the tradition within your academic unit, and the guidance provided by your advisor and committee. The level of detail can be simply a rough sketch of your ideas, a simple or detailed outline of your dissertation, detailed descriptions of your exact experiments, or even preliminary results from a pilot study. Likewise, the length of the document can range from a few pages to a hundred or more pages.

In most universities, you are required to present formally the dissertation prospectus, and in some cases, it is considered a defense. Once approved by your committee, the proposal becomes a contract between you and your committee indicating what you will do to fulfill this part of your requirement for earning your degree. You are saying to the committee, "This is the unknown knowledge I have identified, and this is how I intend to learn more about it." The committee's responsibility is to evaluate the plan and make sure there is enough substance in your proposal to constitute a contribution to knowledge generation. Similarly, the committee needs to be sure the research plan is not too large and therefore unreasonable for you to complete.

The contract works both ways. It also is a description of the "end" of your dissertation research. In other words, if you have completed the tasks stated in your proposal, the committee or your advisor should not come back to you and say, "Well, this research really needs a bit more here and a bit more there to be complete." If those new "bits and pieces" are not part of your proposal (which you can view as a contract), then you are able to tell the committee you have fulfilled the research requirements as stated in your proposal (and signed by your committee) and these new suggestions are excellent ideas for future research. The beauty of a good dissertation topic is it will inevitably open up new avenues of research. It is not your obligation to complete all new avenues as part of your dissertation research.

Hence, the proposal places the necessary boundaries on this phase of the research for both you and your committee. It is critical to get it right because it sets the tone for the kind of research you will do.

Common pitfalls in writing a dissertation proposal include the following:

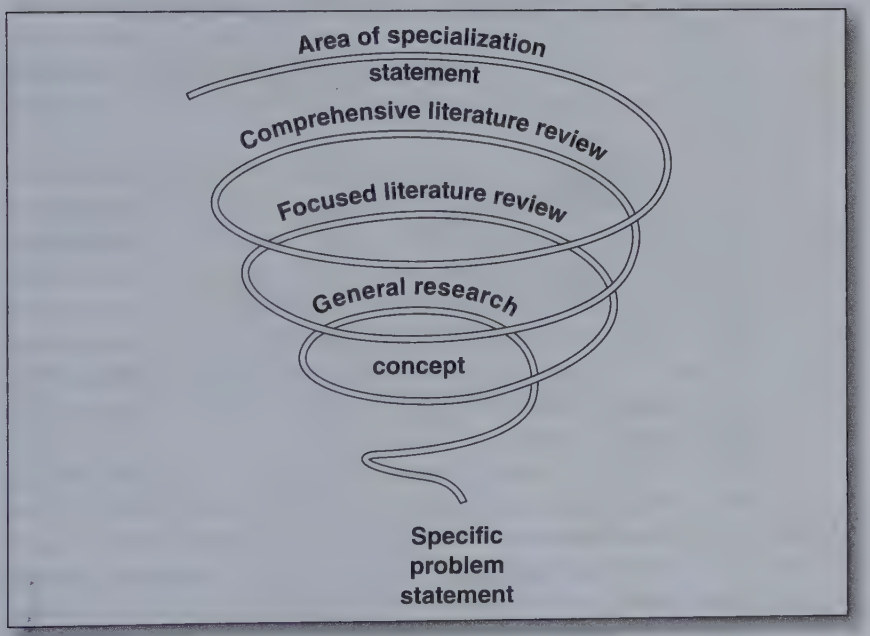
- Not knowing the literature well enough to develop a meaningful research question
- Spending too much time on the literature review (not knowing when to stop reviewing and begin researching)
- Providing scant details on the research plan; thinking that a little hand waving or a statement about how the methods will be decided as the research unfolds is sufficient
- Poorly articulating the theoretical framework of the research
- Not understanding the relevance of the research as a contribution of knowledge
- Not understanding that writing a dissertation proposal is not a 1-week (or even a 1-month) effort

This book helps avoid these pitfalls.

The Book's Plan

The first paragraphs of this chapter describe a goal—attending a graduation ceremony. To achieve that goal, several milestones need to be met, including designing, writing, and defending a research proposal. This book provides practical guidance on how to develop a specific research plan from a generalized idea to a specifically defined written document and oral presentation. Figure 1.1 illustrates a spiral. The top of the spiral represents the general subject matter that interests you. The bottom of the spiral represents the specific research problem you will solve in your dissertation. The chapters in this book describe how to move from the top of the spiral to the bottom.

Figure 1.1 The research spiral illustrates the path from a general research interest to a specific research problem.



The 14 chapters of this book are designed to guide graduate students and advanced undergraduate students through the process of designing a research plan and writing ideas into a comprehensive proposal. The book provides a balance between descriptions of proposal sections, specific tasks and activities to design and write each section, and guidance on dealing with the emotional pitfalls many students face.

Chapter 2 begins with important comments on academic integrity. It clarifies what is acceptable research practice and what is not. More often than not, students first encounter academic integrity in the classroom. Students are expected to complete their own work and not copy that of others. Scholarly ethics, however, extend beyond cheating. Chapter 2 provides descriptions of several ethical topics and scenarios for how to handle them.

Chapter 3 describes how to begin a research trajectory with a curriculum vitae (CV). The trajectory that aims for a research proposal and beyond begins by evaluating the past and how it forms a basis for the path forward. This chapter describes the CV and how to write one. While the CV documents the past professional record, it is also a vital tool throughout an academic career. It provides examiners with explicit and detailed knowledge of a scholar's skills. While a proposal is forward looking, the CV is backward looking and a pivot for defining a scholar's research trajectory.

A short description of a scholar's area of specialization (AOS) bridges the past (the CV) with the future (the research proposal). Chapter 4 describes what an area-of-specialization statement is, why it is important, and how to write an effective one. The AOS defines the subdiscipline that will become the focus of research, identifies the research problems within that subdiscipline, and explains the skills needed to accomplish research in that subdiscipline.

The next two chapters of the book describe important skills for graduate students: effective reading (Chapter 5) and writing (Chapter 6). Graduate-level skills in reading require effectiveness, which means being able to read broadly and conceptualize the big picture as well as knowing the details of certain studies. Broad and detailed reading must be accomplished efficiently because there is so much literature to synthesize. Chapter 6 provides guidance to graduate students on how to explain their ideas through writing. The writing chapter covers many of the topics that emphasize and build on the writing skills learned as an undergraduate.

Building on the topics of the AOS statement (Chapter 4) and the reading (Chapter 5) and writing (Chapter 6) skills just identified, the literature review (Chapter 7) is an essential next step to the research proposal. The literature review synthesizes the existing literature by describing what has been studied, what was found, and how the findings relate to gaps in knowledge. While this step is essential, students can become bogged down in details or miss entire portions of the literature. Chapter 7 provides practical steps on how to effectively and efficiently stay up to date on the literature. It explains how to differentiate between a summary of the literature and a critical, synthetic analysis of the literature.

Chapter 8 provides a break from the steps of writing a research proposal to describe the role of the academic advisor and the remainder of the support

system in the academic village. The academic advisor is typically the most important person in the proposal writing process. Different styles, expectations, and responsibilities of both the student and the advisor are described. By the time you own and read this book, you probably already have an academic advisor, but it is important to coordinate with your advisor on the kind of interaction you both expect during the proposal writing step and then the research. Some students are highly independent and desire more autonomy than others. Some professors expect that level of autonomy. Other students and advisors work more closely together. Chapter 8 also describes the role that other academic partners play in the process of earning a degree. It explains styles, expectations, and responsibilities of the academic village.

Returning to the steps in writing a dissertation proposal, the next two chapters describe how to conceptualize a generalized research concept (Chapter 9) and how to turn the ideas into a specific research question or objective (Chapter 10). Chapter 9 describes how to identify a generalized research concept. This is a description of a knowledge gap in the literature that your research aims to address. It is less specific than a research question and more specific than the overarching literature review. Chapter 10 describes how to write a problem statement, a specific instance of the generalized research concept. This section of the proposal identifies the research question or objective and the rationale for why it fills a gap in knowledge.

Chapter 11 describes what is required for deciding on and writing about the research methods. Research methods are activities an investigator performs to answer the research questions or meet the research objectives. Two approaches for writing the research methods are described. The first is a standard approach, and the second reflects how to approach methods when the research has a theoretical or methodological approach. The standard approach involves describing the study area, data sources, and analysis. Theoretical or methodological research methods describe the generic framework followed by an approach to evaluate the new method or theory.

There are two culminating tangible outcomes from this book: a written research proposal (Chapter 12) and an oral presentation of the proposal (Chapter 13). The written research proposal describes the research problem, why it is important, how the problem has been addressed or unstudied before, and how the current project aims to solve the problem. It is the result of the activities written about in previous chapters. The chapter describes how to assemble pieces already written and organize them into a single document.

Complementary to the written document is an oral presentation of the research proposal. More often than not, little attention is given to how to present effectively. Chapter 13 provides practical guidance on content (what to include

as well as what to exclude), organization (what order and level of detail for each section), and presentation (visual aids and speaking style). The emphasis is to eliminate or minimize reliance on text-based slides so the speaker is more engaged with the audience. This chapter describes how to prepare and deliver a high-quality presentation.

The proposal is clearly an important accomplishment toward earning a graduate degree. There is certainly time to celebrate this important milestone. However, the research plans just described need to be implemented. The last chapter of the book (Chapter 14) describes how to assimilate the learning experiences from writing the proposal to move forward and complete the degree. The content of this chapter includes how to reuse portions of the text, how to use the time line effectively, how to engage in the review process, and how to overcome common struggles.

Audience

The audience for this book is students in doctoral programs in the social and behavioral sciences with research plans that use primarily quantitative methods. Most of the references are toward doctoral programs, but many of the ideas can be extended to students writing proposals for master's theses or undergraduate honors papers. It is assumed that the students are in residence so that there are face-to-face interactions with faculty and other graduate students. That said, many of the Action Items can be adapted to distance learners (e.g., online video conferences in place of in-person meetings), and many of the Action Items are done alone. The format of the proposal, including the research questions, methods, and structure of the document, leans toward students with quantitative or mixed quantitative/qualitative research plans. While there is some attention to qualitative methods, it is not the focus.

Motivation

I designed this book to be actively read (see Chapter 5 for a discussion on active versus passive reading). Throughout the book are Action Items, which describe activities the reader should complete to conclude "reading" this book with a successful research proposal in hand. Throughout the book there are activities that support development of a research proposal. Those listed as *Quick Tasks* take only a few minutes. *Action Items* will take a day or so to finish. *To Do Lists* are substantial activities and will require several days or weeks to complete.

Students have asked me how long it takes to write and defend a research proposal. The activities described in this book require about 3 to 4 months for the typical student in the social sciences to complete. This rule of thumb however is discipline, department, advisor, and student specific. Often unique circumstances lead to a longer or shorter amount of time to design and write a proposal. Regardless of the time required, staying focused and working each day results in progress toward the degree.

Staying focused and motivated often requires some external help. As researchers pushing past the boundaries of known knowledge, adversities (such as rejection, setbacks) are normal. In fact, they are expected. They are nevertheless difficult. The key to success in academia is to move beyond these struggles and become stronger and wiser as a result. I have found that slogans, sayings, expressions, proverbs, and general words of wisdom help me overcome the emotional anger and frustration with such adversities. They help me remember that I am not alone in the struggle and that I can continue to work. Some common motivational expressions include these:

> If at first you don't succeed, try, try again.
>
> Don't throw the baby out with the bathwater.
>
> "We are what we repeatedly do. Excellence, therefore, is not an act but a habit."—Aristotle
>
> "Men's best successes come after their disappointments."—Henry Ward Beecher
>
> "Genius is 1% inspiration and 99% perspiration."—Thomas Edison

In addition to inspirational sayings, photos and images can also provide powerful inspiration. One I use comes to mind. It is a photo from a magazine of a person carrying a mountain bike through deep, deep snow. The determination of this person despite the clear adversity was an inspiration to me (plus my passion for cycling contributed to my interest in the image). Creating new knowledge is difficult and occasionally not fun. Success requires determination sometimes derived from unusual sources.

Quick Task

Select a slogan or an image that inspires you to keep working even through adversity. Put it in a place where you can see it when you need it—at your desk, digitally on your desktop, or inside your medicine cabinet next to your toothbrush.

Reminders

- Graduate students are creators of new knowledge.
- Be a leader.
- The dissertation proposal is a contract.
- Visualize a trajectory.
- Stay strong, stay motivated.

2

Ethics

Introduction

Imagine this scenario. One of your fellow graduate students is writing her dissertation proposal and plans to defend it in about 3 months. Her advisor suggests to her that she look at other proposals that were successfully defended. She turns to you and asks to see your dissertation prospectus that you defended this past fall. You hesitate. It sounds possible that you might have similar topics. You are concerned because you put a lot of work into compiling the literature, determining the key points in the literature, framing your research question, and writing your methods. What do you do? Is it possible that she could take your ideas? Should you share the proposal and hope she understands that this is your work?

The answer is yes; you should willingly give her the copy of your proposal. To begin with, at most universities, the dissertation prospectus is public record. So even if you do not give it to her, she does have a right to see it. Second, if she behaves in an unethical manner by plagiarizing your work, then she could fail her proposal defense or, worse, be dismissed from the university without her degree. If you are seriously concerned, then you are obliged to follow up by reading her proposal and attending her defense.

Concerns such as this are an example of the importance of academic integrity. This chapter describes the importance and role of academic integrity and how to identify and avoid unethical behavior. Professional reputation, collaborative research, scientific misconduct, human subject testing, harassment, and work-life balance are covered. These topics broadly explore how you expect to be treated and how you should treat others. Many situations are clear. Others are not, particularly when they involve someone of authority.

The Scientist as Autonomous Being

How to write your curriculum vitae (CV) is covered in Chapter 3. A CV is a document that describes the scholarship and academic activities of an individual,

including degrees earned, positions held, papers published, and grants awarded. Professionals in research perform their work in a university as a professor or at a government or nongovernment agency as a research scholar. There is a mutual benefit for both the scholar and the institution with this association. For the scholar, a reputable university or research agency adds prestige to his or her career. It suggests the scholar meets a certain standards of academic and professional excellence. Practically, it also means resources to support the scholar's research, in space, money, and personnel. There is also the potential for top-notch colleagues, including the best graduate students and postdocs.

For the university or research agency, the institution's reputation improves with the productivity and reputation of the scholar. Each scholar is an investment with an anticipated return on the investment. The fiscal return comes from the grants and students, where each brings revenue to the university or agency. The nonmonetary returns are found in the local, national, and international reputation by bringing positive press about the university or agency.

For the institution, the positive, win-win relationship, however, only goes so far. The scholar remains an autonomous entity. Academic scholars who move to a different institution take their reputation, and potentially their postdocs, students, and grant money, with them. Given this status as an autonomous being, a critical component to remember is that your name is your legacy. You build your legacy with your behavior, your collaboration with colleagues, and the quality of the scholarship you produce.

Collaborative Research

Researchers who work independently 100% of the time are rare. More frequently, scholars work collaboratively with colleagues, postdocs, and graduate and undergraduate students. Collaborative research suggests that the whole is worth more than the sum of the parts. Collaborators each bring different experience, skills, and expertise to the table. Furthermore, in an era of multi-, cross-, and transdisciplinary research initiatives, collaborations are extending beyond the colleagues down the hall. Collaborative research demands trust.

Trust refers to an expectation or reliance on another person to perform the work expected in a timely, accurate, and ethical manner. *Timely* means you will deliver your part of the research when you agreed to do it. Potentially extenuating circumstances sometimes prevent on-time delivery, but these should be rare. When these do occur, it is your obligation to communicate with the project leader as soon as possible to minimize the impact on the rest of the project. *Accurate* means you need to check your work. If you are analyzing data, proof your work, examine the results critically, and ask yourself if the results make

sense or not. Use common sense and avoid assuming that since the computer generated the results, all is fine. If you are preparing a bibliography or literature summary, check for accuracy in the references. There is no excuse for incorrect article titles, misspelled author names, missing page numbers, or incorrect formatting. These seemingly minor issues point to a larger problem—carelessness. Seeing carelessness in a bibliography suggests this problem may extend into other parts of the research that are harder to detect.

Finally, collaborative researchers expect the work to be performed ethically. Ethical research extends into many areas but includes falsifying data, manipulating results, and plagiarizing words (further discussed in the Scientific Misconduct section that follows). The implications of scientific misconduct impact the reputation of *everyone* involved from the institution to the individuals.

While everyone is blamed when research is performed unethically, individuals also deserve due credit for high-quality, publishable research. In collaborative research, anyone who participates should receive credit for his or her contribution. Credit for work ranges from being an author on a referred paper to being named in the acknowledgments. In some fields, the principal author—who receives the most recognition for the manuscript—is the last author. In other fields, the first author receives the most recognition. This person is also the one who has the most responsibility, including correspondence with the editor and being the contact person listed on the paper after it is published.

The key for deciding who should be the principal author comes from communication. Talk to your advisor about who should be included and in what order. Some advisors require coauthorship (and even principal authorship) on all student manuscripts. Other advisors are more relaxed about their expectations. Speak to your advisor as you are preparing a manuscript about who should be included on a paper and in what order.

Quick Task

- Speak with your advisor about the norms and expectations on authorship in your discipline and specifically with him or her.

Scientific Misconduct

Scientific misconduct is any aspect of unethical, untruthful, or deceitful action performed during the pursuit of greater knowledge, regardless of whether the work is collaborative. Scientific misconduct of any form will

permanently damage your reputation and perhaps those of your colleagues. Slandering a colleague, stealing ideas, collecting data unethically, falsifying data, manipulating results, and plagiarizing words or images can lead to a damaged career. Actions that may not seem like a big deal at the time, such as a quick copy and paste from a website or a small change to a few data values, are a big deal.

Most forms of scientific misconduct are conscious and deliberate, deliberate "fudges" to improve an outcome. These actions are taken instead of the ethical path because of unsatisfactory results, looming deadlines, external pressure to succeed, and lack of understanding of scientific misconduct. Some forms of scientific misconduct arise unintentionally due to carelessness or inattentiveness in any aspect of the research, from reviewing the literature, to collecting data, to analyzing data, to interpreting results, to writing. None of these reasons—even sloppiness or naïveté—satisfactorily excuse scientific misconduct, nor do they reduce the impact on one's career.

SLANDER

Deliberately damaging a colleague's reputation and potentially his or her career is morally wrong. Examples of deliberate actions that can damage another person's career are the following:

- A professor can slow down or prevent a student from earning a degree or write damaging recommendation letters during a job search.
- A colleague can discourage someone from pursuing a good idea and then later use that idea himself or herself.
- A reviewer can write an unfair review for a submitted manuscript or proposal.
- A senior scholar can write a negative letter for a junior scholar, ultimately preventing the person from being promoted.
- An administrator can reject a person from promotion for undocumented or undisclosed reasons.
- Anyone who uses slander against another in a public or private setting can permanently damage the reputation of another individual.

Why do people do these things? There are myriad reasons, but most often the target is someone seen as a threat to the perpetrator's success, such as an intelligent and productive junior scholar who threatens the norms. Victims can sometimes find legal recourse, but the damage to their career can be permanent regardless of the outcome of a lawsuit. If you are discovered to be the perpetrator, your reputation as a professional is also then damaged. Avoid such situations through honesty.

If you are ever a victim of slander you need to pursue it through the appropriate channels. Start by investigating the options within your institution. If the situation is extremely serious, seek legal counsel.

STEALING IDEAS

A critical element of scholarship is reviewing and providing feedback on the work of others. Feedback is provided to students by professors and to scholars for manuscripts submitted to journals and for proposals submitted to granting agencies. More information on how to effectively give informative feedback is provided in Chapter 14. A potential ethical issue in this process is that reviewers are experts in the subject matter and are also investigating similar subjects. This means reviewers have the potential to learn from and potentially steal from another person's work. While it is impossible to read someone's work and not learn from it, the ethical action is to not steal anyone else's ideas from this process.

Some of the ideas being developed by colleagues are no doubt excellent, and the temptation to use these ideas may be high. But remember, each scholar is an autonomous entity, and using these ideas is stealing. The outcome does not result in a new television or cash in hand, because the goods are intellectual property. But when discovered, the damage to your reputation is permanent.

If you find yourself a victim, you need to speak immediately with your advisor or program director about the proper course of action. The course of action will vary depending on the nature of the infraction, who is involved, and the institutional support. Unfortunately, depending on the situation, there may be little you can do. Too many situations have shown this to be the case. The only bright side is that if you had one good idea, then you will likely come up with another and another.

PLAGIARISM

Plagiarism is a specific form of stealing ideas. It involves using the words or ideas from another without identifying the source. In other words, if you plagiarize, you are attempting to represent someone else's work as your own. Digital resources and the copy/paste functions make note taking easy. However, being sloppy in this exercise by forgetting to reference sources makes anyone vulnerable.

Intentional or not, plagiarism is unethical. For example, students have said to me, "I meant to go back and add citations when I was done." These students are suggesting that they unintentionally copied ideas from another paper. However, plagiarism is the intentional *or unintentional* use of another person's ideas and words in an effort to represent them as their own. Being sloppy or ignorant is not an excuse.

Instructors have turned to software to evaluate student papers. The software identifies the probability of plagiarism by comparing a paper to published

sources. Similarly, a quick search on Google with key phrases often identifies the original source of a phrase or paragraph, which places a student or anyone in a precarious academic position.

FALSIFYING DATA AND RESULTS

Falsifying data means deliberately adding or manipulating data to obtain the desired results. While it can be accidental (e.g., incorrectly converting data from one set of units into another), more often than not, data falsification is intentional. Falsified data have been manipulated to support a particular hypothesis.

Unethical research propagates errors. This means that published research with fudged results will become the basis of future research by other scholars. The problems are compounded as more research is built upon this faulty work. If the foundation upon which you build your own research is unstable, then your research crumbles too. In the best-case scenario, the problem is uncovered and no future work is jeopardized. In these cases, only the researchers are penalized (jobs are lost, reputations are damaged, and careers end). In the worst-case scenario, falsified research results are used in national or local decision making, public policy formation, health care policy, or pharmaceuticals. In these cases, potentially many people in the private and public sectors are hurt because the outcomes differ from what was expected.

Problems associated with scholarship are discovered in several ways, such as a simple Internet search. Problems appear also when another lab or research group attempts to reproduce your work. For example, say your paper applies a new method for analysis, showing satisfactory results. The other research group is unable to obtain the same level of results because you adjusted your results a bit. This is problematic because research is built on the knowledge and experience of others.

To Do List

1. Be knowledgeable. Search for information on ethical conduct in research. One example is an interactive video produced by the Office of Research Integrity in the U.S. Health and Human Services. By role-playing as different members of the university, this online video illustrates the responsibility of members of a research team when potentially faced with questions of scientific misconduct. It provides excellent insight into the

opportunities individuals have to act one way or another and the potential outcome of these choices. The video can be viewed at the following website: http://ori.hhs.gov/thelab.

2. Don't be sloppy; get organized. If you are inherently a neat and organized person, then, great, you are set. Otherwise, make a promise with yourself to become neater—at least with your work projects. Here are some starting points:

- Recognize and agree to the fact that being organized takes time and plan "organizing my stuff" into your activities.
- Have a dedicated workspace (or two). At home, the workspace needs to be something more than a portion of the kitchen table, even if it means stuffing a desk into a closet (that was my home office in graduate school).
- Organize computer files into folders; separate work activities from personal ones.
- Have a backup system in place. Invest in an external hard drive or in cloud space and back up your files on a regular basis.
- If you are hopelessly lost, dedicate yourself to improving your organizational skills. Find online resources or books to help get organized. Find a system that works for you.

Human Subject Testing

Research requiring data on human activities, opinions, feelings, and biological response is central to the social and behavioral sciences. Consequently, investigators must know their responsibilities to protect the rights and welfare of their subjects. Vulnerable populations such as children, the elderly, the incarcerated, and the mentally and/or physically impaired are given particularly close attention because they may not understand the implications of the investigation. Some of the rights and welfare of the subjects include the following:

- The right to protect their identity
- The right to withdraw from the investigation, regardless of whether the data collection is complete
- The right to know how the data will be used
- The right to know that data collected are used in the way they were promised and in no other way
- The right to know the risks associated with the testing and data collection
- The right to not be exposed to unnecessary harm

To ensure these and other rights are not violated, investigators who acquire data on humans are required to have their research plan approved by a review board, often call the Institutional Review Board, or IRB. Prior to submitting a research plan to the IRB, investigators are required to complete a training certificate. Earning the training certificate requires taking a short course and passing a test, which are available online. The training certificate indicates one is knowledgeable about human subject testing.

Action Item

Search for the research integrity office at your institution. Read the IRB requirements for obtaining permission to use human subjects in research. If you expect your research to involve human subjects, begin to take the required seminars and tests.

At most universities and institutions the IRB meets at regular intervals to review applications. IRB applications can require a full review (which can take several months to gain approval), exempt status (because the research falls within certain typical categories such as an educational setting), or an expedited review (in which the study falls under certain categories). The process to gain approval is clearly outlined and typically involves training (described earlier) and submitting an application. The application includes, among other items, a detailed description of the study and explicit details on how data will be collected and used.

Studies involving animal testing have rules as well. Animal testing appears less often in the social and behavior sciences. Nevertheless, like human subject testing rules, these rules are to protect the rights and welfare of animals. If you expect your research to include animals, learn about investigator responsibilities in animal subject testing.

Harassment

Harassment is any type of bullying a person uses against another, typically to assert power, dominance, or control. It could be unfavorable comments directed at an individual, inappropriate discussions behind someone's back, or direct threats to someone with the suggestion of serious ramifications. The result can be an uncomfortable or even hostile work environment.

Like harassment generally, sexual harassment is any form of unwelcome sexual advance. Some assume that the harasser is always male and the victim is always female. That is not the case. Sexual harassment can be any combination of male or female harasser and victim. Furthermore, the harassment may not always be directed from a professor toward a student (although that is more often the case). Any combination is possible. Sexual harassment can be as subtle as inappropriate comments or as direct as threats. More direct threats of sexual assault are also illegal.

Most instances of harassment have a difficult path toward resolution. If you are a victim of harassment or sexual harassment or you know someone who is, seek help. All universities have an office where you can go and speak to someone confidentially about a situation. They can help you decide how to proceed.

In contrast to harassment are consensual relationships with co-workers. The only real ethical issue occurs when one is a minor or one is in a decision-making position over the other. A decision-making role involves assigning grades, determining passing a class, or signing off on a degree. If this is the case, then both parties are at risk. If you are a teaching assistant (TA), do not ask to date anyone in your class. Instead, make the advance *after* the end of the semester. Likewise, if you are a graduate student interested in a professor, do not take classes from that person or have him or her serve on your committee. Situations do occur where professors and graduate students have dated, and some are now happily married couples. In these cases, the professors and the students made conscious choices to wait until the end of the semester, to drop a class that was being taken, or to never enter a situation where one had authority over the other.

Action Item

Read your university's policies on harassment. Educate yourself on what actions are inappropriate and the procedures outlined to resolve them. Do not assume you will not need these resources.

Enjoying Life

Graduate school can feel as if you are hurtling yourself from one deadline to the next through finishing coursework, comprehensive exams, grant deadlines, and defending a dissertation. It is tempting to wait until the list is "done" to go out and have some fun. Unfortunately, if one waits until the list is done, stress

and anxiety will become a norm. Furthermore, using that model will result in a person who waits to have fun until a tenured full professor. By then, the pattern of all work and no play will be established.

Mental and emotional health experts describe the importance of fun and free time and how it is positively related to productivity. This means you should incorporate "free time" into your schedule now so that you maximize your productivity. Leisure activities can be time alone or with friends or family. This emphasizes doing the things you enjoy. Some examples include these:

- Cooking
- Shopping
- Exercising (biking, walking, hiking, weight lifting, paddling)
- Playing music
- Playing cards or board games
- Watching television or movies
- Reading novels
- Traveling
- Painting
- Going to museums or cultural sites

Build extracurricular activities into your work life now.

Quick Task

Work fun into your regular schedule. Graduate school is a busy time, but make time for your personal life too.

Reminders

- The scientist is an autonomous being.
- Enter into the review process with respect.
- Take seriously any concerns or questions over scientific misconduct.
- Harassment is any form of bullying from subtle to direct.
- Make time for fun in your life.

3

Curriculum Vitae

Introduction

The first two chapters described the need to generate a research trajectory and how to do so. The foundation for the research trajectory is the curriculum vitae (CV). The CV documents all professional activities—describing the professional path so far—and inferring the future trajectory. Therefore, to start a research proposal, begin with what is already done. Build the foundation. This chapter describes how to write, revise, and maintain a CV that effectively describes your academic past and sets the stage for presenting your academic future.

There are two reasons to write about past activities when starting to write about the future. The first reason is, as stated previously, because your CV describes a research trajectory. The CV places your past on a path that lines up with what you plan to do in the future. Initially this can be a tool for you (Who am I? and Why am I here?), but it is an important tool for other readers too. It is incumbent on you to make the linkage between the past and the future. This is the only piece of the proposal that looks backward—everything else is forward looking.

The second reason is practical. First, many grant applications (e.g., a research proposal, which is what you are writing here), require—at the very least—an abbreviated CV. The CV shows that the principle investigators (PIs) are qualified to do the work proposed. The grant proposal reviewers examine the CV as part of a proposal to determine if the investigators have the skills to execute the research proposed. They want insight on whether the investigators have the ability to collect data, write software, analyze results, and produce journal articles, as stated in the proposal.

Forms of the CV

The CV (also known as an academic vitae) is a dynamic document that details your professional academic record. The word *vitae* is derived from a

Latin word meaning "life," indicating a tool to describe your life (and one you will use throughout your life). The word *curriculum* means "a course of action" and is often used in reference to a plan of study toward earning a degree. A curriculum vitae does not necessarily describe a plan, which is why the term *academic vitae* is sometimes used in its place. Instead the curriculum vitae describes your past academic course of action. The term you use may be discipline or university dependent. I use the term curriculum vitae, or CV, in this book.

Some define the CV as a brief summary of professional accomplishments or as the equivalent to a résumé. The CV and résumé are both comprehensive documents. The difference is the level of detail used to make the document complete. A CV is a detailed record of all professional accomplishments. A professional résumé highlights or references one's professional accomplishments. Both are comprehensive, but the level of detail describing the accomplishments is different.

The word *résumé* translates from French to mean "summary," implying a brief but comprehensive record. Some recommendations suggest a résumé should be one page for professionals with a bachelor's degree or less than 10 years of experience. Professionals with a master's degree or more than 10 years of experience can have a résumé of 2 pages or slightly longer. The idea behind the shorter résumé (particularly compared to the CV) is that busy executives or HR personnel will spend only a few seconds glancing at the document; therefore to capture his or her attention, you need a document that immediately shows key accomplishments. Since the résumé is concise, it highlights key points along the career (making it comprehensive), but it does not need to cover every detail of the path. Some academics maintain a résumé for consultancy and other professional purposes along with a CV for academic purposes.

An abbreviated CV (sometimes called a biosketch) is also different from a professional résumé. An abbreviated CV is not comprehensive. It covers the most recent record or relevant record for the task at hand. An abbreviated CV is sometimes incorporated in professional websites, showing only recent work. An abbreviated CV is often required for grant applications, showing only work related to the grant application. Therefore it might be quite detailed in some areas (e.g., publications directly related to the specific application) and brief or nonexistent in others (e.g., unrelated publications). Some granting agencies (e.g., the National Science Foundation) provide specific instructions on the content, organization, and length of the abbreviated CV. They are even specific on the number of publications you are allowed to include (current guidelines from the NSF request five publications most related to the proposed research and five other publications).

A CV has a number of uses throughout your career. It can be required with a dissertation document. You will need a CV (and a cover letter, but that is not part of this discussion) to apply for an academic position—a postdoctoral or tenure-track faculty position. As already mentioned, your complete CV or an abbreviated CV will be needed for most grant applications. Later, your CV will be included in your promotion materials. If you are asked to serve as a committee member for a student in a different institution, you may be asked for a copy of your CV to approve your inclusion in the committee. A CV is used any time knowledge of past accomplishments is needed. It is therefore critical that the content is up to date, accurate, and thorough at all times.

Content

There are different opinions on what to include and exclude from a CV. In the end, the choice is essentially discipline specific and personal. Most disciplines expect you to list your degrees earned, employment record, publications (preferably differentiated between referred and nonreferred), and grant history. Certain disciplines expect awards, courses taught, students mentored, and professional service.

Your first CV will probably be relatively short (maybe even less than one page). I use the CV as an assignment in the research design and proposal writing class I teach. Students sometimes ask if I grade on the content—e.g., the number of publications (or lack of them). The list of accomplishments is not important. What is important is that you have started and are thinking about it relative to a research trajectory.

As important as it is to remember what to include, there are also past activities you should exclude. Do not include nonprofessional employment such as your summer job at McDonalds (or your current job at Chili's). Include past employment when it is part of your professional training (e.g., if your graduate program is in restaurant management, then these jobs might be relevant).

The difficult decision on what to include and exclude occurs in cases where a person has made a moderate or radical career change. Some students have started a PhD after a lengthy professional career in a different field. They need to decide how much detail about their prior profession to keep on record. In these cases, some indication of past activities should be included, job titles at the very least. What to avoid is gaps—particularly large ones—in the record. Sometimes large gaps are unavoidable because of illness, parenting responsibilities (e.g., stay-at-home parents returning to school), or other personal reasons. These cases make it harder to provide a complete record. It

is therefore incumbent on you to explain the gap in a cover letter or other form of supporting material.

Personal information can be included or excluded. Common examples include volunteer or nonacademic interests such as hiking, cooking, time with family, and speaking foreign languages. At one point, including one's social security number was common practice, but you should *exclude* it to protect your fiscal identity. When adding personal information to the CV avoid including a long list, but a short piece adds character and interest to a comprehensive CV.

Style

Consistency. After content, this is the most important consideration. The style of the CV refers to font type, font size, indentation, spacing between items, referencing style—everything about the way your CV looks. In particular, consistency applies to the chronological order in which you present your work. Some people (perhaps in response to their discipline) list their most recent work first. Others list their work from oldest to newest.

Recently I undertook the task of reformatting my CV into a new style. In my old style, the year of my accomplishments was buried in the description of each item (see Figure 3.1). It was difficult to follow the lineage of my work over

Figure 3.1 This CV style emphasizes author names.

Koerner, Brenda, **Elizabeth A. Wentz**, and Robert Balling, Jr. 2004. Projected carbon dioxide (CO_2) for the year 2020 in Phoenix, Arizona. *Environmental Management* 33 Supplement: S222–S228.

Miller, Harvey and **Elizabeth A. Wentz** 2003. Geographic representation in geographic information systems and spatial analysis. *Annals of the Association of American Geographers* 93(3): 574–594.

Wentz, Elizabeth A., Aimee F. Campbell, and Robert Houston 2003. Implementing and testing two methods of spatio-temporal data interpolation applied to tracking the movement of monkeys. *International Journal of Geographical Information Science* 17(7): 623–645.

Day, Thomas A., Patricia Gober, Fusheng S. Xiong, and **Elizabeth A. Wentz** 2002. Temporal patterns in near-surface CO2 concentrations over contrasting vegetation types in the Phoenix metropolitan area. *Agricultural and Forest Meteorology* 110(3): 229–245.

Wentz, Elizabeth A., Patricia Gober, Robert C. Balling, Jr., and Thomas Day 2002. Spatial patterns and determinants of carbon dioxide in an urban environment. *The Annals of the Association of American Geographers* 92(1): 15–28.

several pages. In the new style, I continued to list my work in reverse chronological order, but I left justified the year so the lineage could be clearly followed. I also changed the font, eliminated the bold font in my name, and removed the spaces between the article references (see Figure 3.2).

Figure 3.1 shows an earlier style of my CV. The publication year is embedded in the reference, and therefore it is difficult to follow the chronology. My name is highlighted however to bring out my role in coauthored publications.

Figure 3.2 This CV style emphasizes publication year.

2004	Koerner, Brenda, Elizabeth A. Wentz, and Robert Balling, Jr. 2004. Projected carbon dioxide (CO_2) for the year 2020 in Phoenix, Arizona. *Environmental Management* 33 Supplement: S222–S228.
2003	Miller, Harvey and Elizabeth A. Wentz 2003. Geographic representation in geographic information systems and spatial analysis. *Annals of the Association of American Geographers* 93(3): 574–594.
	Wentz, Elizabeth A., Aimee F. Campbell, and Robert Houston 2003. Implementing and testing two methods of spatio-temporal data interpolation applied to tracking the movement of monkeys. *International Journal of Geographical Information Science* 17(7): 623–645.
2002	Day, Thomas A., Patricia Gober, Fusheng S. Xiong, and Elizabeth A. Wentz 2002. Temporal patterns in near-surface CO2 concentrations over contrasting vegetation types in the Phoenix metropolitan area. *Agricultural and Forest Meteorology* 110(3): 229-245.
	Wentz, Elizabeth A., Patricia Gober, Robert C. Balling, Jr., and Thomas Day 2002. Spatial patterns and determinants of carbon dioxide in an urban environment *The Annals of the Association of American Geographers* 92(1): 15–28.

Figure 3.2 illustrates the current format of my CV. The publication year appears along the left-hand side of the document and is included in the citation to the article. My name is no longer highlighted.

While the style difference here may not be relevant when you begin your career, the dates become increasingly important as your career matures. In both examples, I have maintained consistent reference style, including underlining student coauthors and italicizing journal titles. In the former, I also highlighted my name in bold so it was visible in the list and included spaces between each entry. Remember, consistency.

Consistency is important because it reflects upon your scholarly skills. If the CV is inconsistent and sloppy, it is a logical extension to assume the research is also inconsistent and sloppy. This is not the message you want to present to prospective employers or granting agencies. Proofread your CV for consistency and ask someone else to read it too.

To Do List

Develop your current CV. Do this by deciding on content and style. Be complete and detailed. Here are some steps to motivate this activity:

1. Start writing your current CV by remembering how you arrived here and not somewhere else. What else did you dream of becoming? When you were a kid, did you dream about being a professional football player? Maybe you always dreamed about becoming a photo journalist traveling to exotic places. List those five fantasy careers here:

   _____

   _____

   _____

   _____

   _____

2. What elements of your fantasy careers are part of your current path in graduate school? Do you use re-photography to analyze urban change? Maybe some of your fantasy careers are embedded in your hobbies or other interests. Consider watching the video or reading the book *The Last Lecture* by Randy Pausch to envision how your dreams can become reality.

3. Begin to write down your accomplishments; include those elements that tie into your dreams. Fill in the easy and obvious headings: contact information, education, employment, publications, presentations, and awards.

    - Contact information. Make sure you have a professional e-mail address. If your e-mail is something like dorkeydot@yahoo.com, get an alias or another e-mail address. The best solution may be to use your university e-mail or Gmail instead of a personal-use address.
    - For education, list post–high school degrees only. This includes certificates and degree(s) in progress.
    - Like education, list any work experience you have held since high school. Include only work that contributes to your profession and not just what supported you financially. This list is not limited to just for-pay work but unpaid internships and research projects.
    - If you have anything published, even publications in a newsletter, list it here. Most first-year graduate students do not have publications. By the time you finish your degree, you should aim to have several publications.

4. The following topics are typically listed next:

    - Provide the names of grants–funded research proposals–in which your name is included in the proposal. If you are hired to work on a grant and your name is not included, do not list it. Most first-year students do not yet have this type of recognition, but some may–such as a fellowship to attend graduate school. Do not feel discouraged if you do not.
    - List presentations next. While not always referred, they are important, because they indicate the breadth of your professional exposure. In early versions of your CV, include school-related activities such as undergraduate Capstone presentations.
    - Include any awards you have received, typically post–high school. If you received an award or scholarship in high school to attend college, you should include it.
    - If you have taught university courses with full responsibility, you should include them. You can also include guest lectures here if you have been asked to prepare one for an instructor.
    - Unlike advice you may receive for a résumé, do not include a section called "References," and do not say, "References available upon request." This is inappropriate for a CV.

(Continued)

(Continued)

- If you are a member of professional organizations, list them last. If you are not a member, consider joining now. There are many benefits to becoming a member–particularly a student member–such as scholarships, travel awards, and job announcements.
- Include professional service activities. Some may be local, such as the graduate representative to the faculty. Others may be national, such as a graduate representative to a professional specialty group.

5. Proofread your CV more than once. Exchange your CV with fellow graduate students and be critical of one another. Overall, look for consistency and clarity.

Quick Task

Get feedback. Ask your advisor, other faculty, and fellow graduate students to read and comment on your CV. Revise.

Feeling Stuck?

Some activities that might stimulate thoughts on your accomplishments:

1. Look at photo albums from your undergraduate education. You might see pictures of the dorm where you lived and remember you were a resident assistant your sophomore year.
2. Go to the Internet and look at the CVs of professors in your department or field. Pay particular attention to the headings they use and the early accomplishments they include. Think about things you have done in these areas.
3. Ask your advisor for several copies of his or her CV from different career stages. A current copy will show you where he or she is now. But also ask for a copy of the CV when he or she finished the PhD. Between the two documents, the trajectory of work should be evident.
4. There are numerous examples on the Internet describing how to write a CV. Keep in mind though that topic headings, order, and length can be discipline specific.