

Writing Scientific Research in Communication Sciences and Disorders

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Contents

<i>Foreword by Joseph R. Duffy, PhD, BC-ANCDs</i>	<i>ix</i>
<i>Preface</i>	<i>xi</i>
<i>Acknowledgments</i>	<i>xiii</i>
1 Writing and Learning Are Complementary Activities	1
What the Research Says About Writing and Learning	1
Purpose of This Book	2
References	3
2 The Introduction	5
Setting the Scene	5
Reviewing the Literature	6
Stating the Purpose	7
Summary: How to Write the Introduction	8
Keeping Readers With You	9
Guidelines for Writing the Introduction	10
References	10
3 The Method	11
Organization of the Method Section	11
Participants	12
Materials	14
Apparatus	18
Procedures	20
Design	20
Data Collection (Data Acquisition)	21
Reliability	22
Statistical Analysis	22
Style	23
Guidelines for Writing the Method	23
4 The Results	25
Commonly Used Statistics in Communication Sciences and Disorders	25
Special Cases	26
How to Report Statistics	28
Writing the Results Section	30
Guidelines for Writing the Results	32
References	33

5	Constructing Data Tables	35
	Elements of Data Tables	35
	A Checklist for Evaluating Tables	56
	References	56
6	Constructing Data Graphs	57
	Graph Types	57
	Axis Titles, Scale Labels, and Legends	74
	General Principles for Constructing Data Graphs	76
	A Checklist for Constructing Graphs	85
	Reference	85
7	The Discussion	87
	How to Begin the Discussion Section	87
	How to Organize the Discussion	90
	How and When to Use Headings to Enhance Readability	92
	Combined Results and Discussion Sections	93
	How to Close the Discussion	93
	Conclusions	94
	Hedging Language	94
	Guidelines for Writing the Discussion	95
	Reference	95
8	The Title	97
	Title Format	97
	Length of Titles	102
	Syntax	104
	Abbreviations, Acronyms, and Technical Terms in Titles	105
	Key Words	106
	Running Titles	107
	Guidelines for Writing the Title	107
	References	108
9	The Abstract	113
	Kinds of Abstracts	114
	Suggestions for Writing Abstracts	115
	Guidelines for Writing Abstracts	120
	References	120
10	Literature Reviews	123
	Searching the Literature	123
	Definitions of Review Articles	124
	Conventional and Systematic Reviews	125
	Structure of Review Articles	129

Content of Review Articles	131
References	144
11 Content Editing	147
Moving From the Writer's Mind to the Editor's Mind	148
Review	148
Markup	149
Revision	149
Guidelines for Content Editing	150
Reference	150
12 Copy Editing	151
Removing Clutter	151
Modifiers	167
Pronouns	168
Infinitives: To Split or Not to Split	171
Editing Verb Tense	174
Word Choice and Precision	176
Punctuation	180
References	190
13 Getting Published	191
The Changing Face of Publication	191
Issues to Consider When Choosing a Journal	191
The Submission and Review Process	193
The Final Stretch: Preparing the Manuscript for Publication	196
Helping Search Engines Find and Index Your Work	196
Publication Ethics	197
Final Thoughts	197
References	197
14 The Writing Process	199
Resources for Getting Started and Keeping Going	199
Suggestions for Making the Writing Process More Efficient	200
Writing Resources for Teachers and Students	201
Guidelines for the Writing Process	202
References	202
<i>Index</i>	205

Foreword

This book is not about theory, not about a specific communication disorder, not about experimental design, and not about statistical analysis. It is about scientific writing—that part of research that tells a story about a problem that has been studied systematically, a story often driven by theory and organized around hypotheses, and structured by solid study design and methods of data collection and analysis. It is essentially the final act of any research endeavor, but typically the only act seen by students, clinicians, and researchers who hope to benefit from its publication.

Writing about research, or scientific writing, is no easy task and, in fact, has itself been a topic of considerable discussion in the scientific literature. It is well accepted—though not always evident in published research—that “the fundamental purpose of scientific discourse is not the mere presentation of information and thought, but rather its actual communication,” and that just because science is often complex, it “need not lead to impenetrability of expression” (Gopen & Swan, 1990, p. 550).

Although there can be no fixed formula for good scientific writing, “in real and important ways, the structure of the prose becomes the structure of the scientific argument” (Gopen & Swan, 1990, p. 558). This reflects the close bond between clear thinking and clear writing and suggests that improving one may improve the other. At the same time, however, scientific writing is a special skill that does not automatically flow from clarity of thought; for most people, it requires focused attention and hard work to hone writing skills. If these statements seem

too esoteric or vague, it may help simply to remember that editors and publishers are not in business to rewrite poorly written papers and that poorly written papers often raise concerns about clarity of thought and scientific merit. Authors who write clearly and efficiently have a leg up in the competition for space in journals.

In this book, Bob Brookshire and Shelley Brundage provide invaluable guidance for writing about research in communication sciences and disorders. They systematically address the content, structure, and style associated with each section of a scientific paper and the variety of approaches that can be used to write them well. You will find many concrete examples from published studies that illustrate how each section of a manuscript can convey the research story concisely and informatively. The chapters dealing with the construction of data tables and graphs not only will help decisions about how best to summarize data, they will also help you, the writer, identify and interpret the data that most directly address the questions posed in the study. Careful attention to the advice provided about the construction of the abstract and the title is strongly recommended, because they are what readers use to decide if allotting time to read beyond them might be of value; limited in length, you would think the title and abstract should be easy to construct, but speaking from my own writing struggles, they are not. Students will also want to pay close attention to the chapter on literature reviews, because it is broadly applicable to many academic papers you may be required to write, even if they do not involve experimental research. And, in my

opinion, students and many experienced researchers will benefit from reading and then revisiting (perhaps repeatedly) the advice given in the chapters on content and copy editing. Failures at this stage of the writing process are often the source of manuscript rejection or harsh reviews, even in the presence of an important and well-designed and executed study or review paper.

Finally, before reading the book in a linear way, consider first reading the final two chapters (13 and 14) that address the peer review process and the writing process. They will give you a sense of the challenges—and strategies for meeting them—that are part of the journey that will put you in a position to share what you have learned with your professional colleagues.

For undergraduate and graduate students, *Writing Scientific Research in Communication Sciences and Disorders* should be a valuable resource whether or not you eventually embark on a career that will require you to write and publish the results of research. Clear writing is equally important in clinical and educational settings in which you must convey your observations, diagnoses, and recommendations for patients, clients, caregivers, students, and colleagues in written form. And, for those who are already working as researchers, clinicians, and teachers, I can attest from personal experience to the career-long need to refine writing skills; they are nearly inseparable from the continuing need to refine clinical and research skills. This book will serve as an aid to you, and to me, in that process.



—Joseph R. Duffy, PhD, BC-ANCDS
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Reference

Gopen, G. D., & Swan, J. A. (1990). The science of scientific writing. *American Scientist*, 78, 550–558.

Preface

It began innocently enough, with a memory of a writing seminar taught at the University of Minnesota, and the quest to convert the concepts and notes taught there into a book on writing. Dr. Robert Brookshire created that seminar, and this book is my attempt to capture the wisdom of that course and the book that he began.

Developing my own writing seminar at George Washington University took me back to Bob's course and to writing my doctoral dissertation under his expert guidance. I knew that he had been refining his course notes with a goal of publishing a book on writing, but he died before finishing it. Before he died, Bob asked that Joe Duffy review the manuscript and consider what could be done to shepherd the book into print. Joe and I discussed this and shared the files Bob had drafted. With them in hand, I eagerly agreed to take on the task of finishing the book.

Bob's files contained the core of this book, but they were not yet in a condition that he would have considered ready for publication. Some key chapters needed to be written, and existing chapters needed editing. Throughout the process I have asked myself repeatedly, "how would Bob write or rewrite this?" Finishing the book was a great way to get reacquainted with him. Perhaps that is a sign of excellent mentors: their guidance and ways of thinking remain with you long after the initial mentorship experience. Bob was one of those truly great teachers and mentors.

Bob Brookshire was a prolific and highly respected scholar in aphasiology, known for his skills in measuring complex human communication behaviors.

He authored over 50 peer-reviewed papers and mentored 22 master's thesis students and 12 doctoral students. He and his wife and collaborator, Linda Nicholas, published seminal articles on the auditory comprehension and verbal production abilities of persons with aphasia. Their work produced the Discourse Comprehension Test (Brookshire & Nicholas, 1993), a test to evaluate discourse comprehension in aphasia. Nicholas and Brookshire's correct information unit analyses continue to be used to quantify the speech production of persons with communication disorders. Bob was also the author of the widely adopted textbook, *Introduction to Neurogenic Communication Disorders*, now in its eighth edition.

Bob's commitment to clear scientific writing and his editorial skills were well known by students and colleagues. With his green pencil in hand (because "red looks too much like blood"), he would respond to many a student's thesis or dissertation with entreaties to find a "better word" or to "be clear and direct," often with the gentle comment, "I wonder how much of this you really need." As he reminded us often, findings that are not well communicated are essentially lost on the reader.

Bob received many awards during his long career, but of all the recognition he received, it was the Golden Shovel Award that held pride of place in his office. This award recognized his 20+ years as editor of the *Clinical Aphasiology Conference (CAC) Proceedings*, where his green pencil did the shoveling that made those proceedings clear and concise. Bob also served as an

associate editor for two ASHA journals, the *Journal of Speech, Language, and Hearing Research* and the *Journal of Speech and Hearing Disorders*.

The goal of this book is not to teach you how to write. Chances are you already know how to do that. The purpose is to help you to write better, *and to do so for*

scholarly scientific publication. I hope this book helps you to become a better writer, and to find your own writing voice. And I hope, as would Bob Brookshire, that by so doing, your contributions to scientific discourse will be clearly and concisely communicated.

—Shelley B. Brundage
Washington, DC



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Acknowledgments

I'll be honest, until I worked on this book, I never read the acknowledgments section. Now I read them all the time. I have a lot of people to thank, but I promise I will not go on and on like I won an Oscar or something.

First, I am very grateful to Linda Nicholas, for her support and her trust in me to bring this book to publication. Linda, thank you for believing I could do this, and for allowing me to honor Bob's work by doing so.

My husband Rich was steadfast in his support and willingness to help with any detail, none too big or small. Thank you especially for creating the index, wrestling with MSWord and WordPerfect, your editing skills, and for your willingness to eat pizza much more frequently than usual.

Joe Duffy served as an early advisor and mentor in the publishing process. Thank you, Joe, for helping me find Plural and for your advice on how to put a book proposal together. Thank you also for your assurances that you thought I could do this. That means a lot to me.

My department colleague Adrienne Hancock, herself an excellent and prolific scholar, kept me focused and talked me

out of "writing rabbit holes" at some critical times during the last year. I continue to enjoy our conversations about teaching and writing.

I am grateful to my colleagues in the George Washington University Writing Program for our discussions about all aspects of teaching writing. Thank you to Randi Kristensen, Derek Malone-France, Rachel Riedner, and Phil Troutman.

The encouragement that I received from my writing group at Academic Ladder was invaluable and kept me focused on getting the book *done*. Thanks to all of you in Social Science Professors Group 5.

Everyone at Plural Publishing has been supportive and helpful. From my initial meeting with Valerie Johns, to Kalie Koscielak's informative e-mails and organized processes, it has been an educational and enjoyable experience for me.

Finally, thank you to my daughter Janetta, who thought it was "cool" that her mom was writing a book on writing, and even "cooler" that I was doing it to honor one of my teachers. Janetta, I think you are pretty cool, too. Let's not have pizza for dinner.



11

Content Editing

“I have rewritten—often several times—every word I have ever published. My pencils outlast their erasers.”

—Vladimir Nabokov

The first draft is complete. You have covered the major ideas, and the progression of ideas makes sense. You may think that the hard work is behind you—that rewriting a sentence here and there, changing an occasional word or phrase, and correcting scattered errors in spelling and punctuation will yield a manuscript that will draw compliments from colleagues, plaudits from editors, and admiring comments from tenure committees. Not likely. Unless you are very skilled or very fortunate, you are in for more work. That work is called editing. Successful writers typically spend more time at editing than at writing:

*I can't write five words but that
I change seven. (Dorothy Parker)*

Impatient writers typically underestimate the time and effort needed for editing. They skip outlining and jump into the first draft as soon as they have a fuzzy idea of what they want to say. They struggle through a draft without a clear sense of direction. By the time they finish, they are exhausted and want nothing more than to get the paper behind them. They

do a perfunctory read-through, repair the most obvious faults, and type the result as a final draft. The result is a poorly written paper that only those who are compelled by their work responsibilities (instructors, thesis advisors) will struggle through.

Producing a publishable paper from a first draft requires time, discipline, patience, and diligence. It's a huge help if the first draft is based on a detailed outline. The detailed outline helps to ensure that the organization of the first draft is at least passable, that there are no gaping holes in the progression of ideas, that the progression of ideas makes sense, and that verbal flights of fancy are minimized. Even so, much work remains—editing a first draft into a final draft.

Here is an overview of how most book publishers organize the editing process (more on the publishing process in Chapter 13, Getting Published). Most move a manuscript through three editing stages. A content editor evaluates the manuscript to ensure that it is well organized; that all important information is present; and that the manuscript is free of tangential or digressive material, errors,

inconsistency, faulty logic, and vague or unsupported assumptions or points of view. A copy editor evaluates the manuscript for appropriate style, word usage, grammar, and punctuation. A proofreader reviews the typeset copy (called a proof copy or page proofs) and corrects errors in spelling, punctuation, and format (a process called line editing).

The editorial approach we use and recommend resembles that of book publishers. We separate manuscript editing into content editing and copy editing. We divide content editing into three parts—review, markup, and revision—because they require different mind-sets. In review, one adopts the mind-set of an average reader who wants to get the overall point (gist) of what is written. In markup one adopts the mind-set of an editor who is looking for faults that affect the integrity and readability of a manuscript, and fixing them. In revision, one adopts the mind-set of (dispassionate) authors who know their purpose and who can align what is written with what is intended.

Moving From the Writer's Mind to the Editor's Mind

It will be difficult (and usually impossible) to see what you have written from a reader's or an editor's point of view if the ideas you had in mind as you wrote the first draft are still in your mind as you move into review, markup, and revision. When you are in the afterglow of creation, it's easy to mistake what is in one's mind for what is on the paper. It's easy not to notice that some ideas are underspecified, that others are overdeveloped, that transitions among ideas are weak or missing, and that ideas that seemed perfectly clear

when you wrote them actually are muddled and confusing.

Keep the writer from whispering into the ear of the editor as you review and revise. Clear your mind of the peripheral thinking that went into the first draft. Give the thoughts you had in mind as you put ideas on paper time to fade from memory. Forget about what you have written for a few days. Print the first draft. Double-space it and leave wide margins—at least one inch all around. Then put it out of sight. Take a break. Call your mother. Weed the garden. Go to a movie. Don't return to the first draft until you can see it with the eyes of a dispassionate editor.

Review

Don't try to find and correct every fault in one pass through the draft. On that path madness lies. Break content editing into manageable parts. Begin by reading through the draft from beginning to end to get a general sense of its content, organization, and readability. Mark major faults that affect the global characteristics of text that determine its overall unity and sense of purpose. Do not concern yourself with characteristics such as word choice, sentence format, or grammar. As you review, focus on five general qualities:

- **Organization.** Is the organization of the paper clear and easy to follow?
- **Purpose.** Is the point or purpose of the paper and of each section clear?
- **Completeness.** Are all the important ideas covered?
- **Emphasis.** Do some ideas get too much or too little emphasis?
- **Directness.** Do some ideas seem tangential or digressive?

The purpose of review is to get a sense of content, organization, and readability. To keep review painless and effective, relinquish the “keep-the-words-flowing” mind-set of the writer and take up the “does-this-make-sense” mind-set of an editor. Read the manuscript through from beginning to end without stopping. Get a sense of how well the manuscript communicates what you want readers to know. Keep your eyes and mind moving. Don’t look for, mark, or repair flaws, but try for a general sense of which parts of the manuscript need editorial work.

Markup

Now work your way through the draft paragraph by paragraph. Mark faults that affect the manuscript’s unity and sense of purpose. Make liberal use of notes and comments to guide yourself through revision:

- Mark material that seems tangential or digressive.
- Mark locations where transitions are weak or nonexistent.
- Mark ideas that seem vague and do not flow naturally from what precedes them.
- Mark ideas that seem to be getting too much or too little emphasis.
- Bracket material that seems out of place. If you have a sense of where to relocate the material, indicate the new location with a marginal note.
- Add missing headings and subheadings.

Don’t fret about minor faults (word choice, sentence structure, and the like). Minor faults that you repair during markup may be removed when you get to revision.

When you finish markup, the draft may look a mess, but you have a guide that will save you time and misery when you revise.

Revision

Now work through the marked-up manuscript. Delete, rewrite, relocate, and revise according to the markup. Expect to do a lot of cutting. Writers usually include more in a first draft than is needed to communicate what they have to say. Minor points the writer knows well get attention whereas major points the writer is less familiar with are neglected. Sometimes an idea seems so compelling that the writer works it in, even though it has little to do with the point of the paper. The free-ranging writer’s mind sometimes leads writers on “oh that reminds me” excursions away from the story they should be telling. First drafts almost always are cluttered with verbal brush piles that need clearing.

Move out-of-place material to a location that suits your purpose and that makes sense to readers. Clarify vague ideas. Prop up underspecified ideas, and move overspecified ones further into the background. Strengthen weak transitions. Cut material that is not necessary. If you cannot bear to hit the “delete” button, then cut the material, paste it to the end of the document, and label it as “not used.” Unless it is a true treasure, you will find it easy to delete later. Don’t edit sentences, change punctuation, or correct spelling errors. That’s copy editing.

Keep moving. The draft you create from the marked-up first draft will not be the final draft, so don’t work for perfection. Work for a draft that is shorter, better organized, and more readable than the first draft—a draft that you will review,

revise, and edit to bring it closer to a final draft. You don't have to get it right the first time (or the second, or the third).

Don't skimp on content editing. Keep at it until you are satisfied with the organization, readability, and logical integrity of the manuscript. That usually requires several cycles of review and revision. When you are satisfied, print it out (double-spaced, with wide margins) and put it away for a day or two to clear your mind of the thoughts that were there as you edited content. When you next take up the manuscript, you will be looking at the draft with the eyes of a copy editor.

editor for mark-up, and an author for revision.

- Review the organization, purpose, completeness, emphasis, and directness.
- Mark up places where the arguments are tangential, vague, or out of place.
- Take a break: Call your mother. Good content editing takes time.
- Revise by deleting, rewording, or moving ideas that you highlighted during markup.

Guidelines for Content Editing

- Change your mind-set to match the task at hand: a reader for review, an

Reference

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