catano, 2012), researchers proposed using a longitudinal panel research design, which involves repeated measurements of constructs and factors using surveys administered at various points in members' careers to assess changes in attitudes over time and to investigate factors that cause such changes (Goldenberg, 2012; Laplante, Otis, & Goldenberg, 2016).

Project Horizon assessed factors relevant to predicting attrition and retention, such as psychological conditions (e.g., anxiety, depression), dispositional factors, such as the Big Five personality factors, as well as traits such as hardiness and positive and negative affect, social factors (e.g., organizational support, social support, supervisor support), and members' expectations (e.g., perceived fit, psychological contract). Other factors related to prior exposure to, or familiarity with, the military were also studied. Several outcome measures were used as indicators of retention and attrition, including newcomer adjustment, job satisfaction, organizational commitment, and turnover intentions.

Longitudinal tracking was done through a series of surveys administered to all CAF recruits who started the basic training course over a period of two years (three years in the case of officer cadets). Between September 2014 and July 2018, surveys were administered at the beginning of the basic training course, at the end of basic training, three months after basic training, and six months after that—thus covering the entire first year of a recruit's life in the CAF. Planning is underway for the next phase of data collection (when participants reach five years of service).

Although data from the various phases and from auxiliary data sources (e.g., selection measures, attrition data) are currently in the process of being linked to each other, cross-sectional data (from within each phase) have been analyzed and have provided some insights into the factors affecting retention. For example, morale (e.g., level of motivation, drive and enthusiasm during training) and intentions to stay in the CAF were most strongly related to person–organization fit (i.e., a recruit's perceptions of the fit between their own values and the CAF's), a *calling* work orientation (i.e., the extent to which recruits' work is

11. Dr. Joelle Laplante contributed to this section of the chapter.

integral to their lives and identity), and the extent to which recruits felt they were given sufficient information and support on the first day of their basic training (Laplante et al., 2016). Six months later, the variables most strongly associated with morale, organizational commitment, and intentions to stay in the CAF were person–job fit, the meaningfulness of work, and work–life balance (i.e., the extent to which recruits were able to balance the demands of training and their personal life; Goldenberg, Laplante, Otis, & Pearce, 2019).

The impact.

Findings like these not only help us understand recruits’ intentions to stay in the CAF, but they have also informed the CAF’s personnel retention strategy and the programs and policies that affect retention.

USING BEHAVIOURAL INSIGHTS IN PERSONNEL RESEARCH

The challenge.

Behavioural insights is a multidisciplinary approach that draws on psychology, behavioural economics, and social marketing to influence positive behavioural change and policy implementation at the grassroots level (see Ariely, 2008; Kahneman, 2011; Thaler & Sunstein, 2008). The challenge for the CAF and National Defence was to make the most of this research to effect positive changes in the organization.

Applying social science.

In August 2017, Director General Military Personnel Research and Analysis established a behavioural insights team, the Personnel Research in Action (PRiA) team, with a mandate to translate behavioural insights into policy and practice to influence behaviour toward positive ends. The key functions of PRiA are as follows: develop and maintain expertise in behavioural economics, program assessment, science–policy integration, and iterative design methods; bring together stakeholders from research, policy, and practice to design, implement, assess, measure, and quantify the cost–benefit behavioural economics interventions; and develop networks or clusters with other government departments, academia, industry, and allied research organizations to apply behavioural insights to CAF and National Defence issues.

The impact.

Among PRiA’s first initiatives was to help strengthen the CAF’s recruitment process. PRiA developed a series of email messages—called “nudges,” which influence decision making without constraining freedom of choice—to encourage applicants to remain in the recruitment process (Gooch & Kemp, 2018; O’Keefe, Gooch, & Kemp 2018a; O’Keefe, Gooch, & Kemp, 2018b). A second contribution to the recruiting process was the Practice Canadian Forces Aptitude Test, which was made available to prospective CAF recruits (Kemp, 2018; Kemp & Gooch, 2019). The practice test simulates the conditions and questions on the official Canadian Forces Aptitude Test, so prospects can experience a realistic version of the official test before taking it at a recruiting centre. The purpose of the practice test is to lessen

test-takers' anxiety, to build their confidence, and to encourage test-takers to continue with the recruiting process.

Other initiatives supported by PRiA include encouraging self-declaration among visible minority applicants to ensure that the CAF is representative of the Canadian population; encouraging CAF members to attend their annual fitness test; and encouraging retiring members to use all available resources as part of their career transition from military to civilian life.

ADVANCING PERSONNEL RESEARCH WITH MULTIPLE DISCIPLINARY APPROACHES¹²

With the increasing complexity of defence and security issues, researchers from various disciplines are being called upon to take more robust theoretical approaches and methods to advance the military research that informs policies, programs, and senior leaders' decision making.

Interdisciplinary, multidisciplinary, and transdisciplinary approaches provide a more holistic understanding of problems and capability gaps. An interdisciplinary approach synthesizes different methods and theoretical approaches across disciplines to solve a particular problem. A multidisciplinary approach uses different disciplines to examine a particular problem but provides potential solutions through the respective disciplines. A transdisciplinary approach considers multiple disciplines in identifying optimal and holistic solutions to a given problem but also takes into consideration stakeholder and community perspectives. By incorporating multiple disciplinary approaches, researchers are able to generate additional knowledge, skills, abilities, and expertise to advance evidenced-based solutions to research problems.

It is important for researchers to examine the merits of working in collaborative teams and settings composed of people who come from various disciplines (e.g., clinical psychologists, psychological scientists, sociologists, economists, engineers, computer scientists, and physicists) to better address research problems. In the military context, multiple disciplinary approaches help researchers to advance their knowledge, skills, and capacity in addressing complex research problems. Multiple disciplinary approaches lead to better integration of knowledge, skills, and expertise, and can further provide a more holistic approach to understanding organizational, national, and international priorities impacting defence and security.

EDUCATION IN APPLIED MILITARY PSYCHOLOGY

THE ROYAL MILITARY COLLEGE OF CANADA¹³

The Royal Military College of Canada (RMC), established in 1876, is widely recognized as a “university with a difference.” Most universities in Canada operate within provincially established guidelines, but RMC, as a federal university, receives funding and control via the federal government of Canada. Undergraduate students attending RMC become members of the Canadian Armed Forces (CAF) prior to commencing studies and their job for the next 4 – 5 years is to be a student. This means that their education is free and the students

12. Dr. Barbara Waruszynski contributed to this section of the chapter.

13. Dr. Allister MacIntyre and Dr. Danielle Charbonneau contributed to this section of the chapter.

receive a salary while in attendance. These students represent the future leadership of the CAF and, upon completing their degrees; the graduates receive a Queen's commission as officers in the CAF. A broad range of degree options in the Arts, Sciences and Engineering are available, with the understanding that the degree choice must be compatible with the CAF occupation they have been assigned. The focus at RMC is on more than simply academics. In order to graduate, students must achieve acceptable standards in the "Four Pillars." These four distinct pillars include academics, fitness, military/leadership and bilingualism (Canada's two official languages, English and French). In addition to the undergraduate program, which educates students for careers in the CAF, RMC offers university courses to hundreds of military and civilian members of the Department of National Defence by distance through its Division of Continuing Studies. Finally, at the graduate level, RMC offers Masters and PhD programs in Arts, Sciences and Engineering. Some of these programs are open to non-government civilian applicants. Graduates of RMC possess unique abilities and capabilities and universally occupy positions of responsibility and leadership throughout Canada and the world.

UNDERGRADUATE DEGREES IN PSYCHOLOGY

The undergraduate program in psychology at the Royal Military College of Canada meets the needs of those enrolled in a Bachelor of Arts Honours Psychology or a Bachelor of Arts Psychology degree (RMC, 2018). The program offers a mix of foundational courses in psychology and required courses in leadership, ethics, and military professionalism that focus on the military workplace and military operations. Courses in the program examine topics in military psychology, personnel psychology, leadership and ethics, as well as basic experimental psychology. Optional courses include group dynamics, counselling, cross-cultural psychology, and persuasion and influence. As much as possible, the psychology professors use military examples to illustrate the principles discussed in courses.

ACADEMIC POSITIONS AT THE ROYAL MILITARY COLLEGE OF CANADA

With respect to academic positions, the Department of Military Psychology and Leadership at the Royal Military College of Canada has eight civilian psychologists with doctorates. These positions are similar to those in civilian universities in that they entail teaching, conducting research, and holding some administrative positions. For about 15 years, psychology faculty members at the Royal Military College of Canada have also provided 360 degree leadership assessments to experienced military personnel taking the year-long Joint Command and Security Program, and National Security Program. The confidential assessments, which are conducted for developmental purposes, have participants complete a self-report questionnaire on their leadership behaviours and habits, and then provide the names of subordinates, peers, and supervisors to evaluate them on the same questionnaire. Individual reports are prepared and sent to participants about one or two weeks before a coaching session. Coaches are either faculty members at the Royal Military College of Canada or CAF veterans with a minimum of a master's degree and an appropriate set of skills and experience. Coaching focuses on the areas in which participants or their raters have identified as areas for improvement. At the end of the coaching session,

there is a course requirement for participants to prepare and submit a developmental plan to their coach.

CONCLUSION

Applied psychology in the CAF has evolved significantly from its early days during the Second World War when it focused on personnel selection. As this chapter shows, psychology now plays a variety of roles, such as clinical and counselling support, applied research, and the CAF now provides teaching opportunities. We hope that this chapter has piqued the interest of aspiring psychologists to consider a career helping the brave people who serve Canada!

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