
John Blackwell
Jan Martin

A Scientific Approach to Scientific Writing

 Springer

A Scientific Approach to Scientific Writing

John Blackwell · Jan Martin

A Scientific Approach to Scientific Writing

 Springer

John Blackwell
Sees-editing Ltd
Weston-super-mare, BS23 2JU, UK
jrb@sees-editing.co.uk

Jan Martin
Sayer-Martin Ltd
Aberaeron, SA46 0HS, UK
drjan.martin@virgin.net

ISBN 978-1-4419-9787-6

e-ISBN 978-1-4419-9788-3

DOI 10.1007/978-1-4419-9788-3

Springer New York Dordrecht Heidelberg London

Library of Congress Control Number: 2011926358

© Springer Science+Business Media, LLC 2011

All rights reserved. This work may not be translated or copied in whole or in part without the written permission of the publisher (Springer Science+Business Media, LLC, 233 Spring Street, New York, NY 10013, USA), except for brief excerpts in connection with reviews or scholarly analysis. Use in connection with any form of information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed is forbidden.

The use in this publication of trade names, trademarks, service marks, and similar terms, even if they are not identified as such, is not to be taken as an expression of opinion as to whether or not they are subject to proprietary rights.

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Acknowledgements

This book would probably not have been written without suggestions and encouragement by Jianquan Liu (Professor of Molecular Ecology, Lanzhou University, China) and Xuxia Zhao (International Coordinator, Northwest Institute of Plateau Biology, Chinese Academy of Sciences). In addition, valuable comments have been made at various points in its writing by Dr. David Blackwell (Organic Chemistry, Cambridge), Elena Conti (Professor of Systematic Botany, University of Zürich, Switzerland), Prof. Anna Linusson (Department of Chemistry, Umeå University, Sweden), Prof. Thomas Moritz (Head of Department of Forest Genetics and Plant Physiology, SLU, Sweden), Prof. Michal Otyepka (Head of Department of Physical Chemistry, Palacky University, Czech Republic), Prof. Göran Sandberg (Executive Director, Knut and Alice Wallenberg Foundation, Sweden), Dr. Johan Sandberg (Department of Informatics, Umeå University, Sweden), Prof. Ian Scott (IBERS, Aberystwyth University, UK), Prof. Bo Strandberg (Sahlgrenska Academy at University of Gothenburg), Dr. Jan-Olov Weslien (Skogforsk, Sweden) and Prof. Mike Young (IBERS, Aberystwyth University, UK).

Thanks are also due to Joëlle Hoggan, Jon Sayer and Eveline Forrest (Forrest Text) for their help at various stages of writing this book.

Contents

- 1 Maximizing Chances of Publication 1
- 2 Essential Steps Before Writing a Paper 3
 - 2.1 Gather Your Notes 3
 - 2.2 Find Somewhere Quiet 3
 - 2.3 *Selectively* Review the Literature 4
 - 2.4 Identify a Target Journal 5
 - 2.5 Awareness of Linguistic Limitations 6
 - 2.6 Defining and Delimiting ‘the Study’ 8
 - References 11
- 3 Drafting Papers 13
 - 3.1 Arranging the Information 13
 - 3.2 The *Title* and *Abstract* 14
 - 3.2.1 Hypothetical Case Study 1 15
 - 3.2.2 Hypothetical Case Study 2 18
 - 3.3 The *Introduction* 19
 - 3.3.1 Hypothetical Case Study 1 20
 - 3.3.2 Hypothetical Case Study 2 22
 - 3.4 The *Materials & Methods* Section 26
 - 3.4.1 Hypothetical Case Study 1 28
 - 3.4.2 Hypothetical Case Study 2 28
 - 3.5 The *Results* Section 30
 - 3.5.1 Hypothetical Case Study 1 30
 - 3.5.2 Hypothetical Case Study 2 31
 - 3.6 The *Discussion* and *Conclusion(s)* 31
 - 3.6.1 Combined Results & Discussion Sections 34
 - 3.6.2 Further Reminders of Novelty 36
 - 3.7 Anomalies 36
 - 3.8 A Strategy for Dealing with Major Limitations 38
 - 3.9 Figures and Tables 39
 - 3.10 Reference Formatting Systems 41
 - References 42

4	Complex Studies	43
4.1	Hypothetical Case Study 3	43
4.1.1	The Rationale, Objectives and Findings	45
4.1.2	Title and Abstract	47
4.1.3	Introduction	47
4.1.4	Materials & Methods	50
4.1.5	Results	51
4.1.6	Discussion	51
4.1.7	Conclusion	52
4.2	Hypothetical Case Study 4	53
4.2.1	The Rationale, Objectives and Findings	55
4.2.2	Title and Abstract	56
4.2.3	Introduction	57
4.2.4	Materials & Methods	59
4.2.5	Results	59
4.2.6	Discussion	60
4.2.7	Conclusion(s)	61
4.2.8	Incorporated Sub-headings	62
5	Linguistic Points	63
5.1	Jargon	63
5.2	Tenses	64
5.3	Active and Passive Voices	67
5.3.1	Practical Considerations	72
5.4	Unnecessary 'Weak' Verbs	72
5.5	Narrative Flow and Coherent Arguments	72
5.5.1	The Overall Paper	73
5.5.2	Sections of Papers	73
5.5.3	Paragraphs and Sentences	74
5.6	Plagiarism and Acceptable Uses of Other Authors' Works	75
	References	76
6	Covering Letters and Referees' Objections	77
6.1	The Covering Letter	77
6.1.1	Hypothetical Case Study 1	78
6.1.2	Hypothetical Case Study 2	78
6.2	The Review Process	79
6.3	Anticipating Objections	81
6.3.1	Anticipating Objections While Planning a Study	81
6.3.2	Anticipating Objections While Executing a Study	81
6.3.3	Anticipating Objections While Preparing and Writing a Paper	82
6.3.4	Anticipating Objections After Submitting a Paper	83
6.4	After Receiving the Editor's Decision	84
6.4.1	Acceptance Without Revision	84
6.4.2	Acceptance with Minor Revisions	85

6.4.3	Acceptance with Major Revisions	86
6.4.4	Outright Rejection	93
	References	94
7	Other Kinds of Written Scientific Communication	95
7.1	Electronic Communications	95
7.2	Other Communications	98
7.3	Reviews	98
	References	103
8	Summary	105
	Subject Index	107

Chapter 1

Maximizing Chances of Publication

In the modern world, every scientist who wants to publish findings in an international, peer-reviewed journal must write in English. This can be very challenging for people who are not native speakers of English. Indeed, it can be challenging for people who *are* native speakers. However, whether you are writing papers in your first or any other language, the process can be greatly facilitated by approaching it in a logical, systematic manner.

The authors of this guide have written, re-written or edited more than 4,000 texts of diverse kinds and (together with numerous friends, colleagues and clients who have commented on various drafts) have substantial experience of both writing papers and the problems encountered by people who are learning to write them, in either their first or other languages. This brief guide is intended to help people tackle these problems, using four increasingly complex hypothetical case studies. The book focuses on writing research papers because they are key outputs for scientists seeking a high-profile career and the main elements of the primary literature. However, as discussed in [Chapter 7](#), the outlined systematic approach can be applied when writing other kinds of presentations (e.g., reports, reviews and oral presentations).

It is impossible to describe how to write anything without considering some linguistic aspects. Here, we address aspects we believe to be critical for structuring a paper, but it is assumed that readers will have had many years of English education; hence attempting to add significantly to your knowledge of the language would be pointless. Furthermore, there are many good books on English grammar, for people of all ages. We are not intending to add to their number. Instead, the main aim is *to show you ways to arrange, compose and present a study*, starting from brief, simple statements, in order to *maximize the chances of publication*.

There are several ways to do this. The most effective way of all is to buy the company that owns the target journal. Then you can publish all of your papers, and those of your friends and colleagues, in it. The problems with this strategy are that it is very expensive and there is a risk that the quality, and hence the impact rating, of the journal will decline. The second strategy is to discover an embarrassing secret about the journal's editor and apply blackmail. The problems with this approach are that it is difficult and immoral. The third option is to describe the problems/phenomena

you have addressed, your results and their implications clearly and concisely. This is the approach that can be most easily adopted by the majority of readers and the one that will be considered here.

As discussed in [Chapter 6](#), however brilliant or innovative your study may be, there is no guarantee that it will be accepted by the target journal. However, presenting your study clearly and coherently greatly improves the chances of acceptance. Furthermore, *writing papers is simple*. Essentially, all that you need to do is this: Describe what you have done and why you have done it, outline the results and limitations (or *focus*) of the study, discuss the implications of the findings and highlight their importance.

The problem is that this has to be done:

- clearly and concisely
- while covering all the key points and showing that your study is very important
- and in a foreign language, if you are writing in English and you are not a native English speaker.

As noted before, currently, if one wants to publish papers in international, peer-reviewed journals, they must be written in English. *This is clearly unfair* and may change in the future. Indeed, as China's economic power grows, it is quite possible that in a few decades everyone will have to write in Chinese. However, at the moment all scientists who want a successful career have to write in English. Thus, the objective of this book is to present a coherent, systematic strategy that can help both native and non-native English speakers to construct, write and publish papers, and other kinds of scientific communications, in English.

Chapter 2

Essential Steps Before Writing a Paper

Having completed a study and acquired all the data required to present it, you are ready to begin preparing a paper. However, before beginning to write, you have to take several critical preliminary steps: Your notes must be gathered, a suitable place for writing must be found, a selective literature review may be helpful, a target journal must be identified, linguistic limitations must be recognized, the study must be defined and delimited, and the information must be arranged. Failure to take these steps will make writing more difficult and seriously compromise the chances of publication. Therefore, this chapter outlines what needs to be done in each of these steps.

2.1 Gather Your Notes

Writing a paper can be greatly facilitated by keeping good notes during the study phase. A comprehensive laboratory or field notebook (either electronic or handwritten) is a valuable resource when you finally sit down to write your paper. It is easy, during data collection, to assume that you will be able to remember why or how you did things. Unfortunately, when you begin to write up your work, several months or even years later, you are likely to find it difficult to recall details. Keeping thorough notes as you proceed, supported by other sources of information such as sketches or photographs, can alleviate a great deal of stress in the latter stages of your study. Of course, it is not only essential to keep good notes, it is also essential to use them. Thus, before sitting down to write, all the relevant notes must be gathered.

2.2 Find Somewhere Quiet

Having gathered your notes, it is essential to find somewhere peaceful to write, or at least somewhere where disturbances are minimal, because writing well requires intense concentration. Ideally, one should find a quiet room and pin a 'Do not disturb' note on the door while arranging the material and writing. Supervisors can help by refraining from demanding to see how the work is progressing every few

minutes. Supervisors have many ways to make students' and post-doctoral workers' lives miserable if they wish, but constantly disturbing them when they are writing is particularly unhelpful; it reduces the quality of the output, thus impairing the chances of publication. On the other hand, an inexperienced writer will need help. Hence, setting a good balance between providing helpful advice and interfering too much is an important 'soft skill'.

2.3 *Selectively* Review the Literature

It is vital to review the relevant literature, to ensure that no important observations that either support your findings or contradict them have been missed. Failure to mention such references will create a poor impression and may seriously impair the chances of publication (especially if you miss publications by one or more of the referees). Thus, it is essential to search all of the relevant databases, such as CAB Abstracts (<http://cababstracts.edina.ac.uk>) and ISI Web of KnowledgeSM (<http://apps.isiknowledge.com>), using all of the potentially relevant keywords. The websites of these databases themselves, and a number of books and other web sources (e.g., Harvard College Library's site; <http://hcl.harvard.edu/research/guides/citationindex/> accessed September 5, 2010), describe ways to search these databases.

However, you can only tell what fields of literature you need to scan when you know precisely what each section of a planned paper is going to cover, and thus the *kinds* of references you need to cite. Otherwise much time could be wasted reading material that is only tangentially related to your study. For instance, if you tried to read every report that has ever been written on over-fertilization of every type of soil, supporting every crop, and all the associated problems, you would never stop reading.

Furthermore, a detailed review of the literature before drafting a paper can be counter-productive, since nearly all of the papers that *could* be read will have some sections that are relevant to your study, but also many sections that have little relevance. Reading such papers can be seriously distracting because they will present many ideas that you may start to think should perhaps be mentioned, complicating rather than helping attempts to draft a clear, coherent framework. In addition, you are likely to be an expert in the subject (otherwise you would not have been able to plan and execute the work) and you should already have good knowledge of the pertinent literature. Therefore, it is generally better to draft your paper first, and *then* identify the aspects of the literature that you can *selectively* focus on. Hence, we recommend restricting any literature survey, at this stage, to at most a couple of recent reviews to refresh your memory about key aspects of the subject that may need to be covered, jotting down brief details of references that *could* be cited. However, even this is optional until the framework of the paper has been drafted.

Ways of identifying references that *need* to be cited while drafting the framework are described in detail later, but here we will mention that key steps in writing