

Panel on Writing Mathematical Papers

(with a special focus on Statistics)

P. Lafaye de Micheaux¹

¹School of Mathematics and Statistics
UNSW Sydney

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Outline of the talk

Introduction

Why bother writing?

Structure

Style

Advice

Introduction

Aim of this talk is to :

- | give you basic ideas on what is an article in a scientific journal (particularly in Statistics)
- | how to write an article

Why bother writing ?

- | research is useful only if it is communicated to others
 - | orally in conferences or seminars (fast but ephemeral)
 - | written in a scientific journal (permanent)

New research is built on previous one, that has been authenticated as original and important.

Choice of a journal

- | There exists many statistical journals <http://web.maths.unsw.edu.au/~lafaye/alfjourn.html>
- | Each one has a different readership in mind

Ideally, you should choose the journal before writing. Always have in mind who you are writing to.

Structure of an article in statistics

In Statistics, structure is usually as follows :

1. Title (short, punchy, meaningful, informative)
2. Abstract + keywords
3. Introduction
4. Description of the problem
5. Solution to the problem and proof
6. Exemple(s)
7. Simulations
8. Discussion and/or conclusion
9. Acknowledgments (thanks, grants)
10. References
11. Appendix

The introduction

The introduction is crucial. Several readers will only read that. Some of them might read the rest of the paper, if the introduction is good enough. It should contain :

1. description of the problem studied
2. explicit description of your model
3. motivate your approach to solve the problem (e.g., originality)
4. perform a literature review : cite articles that are important (e.g., in “big” journals), recent (conveys the impression that the research is important now), researchers you know personally (they might referee your paper)
5. brief description of the content of the other sections (e.g., In Section 2, we ...)

Try to tell a (logical) story.

Section 2

Here you go into the details. Give the main results, theorems. Lengthy or complicated proofs are usually postponed to the Appendix.

Simulations

Give the name(s) of the software used, including version number (e.g., R version 3.5.1). Give the platform (PC, cluster), the OS (Linux, Mac, Windows). Give indications about computing time.

Compare your findings to the main competitors, focusing on what is better for your approach. Provide a complete and well documented code that enable a total reproducibility of your results (use seeds).

Use tables or graphs. Comment the main results of the simulation.

Style of an article

Our time is precious. This is not a novel. Be concise, clear, accurate, simple. Write very short sentences (one idea = one sentence). Back up each one of your claim with a reference or a clear explanation. Do not use emotional adjectives.

Advice

- | Use/download a nice \LaTeX template.
- | Use good tools (\LaTeX , Beamer).
- | Read (recent) papers from the journal where you plan to submit.
- | Start writing something.
- | Start with writing the titles of each section, i.e., a detailed outline.
- | Write a few sentences in each saying what you will put in each section.
- | Re ne.



Brown, G. (1986).
The Teaching of Mathematics : Writing
Mathematical Dialogues.
Amer. Math. Monthly, 93(4) :296–298.



Daepf, U. and Gorkin, P. (2011).
Reading, writing, and proving.
Undergraduate Texts in Mathematics. Springer,
New York.
A closer look at mathematics, Second edition [of
MR1997305].



Derntl, M. (2014).
Basics of research paper writing and publishing.
Int. J. Technol. Enhanc. Learn., 6(2) :105–123.



Ehrenberg, A. S. (1982).
Writing technical papers or reports.
The American Statistician, 36(4) :326–329.



Gastel, B. and Day, R. A. (2016).
How to Write and Publish a Scientific Paper .
Greenwood, eighth edition edition.



Gelman, A., Pasarica, C., and Dodhia, R. (2002).

Let's practice what we preach.
The American Statistician, 56(2) :121–130.



Gillman, L. (1987).
Writing Mathematics Well, A Manual for Authors.



Mathematical Association of America.
Higham, N. J. (1998).
Handbook of Writing for the Mathematical
Sciences.
SIAM, second edition edition.



Kane, J. M. (2016).
Writing proofs in analysis.
Springer, [Cham].



Knuth, D. E., Larrabee, T., and Roberts, P. M. (1989).
Mathematical Writing.
Mathematical Association of America,
Washington, DC, USA.



Krantz, S. G. (1998).
A Primer of Mathematical Writing, Being a
Disquisition on Having Your Ideas Recorded,
Typeset, Published, Read, and Appreciated.

American Mathematical Society.

Krantz, S. G. (2000).

Handbook of Typography for the Mathematical Sciences.

CRC Press, Inc., Boca Raton, FL, USA.

Maddox, R. B. (2002).

Mathematical Thinking and Writing, A Transition to Abstract Mathematics.

Academic Press.

Marron, J. S. (1999).

Effective writing in mathematical statistics.

Statistica Neerlandica, 53(1) :68–75.

Miller, J. E. (2006).

How to communicate statistical findings : an expository writing approach.

Chance, 19(4) :43–49.

Miller, J. E. (2013).

The Chicago guide to writing about multivariate analysis.

Chicago Guides to Writing, Editing, and Publishing. University of Chicago Press, Chicago, IL.

Second edition [MR2195180].

Petard, H. (1966).

Mathematical Education Notes : A Brief Dictionary of Phrases Used in Mathematical Writing.

Amer. Math. Monthly, 73(2) :196–197.

Sundstrom, T. (2014).

Mathematical Reasoning : Writing and Proof.

CreateSpace Independent Publishing Platform.

Trzeciak, J. (1993).

Writing Mathematical Papers in English, A Practical Guide.

Gdanskie Wydawnictwo Osviatowe.

Vivaldi, F. (2011).

Mathematical Writing, An Undergraduate Course.

Queen Mary, University of London.