

THE
CRAFT
OF
RESEARCH

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THE *Craft* OF *Research*

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Preface

WE INTEND THIS BOOK for student researchers, from the newest beginners to graduate and professional students. We hope to

- introduce beginning researchers to the nature, uses, and objectives of research and its reporting;
- guide beginning and intermediate researchers through the complexities of planning, organizing, and drafting a report that poses a significant problem and offers a convincing solution;
- show all researchers, from beginning to advanced, how to read their reports as their readers will, how to diagnose passages that readers are likely to find difficult, and how to revise them quickly and efficiently.

Other handbooks on research address some of these matters, but this one differs in several ways.

Many current guides recognize that researchers do not move sequentially from finding a topic to stating a thesis to filling in note cards to drafting and revision. As anyone who has done it knows, real research loops back and forth, moving forward a step or two, going back while at the same time anticipating stages not yet begun, then moving forward again. But so far as we know, no guide has tried to show how each part of the process influences all the others—how asking questions about a topic can prepare the researcher to draft, how the process of drafting can reveal problems with an argument, how the elements of a good introduction can send the researcher back to the library for more work.

This book explains how researchers must work at different stages of their project simultaneously, how that overlap can help them understand the problem better, and how they can manage the complexity this process entails. That means, of course, that you must read this book twice, because we will describe not only how earlier stages anticipate later ones, but how later stages motivate earlier ones.

Because research is so complex, we have been explicit about as

many steps as possible, including some usually treated as part of a mysterious creative process. Among the issues that we explicitly “unpack” are these:

- how to turn an interest into a topic, that topic into a few good questions, and the answers to those questions into the solution of a problem;
- how to construct an argument that respects readers’ desire to know why they should accept your claim;
- how to anticipate the objections of reasonable but skeptical readers and how to qualify your arguments appropriately;
- how to create an introduction that “sells” the significance of your research problem to readers;
- how to write conclusions that leave the reader with a sense not only of your major claim but of its wider significance;
- how to read your own text as others will and thereby know better where and how to revise it.

We know that some beginning researchers may follow our suggestions in ways that may seem mechanical. We are not deeply troubled by that because we believe that it is better for students to succeed mechanically than for them not to succeed at all. We also believe that teachers can trust students to overcome that early and inevitable awkwardness. All of us tend to be mechanical when we first learn a skill, but eventually we learn to hide its machinery behind its substance.

Another distinguishing feature of this book is that we relentlessly encourage researchers to side with their readers, and we explain explicitly how to do that by explaining how readers read. The aim of a research report is to engage in a conversation with those who may not be eager to change their minds, but who, for good reasons, will. The place where you conduct that conversation is in your report. As they read, readers expect to find certain features of organization; they prefer certain patterns of style; they tacitly pose questions, raise objections, usually want to see matters laid out more explicitly than you may think necessary. We believe that if you can understand how readers read and can know better how to meet their expectations, then you have a better chance of helping them to see things your way.

We focus on the process of doing all this by showing how the

formal properties of the “product”—the report—can help you plan and conduct the process that creates it. As you will see, the elements of a report, its structure, style, and formal conventions, are not empty formulas that writers mimic just because thousands used those formulas before them. Those forms and patterns are the means by which researchers, beginners and experienced, test their work, explore their understanding of it, even find new directions. In other words, we believe that the formal demands of the product can not only guide the researcher through the process of its creation, but can themselves contribute to the author’s creativity.

We have also tried to indicate what researchers at different stages of their professional lives should know and be able to do. If you are doing your first research project, you should have an idea of what advanced researchers are expected to do, but not worry if you cannot do it all. You should know, however, what your teachers are likely to expect of *you*, particularly if you are preparing to become a serious researcher. So we occasionally announce that we are about to address an issue that is particularly important to advanced researchers. Those of you just getting started may be tempted to skip those sections. We hope you won’t.

This book was born in the belief that the skills of doing and reporting research are not just learned but can also be taught. Where we could explain the steps in the process explicitly, we did; where we couldn’t, we tried to describe its general shape. Some aspects of research can be learned only in the context of a community of researchers committed to particular topics and ways of thinking and interested in sharing the fruits of their work. But when such a context is not available, students can still learn important research skills through direct instruction and carry those skills into the communities they want to join. We explore some specific ways to do that in our Postscript to Teachers.

This book was also born in our experience that research is not the sort of thing one learns once and for all. Each of the three of us has faced research projects that have forced us to take a fresh look at how we do research, even after we had decades of experience. In those moments when we had to adapt to a new research community or to changes in our own, we have used the principles presented here to help us focus on what is most important to

readers. So we have written a book that you can return to as you and your circumstances change, one that we hope will be useful time and again as you grow as a researcher.

We want to thank those who have helped us bring this project to fruition. They include some early readers: Steve Biegel, Jane Andrew, and Donald Freeman. The chapter on the visual presentation of data was improved significantly by the comments of Joe Harmon and Mark Monmonier. We would also like to thank those who helped us select and edit the Appendix on Sources: Jane Block, Diane Carothers, Tina Chrzastowski, James Donato, Bill McClellan, Nancy O'Brien, Kristine Fowler, Clara Lopez, Kim Steele, David Stern, Ellen Sutton, and Leslie Troutman. We are also indebted to those at the University of Chicago Press who, when we agreed to undertake this project almost a decade ago, kept after us until we finally delivered.

From WCB: In addition to the hundreds who have taught me whatever I have contributed to this book, I should like to thank my wife, Phyllis, my two daughters, Katherine and Alison, my three grandchildren, Emily, Robin, and Aaron: together these six keep me optimistic about the future of responsible inquiry.

From GGC: Through turbulent times and calm, through creative periods and fallow, there was always home and family—Sandra, Robin, Karen, and Lauren—to give point and purpose to it all.

From JMW: Joan, Megan, Ol, Chris, Dave, and Joe have sustained me when we have been together and when not. Together is better.

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PART ONE

Research, Researchers, and Readers

Prologue: Starting a Research Project

IF YOU ARE BEGINNING your first research project, the task probably seems overwhelming: How do you look for a topic? Where do you find relevant information? How do you organize it once you find it? And even if you have already written a research paper in a writing class, the idea of another one may be still more intimidating if you now have to do the *real* thing for the first time. Even experienced researchers feel a bit anxious when they undertake a new project, especially if it's of a new kind. So whatever concern you feel now, all researchers have felt, and many of us still do. The difference is that experienced researchers know what lies ahead—hard work, but also the pleasure of the chase; some frustration, but more satisfaction; periods of confusion, but confidence that, in the end, it will all come together.

MAKING PLANS

Experienced researchers also know that, like any complex project, research is more likely to “come together” if they have a plan, no matter how rough. Before they start, they may not know precisely what they are looking for, but they know in general the kinds of material they will need, how to find them, and how to use them. And once they assemble their materials, competent researchers don't just start writing, any more than competent builders just start sawing wood. *They plan a product of a certain kind and certain shape, a product that expresses their deliberate intention to achieve a particular end, a product all of whose parts are designed to contribute to that end.* But neither do good researchers let their plan box them in. They are ready to change their plan if they run into a problem or if they suddenly understand their project better, or if they discover in some by-way a more interesting objective that requires them to head off in a new direction. But they all begin with a purpose and plan of some kind.

In fact, writing projects of almost every kind begin with a plan

to create a document of a specific form, often a form shaped by the experience of generations of writers. Writers use these forms not just to please editors or supervisors, but to save themselves from having to invent a new form for each new project and, just as important, to help readers recognize their objectives. A reporter knows that she has to use an inverted pyramid form in a news story, putting the most salient information first, not for *her* benefit but so that *we* can find the gist of the news quickly and then decide whether to read on. The form of an audit report tells an accountant what he has to include, but it also helps *investors* find what they need in order to evaluate Abco, Inc. as an investment; the nurse knows what to write in a patient record so that *other* caregivers can use it; a police officer composes her arrest report in a standard way so that it can guide those who will investigate the crime later. In the same way, when a researcher reports her results in a form familiar to readers, those readers can read her report most efficiently.

Within these forms, of course, writers are free to take different points of view, emphasize different ideas, and put a personal stamp on their work. But when they follow a standard plan, they make it easier for themselves to write and for their readers to read.

The object of this book is to help you create and execute such a plan.

THE VALUE OF RESEARCH

But first a question: Aside from a grade, what's in it for you? An answer that some might think idealistic is that research offers the pleasure of solving a puzzle, the satisfaction of discovering something new, something no one else knows, ultimately contributing to the wealth of human knowledge. For the beginning researcher, though, there are more immediate practical benefits. Right now, doing research will help you understand the material you are studying in a way that no other kind of work can match. More distantly, the skills of research and writing that you learn now will enable you to work on your own later—to gather information, organize it into coherent form, and then report it reliably and persuasively, skills indispensable in a time aptly named the “Age of Information.”

In any field, you will need the skills that only research can help you master, whether you expect to design the production line or to run it.

The skills of research and writing are no less important to those who use the research of others. These days, that includes just about all of us. We are inundated with information, most of it packaged to suit someone else's commercial or political self-interest. More than ever, society needs people with critical minds, people who can look at research, ask their own questions, and find their own answers. Only when you have experienced the uncertain and often messy process of doing your own research can you intelligently evaluate the research of others. Writing your own paper will help you understand the kind of work that lies behind what experts say and what you find in your textbooks. It lets you experience firsthand how knowledge develops from answers to research questions: how that new knowledge depends on which questions you ask and which you don't; how those questions depend not just on your interests and goals but on those of your readers; how the standard forms for presenting research shape the kinds of questions you ask, even determine those that you *can* ask.

But we must be candid: writing a research paper is demanding. It consists of many tasks, all competing for your attention, often at the same time. However carefully you plan your research, it will follow a crooked path, taking unexpected twists, even looping back on itself. Each stage overlaps with others: all of us draft before we finish our research, continue our research after we begin drafting. Some of us do our best work late in the game, recognizing the problem we have been trying to solve only after we have found its solution. Others move to the drafting stage late, doing more of the trial-and-error work not on paper but in their heads. Each writer is different, and because each project is different as well, no single plan can solve all problems.

As complex as that process is, though, we will work through it step-by-step, so that you can move forward confidently, even as you confront the inevitable difficulties and confusions that every researcher experiences but eventually learns to manage. When you can manage the parts, you can manage the whole, and look forward to more research with greater confidence.

HOW TO USE THIS BOOK

The best way to deal with this complexity (and the anxiety it may arouse) is to read through this book once quickly to see what lies ahead. Then, depending on your level of experience, decide which parts of the task look easy or hard *for you*. As you begin your work, read more carefully the chapters relevant to the task at hand. If you are new to research, begin at the beginning. If you are in an advanced course but are not yet thoroughly at home in your field, skim Part I, read II, but concentrate on III and IV. If you are an experienced researcher, you will probably find most helpful Chapter 4 of Part II, 9 and 10 of Part III, and all of IV.

In Part I, we address some issues that those undertaking their first project often raise—why readers expect you to write up research in particular ways (Chapter 1) and why you should conceive of your project not as solitary work but as a conversation with those whose work you will read and then with those who will read yours (Chapter 2).

In Part II, we explore the process of framing your project—how to find a topic, narrow it, question it, and justify it (Chapter 3), how to transform those questions into a research problem (Chapter 4), how to find and use bibliographic sources to guide the search for answers (Chapter 5), and how to think through what you find (Chapter 6).

In Part III we discuss the nature of a good research argument. We begin with an overview of what a research argument is (Chapter 7); then explain what counts as a significant claim and reliable evidence in its support (Chapter 8); explore an abstract but crucial element of a research argument called its “warrant” (Chapter 9); and conclude with a description of how every writer must address objections, stipulate limiting conditions, and express conditions of uncertainty (Chapter 10).

In Part IV we lay out the steps in producing the final written report, beginning with the drafting process (Chapter 11). Next we address a matter not usually raised in books of this kind—how to communicate complex information visually, even information that is not quantitative (Chapter 12). The next two chapters concern testing and revising your organization (Chapter 13) and style (Chapter 14). We then explain how to produce an introduction that

persuades readers that your report will be worth their time (Chapter 15). Finally, we spend a few pages reflecting on research beyond the techniques of doing it well: the matter of the ethics of research in a society that increasingly depends on its results.

Between the chapters you will find a number of “Quick Tips,” brief sections that complement the chapters. Some Quick Tips are checklists for using what you learn in the chapters, some discuss additional considerations for advanced students, several address matters not covered in the chapters, but all of them add something new.

Research is hard work, but like any challenging job well done, both the process and the results bring immense personal satisfaction. But research and its reporting are also social acts that require you to think steadily about how your work relates to your readers, about the responsibility you have not just toward your subject and yourself, but toward them as well, especially when you believe that you have something to say that is important enough to cause readers to change their lives by changing what and how they think.

CHAPTER ONE

Thinking in Print:

The Uses of Research, Public and Private

WHEN YOU STAND in the reading room of a library, you see around you centuries of research, the work of tens of thousands of researchers who have thought hard about countless questions and problems, gathered information, devised answers and solutions, and then shared them with others. Teachers at all educational levels devote their lives to research, governments spend billions on it, businesses even more. Research goes on in laboratories, in libraries, in jungles, on oceans and under them, in caves, and in outer space. Research and its reporting make up a huge industry in the world today. Bigger yet is reporting on the reports. Those who can neither do reliable research nor reliably report the research of others will find themselves on the sidelines of a world that increasingly lives on information.

1.1 WHY DO RESEARCH?

But you already know about research, because you do it every day. Research is simply *gathering the information you need to answer a question and thereby help you solve a problem.*

PROBLEM: After a day of shopping, you realize your wallet is missing.

RESEARCH: You recall where you've been and start phoning lost and found departments.

PROBLEM: You need a new head gasket for a '65 Mustang.

RESEARCH: You call auto parts stores to see who has one in stock.

PROBLEM: You need to know where Betty Friedan was born.

RESEARCH: You go to the library to look her up in *Who's Who*.

PROBLEM: You hear of a new species of fish and want to learn more.

RESEARCH: You search the *New York Times* to find a story about it.

But while most of us do such research every day, few of us have to write up what we find, because our research is usually for our purposes alone. Even so, we have to rely on the research of others who did write up their findings because they anticipated that one