



SPATIAL DETERMINANTS
OF HEALTH LAB

Spatial Determinants of Health Lab

Student Handbook

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Welcome

About our Group

The Spatial Determinants of Health Lab is committed to fostering diversity and inclusivity in our pursuit of scientific discovery. These values are reflected not only within the composition of our members, but also by the breadth of the innovative research we undertake. In our pursuit of knowledge, we encourage an environment of collaboration, open communication, and trust, which welcomes diversity and respects differences of opinions. It is these principles of diversity and inclusion that allow us to discover new ways of thinking and behaving which lead to innovation and scientific success.

Our research group integrates scholars at all levels, from students in their 1st year to senior PhD students or post-doctoral scholars. We all have our strengths and our goals. A primary objective of our group is to provide the support needed for scholars to reach their personal, educational, and professional goals in a collaborative environment.

This student handbook is developed to provide some guidance and support along this journey. I've collected numerous resources on research processes, theoretical perspectives, and learning resources related to the work undertaken by our group. I've also included some core fundamentals on wellbeing, collaboration, and professionalism that provide the foundation for how we work and interact. I hope this is useful. This is a 'living document' so any suggestions are always welcome.

Best,

A handwritten signature in blue ink, consisting of a long, sweeping horizontal line with a small loop at the end.

Paul

Expectations and Support

Your period of academic and research training is an exciting time and full of opportunity. As your supervisor I want to welcome you to this journey and provide a few hints to start you on your way. You might have to return to these points later on as your academic and personal journey shifts.

1. My role is to guide and advise you in your scholarly journey. You will learn how to identify knowledge gaps, to critically review literature, to pose research questions, to navigate the pitfalls of research governance, and so on.
2. Parts of your research path may come easy and some of this may take some work. The most powerful thing you can do is ask for help. I am available to listen, to help reflect, and (hopefully) to provide some guidance.
3. At the outset of your degree I will provide directed leadership and instruction. However, academic learning is an evolving process towards independence as a researcher. As you progress, you are expected to become more and more independent. Eventually you will be in control over supervision and will be telling me what you need.
4. Although we will start with me ahead of you in terms of research knowledge, by the end we will be equal. If you're completing a BSc, you're at the beginning of developing basic research skills. If you're completing an MSc, you will have mastered the requisite skills required for your program. If you're completing a PhD, you will finish as the 'expert' in your area of research.
5. You are not alone in your journey. A major function of a lab group is to provide mutual support for academic growth. I will be open about my journey and am open to speak personally to anyone about theirs.
6. There is a shared responsibility with your progression. In the pages below I will outline some of things I am accountable for. Ultimately however, much of the responsibility will come from you.

We are all fallible and we all make mistakes. I have no expectation of perfection and when mistakes happen (and they will), I will do my best to help you figure out where things went wrong and to overcome potential consequences.

General responsibilities for the student (you):

1. Plan early to discuss your research topic and set a clear timetable;
2. Monitor progress (including administrative deadlines) to ensure timely completion;
3. Determine what type of feedback is most helpful and agree to a schedule of meetings;
4. Take the initiative to raise problems (including the initiative to arrange meetings);
5. Maintain the progress of work in accordance to your set timetable;
6. Circulate an agenda and documents before meetings, and circulate minutes afterward;
7. Keep systematic records of work completed and provide regular reports; and,
8. Show draft work with sufficient time for feedback before proceeding to a final stage.

General responsibilities for the supervisor (me):

1. Understand the qualities associated with undergraduate & graduate research;
2. Clarify expectations throughout the process, including when they aren't being met;
3. Support conceptual development of research;
4. Assist in setting the timing and sequencing of project activities;
5. Provide constructive and timely feedback;
6. Ensure a high-quality of research output;
7. Support educational and professional development; and,
8. Demonstrates appropriate work-life balance.

Wellbeing and Mental Health

We are all here to grow as scientists, leaders, and people by pursuing ambitious research goals. However, that should never come at the cost of your well-being. Your mental and physical health are by far the most important consideration in all that you do while in our lab. Moreover, success should not come at the cost of maintaining your interests/hobbies or healthy relationships in your life.

You are more likely to be successful if you take care of yourself and give time to the things outside of work that matter to you.

Below are some general guidelines on well-being, but every situation is unique, and I'm always open to discussion on this topic, so don't hesitate to ask.

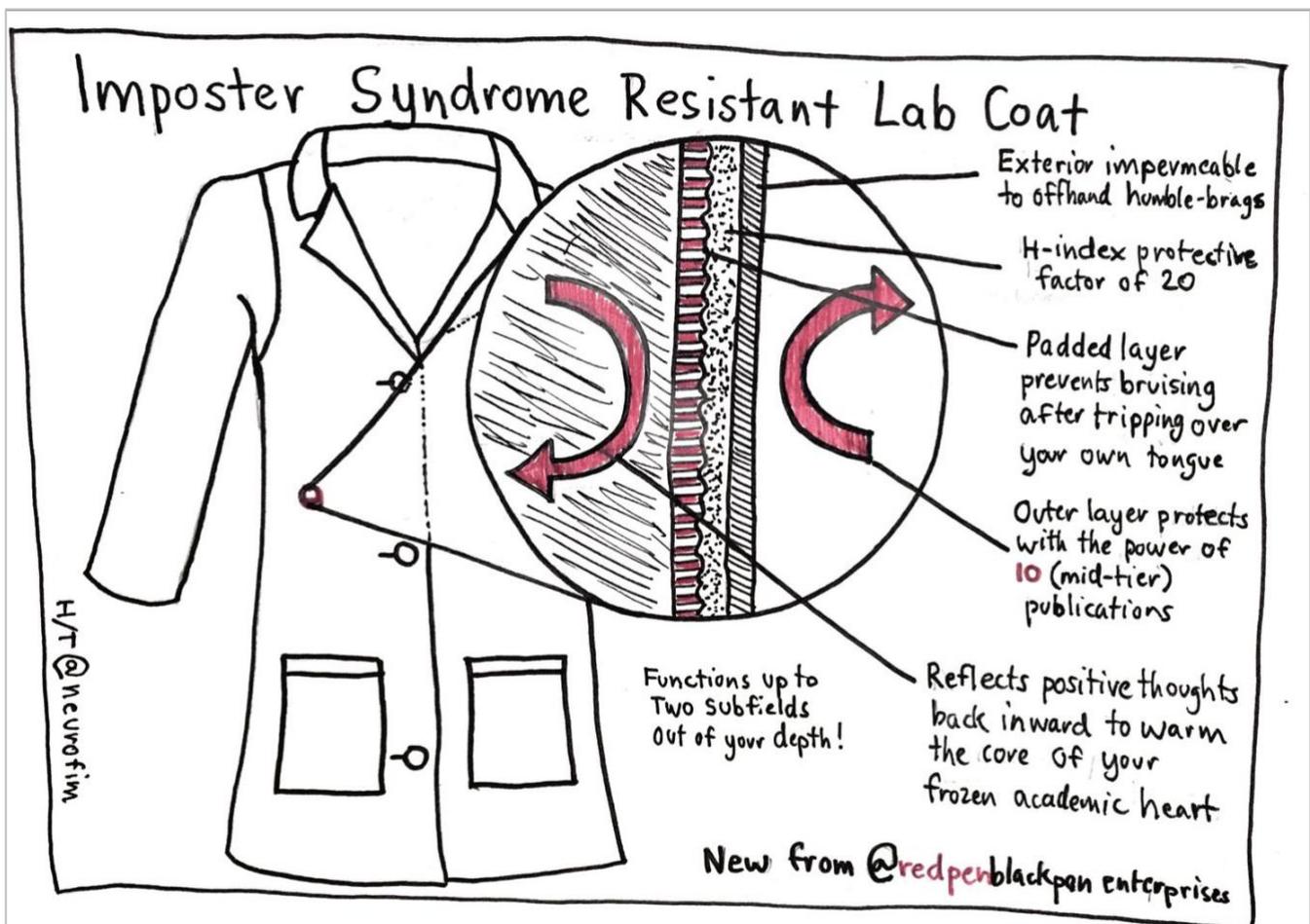


Figure 1: Build a resistant lab coat.

Mental and physical health concerns. If you are not feeling well, either physically or mentally, take the time off you need to seek out help and take care of yourself. If you are struggling with depression or anxiety and wondering: “Is it okay to go see a counsellor instead of finishing up the scoping review?” The answer is “Absolutely! Get the help that you need.” If you have an acute situation that requires help, take the day (or a few days) off with no questions asked. If you are going to be out for more than 3 days or miss a group meeting, just give me a heads up so that I know you are okay – no need to give details if you don’t want to, it is sufficient to email and say that you have a “personal health emergency.” If you need to take more substantial amounts of time off, you can work with me to facilitate this. Being an undergraduate, grad student, or postdoc is stressful. We all care about you and are here to support you – just let us know how we can help.

Personal emergencies. If you are a member of our group for multiple years, the chances that a life situation (or multiple life situations) will arise are fairly high. As an example, during grad school I dealt with anxiety and panic attacks, while maintaining a long-distance marriage. In these situations, the top priority is taking care of yourself and dealing with the situation. If you feel comfortable, let me know that you are dealing with something and approximately how much time you will need off. You can share as much or as little detail as you feel comfortable with. These situations are inherently stressful, so also make sure you are taking care of yourself and getting help if needed.

Work-life integration. Being ambitious and working hard are part of academic culture, but it should come from a perspective of driving yourself out of the fun of pushing your limits and exploring what you are capable of. The key is to know your limits. Similar to playing sports, you advance by pushing out of your comfort zone, but if you push too hard you end up injured and stuck on the sidelines. Managing your motivation and work habits while integrating interests and commitments outside of work is a key self-leadership skill that will serve you well throughout your career, and now is a great time to build that skill. You can get useful tips and advice on this from myself, your peers, university centres, and other resources (books, podcasts, etc.).

My Mental Health Story

On a personal note, you are likely aware that I have diagnosed Attention Deficit / Hyperactivity Disorder (AD/HD). ADHD is a genetic, neurological disorder that is indicated by problems with attention, impulsivity, and/or hyperactivity. Many adults with ADHD have difficulties with inattention but exhibit few or no symptoms of hyperactivity. Adults with this set of symptoms related to inattention but not hyperactivity have the “predominantly-inattentive” ADHD subtype. This form of ADHD primarily effects executive functions of the brain, such as verbal and nonverbal working memory, self-regulation, motivation, and planning. These differences can present as difficulty in maintaining attention or focus, use of working memory and recall, regulating emotions, organizing, or prioritising tasks.

As a professor, these symptoms can be both a blessing and a challenge. While I'm easily distracted by shiny new projects, I can also be creative and like to join new teams. I can be forgetful of specifics (names and dates especially), I focus on ideas and connect what we've said before to new things I've learned. Sometimes I can work on one idea to the expense of many other small tasks, but my hyper-focus can be a real benefit to getting last-minute grants submitted, pushing through to get a paper submitted, or overcoming some challenging analysis.

What I've learned is that I have developed a series of compensating tricks that have helped get me to where I am today. On the positive side, I have a flexibility in my home and work life, where I can alternately be distracted or hyper-focussed, sometimes going to coffee shops to write at 5am for days in a row. This means I'm also very good at brainstorming and finding creative solutions to problems.

On the negative side, the differences I have with executive functioning can result in difficulties with administrative tasks, both getting them done and having the details completed correctly. This is particularly the case with prospective memory, which is the type of memory required for remembering to do things in the future. (When this happens, do this...) At home this is compensated by an incredibly organized partner with a tremendously detailed memory. At work this is compensated by having administration send multiple email reminders.

Everyone has their own strengths and weaknesses, and we might share some of these. A luxury I get with a diagnosis for ADHD is that I can be explicit about mine and develop systems to account for them. It also means that I have no expectations for my students to be perfect.

As a student working with me, I want you to be aware of this, and I want to be upfront as to where you will have more responsibility. Below I will overview some of the responsibilities of a supervisor (me) and a student (you). You'll find that I ask students to follow their own progression closely and be clear on what dates and deadlines they need to meet their timeline. But you will also see that I am willing to work closely with you in achieving your academic goals.

Resources at Carleton

Carleton University has strong mental health resources for undergraduate and graduate students, providing services beyond which is offered by Provincial health care and most employer insurance plans. The primary way to access services is through Health & Counselling Services (www.carleton.ca/health). This includes Counselling Services, access to physicians, and on-staff psychiatrists. There are also several specialised programs, including counselling groups that are specifically adapted to students and scholars.

Authorship and Research Credit

I take the issue of authorship and research credit for students very seriously. I firmly believe that all participants in a research project, whether students or employees, should be credited with their contributions. To assist in this, I have adopted the CRediT (Contributor Roles Taxonomy) statement on research contributions.

CRediT is high-level taxonomy, including 14 roles, that can be used to represent the responsibilities typically played by contributors to scientific scholarly output. The roles describe each contributor's specific contribution to the scholarly output. This taxonomy has been adopted by the PLOS journal system through their journal submission system.

#	Role	Definition
1	Conceptualization	Ideas; formulation or evolution of overarching research goals and aims.
2	Data curation	Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and re-use.
3	Formal analysis	Application of statistical, mathematical, computational, or other formal techniques to analyse or synthesize study data.
4	Funding acquisition	Acquisition of the financial support for the project leading to this publication.
5	Investigation	Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection.
6	Methodology	Development or design of methodology; creation of models.
7	Project administration	Management and coordination responsibility for the research activity planning and execution.
8	Resources	Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools.
9	Software	Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components.
10	Supervision	Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to core team.
11	Validation	Verification, whether as a part of the activity or separate, of the overall replication/reproducibility of results/experiments and other research outputs.

#	Role	Definition
12	Visualization	Preparation, creation and/or presentation of the published work, specifically visualization/data presentation.
13	Writing – original draft	Preparation, creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation).
14	Writing – review & editing	Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre- or post-publication stages.

For more information on CRediT see: <https://www.casrai.org/credit.html>

If you have any questions about your contribution to research output, please speak with me or your colleagues. It is best to talk about this openly and early.

Processes

In order to facilitate team-based research, we've developed a series of work processes that we're following for the Lab. These centre on communication, data sharing, knowledge sharing, and document templates. Multiple recent studies have shown that research labs that have tightly integrated communication and project sharing have students who are more successful and productive.

Most of our research work is computer-based rather than lab-based. As such, our main research processes centre on the sharing of data and information as a team in order to facilitate the sharing of knowledge between each other and our various partners.

Communication

Our lab uses several communication tools to coordinate research and weekly activities. The goal is to have systems that are flexible and integrate with the way we conduct our research. The main methods of communication are through Slack and email.

Slack is an integrated platform that allows for instant messaging, sharing documents, creating documents, and web-based meetings. Slack is available as a web-based service, a desktop application, and an iOS/Android app. I use it with notifications turned on (but I do turn off my phone notifications at home and on weekends).

Our main Slack workspace is "SDHL Carleton University" and we will invite everyone in the lab to join. It may take a bit to get used to working in this environment, but those who've started using it have found it very helpful. My preference is for you to message me first through Slack.

Email remains an important way to communicate as a lab. However, it doesn't work well as an instant-messaging service. Given the proliferation of email that I receive through the university, I'd prefer if we keep email for longer one-on-one updates rather than using it for back-and-forth on coffee plans. For that we can use Slack messaging.

Data sharing / Citrix FileShare

Gone are the days where project work is done in isolation and documents are stored on one individual's computer and shared infrequently via email. Most of our outputs are collaborative (Even a thesis / dissertation is a collaboration with me!) and require sharing of working documents, data, templates, output, etc. To facilitate this, we will use a series of shared FileShare folders for the lab and for ongoing shared projects. Each of you may also share folders with each other and with me for other tasks.

For our lab, we have created a main folder in FileShare called "SpatialLab" where we will all have access to a variety of documents. These include administrative documents (including this one), data, projects, and templates. For each of our shared projects we may have an additional folder that includes paper drafts and the like for us to share.

The easiest way to integrate with these folders is to use the Citrix FileShare desktop application, which allows for a shared folder to be linked to a folder on your computer. You can then work directly from this folder, with all documents being continually updated. You will also be able to access these documents from the Carleton servers, from your Carleton email, and remotely via iPhone / Android apps.

Document templates

To help you with your work and studies, we have created a series of templates that can be used for your research outputs. These include:

- PowerPoint presentation template (SDHL branding)
- Letter template (SDHL branding)
- Infographics (SDHL/Carleton branding)
- Reports (SDHL/Carleton branding)
- Graduate student thesis/dissertation mid-term report template & example
- BSc thesis template
- MSc thesis template
- PhD dissertation template

Reference software

For maintaining scholarly references and literature reviews we use **Mendeley** as our primary tool. Despite the disadvantage of being owned by Elsevier, it remains the most economical tool for sharing reference sources as a group (it's free).

For each of our projects we create a shared "group" for references, inviting anyone who is working on the project. The associated PDFs can be linked with each citation and can be stored locally on your computer or device.

It is important that you maintain a strong reference library as you move through your academic career. Information is our currency and being able to access it, along with your thoughts on it, is essential as you get closer to completing major documents such as papers, thesis, or dissertations.

For some good resources on how to use Mendeley see:

<http://www.raulpacheco.org/2018/12/a-brief-guide-to-using-mendeley-as-a-reference-and-citation-manager-and-as-an-aid-to-write-scholarly-papers/>

Raul Pacheco also describes how Mendeley is part of his analog and digital **active reading** process:

<http://www.raulpacheco.org/2019/02/reading-scribbling-highlighting-taking-notes-and-organizing-information-from-a-journal-article-or-book-chapter-walking-through-my-digital-and-analog-processes/>

Student Progression

One of the most difficult aspects of academic work is developing and keeping a timeline for your individual work. Academic work is lengthy, with the end-product (paper, thesis, dissertation) often years into the future. Along the way your ideas will change, you'll be confronted with challenges in accessing or analysing data, with interviewing, or in juggling personal and professional lives. Making sure one is on-track in the face of this can thus be difficult.

I've outlined below some general timelines for BHSc, MSc, and PhD research. These timelines are based on thesis/dissertation outcomes and don't include the administrative checkpoints for each program. For these, refer to the website for specific timelines and deadlines.

It is important that you spend time at the beginning of your degree planning your timelines and where you want to go in the program. Use the templates provided and shown below to develop something that works for you. Some hints to do this are:

- Start early to develop a timeline;
- Revisit your timeline often to gauge progress and make adjustments;
- Discuss any changes with the research team.

BHSc Thesis Timeline

Term 1 (Fall)

- Identify a research topic and question
- Set and agree on timelines and milestones
- Present question and outline to lab group
- Examine literature and conduct structured review

Term 2 (Winter)

- Conduct analysis and write results
- Submit draft for review and comment
- Develop and present poster at Science Research Day
- Present thesis at the Health Sciences Research Day

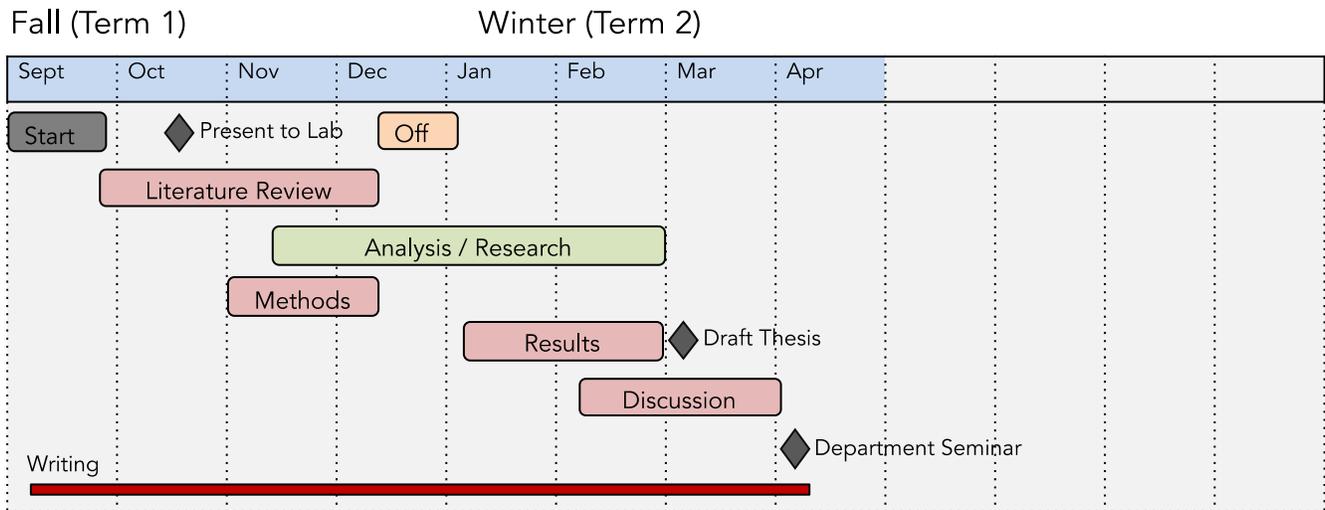


Figure 2: General Progression Timeline, BHSc Honours Thesis

MSc Research Timeline

Note that the timeline in Figure 3 doesn't include administrative check-points. Refer to the graduate handbook or Departmental website for specifics. This is also provided as a PowerPoint file on the website below.

Term 1 (Fall)

- Become acquainted with graduate program and expectations
- Examine literature for interests and potential gaps
- Define research area and topic together with supervisor
- Set and agree on timeline and milestones

Term 2 (Winter)

- Specify research question and hypothesis
- Apply for ethics (if required)
- Conduct literature / scoping review of topic
- Present research question, relevant literature, and research plan

Term 3 (Summer)

- Conduct field research / data analysis
- Write draft of literature / scoping review
- Write draft of data and methods
- Present literature / scoping review to supervisor and lab

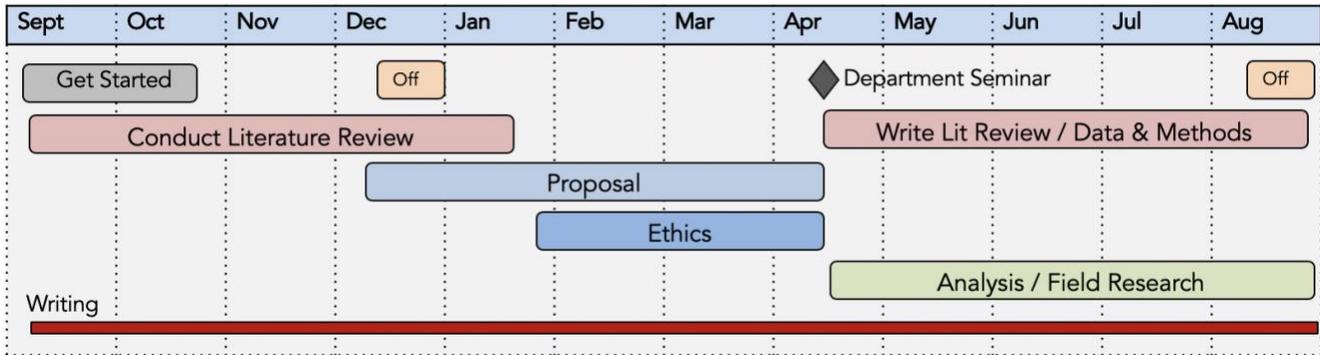
Term 4 (Fall)

- Continue field research / data analysis
- Compile and present results to supervisor and lab
- Submit literature / scoping review for publication
- Develop draft structure of results

Term 5 (Winter)

- Write up results and conclusions
- Submit draft of thesis to supervisor (early)
- Incorporate and respond to feedback
- Submit final draft of thesis

Year 1



Year 2

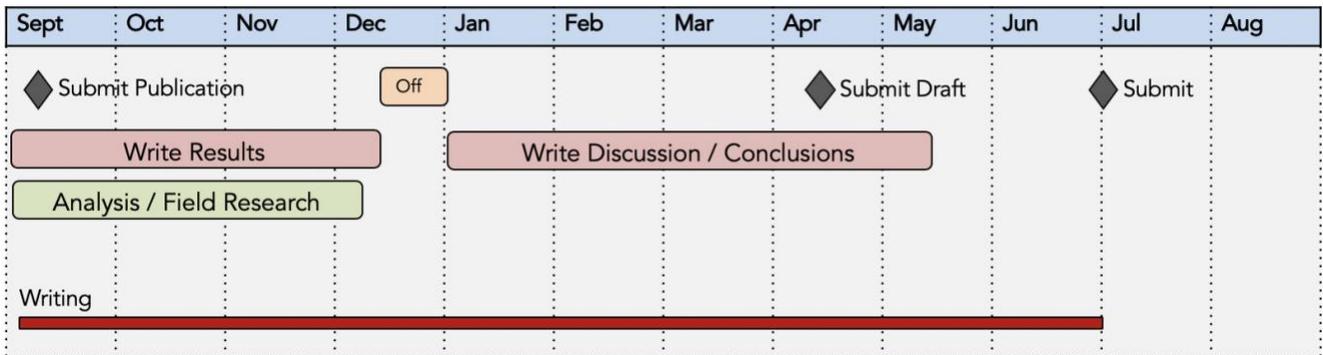


Figure 3: General Progression Timeline, MSc

PhD Research Timeline

Year 1

- Get oriented with PhD program and research environment
- Conduct structured literature review (scoping, systematic)
- Develop and present PhD research proposal
- Submit ethics and have approval for research
- Begin preliminary research and/or field research
- Write and submit paper from literature review (Paper 1)

Year 2

- Write and submit paper on preliminary analysis results (Paper 2)
- Write and submit paper on secondary structured literature review (Paper 3)
- Complete mid-program defence
- Conduct first phase of analysis and/or fieldwork

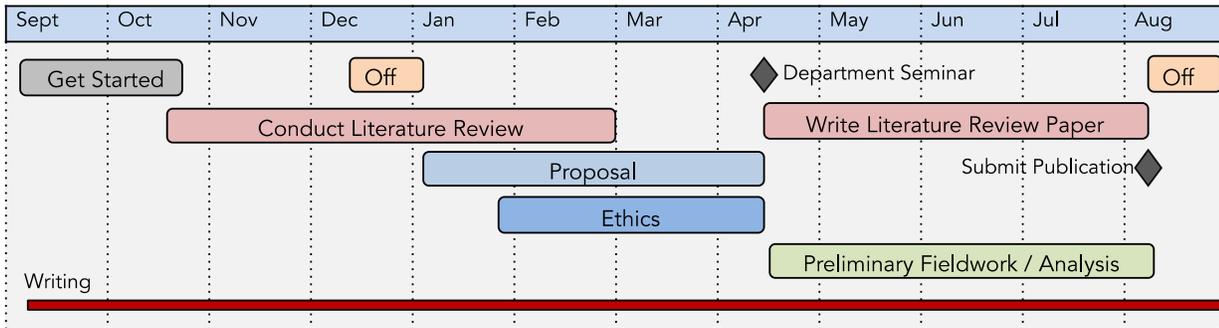
Year 3

- Write and submit results paper from secondary results (Paper 4)
- Write and submit paper from discussion of current analytic results (Paper 5)
- Conduct second phase of analysis and/or fieldwork

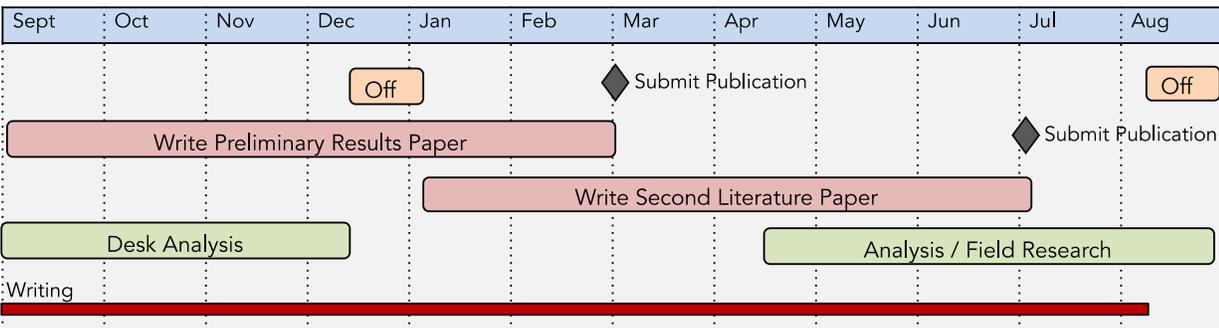
Year 4

- Write and submit final paper on final analysis phase and/or fieldwork (Paper 6)
- Write dissertation wrapper for submitted papers
- Submit draft with additional time for review
- Present and defend final dissertation

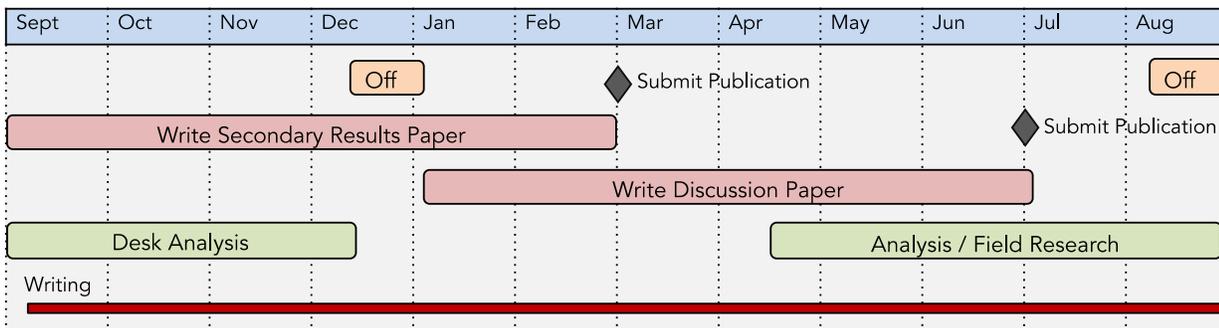
Year 1



Year 2



Year 3



Year 4

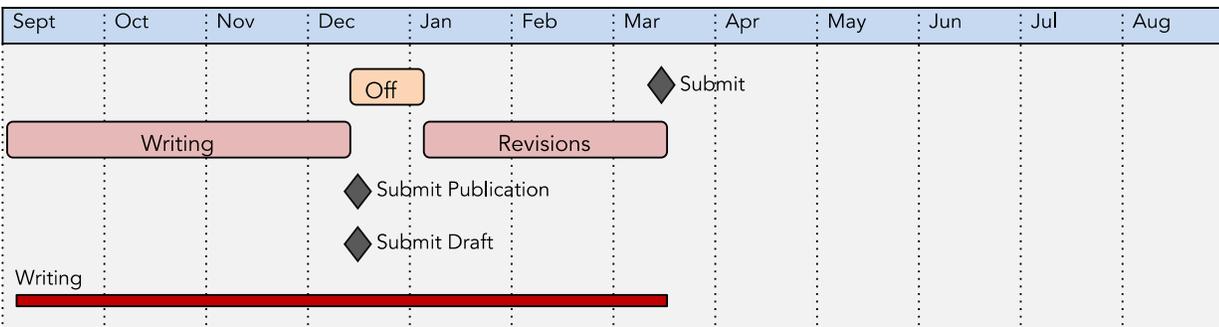
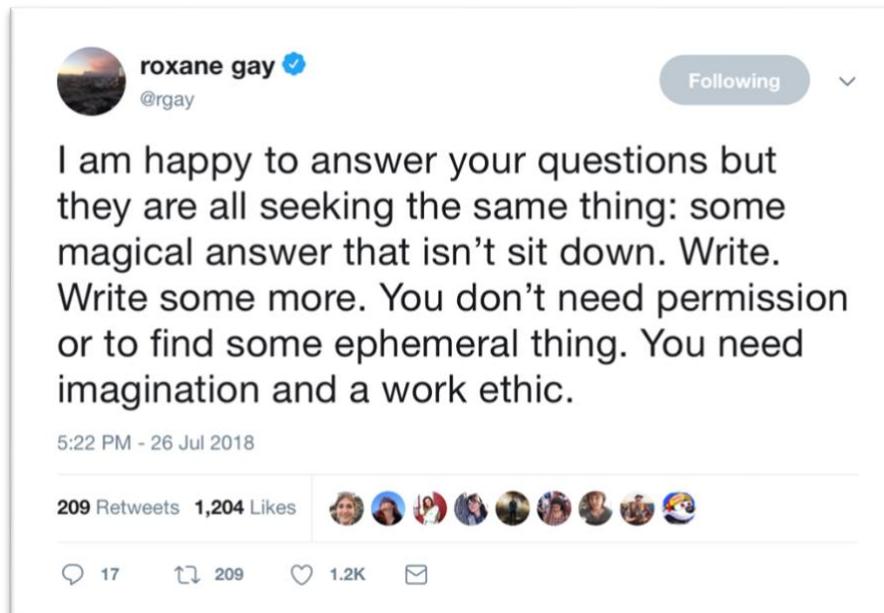


Figure 4: General Progression Timeline, PhD

Writing



Writing can simultaneously be the most frustrating and most rewarding aspects of an academic research career. While writing is the primary currency of this profession, most people find it difficult, and many people find it outright painful. However, with deliberate practice the act of writing can become easier.

It isn't possible to cover all the skills for academic writing in one short document, but there are some very consistent threads that weave through writing books. This section covers some common advice, resources, and apps that can help with academic writing. At the outset, recognise that despite all the advice there are a few givens.

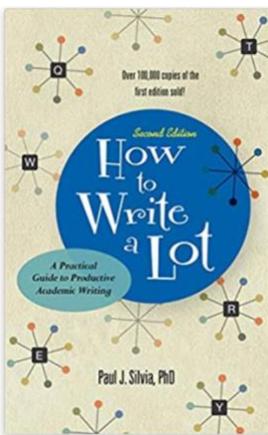
1. Do it your way



In her book ***Air and Light and Time and Space***, Helen Sword shows that the ways in which academics approach writing are rich and varied. She based her conclusions on in-depth interviews with 100 productive academic writers and editors as well as 1,223 anonymous questionnaires. Sword identifies four cornerstones that form the **BASE** of any successful writing practice: Behavioral habits of discipline and persistence; Artisanal habits of craftsmanship and care; Social habits of collegiality and collaboration; and Emotional habits of positivity and pleasure. Building on this, she shows the emotional complexity of the writing process and exposes the lack of writing support typically available to scholars. She also lays to rest the myth that academics must produce safe, conventional prose or risk professional failure. The successful writers profiled here tell stories of intellectual passions indulged, disciplinary conventions subverted, and risk-taking rewarded.

If you are curious about how successful academic write, this book is a great place to start.

2. Accept that it's (sometimes) hard work



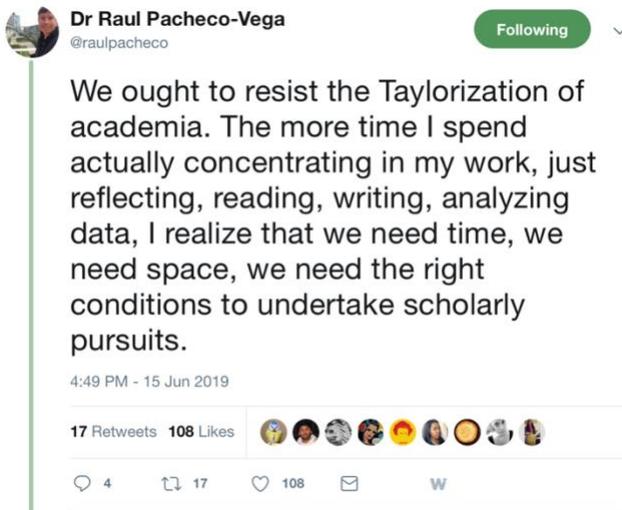
Writing habits are diverse, but the thread that runs through Sword's book is that academic writing is hard work. Paul Silvia puts that right at the heart of his humorous, content-packed book ***How to write a lot***. There is no easy shortcut or 10-step programme to producing good academic writing. Writing about complex issues that require deep understanding takes time and effort. The goal of this book is to develop skills for writing so that we can write while still having a life.

After addressing some common excuses and bad habits, this book provides practical strategies to motivate students, professors, researchers, and other academics to become better and more prolific writers. Silvia draws from his own experience in psychology to explain how to write, submit, and revise academic work, from journal articles to books, all without sacrificing evenings, weekends, and vacations. While that may seem like discouragement rather than upbeat advice, many people actually find it reassuring to know that their numerous re-thinks, re-writes and edits are normal and necessary.

Writing Productively: The four pillars

Pillar 1: Secure Time and Space

The first pillar of productive writing is to create the “space” for writing in your daily life. The easiest way to do this is schedule writing time by putting it in your diary, committing to it, and protecting it. If you tend to write in your office and are prone to being interrupted, this might mean putting up a (non-negotiable) ‘do not disturb’ sign. If you are easily sidetracked by the siren call of your phone or social media, you might want to use apps to keep you focused.



Do you find it hard to imagine adding writing to an already-stretched schedule? Then turn to Eviatar Zerubavel’s *The Clockwork Muse*. Zerubavel is a productive academic writer himself and his instructions for how to fit writing into life are practical and precise. He makes a strong case for scheduling writing time then breaking it down into tasks and setting concrete goals.

Zerubavel coined the now-popular distinction between A and B time writing. A-time writing (which, for most people, will be the ‘slam it on the

page’ stages of writing, and major rewrites) usually lends itself better to earlier parts of the day; B-time writing (local editing, proofreading, reference checking ...) typically works better later in the day. Productivity decreases when there is a mismatch between the time of the day and the writing task. Creating appropriate synergies gives you a leg-up and boosts productivity.

Pillar 2: Make Writing Routine

Routine! Not the most exciting word. Surely writing is juicier than that? Apparently not. The second pillar of productive writing is making writing so routine that it becomes a habit. Routine means regularly, in small bites. It relies on the first pillar of scheduling.

Robert Boyce's *Professors as Writers* is the oft-cited key publication here. It is based on a landmark piece of research on how academics write.

Boyce distinguished between three standard approaches to writing: emergency writing (writing fuelled by deadline pressure), spontaneous writing (writing when inspired) and scheduled writing (writing daily for 30 minutes). The study followed a large cohort of early-career academic staff trying out all three approaches over a period of time.



it looks like you're writing a novel @gr8writingtips · Jun 14

the most productive writers stick to a **routine**, screaming incoherently, weeping, and breaking things at precisely scheduled times



99



215



Across the board, the academics in Boyce's research were most productive when they

followed the low-key, structured method of writing for 30 minutes a day: when they adopted this approach, they produced significantly more pages and creative ideas.

Of course, all writers will feel more inspired on some days than others, and deadline adrenaline can give you the push that you need to complete a writing project. But overall, the engine of productive writing is routine.

The reason for that seems to be that when writing becomes routine, it stops being a big deal. There is no decision involved on whether to write, so no hump to get over. Last-minute work spreads out over a longer period of time; the urge to procrastinate diminishes as productivity increases.

Pillar 3: Practice

In 1934, Dorothea Brande published *Becoming a writer*, a book that continues a source of inspiration for many. In it, she talks with passion about the practice of writing every day, come rain or come shine. This has since been re-articulated by numerous other authors in different frameworks.

The idea of writing daily is compatible with the outcome of Boyce's study, of course. But what is distinct about the third pillar of productive writing is its emphasis on practice, or training. You are just writing – no more, no less. You write without editing; you let your thoughts walk on the page without changing them.

Whatever you commit to (750 words, half an hour – whatever works for you) becomes your writing practice. The practice is the point.

The stumbling block many people run into with this kind of writing is that it seems messy: the words feel wrong. 'Of course the words are wrong,' Peter Elbow says in *Writing with Power* 'That's how it goes with words'. This statement is echoed in many approaches to productivity. It's another way of saying: relax. You are going to get it wrong. It is not just inevitable but necessary, because bad writing leads to good writing.

Rowena Murray coined a memorable metaphor for this. To produce 'fragrant' writing, she says, we need to produce 'manure' writing first. Academics often cling to fragrant writing – the edited, polished draft. They find manure writing too painful, and try to avoid it. The price for this is decreased productivity.

Practice writing will rarely produce good writing instantly, but it will do other things. It will help you make writing a habit and strengthen your 'writing muscle'. It will also help you 'see' your thoughts, establish new connections and articulate new insights. This 'thinking on the page' is the gateway to chapters, articles and books.

Pillar 4: Community

Much writing – and academic writing in particular – occurs in solitude. That solitude can be welcome and productive, but it can also create a sense of isolation that stifles productivity.

The fourth pillar of writing productively encourages tapping into the energy of a community by working alongside others. I have developed a community through Twitter, engaging with other academics, students, and scholars in our writing challenges and successes.



At writing retreats, academics commit to working on their own writing, but shoulder-to-shoulder with others doing the same. This format (which ranges in length from one to several days) is particularly successful in helping to generate pages and break through productivity barriers.

In *The handbook of Academic Writing: A fresh Approach*, Rowena Murray and Sarah Moore emphasise the importance of community as a portal to engaging in productive writing. Moore developed the format of the Structured Writing Retreat, where writing slots are interspersed with short discussions and reflections.

Writing Process

If I were giving a lecture or seminar, and you didn't understand something that was said, you could ask for clarification. With an article or a book, you can't do that. You could send an email or ask a colleague to help clarify, but we may never be satisfied with the response (if we get one at all). So, we have to be very clear in our writing. That's the first reason we plan before we write.

Writing requires fluency, clarity, accuracy, and an economy of words. To get to this point, you can self-edit as many times as you want. You can spend weeks (months) on a paper. However, the flip-side is that this self-editing can be a never-ending process and your writing can be stalled or go in circles.

The prospect of writing an entire paper / thesis / dissertation can be daunting. Planning breaks this down into manageable steps. Even the most accomplished novelists do this. Below is the story map for the J.K. Rowling book, *The Order of the Phoenix*. As you can see, this sketch provides the plots, themes, and other story elements that bring the narrative together. With academic writing we will do the same thing, just on a different scale.

NO	TIME	TITLE	Plot	PROPHECY	Cho/Gring	D.A.	O.G.P	Snake/Horn + follow	Hospital + group
13	OCT	Plots and Respite	Plot	PROPHECY	Cho/Gring	D.A.	O.G.P	Snake/Horn + follow	Hospital + group
14	NOV	The Order of the Phoenix	First meeting of the Order of the Phoenix	PROPHECY	Cho + Gring both present	Umbrella	First meeting	Harry's letter	Harry's letter
15	NOV	The Difficult Tackle	Quidditch versus Ministry	Nagini attack on W.B.	Cho now in work	Friedland			
16	NOV	Black Marks	Reveals the truth about the Black Marks	Nagini set in, Vol has confirmation of Order's story	Cho looks good	Reveals that he is called to be the head of the school of father signing	Reactions - shocked? surprised?	Reveals about Harry's group	Reveals about Harry's group
17	DEC	Rita Returns	Reveals the truth about Rita Skeeter	Reveals information about Rita Skeeter	Harry now deciding on his future		O.G.P	Another lesson	Hospital
18	DEC	St. Mungo's Hospital for Magical Maladies and Injuries	St. Mungo's and Rita Skeeter	NOW VOL IS ACTUALLY TRYING TO GET HARRY TO HQ P	Cho + Gring	around			
19	DEC	(Xmas)		Blade dead - HQ P again	Cho + Gring	around			
20	JAN	Extended Powers of Elvira Underage	Harry's access to the Order of the Phoenix				O.G.P	Snake lesson	Reveals about Harry's group
21	FEB	(Valentine's day)	Harry's access to the Order of the Phoenix				O.G.P		
22	FEB	Council Grains	Underage now really going for Harry's				O.G.P	Snake lesson	Reveals about Harry's group
MARCH	(Easter)		Harry's access to the Order of the Phoenix						
APRIL	(Easter)		Harry's access to the Order of the Phoenix						

Figure 5: JK Rowling's novel spreadsheet for Order of the Phoenix.

“If you can’t explain it to a six-year-old, you don’t understand it.” – Albert Einstein

Writing starts with planning. If you are writing a standard paper for a social sciences or health journal, then the outline for your plan will be the usual Introduction, Methods, Results, and Discussion. Start by jotting down short answers to these questions:

1. What was I trying to do?
2. Why did I think it was worthwhile to do it?
3. How did I do it?
4. What did I show?
5. What do I need to stress?
6. What excuses do I need to make?
7. What is my message?
8. What would I like to do next?

Introductions usually start with the answer to **Question 2**: a *brief* review of important facts and references. The last sentence or paragraph of the introduction should state the answer to **Question 1**.

Methods answer **Question 3**, describing things in sequence.

Your Results (**Question 4**) must be stated as you measured or described them, not as you choose to interpret them. Use tables and figures if they will help readers; dense paragraphs of text interspersed with numbers make for difficult reading.

The Discussion will focus on **Question 5**, which can also be the narrative or story you want to tell. All writing, whether scientific or otherwise is really just storytelling. Towards the end of the Discussion you need to note the Limitations (**Question 6**) of your research. Finally, your Conclusions (sometimes a separate section) will highlight your answer to **Question 7** and note **Question 8**.

One of the best resources on writing a manuscript is from Dr. Raul Pacheco. Rather than get into the weeds of theory, he focusses very much on the practicalities of what you need to *do* when writing.

<http://www.raulpacheco.org/2017/06/writingpapers/>

The basic process outlined by Dr. Pacheco is:

1. Generating ideas and brainstorming
2. Evaluate literature gaps
3. Read and synthesize the literature
4. Create a Conceptual Synthesis Excel Dump
5. Refine research output
6. Structure your paper
 - a. Create an outline
 - b. Write abstract and introduction
 - c. Break paper into separate documents (optional)
 - d. Draft conclusions as you complete the analysis
 - e. Make sure you've told all the stories
 - f. Leave text for the next day
 - g. Don't write beyond your physical limits
 - h. Assemble (& reassemble) the paper when 80% complete
7. Revise using a drafts review matrix
8. Get your manuscript out



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Dr. Pacheco also has a good resource on research writing for non-native speakers of English:

<http://www.raulpacheco.org/2019/05/science-research-writing-for-non-native-speakers-of-english-my-reading-notes/>

Writing Resources

There are numerous strong resources for assisting in writing. I have collected several of these and made them available through the shared lab DropBox. These are all also available online.

Topic	Reference	Description
General Books	Lindsay, D (2011). <i>Scientific Writing – Thinking in Words</i> . CSIRO Publishing: Collingwood, Australia. Graff, G & B Cathy. (2016). <i>They Say I Say: The Moves that Matter in Academic Writing</i> . WW Norton: New York.	Excellent resource on writing from beginning to end, covers articles, thesis, reports, & presentations. To demystify academic writing and develop the 'moves' of persuasive argument. Great for developing and academic style.
Reading	Queen's University (2017). <i>Critical Reading for Graduate Students</i> . Academic Success Centre, Queen's University: Kingston, ON.	Great guide on how to develop your academic reading skills for comprehension, critical reading, retention, and speed/volume.
Abstracts	Azariadis, M (2017). <i>Writing Your Abstract</i> . University of Western Australia. Nature. (2005). "Annotated Abstracts." <i>Nature</i> . 435, 114-118.	Thorough discussion of how to write an abstract for scholarly publications. Annotated abstract from <i>Nature</i> .
Proposals	UTS Writing (2013). <i>Academic Writing Guide Part 4 – Research Writing</i> . University of Technology Sydney: Sydney, Australia. Learning Centre (2012). <i>Writing a Thesis Proposal</i> . University of Sydney: Sydney, Australia.	Covers how to write thesis proposals and submitting proposals for academic conferences. Writing a thesis proposal for the social sciences and STEM fields.

Topic	Reference	Description
Articles	<p>Kotze, T (2007) <i>Guidelines on writing a first scientific article</i>. Department of Marketing and Communication Management: University of Pretoria, Pretoria SA.</p> <p>Mack, C (2018). <i>How to write a good scientific paper</i>. Society of Photo-Optical Instrumentation Engineers (SPIE): Bellingham, WA, USA.</p> <p>Siegel, PZ. (2009) <i>Successful scientific writing: Step by step</i>. Centre for Disease Control: Atlanta GA, USA.</p> <p>STROBE Statement: Checklist of items that should be included in reports of observational studies. (</p> <p>Rao V, Chanock K, & L Krishnan (2009). <i>A visual guide to essay writing</i>. Association for Academic Language and Learning: Sydney AU</p>	<p>Detailed guide for articles with an introduction, literature, methods, results, discussion sections. Good section on reporting statistics.</p> <p>Comprehensive guide on planning, structure, language, figures, editing, submitting, and responding to reviewers.</p> <p>Short one-page guide suitable for posting above your desk.</p> <p>Two-page checklist for items to be included in observational studies. Very handy for planning a paper.</p> <p>This is an interesting book and presents writing as a visual process. Some find this method very helpful.</p>
Reflective Essays	<p>Ghaffar A (2014). <i>The reflection paper</i>. The Writing Centre, University of Toronto Scarborough: Toronto, ON.</p>	<p>Good short resource on the content of a reflection paper compared to a research essay.</p>
Literature Reviews	<p>Ridley D (2012) <i>The Literature Review: A Step-by-Step Guide for Students</i>. Sage Publications: London, UK.</p>	<p>This book discusses in detail how to conduct a literature review for a MSc / PhD thesis.</p>
Scoping Reviews	<p>Peterson J, Pearce PF, Ferguson LA, Langford CA (2016). "Understanding scoping reviews: Definition, purpose, and process." <i>J of the Amer Assoc of Nurse Prac</i>. 29: 12–16</p>	<p>Detailed article on how to write a scoping review. Combined with the PRISMA Scr this is an amazing resource.</p>
Theses	<p>Boily MC (2018) <i>How to Write a PhD</i>. Lecture slides prepared for DIDE, ICL.</p> <p>Wang, GT & K Park (2016). <i>Student Research and Report Writing: From Topic Selection to the Complete Paper</i>. (First Edition.) John Wiley & Sons, Ltd.: New York, NY</p>	<p>Short presentation that overviews the steps in writing a PhD, good for basic information.</p> <p>Starts with the question of 'what is research?' The book itself is a fantastic resource for MSc and PhD students.</p>

Developing a portfolio

There are a few things you need to help develop your academic and professional portfolio. No one thing (except the CV) is required in and of itself, but you should combine these to develop a scholarly presence as you look to either furthering your academic journey or preparing for a career.

Curriculum Vitae

The curriculum vitae (CV) is the most important part of an academic or professional portfolio. Many of you will have already developed a resume when applying for jobs or research positions. While similar to a resume in some senses, a CV is catered specifically to an academic or professional research environment.

See the following on how what to include in an academic CV:

<https://www.vitae.ac.uk/researcher-careers/pursuing-an-academic-career/how-to-write-an-academic-cv>

My own CV has developed considerably over the last years and is now a much larger document than something you would produce. Early in one's academic career you can expect to have a CV that is 2-3 pages in length, and that is totally fine. What's important to highlight is your research goals, what you've produced, and what you're currently working on. Reviewers (employers / grant agencies) want to see a diversity of activity with publications, grant applications, presentations, teaching (TA) experience, committee work, and volunteering.

I update my CV continually, adding to it almost weekly. This ensures that I am capturing the full extent of my scholarly activity.

The primary headings I use on my CV that may be most relevant are:

- Contact Details: keep to a minimum in terms of personal information
- Research Focus: what I'm interested in doing, could also be replaced with goals
- Summary of Professional Work: my academic journey including main experience
- Education: basics of my degrees and specializations

- Relevant Experience: other research-related experience (TA, RA, etc.)
- Awards and Fellowships: anything I've been recognised for
- Peer-Reviewed Publications: starting with peer-reviewed, then book chapters, then other
- Conference Presentations: this includes poster presentations with my name on them
- Awards, Contracts, Grants: any awards I've received. For me this is mostly grant funding
- Committees and Academic Service: any committees, volunteering, organization
- Teaching and Seminars: all my teaching, guest lectures, short-courses, etc.

The most important consideration I have for developing a CV is to be expansive but truthful. You want to capture the full extent of your activity (volunteering at conferences, poster presentations, university committees, etc.). But, you don't want to be seen as stretching the truth or 'padding' your CV. (For example: were you really a peer-mentor or did you show up once and help a friend?) If you have any doubts or want someone to review your CV, please ask and we can do it together.

The last point about a CV is that it **must look good**. You must spend some time making sure it is properly formatted, that all alignment is consistent, fonts are consistent, spacing is visually appealing, and the like. While not officially a criterion, there is huge unconscious bias against CVs that look messy, even if the content is good.

Social Media

Having a social media profile is no longer optional in Academia (in my opinion). In particular, **Twitter** has emerged as a key area for discussion and sharing of scientific and research output. More importantly in my mind is that it can be a strong community for support and advice for university students and researchers.

I realise that Twitter can be considered a "cesspool" of negativity by some. However, the beauty of echo-chamber algorithms is that if you consciously develop who you follow and interact with it can be an incredibly positive space.

Other social media profiles that many find useful in academics include **Instagram**, **Facebook**, and **YouTube**. However, these are often hard to separate from personal and professional use. I personally use Twitter professionally and don't use my Facebook for anything related to research.

Note that if you're interested in posting regularly on your research interests or academic journey, there are several tools available that will post simultaneously to multiple social media accounts. Using these tools, you can also schedule posts throughout the day and maintain a queue of posts over time.

Academic Portfolios

There are three primary places for academic portfolios, each with certain strengths and weaknesses

Google Scholar: This is an essential profile as you begin publishing. Google Scholar will allow you to link publications to your profile and will automatically add publications that have been indexed. In addition, as you move forward in a research career, it will calculate citations and impact factors automatically.

One of the nicer things about Google Scholar is that it will also show you research related to what you're publishing. This is based on both the citations that you include in publications *and* who is citing your documents. ([my profile](#))

ORCID: This is a persistent digital identifier for academics. Many journals, conferences, and other research organizations allow for automatic linking of the ORCID to populate your profiles. As with Google Scholar, some of the categories can be populated automatically (publications, grants), others need to be maintained. I don't do this regularly, but rather sync it whenever I'm asked somewhere for my ORCID. ([my profile](#))

LinkedIn: I love to hate on LinkedIn. It's not terribly useful as a network and you're not likely to get a job because of it. However, if you have a LinkedIn profile it will often come up early and often in any web search results. So, when applying for jobs you should definitely have a profile that looks professional and reflects your objectives and skills.

Website & Profiles

I am not 100% sure on the utility of having a personal website when there is such a proliferation of other online sources for your academic and professional profile. However, I've always had a professional website. What is essential though is that you develop a short bio-profile for use on websites (such as the lab), in grant applications, attached to published paper, and the like. I have several versions I use and reuse. An example (75 word limit) would be:

“Dr. Paul Peters (PhD, U. Texas at Austin) is an Associate Professor in the Department of Health Sciences, Carleton University. The essence of his research is on the study of small places and small spaces in a context of enduring structural inequities and extensive social inequalities. His rural research focusses on inequalities in life expectancy, small-area demographic change, frequent hospital users, and accessibility of health services using a patient- and community-engaged approach.”

An example (150 word limit) would be:

“Dr. Paul Peters (PhD, University of Texas at Austin) is an Associate Professor in the Department of Health Sciences, Carleton University. The essence of his research is on the study of small places and small spaces in a context of widespread social inequalities. Despite decades of universal healthcare, there still remains pronounced inequalities in the social determinants of health and in health outcomes. These inequalities are manifest between social groups across a range of factors, such as income, education, or ethnicity. At the same time, these inequalities are spatially evident, with differences between provinces, regions, communities, and neighbourhoods. Perhaps counterintuitively, the patterns and processes of these inequalities at the local level can be measured using large data sources, sometimes termed “big data.” His recent work encompasses analytic methods, data linkage, social determinants, and environmental health.”

Individual Development Plan (CIHR IDP)

CIHR has recently developed a tool for student scholars to develop an Individual Training Plan (IDP) as part of their funding process. From their website:

An IDP is a tool that supports graduate students and PDFs in actively preparing for the career(s) of their choice by exploring career paths, establishing career goals, and identifying skill gaps, culminating in an action plan to achieve their career goal(s). The use of the IDP presents an opportunity for self-evaluation, and also allows graduate students and PDFs to map their progress over time. Finally, IDPs serve as a communication tool between trainees and mentors (supervisor or other mentor(s)) regarding the training outcomes and expectations of both parties.

CIHR has identified five steps in the IDP process:



I strongly encourage everyone to develop an IDP as part of their training. To assist with this, CIHR has developed a standardised form that can be used to guide this process.

http://www.cihr-irsc.gc.ca/e/documents/training_idp_form-en.pdf

Completing this form may take time and is best done in consultation with some of your peers. It should also be revisited and reevaluated every year.

There is also an additional resource from the American Association for the Advancement of Science:

<https://myidp.sciencecareers.org>.