

## Postdoc Academic Chat #1

# Writing Well: Tips on How to Write Manuscripts That Others Want to Read and Talk About.

Wednesday, September 11, 2019

You spend a lot of your time actually doing research, but the time comes when you need to write it up and get it published. We will discuss several approaches to making this task efficient, effective, and, yes, enjoyable.

### Readings

**#1 Right your Writing: How to Sharpen Your Writing and Make Your Manuscripts More Engaging.**

**#2. Reducing Over-Complexity in Your Scholarly Writing**

**#3 9 Practical Tips to Improve Your Skills in Academic Writing**

**#1 Right your Writing: How to Sharpen Your Writing and Make Your Manuscripts More Engaging.**

The posting below gives some excellent tips on improving your technical writing. The article is by Bob Grant and is from the November, 2009 issue of The Scientist: Magazine of the Life Sciences Every Day Online, <http://www.the-scientist.com/> © 1986-2010 The Scientist. All rights reserved, reprinted with permission.<sup>[1]</sup><sub>SEP</sub>

When Judith Swan was a PhD student in molecular and cell biology at the Massachusetts Institute of Technology (MIT), her research on specialized microtubules in chicken cells went pretty smoothly. But despite expert guidance and advice from her advisor, "when it came time to write, nobody had very much to say," Swan recalls. Swan was essentially told to write up her research, then was edited, critiqued, and told to try again. "We teach writing by stochastic processes-the random walk," she says.

After finishing her PhD at MIT, Swan made her way to Duke University, where she attended a workshop on improving scientific writing presented by the linguist George Gopen. "Oh my goodness," Swan recalls thinking, impressed by how Gopen and his colleagues talked about effective writing in science. "This is an amazing language." She was soon engrossed in an "informal postdoc" with Gopen to pick up on his perspective.

She realized that the entrenched paucity of guidance in scientific writing has led to a body of scientific literature that is often poorly written and opaque. Now an assistant director for scientific and technical writing in Princeton University's writing program (open to scientists and nonscientists), Swan aims to change that. Success in science, she says, "takes as much skill with language as it does working in a laboratory."

The cardinal rule of writing, says Swan, is to focus on the reader, which doesn't mean dumbing down manuscripts. "The real readers that matter are the peer reviewers," she notes. "Peer reviewers are specialists and for them to get excited, you're going to be speaking a language that is not necessarily accessible to the average reader." The trick is to write manuscripts that answer very specific technical questions while presenting the information in a palatable and fluid way. This involves creating a delicate balance between providing too much and not enough contextual information, Swan says. "It's hard to find the right balance," she says, "people are working in a very complex environment with very few guidelines."

Here are ways to improve your writing practices and tips on how to align your writing to your readers' expectations.

### Writing Rituals

Start at the end.

Most readers of scientific manuscripts don't read papers from beginning to end. "The fact that we've got an article structure is so people can know where to jump to," says Australian linguist and self-employed research communications consultant Margaret Cargill. Because the people reading your papers will likely start with the results of your research, so should you, she says. "The whole structure of a paper is built around the results," she says. "That's where you've got to start the telling of the paper." Cargill recommends getting the tables and figures perfect before writing the results section. Then move onto the discussion section and then the introduction.

"You can do the methods anytime, really."

Write daily for 15 to 30 minutes

During your daily writing sessions, don't think about your final manuscript. Just write journal entries, says Tara Gray, director of the teaching academy that provides training and support to New Mexico State University professors. "People think there's two phases of a research project—doing the research and writing it up," she says. Rather than setting aside large chunks of time for each activity, combine them to improve your writing and your research. The first time Gray encouraged a group of faculty members at New Mexico State to adhere to this schedule for three months, they wrote about twice as much as their normal output.

Log your time

Gray says that the simple exercise of keeping a writing log of how much time you spent writing and sharing it with someone—a colleague, spouse or child—makes it more likely that you'll keep it up. "It's just an accountability measure," she says.

Post your thesis on the wall

Keep your thesis statement right in front of you, rather than in a notebook or computer file. It keeps the essential kernel of your research in your face so that you can change and edit the thesis as your research and writing dictate. "It's better to have some rough hypothesis, however rough, than to say, 'I'm not quite ready to make my hypothesis yet'," Gray says. Plus, "you sharpen what you're studying as you study it."

Write an after-the-fact outline

Gray says that copying the topic sentences at the beginning of each section—or even each paragraph—of your paper, and pasting them into a new document can help you focus each section. "Line those [key sentences] up, see where they go, where there's repetition, and where you can sharpen your points." Although Gray says that she is not the type to draft an outline before she writes, she often uses this after-the-fact outlining to hone her writing and whittle down her language to the essential ideas.

Send early drafts to nonexperts

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Enlist the aide of a researcher outside of your main area of focus for review of the first drafts. A mammalian geneticist, for example, might request the help of a plant geneticist for reading early drafts. While it may seem unlikely that fellow academics will have the time to read over your manuscript drafts, Gray says that more than half of the people she sends drafts to read and comment on her work.

### Read out loud

This time-honored trick can and should be used by academics writing scientific research papers, Gray says. "All our prose should move in the direction of being more conversational." A tone that is too chatty should be avoided, but reading your papers out loud can help you achieve a more inviting tone and help reveal bumps in the logical flow of an argument.

### Examples of Sharpened Writing

#### Introduce concepts gently

Instead of jumping right into a new and complex topic, give your reader some gentle lead-in with information that is established or familiar. "Most scientists want to get the new stuff out at the beginning of the sentence. That's absolutely backwards. It doesn't work for readers," says Cargill.

Instead of: "The enthalpy of hydrogen bond formation between the nucleoside bases 2' deoxyguanosine (dG) and 2' deoxycytidine (dC) has been determined by direct measurement. dG and dC were derivatized at the 5' and 3' hydroxyls with triisopropylsilyl groups to obtain solubility of the nucleosides in non-aqueous solvents and to prevent the ribose hydroxyls from forming hydrogen bonds."

Try: "We have directly measured the enthalpy of hydrogen bond formation between the nucleoside bases 2' deoxyguanosine (dG) and 2' deoxycytidine (dC). dG and dC were derivatized at the 5' and 3' hydroxyls with triisopropylsilyl groups; these groups serve both to solubilize the nucleosides in non-aqueous solvents and to prevent the ribose hydroxyls from forming hydrogen bonds." (The semicolon creates a distinction between two bits of information and sets up for the next logical thought.)

#### Ensure that each sentence is a consequence of the preceding one

"When a new sentence begins, you need to have a detail at the beginning of

that sentence that connects with a previous sentence," to help create a narrative tone, says Michael Alley, associate professor of engineering communication at Pennsylvania State University.

Instead of: "Mount St. Helens erupted on May 18, 1980. A cloud of hot rock and gas surged northward from its collapsing slope. The cloud devastated more than 500 square kilometers of forests and lakes. The effects of Mount St. Helens were well documented with geophysical instruments. The origin of the eruption is not well understood."

Try: "Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the mountain emitted a cloud of hot rock and gas. In minutes, the cloud devastated more than 500 square kilometers of forests and lakes. Although the effects of the eruption were well documented, the origin is not well understood."

Avoid long strings of modifiers between the subject and verb

This helps your reader follow the story without getting sidetracked by superfluous detail.

The trick is to write manuscripts that answer very specific technical questions while presenting the information in a palatable and fluid way.

Instead of: "Recently, however, immunoprecipitation experiments with antibodies to purified, rotenone-sensitive NADH-ubiquinone oxidoreductase [hereafter referred to as respiratory chain NADH dehydrogenase or complex I] from bovine heart, as well as enzyme fractionation studies, have indicated that six human URFs (that is, URF1, URF2, URF3, URF4, URF4L, and URF5, hereafter referred to as ND1, ND2, ND3, ND4, ND4L and ND5) encode subunits of complex I."

(The subject-"experiments"-is separated from its verb-"have indicated"-by 27 words!)

Try: "Recently, however, several human URFs have been shown to encode subunits of rotenone-sensitive NADH-ubiquinone oxidoreductase. This is a large complex that also contains many subunits synthesized in the<sup>SEP</sup>cytoplasm; it will be referred to hereafter as respiratory chain NADH dehydrogenase, or complex I."

Avoid "lazy" verbs

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Enliven your writing and keep your reader engaged by using verbs that portray action, rather than "is," "has," and other similarly lethargic verbs

Instead of: "Transcription of the 5S RNA genes in the egg extract is TFIIIA-dependent. This is surprising, because the concentration of TFIIIA is the same as in the oocyte nuclear extract."

Try: "In the egg extract, the availability of TFIIIA limits transcription of the 5S RNA genes. This is surprising because the same concentration of TFIIIA does not inhibit transcription in the oocyte nuclear extract."

To each idea, its own sentence.

To avoid confusing readers and losing momentum, populate sentences with a single point. This also applies to other units of discourse—clauses, paragraphs, sections, articles, and so on.

Instead of: "Enormous mining companies are both continuing operations at old gold mines, such as the case of the Homestake Mine in Lead, South Dakota, which has operated continuously since 1877 and is continuing to increase its operations, and opening new gold mines, often in very disturbing locations, such as the proposed, and for now, postponed, New World Mine, whose proposed location was about 2.5 miles from the border of Yellowstone National Park, near Cooke City, Montana."

Try: "Enormous mining companies continue operations at old gold mines and expand operations to new sites. For example, the old Homestake Mine in Lead, South Dakota has operated continuously since 1877 and is continuing to increase its operations. New mines, such as the New World Mine, which was planned to be sited near Yellowstone National Park, often disturb sensitive ecological communities."

## Resources

For more guidance in clearing up common mistakes in your writing see:

G. D. Gopen, J. A. Swan, "The Science of Scientific Writing," *American Scientist*, 78: 550-58, 1990 (from which several of the above writing examples were taken).

M. Cargill, P. O'Connor, *Writing Scientific Research Articles: Strategy and Steps*, New York: Wiley, John & Sons, Inc., 2009.

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For tips on developing more productive writing habits see: Tara Gray, *Publish & Flourish: Become a Prolific Scholar*, CITY: New Mexico State University Teaching Academy, 2005.

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## **#2. Reducing Over-Complexity in Your Scholarly Writing**

The posting below gives some good pointers on how to reduce complexity in your writing. It is by Gina Hiatt, Ph.D. and is from the Academic Ladder - Get help with the climb, which can be found at: [<http://academicladder.com>] © 2008 Dissertation Coach, reprinted with permission.

Does your writing stall out because you get overwhelmed and confused?

In my never-understanding quest to understand the brain of the academic, I have finally realized something: it is incredibly complex. In the academic brain, thousands of ideas swirl around, each one reconnecting back to earlier ideas or spawning a new question, thought or idea. This is a sure sign of intelligence, you'll be happy to know. On the other hand, this complexity, if not kept under control, can stop you from functioning at an optimal level. Eventually, it can lead you to feel that you have no high-level thoughts at all.

Over-complexity can be a real problem if you want to make progress on the important writing projects that really matter to your life and your career, but which don't come with external deadlines breathing down your neck. Like, say, your dissertation, or that book you really need to finish writing. The complexity of your mind can overwhelm you as you write, causing you to give up on your project because it all seems too muddled. The lack of deadline allows you to set it aside "temporarily," in the magical hope that the unclear mess that you have created will clear up on its own.

Here are some methods of approaching your writing that will help to rein in the chaos:

- \* Write to find out what you think. Your thoughts will be somewhat muddled until you get them in writing. Don't go around and around in circles internally until you know what to write. Write before you know what you're going to say.

- \* Learn to tolerate some degree of confusion, and yes, complexity in your

early writing. I've noticed that many academics get panicky when their first draft is a mess. It's supposed to be a mess! Have faith in the revision process. Whether it's the paragraph you're struggling with today, or the chapter you completed last week, there are ways of simplifying and clarifying your work later on.

\* Let go of the idea that you can create complex arguments in one draft. One-draft writing worked when you were an undergraduate, or maybe even in some grad school courses, as Howard Becker points out in *Writing for Social Scientists*. But it just doesn't work for dissertators or professors. The most prolific, experienced professors know that it takes many drafts before you reach clarity in your thinking or your writing.

\* If you have created a draft with lots of questions and notes to yourself, along with alternative possibilities and other additions that may be unnecessary, cut and paste these extras into another document, so that you can see your own clean draft. You're not throwing away your thoughts, just corralling them into a holding pen.

By the way, I practice what I preach. This simple article, which contains about 935 words, originally had 1451. So I threw out 516 words. Sob.

\* As you write, notice when you're feeling stuck because you have to make a decision. Writing consists of a series of small decisions; e.g. "Should I state that point here?" "Is this enough support for what I'm going to say?" "Do I need to include this citation?" At some point, you're going to have to decide one way or another. Go ahead and flip a coin. It will either become clear to you later what you need to do, or you will get feedback from others that tells you whether you made the right choice. Don't let those small decisions paralyze you.

\* Once you've made your decisions, you don't need to throw out the ideas that you have put into the holding pen. Start a file called "Ideas," into which you can put those thoughts and ideas. You'll be thankful to have this file at some later date, when you are scrounging around for a starting point for a new article.

If you are a grad student in the humanities, a similar file could be called "For the Book." This type of file has been popular with some dissertators in my coaching groups, who agonize over letting go of great ideas or lovely writing



that just won't fit into the dissertation. Those ideas could well be the beginning of a great chapter for that book you will create from your dissertation.

\* Practice revising. How?

\* By mind mapping what you have already written, if the organization of your writing seems unclear. You can do this by writing your main argument and the topic sentences of your most important paragraphs on stickies or index cards. Place the argument in the center, then move the stickies around, or remove them, until it all seems clearer.

\* By creating drafts, rereading them and fixing them. Always focus on clarity. You will get better at this with practice.

\* By giving rough drafts to readers and making changes that they suggest, and rewriting parts that they misunderstand (if your initial readers misunderstand, chances are later readers will, too.)

\* Focus on simplifying. Remove redundancies, make fancy flowery sentences clearer, and take out anything that doesn't move the main argument forward.

\* Check whether you're using the "complexity defense." Ask yourself whether you're making your writing more complicated than it needs to be so that you'll never have to finish it. This could be a way of avoiding the inevitable criticism that any piece of scholarly writing must face.

These are starting points for those of you who are either overwhelmed with the complexity of your thoughts, or afraid that you don't have any thoughts worth writing down. Scholarly writing is never an easy process, but you can make it a little easier on yourself by implementing one idea this week.

### **#3 9 Practical Tips to Improve Your Skills in Academic Writing**

<https://successfulstudent.org/9-practical-tips-to-improve-your-skills-in-academic-writing/>

Sharon Conwell, contributing author to Successful Student, has developed 9 Practical Tips To Improve Your Skills in Academic Writing. Academic writing is a fact of life for all students, academics, and researchers, and it is simply unavoidable. While people who work in fields like Literature or Languages may find writing comes to them naturally, many subjects are unrelated to writing, and expressing yourself and showcasing your findings can be difficult.

Academic writing is also entirely different to writing for other purposes, as its goal is generally to inform, and it is difficult to keep this kind of writing intriguing and engaging. It's also not at all easy to condense complex research, studies, and findings into one long essay that reads fluidly, and is easy for everyone to understand. Following the tips below, you may find your academic writing tasks a little less daunting in the future.

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### 1. Set Up A Place To Write

Having a special spot in your home where you work is a vital tool in developing good writing skills. Make sure you have all the software you need on the computer you'll be writing on, as well as a comfy chair and a clutter-free space.

This shouldn't be the same place that you eat and watch TV – your brain and body should associate it with work, so it's easier for you to stay focused and get in the right zone to put pen to paper. Getting up and down for pens, paper, books, or anything else you might need disrupts your flow – avoid this by having everything you need so you can sit and concentrate.



## 2. Use Online Classes and Guides

Many students who excel in their own fields won't have ever needed specific writing classes. A genius in the engineering, or chemistry department could ace all of their tests, but struggle to properly present their findings in a formal paper. It's unfortunate that many people are expected to automatically be able to write when they have never been taught how to do so. To improve your writing before you start an important paper, free guides are available with [Australian Help](#), or you can really up your game with a full course on writing with [Academized](#).



## 3. Write to Express Yourself

This means multiple things. First, that above all, you should be clear. Make your points, and make them in a way that it's easy for the reader to understand. This means that you should be concise and avoid repeating yourself, as this can really confuse your reader and undermine your structure. You should be expressing your points clearly, not writing in circles in order to use impressive language or terminology. Writing a simple sentence, using an appropriate level of language is far better than a text full of overly complicated sentences, that are too long and contain unnecessary language.

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#### 4. Use Online Editing and Proofreading Sources

There are many tools online that are easy to use and able to assess and improve your writing. One of these tools is the Hemingway App, which analyses your writing for spelling, grammar, abundance of adverbs, long sentences, and awkward structures. By remedying the faults this app finds, your writing will become a lot stronger. A Readability Score is a great way to assess whether your level of language is appropriate for a college essay, and there is always room for an experienced and professional writer to look over your work.

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#### 5. Write Like You Speak

While academic writing is fairly formal, it should still read well. Academic writing doesn't need to be filled with stuffy language and overly complicated vocabulary – it should be easy for you professor or peers to read. Writing as if you are speaking helps achieve this, and also makes your writing more engaging as it will feel more like a conversation.

Reading aloud what you've written is a great way to assess whether or not your writing is clear and concise, and whether it will actually make sense to your audience. While the writing shouldn't be casual, it shouldn't be too hard to follow either. One way of ensuring your writing is clear and more like speech is by using the active voice, rather than the passive. This is a much more natural way of expressing your ideas.

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## 6. Never Forget Your Audience

When you are writing for academia, bear in mind who your intended audience actually is. If you're a student writing for a professor, then you can assume they will not need certain points explained, and will probably not need definitions either. However, if you are looking to write about your field to the general public, or for students just beginning a course, then you may want to alter your language. The audience is the reason for your writing, so they should not be forgotten.

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## 7. Get Rid Of Any Distractions

This is true for all kinds of writing, but especially for academic writing where your subject could be fairly dry. Stay away from your mobile phone, stop checking your emails, and turn off the TV. Focusing for a few minutes on your writing will help you achieve clarity, and will decrease your likelihood of writing long rambling sentences, as you will be aware of exactly what you are saying at all times.

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## 8. Read And Write As Much As Possible

Writing is like any other exercise or skill – practice makes perfect. Sitting down and writing for a little while every day can massively improve the quality of your results, and you will also be aware of the style and structure of academic papers after you have read a few.

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## 9. Vary Your Sentence Structure and Punctuation

This is true for all kinds of writing, but especially applies to lengthy texts like academic writing. It is vital to understand the need to break up your texts and avoid monotony by using different length and structure for sentences, and mixing up our paragraphs with different kinds of punctuation. Overall, a massive amount of research has to go into academic writing, however following the above tips can be a big help in turning that research into an excellent academic paper.