

Good scientific writing: a means to an end

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Background

- ⑨ Biology undergraduate from Washington University in St. Louis, 1984; undergraduate research began in 1982.
- ⑨ Medical School 1985-86
- ⑨ Work in research lab at Wash U on ribosomal RNA processing, 1986-89
- ⑨ PhD program in philosophy and full-time research associate in *Drosophila* genetics at Columbia University, New York City, 1990-96
- ⑨ PhD program in microbiology at Columbia University School of Medicine, 1996-1999
- ⑨ Postdoctoral fellowship in immunology at Washington University School of Medicine, St. Louis, 2000-2004
- ⑨ Editor at *Nature Immunology*, 2005-2009
- ⑨ Director and Editor-in-Chief, *Annals*, 2009-

Nature Research Journals

⑨	<i>Nature Genetics</i>	1992
⑨	<i>Nature Struct & Molec Biology</i>	1994
⑨	<i>Nature Medicine</i>	1995
⑨	<i>Nature Biotechnology</i>	1996
⑨	<i>Nature Neuroscience</i>	1998
⑨	<i>Nature Cell Biology</i>	1999
⑨	<i>Nature Immunology</i>	2000
⑨	<i>Nature Materials</i>	2002
⑨	<i>Nature Methods</i>	2004
⑨	<i>Nature Chemical Biology</i>	2005
⑨	<i>Nature Physics</i>	2005
⑨	<i>Nature Nanotechnology</i>	2006
⑨	<i>Nature Protocols</i>	2006
⑨	<i>Nature Photonics</i>	2007
⑨	<i>Nature Geoscience</i>	2008

The New York Academy of Sciences



- 1817: Samuel Mitchill founds NYAS
- 1823: First *Annals* is published
- 1831: Members help found NYU
- 1868: Members help found AMNH
- 1909: Darwin centennial symposium
- 1946: 1st conference on antibiotics
- 1948: 1st NYC HS science fair
- 1972: Landmark Women in Science meeting
- 1983: 1st conference on AIDS
- 2003: 1st multidisciplinary SARS meeting



Vision and Mission of the NYAS

Vision

Creating a global community of science for the benefit of humanity.

Mission

- ⑨ Advances scientific knowledge,
- ⑨ Helps resolve science-based global challenges,
- ⑨ Increases the number of scientifically informed individuals.

How We Do It

Convening • Disseminating • Mentoring • Partnering

Annals of the New York Academy of Sciences

- ⑨ Oldest continuously published scientific serial in US (1823); publish 32 volumes per year.
- ⑨ Conference proceedings, annual reviews and selected topical collections
- ⑨ Available in >5,000 research libraries worldwide; >1 million full-text downloads annually
- ⑨ Published for NYAS by Wiley-Blackwell; *Annals* is the 4th most active title on the Wiley Interscience website

Disseminate

Trans-Disciplinary

Biology
Medicine
Chemistry
Physics
Engineering
Math
Social Sciences

Trans-Institutional

Rockefeller
Columbia
Cornell
NYU
CSHL
Princeton
And many others

NYAS



Trans-National

NYC/NYS/US
Americas
Europe
Asia
Africa

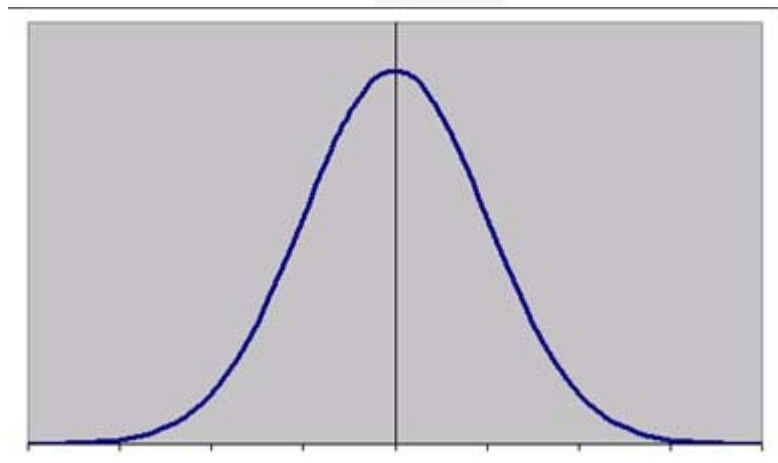
Trans-Sectoral

Science
Medicine
Government
Law
Finance
The Arts

Scientific writing

Some truths about 'good writing'

- ⑨ Not all great papers are written well.
- ⑨ Some of the best written papers are not the best scientific works.
- ⑨ A lot depends on what you have to say....
- ⑨ Good writing matters most to most of us:



Bad paper

Great paper

Why does good writing matter?

- ⑨ After all, science is about facts in the world.
- ⑨ ‘Good’ writing is an aesthetic value.
- ⑨ People—living, breathing people—have to read and evaluate your work.
- ⑨ For manuscript publishing and obtaining grants, this means you have to *please* your readers!

What do good journals look for?

- ⑨ Experimentally sound; well-controlled; formal demonstration of thesis
- ⑨ Significant step forward
- ⑨ Impact on the field
- ⑨ New direction for further research

Elements of a strong grant/manuscript

- ⑨ Clear presentation
- ⑨ Convey why the reader should care
- ⑨ Well-controlled data
- ⑨ Rule out alternative explanations
 - hypothesis testing
- ⑨ Do not over-interpret the data
- ⑨ Discussion puts paper in perspective
- ⑨ Data are a significant step forward,
with implications beyond immediate question

Important things to consider when preparing a grant/manuscript

- ⑨ Consult guidelines of the journal/grant agency!

- ⑨ Be succinct but informative
 - Story is logically conveyed
 - One concept per paragraph
 - Write with the novice and the expert in mind

- ⑨ Represent your data realistically; do not over-interpret
 - Place study and results in context
 - Develop implications and discuss possible future experiments

Adhere strictly to guidelines!

ORIGINAL RESEARCH

(1) Reports

Word Limit: 2,000 words excluding references, tables, and figures

Abstract: no abstract required, however, manuscript should include an introduction not to exceed 75 words

References: 30 maximum, Figures/Tables: 3 maximum

Substantial novel research

(2) Communications

Word Limit: 1,500 words excluding references, tables, and figures

Abstract: no abstract required, however, manuscript should include an introduction not to exceed 75 words

References: 20 maximum, Figures/Tables: 3 maximum

Substantial novel research

(3) Articles

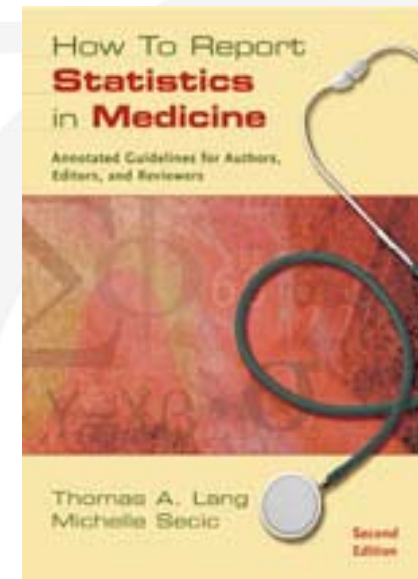
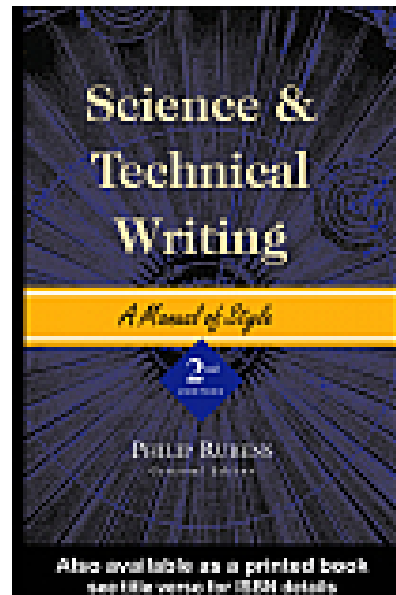
Word Limit: 4,000 words excluding abstract, references, tables, and figures

Abstract: 150 words maximum

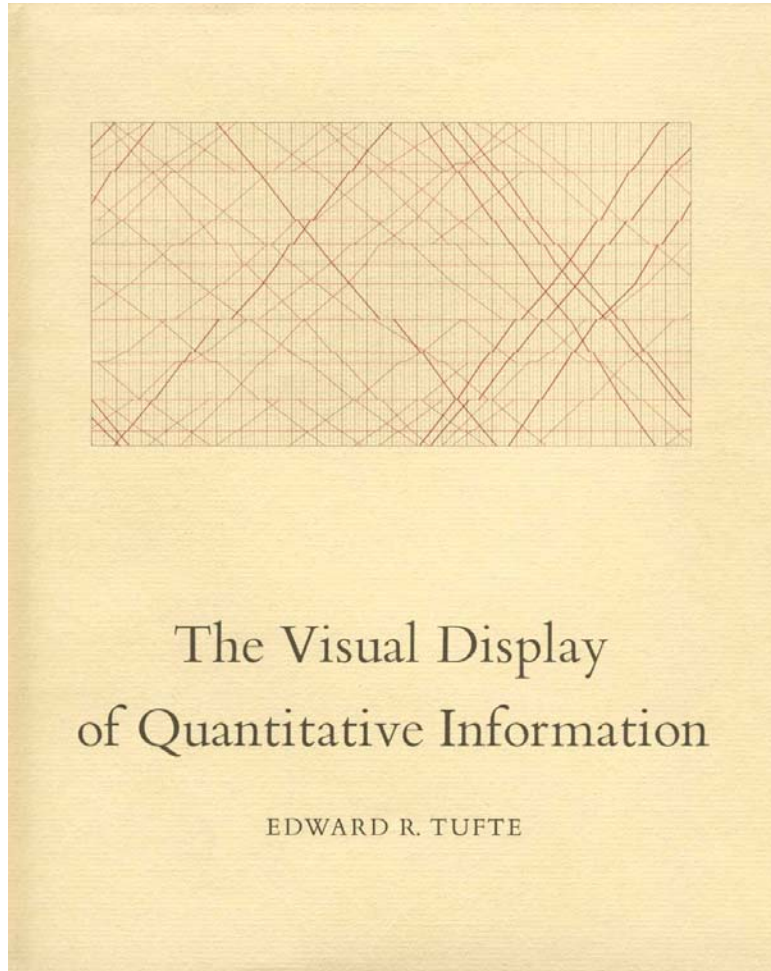
References: 50 maximum, Figures/Tables: 10 maximum

Substantial novel research

Consult style guides when in doubt



Prepare clear and simple figures!!



The classic book on statistical graphics, charts, tables. Theory and practice in the design of data graphics, 250 illustrations of the best (and a few of the worst) statistical graphics, with detailed analysis of how to display data for precise, effective, quick analysis. Design of the high-resolution displays, small multiples. Editing and improving graphics. The data-ink ratio. Time-series, relational graphics, data maps, multivariate designs. Detection of graphical deception: design variation vs. data variation. Sources of deception. Aesthetics and data graphical displays.

Problems encountered in grants/manuscripts

- ⑨ **Conclusions are drawn without experimental support**
- ⑨ **Appropriate controls are absent**
- ⑨ **Great hypothesis; but data show correlations only; no formal proof of hypothesis is provided**
- ⑨ **Alternative hypotheses are not experimentally ruled out**

General points to keep in mind

- ⑨ There's too much information out there for people to keep track of; make your writing count.
- ⑨ Less is more, but only if what's provided is clear and informative.
- ⑨ People—frequently tired and over-worked—read and evaluate your work. Make it easy on them.
- ⑨ Have more than one colleague read your work.
- ⑨ Be prepared to re-write and revise: don't fall victim to thinking “my writing is clear enough”.
- ⑨ Be true to yourself; pursue what you're passionate about!

