Scientific English

M2 Marine Physics

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Lecture

Introduction

- Brief history of Science and scientific writing

Scientific writing

- Structure and content of a paper
- Writing and revision papers
- Writing reports, proposal, etc ...

Effective Scientific writing

- How to write more effectively

The peer-review process

- What? And How?

Activities

- Read and discuss scientific articles
- Write a short article
  Due date: **Jan. 23rd**
- Review articles
  Due date: **Jan. 30th**

Material available at: http://ocean.fsu.edu/~qjamet/share/Scientific_English/

Scientific English

Tentative paper instructions

Text requirements for your paper:

- 6 publication units (1 PU = 500 words or 1 figure or table)
- Using a standard structure:
  - Abstract
  - Introduction
  - Methods
  - Results
  - Conclusion
- Use Overleaf, Curvenote, Authorea, LaTex or Microsoft Word templates available here: *https://www.agu.org/publications/authors/journals*

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I. Subjects and Actions

II. Cohesion, Coherence and Emphasis

III. Concision and Simplicity

IV. A few grammar tips

V. **Writing and self-revising** (summary)

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How to write more effectively

I. Subjects and Actions

II. Cohesion, Coherence and Emphasis

III. Concision and Simplicity

IV. A few grammar tips

V. **Writing and self-revising** (summary)

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V. Writing and self-revising

- **How to Write a Paper in Scientific Journal Style and Format**

  www.bates.edu/biology/student-resources/resources/

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V. Writing and self-revising

A typical architecture of a scientific article:

- Title
- Abstract (+keywords)
- Introduction
- Methods
- Results
- [Discussion]
- Conclusion
- Acknowledgements
- [Appendix]
- References

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V. Writing and self-revising

A typical architecture of a scientific article:

- Title
- Abstract (+keywords)
- Introduction
- Methods
- Results
- [Discussion]
- Conclusion
- Acknowledgements
- [Appendix]
- References

But you will (almost) never write the different parts in that order !

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V. Writing and self-revising

Need to proceed step by step

A) Balanced Review of the Literature:

- In-depth, balanced review of the literature relevant to your study questions prior to designing and carrying out the work.
- This review will help you learn what is known about the topic you are investigating and may let you avoid unnecessarily repeating work done by others.
- Keep notes about the articles you read (ideally a quick summary of the main results).

- **This literature will form the basis of your Introduction and Discussion.**

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V. Writing and self-revising

Need to proceed step by step

B) Design and Conduct the Experiment:

- Keep careful notes on procedures used during the experiment, on the design and parameters of your model.

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V. Writing and self-revising

Need to proceed step by step

C) Analyse and Interpret the Results:

- Most scientists lay out their **Tables and Figures** before writing the Results section.
  The tables and figures contain the story of your paper. Each table and figure should have a clear point, and together, they should tell the story of your manuscript.
- Write the **Table and Figure legends**.
- Note the **one or two key results** that each Table or Figure conveys and use this information as a basis for writing the **Results section**.
- Sequence and number the Tables and Figures in the order which best enables the reader to reach your conclusions.

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V. Writing and self-revising

Need to proceed step by step

D) Write the Results Section:

- Use the text component to **guide the reader through your key results**, i.e., those results which answer the question(s) you investigated.
- Do not simply repeat numbers that are already available in tables and figures
- You need to **summarize** what the data show:
  - Point out simple relationships
  - Describe big picture trends

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V. Writing and self-revising

Need to proceed step by step

D) Write the Results Section:

- Example: "*over the course of treatment, topiramate was significantly more effective than placebo at improving drinking outcomes on drinks per day, drinks per drinking day, percentage of heavy drinking days, percentage of days abstinent, and log plasma-glutamyl transferase ratio (Table 3.)*"

- The reader can go to the table to see the specific numbers

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V. Writing and self-revising

Need to proceed step by step

D) Write the Results Section:

- Each Table and Figure must be referenced in the text portion of the results, and you must **tell the reader what is the key result(s)**

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V. Writing and self-revising

Need to proceed step by step

E) Write the Introduction:

- Once your questions have been refined based on your results, you can write a first draft of the Introduction to your paper.
- Focus on the specific hypothesis/aim of your study = do not make an exhaustive review of your subject!

- At the end of the introduction, the reader should have in hand the different concepts/ideas that will be discussed in the paper.

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V. Writing and self-revising

Need to proceed step by step

F) Write the Methods:

- You can write the Materials and Methods section at any time, but after introduction, it is usually a good time.

[Write the Appendix]:

- The appendix contains additional material which **supports** the body of the work but which would be **distracting or inappropriate** to include within the text itself.
- Can include Figure, Tables, equations, text.
- Equivalents: Supporting Informations/Materials (e.g. GRL), Methods (e.g. Science, Nature).

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V. Writing and self-revising

Need to proceed step by step

G) Write the Discussion:

- Interpretation of your results includes discussing how your results modify and fit in with what we previously understood about the problem.
- Review the literature again at this time.
  - After completing the experiments you will have much greater insight into the subject, and by going through some of the literature again, information that seemed trivial before, or was overlooked, may tie something together and therefore prove very important to your own interpretation.

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V. Writing and self-revising

Need to proceed step by step

G) Write the Discussion:

- You can start with your key finding: “We found that…”
- Tell it like a story (**use the active voice**)
- Don’t travel too far from your data
  (It's okay to step away from your data and speculate a bit towards the end. But when you're drawing your main conclusions, you need to make sure that you are telling the reader what you actually found, not what you hoped to find.)
- Write about the **limitations** that matter (anticipate criticisms),
  e.g. ‘A potential caveat of our study/method …’
- Open the discussion with perspectives

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V. Writing and self-revising

Need to proceed step by step

H) Write the Abstract and Title:

- The Abstract is always **the last section written** because it is a concise summary of the entire paper and should include a **clear statement of your aims**, a **brief description** of the methods, the **key findings**, and your **interpretation** of the key results.
- The Title will probably be written earlier,
  but is often modified once the final form of the paper is clearly known.
  - Initial title (start writing paper): Will likely focus on the **method**
  - Final title (once the paper is written): Will likely focus on the **results**

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V. Writing and self-revising

Need to proceed step by step

H) Write the Abstract and Title:

- Example:

Underestimated oceanic vertical mixing due to climatological winds, and impacts in oceanic simulations coupled to a atmospheric mixed layer

Fast Warming of the Surface Ocean Under a Climatological Scenario

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V. Writing and self-revising

Need to proceed step by step

I) Self-revise your paper

- Most authors revise their papers at least 2-3x before giving it out for peer review.
- Go back over your paper now and read it carefully; read it aloud if you can.
- Begin revising your paper working from a **global perspective** (overall organization), to **paragraph content and organization** and finally down to **sentence level line editing**.

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V. Writing and self-revising

Need to proceed step by step

I) Self-revise your paper

- **Global Perspectives**:
  - Does it say what you wanted it to say?
  - Do any ideas, experiments, or interpretations need to be moved around within the text to enhance the logical flow of your arguments?
  - Check:
    - The sequence of ideas/background/content in each section for logical progression
    - Relationship of ideas between the Introduction (what we knew before our study) and the Discussion (how our study changes or supports our previous understanding).

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V. Writing and self-revising

Need to proceed step by step

I) Self-revise your paper

- **Paragraph content**:
  - In each paragraph do the other sentences support the topic sentence?
  - Check:
    - Each paragraph has a coherent topic sentence, most often as the lead sentence.
    - The transitions between paragraphs, ensure they are logical and smooth.

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V. Writing and self-revising

Need to proceed step by step

I) Self-revise your paper

- **Line editing**:
  - **READ THE PAPER ALOUD.**
    If doesn't sound correct when spoken aloud, it will read even more oddly.
  - Check:
    - passive verb construction ; replace by active verb, if possible.
    - consistent and correct use of terminology.
    - superfluous lead phrases (Once that was done, ..) ; rephrase/remove
    - redundancy
      (i.e., places where you repeat what you have said elsewhere).
    - clarity and brevity. Can you say the same thing with fewer words?

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V. Writing and self-revising

Need to proceed step by step

I) Self-revise your paper

- **Miscellaneous**:
  - Tables and Figures:
    - sufficient information to stand alone?
    - Appear in right order, and correctly referred in the text?
  - References:
    - Correctly cited, proper format?
    - Read and verify that
      (a) it contains the information you are citing, and
      (b) it its the original source of this information.
  - Check for typos and grammar

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V. Writing and self-revising

Need to proceed step by step

J) Review by others:

- Send it to co-authors and/or knowledgeable colleagues.

K) Prepare the Final Draft:

- Carefully proof-read your final draft to make sure its as well done as possible.
- Double check that you've properly cited all your sources in the text and in the Literature Cited.

L) … and press ‘Submit’ !!

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V. Writing and self-revising

Tips for writing

1. Talk about your research before writing about it

- *A really good tip before you sit down to write about your research is try to talk it out with somebody, a friend who is not necessarily in your discipline.*

  When we talk about our research, we do it in a more conversational tone, we talk in more simple terms. We actually present our ideas better than when we sit down to write, so talking it out first can really help.

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V. Writing and self-revising

Tips for writing

1. Talk about your research before writing about it

2. Stop waiting for inspiration

- *You don't need any special muse or inspiration to be able to write. So just get over this notion that you have to be inspired in, and get yourself to sit down and write.*

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V. Writing and self-revising

Tips for writing

1. Talk about your research before writing about it

2. Stop waiting for inspiration

3. Accept that writing is hard for everyone

- *Another thing that I think is really important to realize is that writing is hard for everyone, even professional writers.*
  So don't be anxious about it.

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V. Writing and self-revising

Tips for writing

1. **Talk about your research before writing about it**
2. **Stop waiting for inspiration**
3. **Accept that writing is hard for everyone**
4. **Revise. Nobody gets it perfect on the first try**

- *Let's consider the actual writing process – you write a sentence, realize you need a reference, search around for it, re-read the sentence, decide it's not perfect, edit it, and wonder if you'll ever finish at this speed.*

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V. Writing and self-revising

Tips for writing

1. **Talk about your research before writing about it**
2. **Stop waiting for inspiration**
3. **Accept that writing is hard for everyone**
4. **Revise. Nobody gets it perfect on the first try**
5. **writing and editing are separate processes**

- *An effective writing method is to actively think about the content, write an entire paragraph or two – or three, or four – and then edit for perfection. This approach ensures a logical flow of sentences, as you're following your own train of thought at a decent pace.*

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V. Writing and self-revising

Further readings

- *https://www.aacc.org/publications/clinical-chemistry/clinical-chemistry%C2%A0guide-to-scientific-writing*
- Use of Figures and tables:
  - Part 7. Put Your Best Figure Forward: Line Graphs and Scattergrams
  - Part 8. Bars and Pies Make Better Desserts than Figures
  - Part 9. Bring Your Best to the Table
- Authorship:
  - Part 14. Passing the Paternité Test
  - https://www.nature.com/articles/ngeo2949
  - Not sure about authorship of someone?
    Consider using Acknowledgments section.