Scientific Writing: Writing for your Career

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Writing is like exercise...

You’re better off doing it every day (or nearly so)...

Even when you don’t feel like doing it.

Writing well

Writing well is hard. It requires constant thinking...

Writing is flying an airplane without instruments, almost always through the dark storms of doubt. It is new every time.

- Tom Verducci.

Scientific writing...

Publication types have different value

First author or co-author?
- Both! Even early in your career, it is good to have work on some projects where others will do the bulk of the writing.

More papers in weaker journals versus fewer papers in strong journals?
- The goal is always better papers in strong journals.
- The reality is you will have some weaker papers, too.

How many papers do you need?
- Depends on your circumstances. Learn your institution's expectations.
- (Graduate students: Try to have a couple of papers in addition to your dissertation.)

Increase your publication opportunities

Balance ongoing projects & manuscripts
- Need both!

Review manuscripts – improve your skills
- Learn what works; write more effectively/quickly

Find (and create) your “niche”

Balance first authorships & co-authorships
- Understand your role when agreeing to projects

Use “cheap” labor (and share the “wealth”)

Try not to write things that won’t be published
What merits authorship?

The ICMJE recommends that authorship be based on the following 4 criteria:

1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
2. Drafting the work or revising it critically for important intellectual content; AND
3. Final approval of the version to be published; AND
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

All authors should meet all 4 criteria for authorship; and all who meet the 4 criteria should be identified as authors.

Those who do not meet all 4 criteria should be acknowledged.
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You may find differences of opinion about what merits authorship:

- In medicine, someone who collects the data typically expects to be involved in the manuscript.
- In public health, especially epidemiology, the emphasis shifts to the analysis, and the “data collectors” may be left out.

My preference is to give the data collectors the opportunity to contribute to all 4 criteria.

Who is the first author?

Almost always, the person that wrote the bulk of the paper will be the first author.

That person usually had a major role in developing the paper:
- Idea, design, data collection, and/or analysis
- Is the analyst the first author?
- Common for epidemiology; Not common for applied biostatistics
- Epidemiologists must be careful not to underestimate the work involved in data collection.
Co-first authors

In some circumstances, more than one first author may be designated. This situation implies that both authors contributed equally to the full study process (idea → design → analysis → manuscript).

The senior author is last...or second

In most biomedical fields, the last author is the senior author (i.e., the head of the lab or the research project).

Often the analyst (i.e., the biostatistician) is second author.

In certain social sciences, the second author is the senior investigator, and the last author contributed the least to the work.

Working with co-authors is...

When to talk about it...

What should happen...

What to expect...

Improving the process...
Working with co-authors is...
When to talk about it...
- Early in the process
- As needed throughout
- Do not wait until the end, except under unusual circumstances

What should happen...
What to expect...
Improving the process...

“Good, but not immortal.”

When to talk about it...
What should happen...
- co-authors should be engaged and participatory
- co-authors should provide useful feedback on content
- co-authors should provide editorial suggestions

What to expect...
Improving the process...

When to talk about it...
What should happen...
What to expect...
- Co-authors, esp. senior ones, often contribute less than you would like them to
- Some co-authors edit more than comment

Improving the process...
Writing with co-authors is...
Use your co-authors – look for comments & critique

Tell them what you are looking for
- early drafts are about content

Put comments & questions in the text to guide your co-authors
- Use your co-authors’ expertise; you don’t have to have all the answers.

Working with co-authors
When to talk about it...
What should happen...
What to expect...
Improving the process...
- Give deadlines
- Share early drafts, asking for content feedback only, “please don’t worry about grammar and sentence structure, yet”
- Explain exactly what you are looking for
  tell your busy co-author that you want them to look at the 3rd paragraph in the discussion

It is your paper!
If you would like to write better than everyone else, you have to want to write better than everyone else.

And you must be willing to defend what you’ve written against the voracious middlemen—editors, agents, publishers (co-authors!!)—whose sights may be different than yours, whose standards are not as high.

Too many writers are browbeaten into settling for less than their best.
- Zinsser
Be the kind of co-author you would want

Establish your role early; identify your niche

Be timely

Ask explicitly what the lead author wants from you

Provide feedback

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Are you afraid of writing?

Writers have to jump-start themselves at the moment of performance, no less than actors and dancers and painters and musicians. Some writers sweep us along so strongly in the current of their energy...we assume that when they go to work the words just flow. Nobody thinks of the effort they made every morning to turn on the switch.

You also have to turn on the switch. Nobody is going to do it for you.

Unfortunately, an equally strong negative current—fear—is at work. Fear of writing gets planted in most Americans at an early age, usually at school, and it never entirely goes away. The blank piece of paper or the blank computer screen, waiting to be filled with our wonderful words, can freeze us into not writing any words at all, or writing words that are less than wonderful.

With each rewrite I try to force my personality onto the material. —Zinsser
Expect to struggle

Specious barriers to writing a lot

#1 “I can’t find time to write.” aka “I write more if I could just find big blocks of time.”

#2 “I need to do a few more analyses first.” aka “I need to read a few more papers first.”

#3 “To get going and write a lot, I need a new (insert – computer, desk, chair, office…)”

#4 “I am waiting until I feel like it.” aka “I write best when I am inspired to write.”

Silvia R., How to Write a Lot. APA Life Tools. 2007

What do I need to do to write effectively?

So, how do I increase productivity?

How can I write effectively?
What is the most important body part for writing (and rewriting)?

YOUR **BUTT**

Or possibly your feet if you use a standing desk...

Your butt.

You can’t write if you don’t spend time with your butt in the chair and your hands on the keyboard.

Yes, you can spend time to think away from the keyboard, but you **MUST** be in the chair to make it happen.

Take steps to write successfully

1) Make a schedule – and stick to it. Put it in your calendar. Several hours per week – every week. Ideally, write a little every day
2) Commit to writing consistently
3) Write in places where you are comfortable and can think with minimal distraction
4) Give yourself specific goals for a specific writing session
Take steps to write successfully

5) Identify the storyline of your paper.proposal. Revisit that every time you start to write.

6) Use effective outlines (i.e. topic sentences or complete thoughts)

7) Stop when you're in a good place, so you can pick up easily the next day

Resist the urge to forge ahead because things are going well. Stop.
Jot a few notes. Then pick it up tomorrow.

Make a schedule to be consistent

The most important thing for effective writing is consistency.
- It is not when, where, how

Stick to the schedule

Write when your brain works best

Writing is challenging – find a way that works for you
- Write early,
- Write late

When are you most productive?
When is your brain most effective?
When can you think clearly?
Pay yourself first.

Write early (or late)
If you write best early (or late) – protect that time religiously.
Write every day (or almost) during that time
Schedule meetings during that time sparingly, begrudgingly, and do not indicate you are available then on Doodle polls
People will try to infringe on your writing time, especially people who don’t understand the writing process.

**DO NOT LET THEM.**

Put the rocks in first.
Use your prime time effectively

Writing is one of the hardest things that we do.
It is cognitively demanding and susceptible to all kinds of distractions or temptations.
Write when you are at your best...

Don’t waste your best time with email, meetings, coding, grading, chart reviews, or meetings (except the occasional project brainstorm).

Oh, did I say meetings twice?

Avoid binge writing

Do NOT get caught in the “I need extended blocks of time to write” trap.

You can write in an hour, half an hour, or even 15 minutes.

Writing regularly is critical, and will lead to more success than binge-writing.

Writing regularly avoids inertia and prolonged initiation time of intermittent writing.

Commit to a friend (& reward yourself)

“I wrote another five hundred words. Can I have another cookie?”
Know yourself:
Where do you work well?

It was the best of Starbucks. It was the worst of Starbucks.

Set session goals

Prewrite: Plan what you are going to work on for a given day
- make notes the day before as you finish
- use the first few minutes to plan

Set goals for the session (consciously)

Set achievable session goals

Write at least 200 words
Revise the draft I finished yesterday
Write the first 3 paragraphs of the discussion
Brainstorm and make an outline for the paper
Look at reviewers' comments. Decide which ones to address specifically. Draft initial response.
Review your storyline...each time

Good papers and proposals tell a story

Identify the storyline and key messages for the reader early

Write the storyline and key points at the top of the first page

Review it every time you start to write

Find the strategies that work for you

Get the big picture points down first. Try to be clear about the main story.

Vomit on the paper or Think first, then write

Understand yourself. Don't be afraid to try something different.

But do what works for YOU!

Scribble thoughts, ideas, keep track of them, organize them

Find the strategies that work for you... and those that keep you out of trouble
Use effective outlines
Start with the “formula” of a paper
Jot down key ideas you want to convey in each section
Draft topic sentences for each section
Read topic sentences, re-order to improve flow
Skeleton outlines usually are not that helpful

Get the major points down ahead of time
Even if you don’t use an outline, try to identify the major points you want to discuss/convey
- keep a list or notes of key points
It is harder to identify missing points or concepts, than to identify parts to remove
Later, you will get bogged down in style & clarity, and miss the big picture.

Read a printed version to get the big picture
Periodically, read a printed version – away from your computer
Use this version to look at the big picture.
- Is the story coming through?
- Have you missed key points that you wanted to make?
- Are there distractions in the paper?
Do not edit this version for grammar or style, beyond a few notes here and there
Trying to achieve perfection is paralyzing
Many writers worry about every sentence as they are writing them.

They often don’t move on to the next sentence until it’s perfect or good.
Or they don’t even start until it is perfect in their mind.

Perfection paralysis ➔ low productivity

Overcome perfection paralysis
Rewriting is the essence of writing. Embrace revision.
- know from the start that you’ll be revisiting it again.

Draft conversationally – like you are telling your mother or another intelligent person.
- content & clarity first, then formality

Become a journalist ➔ you have a deadline!

Understand where the need for perfection is coming from
(see writer’s block & procrastination)

Writer’s block

What is it? It’s a writer’s block! You put it on top of you and you can’t write. Whew. My back!

I must be doing a bad job. I’m old. I’m worn out.

What does it mean when you get writer’s block? You are not alone. Everyone gets writer’s block.

What do you do when you get writer’s block? Write anyway! Keep going. Write through it.
Writer’s block is often due to fear...

What are you afraid of?

The writer stops writing when they believe the idea is fraudulent...

Writer’s block is often driven by a common cycle of fear

Your start to believe your idea/work isn’t good enough
You think that people will think poorly of you if the writing or the idea isn’t good enough
You fear that you aren’t going to succeed
Which takes you back to not being good enough

Forgive yourself to overcome writer’s block

When you stay stuck, you often feel humiliated—for not having written

Forgive yourself...and get back to writing!!!

Call a friend, take a walk, cry, whatever you need at that moment that will help you move past it.
Getting “stuck” and “unstuck”

Writer’s block is common: You may have it at the paper, section, paragraph, or sentence level.

Start with the easier sections (methods, results)
- cut and paste material from protocol to get started

Move on to another part when you get stuck
- make a note, then start next paragraph
- the topic sentence outline is very helpful here

Move on to tables or figures; work on references then come back

Getting going... or unstuck

Define the problem & goal: Remember why you are writing whatever you’re writing
- imagine the reader, and the good your paper might do

Pre-write: Plan what you’re going to write, think about it, jot some notes, plan

Commit: Tell someone, a co-author, colleague, or friend, when you will finish

Write in chunks: A big project is overwhelming; a small piece is manageable
- sections, paragraphs, sentences
Procrastination

Procrastination? ...We all do it!
To get over it:
Tell someone about your commitment. Commit to work for 15-20 minutes. Tell your friend you did it!
Remind yourself again of why you’re writing
Procrastination often comes from fear → What are you afraid of?
Observe your mind trying to get out of the commitment, trying to "run". Just observe.
Work in short chunks. Get up. Walk. Refresh. Take a real break, not your usual procrastination activities (social media, internet, etc.)

The Pomodoro Method (adapted) may help you
1) Put your butt in the chair
2) Set a timer for 25 minutes → write
3) Take a 5-minute break
4) Repeat x3 (four total or ~2 hours)
5) Take a longer break (20-30 minutes)
6) Return to step 2
A way to overcome procrastination

1) Put your butt in the chair
2) Use the 10-minute rule
3) Get away from your email, the internet, your phone
   - unless you are a physician on call, you can be off the grid for 1-2 hours
     (trust me, the world will manage in your absence)
4) Write → And I mean write anything!!!
Practice creative procrastination*

You often can't do everything.
Learn to put off low-value tasks to give you time to do the important things (aka writing)

Dare to be average (at low-value tasks)

Tracy B. Eat that Frog!

Take a writing break to recover

Take breaks from writing a particular paper
- a few days, a week, a month
Just like with exercise, sometimes, you need time to “recover”
Recovery gives new energy and ...

New energy → new insights

Writing is hard work →

Failure is common
You will have bad
writing days.
Expect to fail, at
least sometimes
Writing is hard work

Writing is, for most, laborious and slow.

...writers must learn to cultivate patience...

- Strunck & White

Writing is thinking

...the act of composition, or creation, disciplines the mind; writing is one way to go about thinking, and the practice and habit of writing not only drain the mind but supply it, too.

- Strunck & White

Use existing text to jumpstart the paper

Writing the paper begins before the study
  - Specifying the hypotheses
  - Writing the background for the proposal or protocol
  - Writing the methods in the proposal or protocol
  - Determining the analysis plan for specific research questions

Use existing text from proposals/protocols to get started.
Use the results to craft the story

Look carefully at the results

Identify the 1 or 2 main findings
- In most cases, these should relate to your stated hypotheses

Be sure that you know how these results fit with the existing state of knowledge

Sketch out the story: Think about how you would explain to your mom or spouse or friend (maybe even try it!)

Convert an abstract to a paper

Accepted abstracts are usually presented as posters or oral presentations

Both can be used to develop the first draft of a paper

Poster → Cut & paste sections

Oral → Use presentation as paper outline

Write in an efficient order

Draft methods early – even before study is complete

Make tables

Draft results

Draft introduction & discussion

Abstract - last (or first!)
- last → describe findings accurately
- first → forces writer to focus on main story
Share your drafts early

Papers are a process. Be patient.

Share drafts early
Accept criticism
Don’t underestimate the number of drafts

You must be **PATIENT** with the process

Rewriting is the essence of writing

You can select material on your screen and move it to a more appropriate spot, or, if you cannot find the right spot, you can move the material to the end of the manuscript until you decide whether to delete it.

Above all, **do not be afraid to experiment** with what you have written.

Remember, it is **no sign of weakness or defeat** that your manuscript ends up in need of **major surgery**. This is a common occurrence in all writing and among the best writers.

- Strunk & White
Rewriting wins the game

Learn to enjoy the tidying process. I don’t like to write; I like to have written. But I love to rewrite. I especially like to cut: to press the DELETE key and see an unnecessary word or phrase or sentence vanish into the electricity.

With every refinement I feel that I’m coming nearer to where I would like to arrive, and when I finally get there, I know it was the rewriting, not the writing, that won the game.

- Zinsser

Don’t let references block your flow

As you are writing, indicate where references need to go.

If you know the reference, put reference or basic information in a comment

If you don’t know the reference, just put [REF] and find it later.
Do not look it up in the moment.

Use a reference program and format when you are nearly finished writing
Peer editing, writing group

Try to identify at least one person or a small group to form a writing group
Commit to one another
Share drafts and give/receive constructive edits and feedback
Meet weekly, bi-weekly, monthly

My ID fellowship director (& division chief) told me...

“You should ALWAYS be writing something."

Prioritize your writing:
what you write, when you write
Get your BUTT in the chair
Write regularly; don’t binge
Manage your co-authors
Embrace rewriting
Get a little help from your friends

THANK YOU!

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