

Lecture 1 Notes

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Communication Skills for Scientists 2008

“Papers of poor quality do more than waste printing and publishing resources; they mislead and confuse inexperienced readers, they waste and distract the attention of experienced scientists, and by their existence they lead future authors to be content with second rate work.” – *G. K. Batchelor (1981)*

Rule #1: *You can be taught to be a better writer.*

Rule #2: *We write for our audience, not for ourselves.*

Rule #3: *There is no single way to write something. But, there may be better ways.*

Five Characteristics of a Good Title (Lipton, *Science Editor's Soapbox*)

- Informative
- Accurate
- Clear
- Concise
- Attention commanding

Contents of an Abstract

- Principal objectives and scope of research
- Methodology
- Summarize results
- Principal conclusions

Writing an Effective Abstract

- Most journals have limits on abstracts: 200–300 words
- Avoid introductory material.
- Avoid vague or general statements.
 - *“There are significant systematic differences between the newer numerical models and the older model. Two systematic differences are analyzed in detail, and causes for these differences are proposed.”*
- Make sure keywords appear in abstract.

Organization of a Generic Paper

- Cover Page
- Abstract (keywords?)
- Introduction
- Literature Synthesis
- Data and Methodology
- Results
- Discussion
- Conclusion

- Acknowledgments
- References
- Tables and Figures

Begin writing before the research is finished.

- Writing will force you to strengthen your arguments.
- Sections like the literature review and methodology are best written while thinking about that material.

Unlearning Old Habits #1: *Using the first person in scientific articles is acceptable in some circumstances and in a limited fashion.*

Unlearning Old Habits #2

- *Repeating terms, phrases, and sentence structures leads to a strong paper.*
- *Redundancy in your terminology will help the reader follow your train of thought.*

Words and Expressions to Avoid

— despite the fact that	although
— There are waves...	Waves exist...
— it is apparent that	apparently
— it may be that	I think
— it should be noted that	(omit)
— with respect to	about
— in order to	to
— smaller in size	smaller
— the period 1977–1999	1977–1999
— thunderstorm activity	thunderstorms
— over the Mongolia region	over Mongolia

Concise Writing

- Meteorological terms requiring care (e.g., <http://www.cimms.ou.edu/~doswell/peeves/peeves.html>)
 - propagate
 - movement = advection + propagation
 - correlate vs. relate
 - short-wave or long-wave TROUGH/RIDGE
 - utilize vs. use
 - “Time evolution” is redundant.

Ten Rules for Effective Figures

1. Don't leave excessive white space around edges.
2. Make the data stand out.
3. Avoid three-dimensional effects.
4. Use no more than 5 different gray shades for quantitative information.
5. Use sans serif fonts in figures (not serif fonts).
6. Make all axes/domains/contour intervals uniform in size and scale, wherever possible.
7. Reduce multiple figures to a multipaneled figure to aid in comparing results.
8. Create effective axes.

9. Use effective annotation.
10. Avoid imposing physical relationships to data where no such relationship is expected.

Revise, Revise, Revise!

- Never submit a first draft!
- Set the paper down for a while. Too much focus can blind you to errors.
- After this period of rest, crank the level of intensity of editing up a notch.
- Read the paper backwards sentence by sentence.
- Read the paper out loud to yourself or others.
- Get comments from friends, colleagues, enemies, etc.
- If you feel uncomfortable with a sentence or paragraph, readers likely will, too.
- Recognize your weaknesses.
- Reevaluate draft title and abstract.
- Look for inconsistencies within the paper.
- Mind the little things.
- Always perform final edits on paper.
- Edit when you are fresh and undistracted. Set aside several hours without interruptions.

Combating Writer's Block

- Topic or audience clearly defined?
- Give yourself opportunities to write all the time.
- Write little bits throughout the research process.
- Break project up into smaller components.
- Plan your writing into a schedule with deadlines.
- Make appointments with yourself to write.
- Try stream-of-conscious writing.
- Do not let "the editor" dominate during composition.
- Leave unfinished work for the next day.
- Do something different or creative for creative stimulation.
- Reward yourself for small accomplishments.

How to Improve

- Learn from positive *and negative* role models for authors and reviewers.
- Ask Editors, authors, and reviewers for advice.
- Volunteer your services to an Editor.
- Peer review each other's writing.
- Form a journal discussion group and critique papers.
- Read, read, read!
- Write, write, write! Overcomes "writer's block"
- Revise, revise, revise! First efforts do not have to be perfect.