

Writing About Data

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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 (or PI life)**

educational writing

high school, undergraduate

- To inform, describe, entertain, argue, etc
- Mostly secondary information
- Deadlines; immediate consequences
- Work through incremental exercises

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

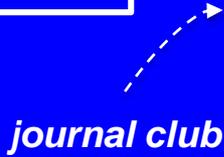


**Does oral communication help us
publish scientific papers?**

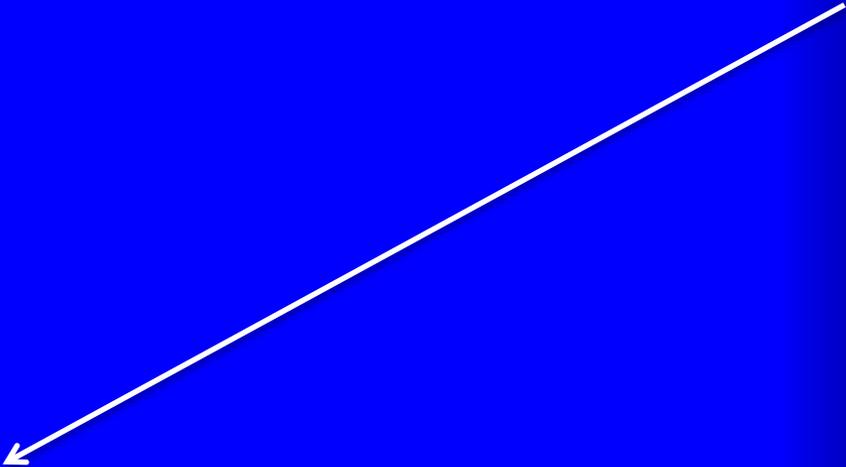
Plan experiments;
Collect data



Discuss w/ advisor;
Lab meeting



Dept seminar/retreat;
posters/workshops



Write a paper

**Oral communication can be *really* helpful,
but is no substitute for writing itself**

**Feedback on a written document can be
more specific and thorough**



In theory, we share and get extensive peer feedback

In reality, getting peer feedback is its own chore

1. because our colleagues' availability is limited



2. because we are cave writing & don't feel comfortable sharing it until it is ready to go out



Can we devise a writing strategy that is more efficient than cave writing?

- 1. Write a short paper (even 1 figure)**
- 2. Share and get feedback**
- 3. Revise**
- 4. Add the new figures when they are ready (or merge the 1-figure papers)**



Any of us could get scooped tomorrow.



The gap filled by new data narrows with time.

Consider the position of your unpublished work if:

A) no writing is done



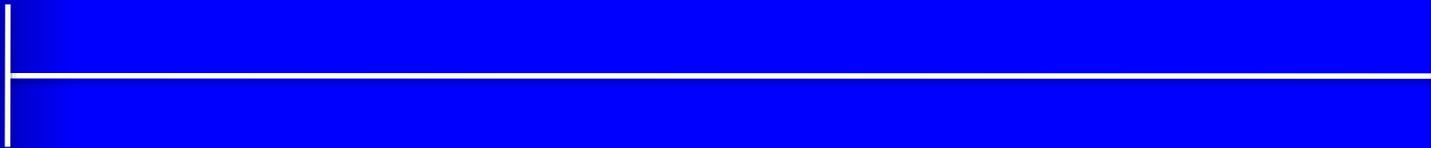
B) it is in disjointed stages of cave writing

C) 70-90% is in the starting blocks

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)

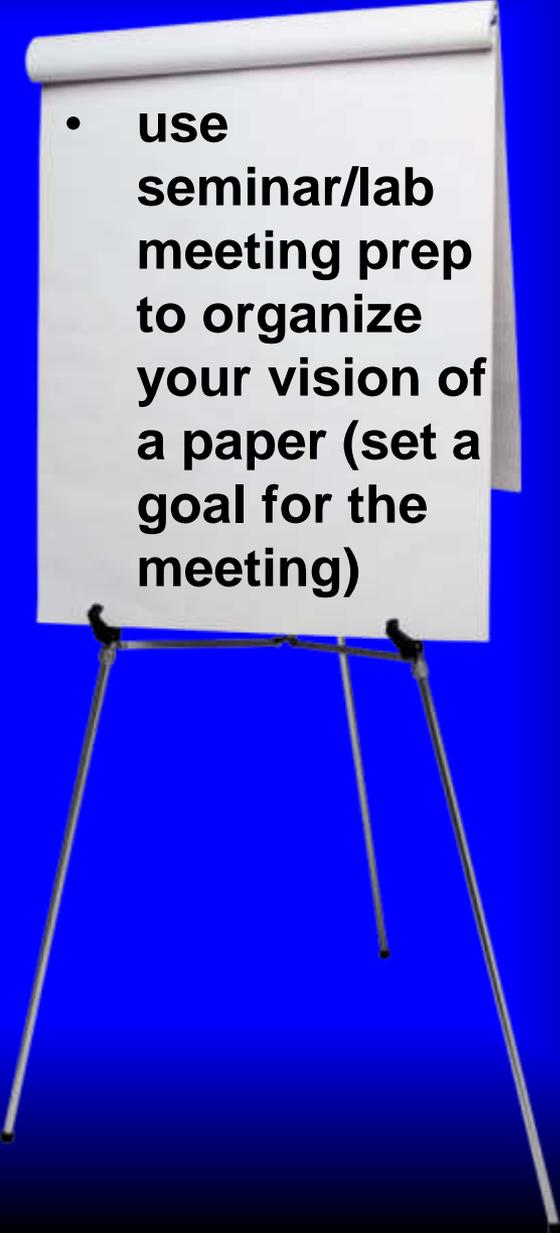
make a list of results (or outline)

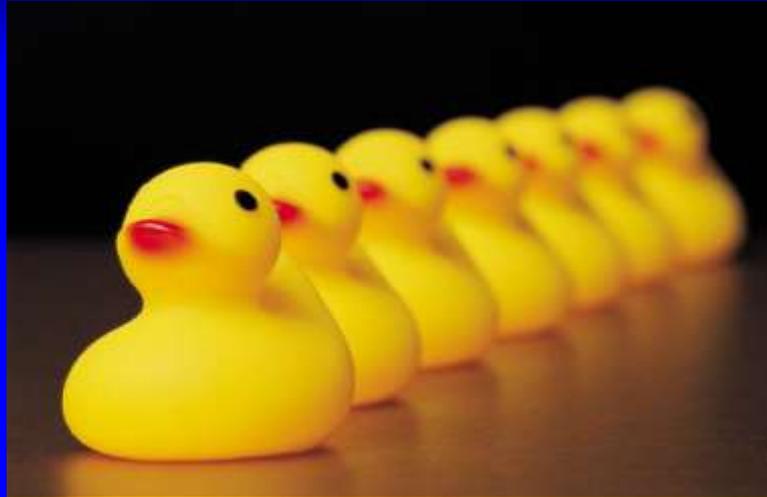
*it is ok if figures are later
moved/added/subtracted*

- **outlines are easy.**
- **outlines help communication.**
- **outlines can be used *prescriptively & descriptively.***

Ways to get started (or to progress further)

- make tables of similar experiments to help decide which data would make the best figure
- make an appointment to walk through preliminary figures with someone (tell a story)

- 
- use seminar/lab meeting prep to organize your vision of a paper (set a goal for the meeting)



Get writing experience by offering to help your mentor:

- write sections of documents
- proof-read
- review pending articles

Parts of a manuscript

Introduction

- defines the problem that is being addressed & 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 will be minor points

Parts of a manuscript

Results

1. Rationale
2. Observation
3. This observation indicates...
4. [the observation suggests...(each observation has at least two possible explanations)]

per ¶
x N results

- The first figure addresses a simple question unanswered in the literature
- Each figure should raise a question that ideally is addressed by the next figure
- Brief conclusion at the end of the section that alludes to its importance

Parts of a manuscript

Discussion (suggestions for paragraphs)

1. summarize the findings
 2. elaborate interpretations on each finding
 3. discuss how the findings intersect with each other & with what's in the literature
 4. draw a final conclusion, closing the circle explaining how you filled the original gap & its importance
- 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.**
 - **Use a workspace to dissect a difficult paragraph/section.**

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
- offer to reciprocate
- cast a wide net & don't wait too long for one person



consulting etiquette

Proof-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**
- **Being nice isn't especially helpful**



Submission & peer-review

- many reviews consist of:
 1. brief summary (\pm recommendation)
 2. major points (reason for recommendation)
 3. minor points (unlikely change conclusions)
- many reactions consist of the same stages as dealing with death:

1. anger
2. denial
3. bargaining
4. acceptance



• the rebuttal evolves... & so does your argumentative writing skill

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

Share ideas with peers and mentors; find what is right for you; take a writing workshop, write a paper about what you have

2. making & keeping it a priority

Keep looking at the calendar; set deadlines for yourself; Find a reason to finish

3. incorporating it into lab life

Find ways to write short, complete documents; set-up a peer-review network

