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978-0-521-69927-3 - Successful Scientific Writing: A Step-by-Step Guide for the Biological and Medical Sciences, Third Edition

Janice R. Matthews and Robert W. Matthews

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## Successful Scientific Writing

The detailed, practical, step-by-step advice in this user-friendly guide will help students and researchers to communicate their work more effectively through the written word. Covering all aspects of the writing process, this concise, accessible resource is critically acclaimed, well-structured, comprehensive, and entertaining. Self-help exercises and abundant examples from actual typescripts draw on the authors' extensive experience working both as researchers and with them.

Whilst retaining the accessible and pragmatic style of earlier editions, this third edition has been updated and broadened to incorporate such timely topics as guidelines for successful international publication, ethical and legal issues including plagiarism and falsified data, electronic publication, and text-based talks and poster presentations.

With advice applicable to many writing contexts in the majority of scientific disciplines, this book is a powerful tool for improving individual skills and an eminently suitable text for classroom courses or seminars.

JANICE R. MATTHEWS is a writer and educator with a broad background in the biological sciences. She has edited books, technical manuals and hundreds of scientific research papers in the veterinary and biological sciences, both in university settings and for private industry.

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# Successful Scientific Writing

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for the biological  
and medical sciences

**Third edition**

Janice R. Matthews and  
Robert W. Matthews



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Frontmatter

[More information](#)

## Contents

<i>Preface</i>	<i>page</i> ix
<i>Preface to the third edition</i>	x
<b>1 PREPARING TO WRITE</b>	<b>1–30</b>
<b>Search and research</b>	<b>1</b>
Conducting a comprehensive literature review	
Using the Internet wisely and well	
Tapping other informal and formal communication channels	
Your research: the big picture	
<b>Choose a communication venue</b>	<b>13</b>
Formal publication: the message determines the medium	
Other ways to publish	
<b>Plan to succeed</b>	<b>21</b>
Organize and plan your message	
Avoid plagiarism	
Use the Process Approach to take charge	
Exercise 1.1. Search strategy and Boolean logic	
Exercise 1.2. Message, format, and audience	
Exercise 1.3. Organizing ideas	
<b>2 COMPOSING A FIRST DRAFT</b>	<b>31–55</b>
<b>Deal with matters of authorship</b>	<b>31</b>
<b>Productivity tools and pitfalls</b>	<b>33</b>
Use word processing to write more efficiently	
Master the tools that will make your writing life simpler	
Spellcheckers, grammar and style analysis programs	
<b>Follow standard structure</b>	<b>42</b>
Introduction	
Materials and methods	
Results	
Discussion and conclusions	

vi	Contents	
	Acknowledgments	
	References	
	Abstracts and summaries	
	The title	
	Other title page items	
	<b>Use tense to show the status of work</b>	48
	<b>Build momentum – and keep it!</b>	50
	Exercise 2.1. Spelling and grammar programs	
	Exercise 2.2. Title choices	
	Exercise 2.3. Tense use	
3	<b>VISUAL SUPPORT FOR THE WRITTEN WORD</b>	56–78
	<b>Choosing and using visual aids</b>	56
	Tables	
	Figures	
	Graphs	
	Photographs and other documentary illustrations	
	Explanatory artwork	
	<b>Examining your choices</b>	75
	Exercise 3.1. Table and figure choices	
4	<b>VISUAL SUPPORT FOR THE SPOKEN WORD</b>	79–102
	<b>Oral presentations</b>	80
	Media choices for oral presentations	
	Developing a traditional text-based oral presentation	
	Visual elements of text, tables, and figures	
	The PowerPoint controversy	
	<b>Speaking in public: the human factor</b>	91
	Control nervousness	
	Delivering the speech or presentation	
	Handling questions	
	<b>Poster presentations: a happy hybrid</b>	97
	Preparing a poster	
	Presenting a poster	
	Exercise 4.1. Slide presentation format	
	Exercise 4.2. Answering questions	
5	<b>REVISING TO INCREASE COHERENCE</b>	103–124
	<b>Work efficiently</b>	103
	Start with organization and logic	
	Use the power at your command	
	<b>Improve the big picture</b>	105
	Rework for clarity	
	Rewrite for readability	
	Condense for brevity	

Cambridge University Press

978-0-521-69927-3 - Successful Scientific Writing: A Step-by-Step Guide for the Biological and Medical Sciences, Third Edition

Janice R. Matthews and Robert W. Matthews

Frontmatter

[More information](#)

Contents	vii
<b>When short might be too short</b>	118
Abbreviations, acronyms, and other shortened forms	
Noun clusters and strings of pearls	
Exercise 5.1. Person and point of view	
Exercise 5.2. Readability	
Exercise 5.3. Shortened forms	
Exercise 5.4. Clarity and brevity	
<b>6 IMPROVING WORD CHOICE, AND SYNTAX STYLE</b>	125–152
<b>Choose a better word</b>	126
Recognize and minimize jargon	
Use bias-free, inclusive language	
Choose the right word	
Focus fuzzy nouns and qualifiers	
<b>Check the verbs</b>	139
Choose livelier verbs	
Unmask disguised verbs	
Active and passive voice	
Subject–verb agreement	
<b>Beware of strange links</b>	145
Ambiguous antecedents and misplaced modifiers	
Dangling participles	
<b>The mischief of multiples</b>	148
Collective nouns and noun phrases	
The grammar of comparisons and lists	
Exercise 6.1. Jargon	
Exercise 6.2. Handling language sensitively	
Exercise 6.3. Devil pairs	
Exercise 6.4. Which and that	
Exercise 6.5. Fuzzy words and disguised verbs	
Exercise 6.6. Active and passive voice	
Exercise 6.7. Subject–verb agreement	
Exercise 6.8. Dangling participles and other misplaced modifiers	
Exercise 6.9. Collective nouns, comparisons, and lists	
<b>7 ATTENDING TO GRAMMAR, NUMBERS, AND OTHER MECHANICS</b>	153–181
<b>Tweak the text</b>	153
Punctuate for clarity	
Capitalize consistently	
Treat scientific names properly	
Use foreign words and phrases to inform, not impress	

Cambridge University Press

978-0-521-69927-3 - Successful Scientific Writing: A Step-by-Step Guide for the Biological and Medical Sciences, Third Edition

Janice R. Matthews and Robert W. Matthews

Frontmatter

[More information](#)

viii	Contents	
	<b>Fine-tune number use</b>	170
	Numerals versus written numbers	
	The SI metric system for measurements and weights	
	Very large and very small numbers	
	Percentages	
	<b>Practicing mixed corrections</b>	179
	Exercise 7.1. Punctuation	
	Exercise 7.2. Capitalization	
	Exercise 7.3. Scientific names and other foreign words and phrases	
	Exercise 7.4. Number use and interpretation	
	Exercise 7.5. Practicing mixed corrections	
8	THE REST OF THE STORY	182–208
	<b>Preparing to publish</b>	182
	Double-check references and attributions	
	Verify submission format	
	Submit the document	
	Remember Murphy's Laws	
	<b>Back and forth: editorial review</b>	188
	Correct galley proof conscientiously	
	Celebrate – You have published!	
	<b>Tips for international publication</b>	192
	Address second-language English readers effectively	
	Choose an effective approach when writing English as a second language	
	Usage and grammar pitfalls for nonnative writers	
	<b>Ethical issues</b>	198
	Respect your data – and your readers	
	Check again for plagiarism	
	Protect yourself from potential libel and slander charges	
	<b>Legal matters</b>	202
	Trade names	
	Copyright	
	Permissions	
	Patents	
	<i>Appendix 1: Suggested responses to exercises</i>	209
	<i>Appendix 2: Excerpts from “Uniform requirements for manuscripts submitted to biomedical journals: Writing and editing for biomedical publication”</i>	221
	<i>Selected resources</i>	232
	<i>Index</i>	236

Cambridge University Press  
978-0-521-69927-3 - Successful Scientific Writing: A Step-by-Step Guide for the Biological and  
Medical Sciences, Third Edition  
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Frontmatter  
[More information](#)

---

## Preface

Times change. Today the need to communicate science information effectively is perhaps more important than it has ever been, but the past decade has witnessed a significant revolution in the manner in which we gather, process, and communicate information. The twin technologies of the Internet and personal computers have changed the way nearly everyone works (and plays).

In keeping with the spirit of change, we have extensively revised, updated, and reorganized this third edition. Whether you are a first time author/speaker or a seasoned professional in the biological or medical sciences, we hope you find this step-by-step manual useful.

Because our preface message to you in the second edition still rings true for us, we are including it here as well. Enjoy.

JRM  
RWM  
2007

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Frontmatter

[More information](#)

## Preface to the second edition

Mend your speech a little, lest it mar your fortune.

– *Shakespeare*

The catch phrase “Publish or Perish” – or its more upbeat variant, “Publish and Flourish” – seems to have as much validity as ever in the minds of scientists everywhere. The scientific community has long emphasized quantity and quality of scholarly publications as a way to judge the eminence of scientists. Granting agencies appear to do the same. Scores received by renewal applications for National Institutes of Health funding for research in universities and hospitals have been shown to correlate very strongly with the number of publications resulting from NIH grants. Perhaps it is not surprising that the publication rate of scientific information doubles about every 12 years (Stix, 1994), although few of us will be likely to match the output of a Russian chemist whose scientific productivity over 10 years totaled 948 papers, or about one publication every four days!

All this writing . . . Does it really make any difference whether it is good, bad, or ugly? We believe it does, and that it matters a great deal, for words are tools of science no less than numbers are. Research is not complete until it is communicated, and publication in a refereed journal is the fundamental unit of scientific communication. The decision not only to write, but to make the effort to write well, lies at the heart of scientific literacy. To most minds, sloppy scientific writing indicates sloppy thinking, and both are disastrous to research and research reporting.

The published word has remarkable persistence. A sloppily written or prematurely published paper can haunt a scientist to the end of his or her days. Over 30 years ago, an examination of the reasons why research grant applications were turned down showed that 12% of the rejected proposals were not approved because the investigators’ previously published work did not inspire confidence. Despite vast technological advances, there is no reason to expect that scientific writing is any less important today.

Still, we never set out to be writers. Few scientists do. During our graduate training, we learned about statistics, research, experimentation; we were taught to use instruments and techniques we have seldom encountered again. There

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Frontmatter

[More information](#)

was never a word of guidance on writing a scientific paper, nor did we notice that this instruction was missing . . . at first. Once our working lives began we quickly learned that while a plumber can make a comfortable living without writing about his pipes, a scientist's career is inextricably enmeshed with (some would say enslaved by) the need to write. So, like most scientists, we have stumbled along, learning writing skills by trial and error – now and then helped along by a benevolent senior faculty member or a friendly colleague.

Now, as a new millennium begins, we find we have become that senior faculty member and, hopefully, those friendly colleagues as well. This guidebook is one outcome. Its goals are to help you to write effectively and efficiently, just as we would if we could meet with you in person. Because it forms such a major part of almost every scientist's written communication, the research article in a biological, medical, or veterinary medical journal is the book's main focus. However, the tips, techniques, and guidelines presented here apply to a variety of other writing contexts, from review articles to the popular press.

The first edition of *Successful Scientific Writing* began as a brief manual requested by graduate students and new researchers affiliated with the University of Georgia's College of Veterinary Medicine, and their colleagues in human medicine and the biological sciences. This edition has been reorganized and expanded to offer increased guidance, additional examples, and more hands-on exercises.

When you picked up this book, did you fear that it would center on split infinitives, case and tense, and other matters that sound only too much like English composition class? They will be covered – but we promise this won't be grammar class revisited. We do not aspire to present you with a comprehensive reference work or stylebook, chock-full of detailed grammatical and stylistic rules and obscure exceptions to them. Where such specialized information might be desirable, we try instead to point you toward relevant resources.

Efficiency and effectiveness include far more than wordsmithing. While good writing seems synonymous with a great deal of revising, rereading, and polishing, we believe that effective scientific writing is not as difficult to accomplish as many people try to make it. We hope to show you how to develop a strong organizational framework for both the task and the document, how to access the literature more effectively, and how to tailor your approach to your individual style. We have shared a potpourri of techniques which have been useful in our own writing – covering aspects as varied as overcoming writer's block, using word processors, and constructing tables and graphs. To illustrate the guidelines and suggestions, we have provided abundant examples and exercises, many of which are based upon actual manuscripts slated for publication in scientific journals in the biological and medical sciences.

Our scientific community is rapidly becoming an international one, and English is becoming a truly global language. New sections in this edition cover using the Internet and email, and special tips when writers and readers have different first languages. Because we are most accustomed to American spelling, grammar, abbreviations, and punctuation, we have usually followed American

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Frontmatter

[More information](#)

---

xii Preface

conventions in these matters. However, we have tried to point out British equivalents or alternatives whenever possible.

Any book can only do so much, especially in as personal an area as writing. Learning to write skillfully is, always has been, and must continue to be a hands-on experience. However, it needn't be the random, slow, haphazard process that typically occurs in academic circles. Whether you use this book as an alternative to a formal course in science communication or to complement such a course, we hope that you will find that studying and applying this material increases your awareness of scientific writing style. Our goal is to help ease your approach to the writing that your chosen profession in the sciences will invariably call upon you to do.

J. R. M.  
J. M. B.  
R. W. M.