Writing about Data for Publication

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What makes scientific writing difficult?

1. being unsure of approach/direction

2. making & keeping it a priority

3. incorporating it into lab life
educational writing

high school, undergraduate

• To inform, describe, entertain, argue, etc

• Mostly secondary information

• Deadlines; immediate consequences

• Work through incremental projects

science writing

graduate, post-doc, faculty

• To inform and argue

• Emphasis on primary information

• Few deadlines; takes time for consequences to materialize

• Each paper is a big project
Plan experiments; Collect data

Discuss w/ advisor; Lab meeting

Dept seminar/retreat; posters/workshops

journal club

Write a paper
Does oral communication help us publish scientific papers?

Oral communication can be *really* helpful, but is no substitute for writing itself.
We need to experiment to know which writing strategies work.

Feedback on a written document can be more specific & thorough than comments from a seminar.
1. Make time to write.
   (e.g., when summer lab meetings are sporadic).

2. Keep it short.
   (e.g., critical analysis of one result/figure).

3. Get feedback.

4. Revise & merge with writing about newer data.
Work with your mentor to get writing experience by:

- asking about the process & his/her experience
- asking to read a work in-progress
- offering to help
- ***follow-through on any offers***
Plan experiments; Collect data

Get writing experience

Discuss w/ advisor; Lab meeting

Write about reproducible results in increments

Dept seminar/retreat; posters/workshops

Write short papers (that can be made bigger?)

Finish a paper
Any of us could get scooped tomorrow
Your story needs to fill a gap in knowledge.

“Big” gap ~ important problem

This gap gets “smaller” over time.
An incremental writing process can catalyze publication of a story that is more than “incremental”.
Scenario:

At a national conference, you see results that will likely be submitted in 1-2 months and, if published first, will reduce the importance of your own results.

What if:

A) you have no writing done?

B) you have some writing done?

C) you have 80-90% of the paper written?
Where do you rank yourself on the following continuum?

I enjoy ambiguous wonderment  I enjoy drawing conclusions
Ways to get started (or to progress further)

Plans are useless.  
Planning is indispensable.  
D. Eisenhower

(it is ok if figures are later moved/added/subtracted)

- outlines are easy.
- outlines help communication.
- outlines can be used prescriptively & descriptively.
Ways to get started (or to progress further)

• Make an appointment to walk through preliminary figures with someone (tell a story)
Oral Communication

Prepare for the meeting:

- Try some writing first
- Present both the rationale and conclusion for each figure
- Present a central question with its centralized response

utilize...

but don’t

substitute
Introduction

- defines the central question & its importance
- does not have to be too long
- does not have to be written first

Materials and Methods

- clear enough for reader to repeat the experiments
- reviewer critiques on M&M are usually minor points
Results
1. Rationale
2. Experiment design
3. Observation
4. This observation indicates…
5. [the observation suggests…]

- The first figure/paragraph addresses a simple question unanswered in the literature
- Each figure/paragraph should address a question raised by the previous result
- Brief conclusion that alludes to its importance
Discussion

1. Summarize the findings

2. Elaborate interpretations on each finding
   - Each observation has at least 2 possible explanations
   - Address all possible counterarguments
   - Why are your arguments are stronger than the counterarguments?
   - Discuss how the findings intersect with each other & with what’s in the literature

3. Draw a final conclusion, closing the circle explaining how you filled the original gap & its importance
Discussion

- Re-emphasize the story’s *centrality* throughout
  - It should be conclusive despite opening new doors
  - Provide a centralized response to your central question

- If all of the experiments are finished, do NOT let the Discussion hold-up manuscript submission. Get help. Get it out.
  
  Descriptive outlining can be very helpful here.
  Use temporary subheadings.
Consulting Etiquette

Author:

- Send a brief message beforehand
  - Describe the document (content, length)
  - Target date (not tomorrow)
  - How valuable their help will be
  - Ask when a good time to send it will be

- And also
  - Offer to reciprocate
  - Cast a wide net & don’t wait too long for one person
consulting etiquette

In-house reader:

• Look at your task-list before agreeing
• Let the requester know if you cannot get to it right away
• Set-aside an available time
• If you have let it slide, ask for an up-dated version
• Read as a reviewer…focus on arguments
Submission & peer-review

- many reviews consist of:
  1. brief summary (recommendation)
  2. major points (reason for recommendation)
  3. minor points (unlikely change conclusions)

- many reactions consist of the same stages as dealing with tragic loss:
  1. denial
  2. anger
  3. bargaining
  4. acceptance

- rationally choose which points to refute and which to utilize
Reflection questions:

• What is the date?

• What is your next paper about, and what is its status?

• What is the projected timeline for your next 1-2 papers?

• What kinds of things hold-up progress?

• What do you do to be pro-active while one aspect is being held-up?

• Who are you writing for?

• What do you expect the reader to do with the new information?
• What is the date?

• What is “plan B” for a paper missing data?

• How does one determine when plan B should be implemented?

• Have you discussed the proposed figures with someone?

• What will you have more time to do once the paper is submitted?
What makes scientific writing difficult?

1. being unsure of approach/direction
   - Experiment & start early

2. making & keeping it a priority
   - Keep looking at the calendar; set deadlines;
   - Find a reason to finish

3. incorporating it into lab life
   - Find ways to write short documents and build as you go; set-up a peer-review network