HOW TO WRITE AND PUBLISH A SCIENTIFIC PAPER

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19 JANUARY 1981
STEPS IN WRITING A PAPER

1. Assess work: What, When, Where to Publish
2. Read Instructions to Authors of Journal
3. Decide who the authors will be
4. Draft a working title and abstract
5. Decide on form of paper
6. Collect the materials under the major headings
7. Design tables/illustrations & titles/footnotes
8. Get releases on previously published work
9. Write topic or sentence outline
10. Write a complete preliminary draft of text
11. Check completeness of references
12. Actively do something else for a few days
13. Re-examine the structure of the paper
14. Do the final version of the tables/illustrations
Steps in Writing a Paper (cont)

15. Re-read references, reduce abbreviations
16. Type the paper--This is the first draft
17. Correct the grammar and polish the style
18. Retype paper, make copies--second draft
19. Ask for criticism from co-authors/friends
20. Make any needed changes
21. Make new title, abstract, index terms; assemble
22. Compile and cross-check references vs text
23. Retype and recheck--penultimate version
24. Get final critical review from senior colleague
25. Make any final changes--final version
26. Write letter to editor including releases
27. Recheck all copies for completeness
28. Celebrate, revise, send elsewhere, or abandon it
29. Correct the proofs
1. **Assess Work**: What, When, Where to Publish

**What to Write and When**

*Scientific paper should describe significant extension to knowledge or advance in known principles. As the outcome of an enquiry, the conclusions determine if the paper is to be written at all. Do not write a history of the experiment. Paper must describe previously unpublished work.*

**Where to Submit the Paper**

Decide early and keep readers in mind. Journals have statement of purpose and scope—compare with your sense of who is your audience.
2. READ INSTRUCTIONS TO AUTHORS OF JOURNAL

SCAN THROUGH FOR EDITORIAL POLICY ON

LENGTH
MAIN SECTIONS
STYLE MANUAL OR GUIDE
ABBREVIATIONS
NOMENCLATURE
FOOTNOTES
ETHICAL GUIDELINES.
3. Decide who the authors will be

Must be agreed upon before proceeding

Include those who contribute substantially to the theoretical or experimental work

All authors must approve final version before submission. Do not include authors without their permission
Draft a working title and abstract

These define scope of what you will say

Working title
Contains one topic
Main subject and point of the paper

Working abstract
Hypothesis
Approach
Conclusion
Significance
Try for four sentences

Working title and abstract are to help author put ideas together
5. Decide on the form of the paper

Biomedical  
Introduction  
Materials and Methods  
Results  
Discussion

Field Science  
Introduction  
Materials and Methods  
Geographic Context  
Analysis of the Data  
Results  
Discussion  
Conclusion

Theoretical  
Introduction  
Theoretical Analysis  
Applications  
Conclusion
6. Collect the materials under the major headings

Sort out the
data
random thoughts on coffee napkins
graphs
ideas
references
etc.

Into file folders for each section but don’t try for logical order yet.
7. **Design Tables/Illustrations & Titles/Footnotes**

Usually contain all the evidence in paper
Function as gate-keeper for browsers/skimmers
Details not to be repeated in the text
Must convey clear message
Tables: Numerical; Graphs: Trends & Relationships
Journal determines number and size
Model style after target journal
Number serially and do tentative titles
Make all titles consistent
Give significance tests, P, SD or SE, and n
Omit columns that can be calculated/deduced
Tables guide writing of the paper
Use histogram not curve for discrete data
Omit illustrations if not as good as journal
8. GET RELEASES ON PREVIOUSLY PUBLISHED WORK

AUTHOR'S RESPONSIBILITY TO GET RELEASE
QUOTE LONGER THAN 50 WORDS NEEDS RELEASE
GET PERMISSION TO CITE UNPUBLISHED WORK
IDENTIFY ANY CHANGES IN ORIGINAL
9. Write topic or sentence outline

**Topic outline is hierarchical noun or phrase listing. Construct by putting section notes in logical order**

**Sentence outline will be expanded to a paragraph per sentence of the outline**
9.1 Section notes before arranging

Write draft title and abstract
SI units Co-authors
Read instructions to authors
Decide basic form Copyright
Collect materials in any old sequence
Design tables and figures (color)
Make outline Ethics
Index terms
Permission to reproduce
Section notes arranged in logical order

9.2 Section notes arranged in logical order

Authorship

Inclusion

Order of names

Journal's requirements (Instructions to authors)

Ethics

SI units

Draft titles and abstract

Basic form

Gross organization of material

Illustrations

Tables

Figures

Copyright

Published

Unpublished

Outlines

Topic

Sentence
9.3 Sentence Outline

Decide on number and order of authors.
Re-read instructions to authors with principles of ethical experimentation and SI units in mind.
Draft a tentative (working) title and abstract.
Decide whether you will follow the conventional order of Introduction, Materials and methods, Results, and Discussion.

Jot down, in any order, all the items you will include under your chosen headings.
Design the tables and figures, and write their titles and legends.
Obtain permission to reproduce them when needed, and consider the general question of copyright and the proper use of other people's work.
Write a topic and sentence outline of the paper.
10. Write a complete preliminary draft of text

Finish first draft in one sitting
Write simply without worry about style or grammar.
Direct your thoughts to the 'moderate specialist' not the expert.
Use name and year for references in writing the draft.
Use appropriate person, tense, and voice
'I' or 'we': what you did
'You' or imperative: instructions
'You' or 'they' (3rd person): what happened
Use many headings and section divisions
10.1 First Draft: The Introduction

2 or 3 paragraphs to indicate aim & scope
Explain how work advances previous work
Get interest & attention of non-specialist
Write to clear your mind then tear up the first few pages!
10.2 First Draft: Materials and Methods Section

Describe experimental design or theoretical approach before giving details.

Justify any choices where there were reasonable alternatives.

Describe methods in logical sequence for experienced researchers to be able to replicate.

Specify drugs and chemicals precisely.

Specify selection of experimental and control subjects.

Specify informed consent procedures and name of ethical committee giving approval.
10.3 First draft: Results section

Make results section coherent
Explain how results are derived from measurements
Indicate variability, accuracy, precision
Add diagrams to clarify experimental design or hypotheses
(Give a seminar to get organized)
10.4 First draft: The Discussion Section

A "disquisition in which a subject is treated from different sides" (shorter OED)
Write after long thinking about your and other's results
Assess validity, comment on significance, and relate to previous work
Do not conceal negative results—explain them
Be absolutely accurate about the work of others
Pull argument together in logical sequence
Point to new study lines in your results
Explain with economy of hypotheses
Clearly delimit facts from testable speculations
Don't be overly optimistic about your precision, generality, or applicability
10.5 First draft: Summary and acknowledgements

Summary
Not a re-worded abstract
for people who have read the paper
state main findings and conclusion

Acknowledgements
Substantial help from
grant-giving bodies
individuals
who supplied
money
materials
technical assistance
technical advice

Be sure that those mentioned agree with
having their name mentioned in that form
10.6 (cont) First draft: References

For secondary sources, use 'Cited by ...'
'Abstract in ...'
Refer to unpublished work in text only
Limited circulation reports need info on how to get a copy
Completion of Text

Number and date the pages
Wait for 2 days and re-read for obvious goofs or missing pages

Forget it for ten days while you do something else
13. **First Draft Revisions**

**Structural**
- Compare to Outline and move items to earlier part of text
- Reduce number of headings
- Examine headings for consistency and redundancy

**Stylistic**
- Make paragraphs a single unit of thought
- Limit paragraphs to 1/2 page (125 words)
- Re-examine tables/graphs in view of new argument/structure of the paper
14. FIRST DRAFT: TABLES AND GRAPHS

HAVE TABLES TYPED IN FINAL FORM
CHECK TITLES AND NOTES FOR CONSISTENCY
PREPARE ILLUSTRATIONS IN FINAL FORM
COMPARE LEGENDS WITH JOURNAL FOR CONSISTENCY
15. First Draft: Citations

Re-read the papers cited
Re-read your own papers
Correct text to agree with papers
Make sure the cited works are relevant
Keep quotes in context
Insert "(sic)" if original misspelled or misused
Additions are enclosed in square brackets
Deletions are indicated by "...
Reduce number of abbreviations/footnotes
Have the first draft typed and make a spare copy. Number and date the pages.
17. First draft: revisions (After ten day wait)

Use journal's style manual

Verbs

Singular/plural agreement
Try to use active voice

Pronouns

Unambiguous referent
Avoid use of "it"

Verbosity and pomposity

Simple, clear, direct sentences
More than 40 words per sentence is too long

Use common, short words

Know the meaning of every word you use

Webster's 3rd new int dict / shorter OED
Second draft

Re-type revisions to first as second draft
Distribute second draft for comments to co-authors
Colleagues in similar field
Friend in another scientific area
Do not send the second draft to
Senior colleague
Institutional Review Journal
20. Comments on the Second Draft

Resolve any substantial problems
21. Final form from second (or Nth) draft

Make final title short, accurate, informative and under 12 words/100 characters.
Provide 'running head' of 45-60 characters.
Provide informative not indicative abstract: 250 words.
Succinct factual statements.
Simple style for non-specialist.
No references, formulae, tables.
Do not add statements not in the paper.
Provide index terms according to journal policy.
21.1 Assembly of complete manuscript: Title

Start on new page

Title

Authors

Name/address where work was done

Authors' new address if needed

Name/address of author for editorial and reprint correspondence
21.2 Assembly of complete manuscript: Abstract

Start on new page
Put index terms at bottom
21.3 Assembly of complete manuscript: text

Number pages on upper right corner
1st author or running head top of each page
Consistent, correct spelling
Consistent, correct headings
Text refers to each and every table/figure
Text indicates mathematical expressions inline
Marginal notes for placement of figures/tables
Start major sections on new page
21.4 Assembly of complete manuscript: Acknowledgements

Start on new page.
Short correct in every detail (grant numbers).
Get approval from those mentioned.
21.5 Assembly of complete manuscript: References

Redo them in the Journal form.

Start on new page.

If you didn't see it, use "cited by ..."

No references not cited in the text.

Accepted for publication OK to include.

Submitted for review not to be cited.

Limited circulation needs 'how to get'.
21.6 Assembly of complete manuscript: Footnotes

Start on new page or put on bottom of page if journal requires. Reduce number of footnotes.
21.7 Assembly of Complete Manuscript: Tables

Start new page for each table
Add to verify totals and sub-totals
Read titles for correctness/consistency
Number tables in proper sequence
Mark top of all figures
23. RETYPE AND RECHECK--PENULTIMATE VERSION

DOUBLE SPACE EVERYTHING

HAVE SOMEONE READ IT TO YOU (ERRORS?)
26. Submitting final version to journal

Short cover letter
Copies of your previous related work
Identify category for your paper
Your address and telephone number
Approval of ethics committee/human use committee
Copyright releases
27. **Recheck for completeness**

*All pages/tables/figures present*

*Send 'ribbon copy' plus copies*

*Keep a complete set for yourself*

*(self-addressed post card)*

*Do not send to second journal for 6 weeks*

*Check list before mailing*
27.1 Final Check List

- Number pages consecutively
- Free-standing, understandable table headings
- Tables numbered consecutively
- Every table referenced in text
- Table placement indicated by marginal notes
- Citations are in reference list
- All references are cited in the text
- Illustrations agree with original
- Illustration legends on separate page
- Illustrations numbered serially, referenced
- Footnotes present and referenced
- Appropriate title, abstract, index terms reviewed
- Special journal requirements reviewed
- Compare to previous then read for 'fun'
27.1 (cont) Final check list

Make copies for authors, institution
Keep file copy
Enclose releases
Check for address for proofs on title page
28. Responding to the Editor

Rejection
Too specialized/general — try another journal
Too long/needs changes — modify & try another
Unsound/incomplete — wait for more data
Misreading — sleep on it before protesting

Revision requested
Accepted
Make changes if you agree
Justify if you don’t agree
Identify all responses to requests
Can be reconsidered with major changes
Maybe a different journal is better
29. Correct the proofs

Return immediately

Read galleys (listening to original) for

Numbers in text
Tables
Illustrations
Legends

References
Spelling
Missing/repeated sentences/paragraphs
Subheadings
Numbering of tables
Illustrations right side up
Redrawing of figures
Add only "note added in proof" after text
Make corrections to minimize displacements
29.1 Making Corrections to the Proofs

Mark in Margin and in the line
Use Contrasting Color
Circle instructions that are not to be printed
Mark every occurrence of changes
Line out question marks of the Editors if OK
Mark both sets, initial and date
Save a copy and return a copy quickly
Don't let reprint purchase hold up return

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