

Posdoc Academic Chat #5

Right Your Writing: How to Sharpen Your Writing and Make Your Manuscripts More Engaging.

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READINGS

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#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.

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

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 cytoplasm; it will be referred to hereafter as respiratory chain NADH dehydrogenase, or complex I."

Avoid "lazy" verbs

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 TFIIA-dependent. This is surprising, because the concentration of TFIIA is the

same as in the oocyte nuclear extract."

Try: "In the egg extract, the availability of TFIID limits transcription of the 5S RNA genes. This is surprising because the same concentration of TFIID 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.

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.

#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 Demystifying Dissertation Writing

The posting below is a short piece on the development of a new book, *Demystifying Dissertation Writing: A Streamlined Process from Choice of Topic to Final text*, by Peg Boyle Single, Ph.D. Published by Stylus Publishing, LLC 22883 Quicksilver Drive, Sterling, Virginia, 20166-2102. ©2010 Peg Boyle Single.

A win-win. That is what I am proposing: a win-win. Far too many doctoral students leave graduate programs without completing their dissertations. Latest estimates put the number at just under 50%, with the humanities and the social sciences having higher attrition rates than the STEM (science, technology, engineering, and mathematics) fields. Faculty members are juggling jobs already overflowing with teaching, scholarship, research, service, and advising. And at a time when doctoral students may be most in need of support from and access to dissertation advisers and when the camaraderie of courses has passed, newly graduated Ph.D.s reported that their advisers were least available to them during the dissertation preparation and dissertation defense phases. So what is the solution? Or at least a solution?

I propose that all doctoral programs offer structured writing seminars. I do not mean research seminars or pro-seminars, where faculty members present their research. Although these are great professional development activities, they do not directly help students write and finish a dissertation. Nor am I talking about seminars focused on research or methodology, where students can discuss and conduct their dissertation research as part of the seminar. I am talking about seminars that focus on the writing process. On how to take useful notes, to prepare functional outlines that include references, to sit down every day and put fingers to the keyboard, to overcome writer's block, to revise adequately, and to know when to stop. I am talking about seminars that teach habits of fluent writing.

When I was a graduate student, I excelled in my courses. I was required to take two years of grueling coursework on psychological theories, research methodologies, and statistical methods. Although I excelled in my courses, I was still at risk for being ABD (all-but-dissertation) because I had no idea how to write a 100+ page manuscript about a self-directed research project. I could pull off writing course-length papers, but the dissertation was a whole different matter.

I was fortunate in that I met Robert Boice, an expert on academic writing and faculty development, and he agreed to facilitate a writing seminar for me and a group of graduate students. He also agreed to advise one last doctoral student before he retired, and that last doctoral student was me. Through him, I learned how to take notes in a way where I kept the purpose in mind, that is, using and citing the research to support my argument; I learned how to write in what he called "brief daily sessions" and give up my practice of writing only when I had ridiculously large blocks of time (and often an

impending deadline); I learned how to turn off my internal critic and overcome my penchant for procrastination. Had I not met him, I may have completed my dissertation, but I truly fear that I may not have.

Because of my experience, I have spent the past fifteen years offering writing workshops and seminars to doctoral students and new faculty members and provided writing coaching to quite a number of academics. While teaching a dissertation writing seminar at the University of Vermont, I tried various writing books as required reading. Many of them are very good. But none of them served my purpose for the course. I wanted a book that emphasized the importance of working within a group setting and of sharing outlines and drafts, encouragement and accountability. So, I wrote it. Or at least I wrote outlines for each class. Then, when I taught the seminar the next year, I expanded and revised the outlines, and revised them again the following year. Before I realized it, I had written a book that could serve as the central text for a dissertation writing or proposal writing seminar or could be used by a group of students who informally met to support each other as they wrote their dissertations.

My book, *Demystifying Dissertation Writing: A Streamlined Process from Choice of Topic to Final Text* is practical, motivational, and yes, even at times comical. I address the nuts-and-bolts of writing a dissertation. I write at length about the importance of prewriting and how prewriting is the best antidote for writer's block. I provide explicit guides on how to use bibliographic programs to take useful notes and then sort and play around with the notes as you organize your dissertation. The book is focused on students in the humanities and social sciences, not because doctoral students in the STEM fields couldn't find a book like this useful, but because the context of working on the dissertation is different. Often students in the STEM fields have ready-made social support in the forms of more advanced doctoral students and post-docs who work in their lab. Also, advisers may be more available as they have a vested interest in and an investment in (often in the form of grant support) the research their students are conducting since often the students are working on one aspect of a STEM adviser's program of research. While this situation does occur in the humanities and social sciences, it is far less common.

In *Demystifying Dissertation Writing*, not only do I teach writing techniques and habits of fluent writing, I also provide tips to doctoral students on how

to work with their doctoral advisers. Among other suggestions, I coach them on how to prepare for meetings with advisers and how to use their advisers' time wisely. For instance, I suggest that when students submit either a chapter or their whole dissertation to their advisers for review, they also include an outline of their whole dissertation. I write:

By including the outline, you provide your adviser with a quick refresher on your project. It will also provide him or her with an efficient way to assess your progress. Remember that you are working on one dissertation while your dissertation adviser may be advising numerous students, along with working on his or her own writing projects, teaching courses, presenting at conferences, and serving on committees. Make it as easy as possible for your dissertation adviser to provide you with useful feedback and to think you are making great progress.

When I taught my seminar, the students got a "win." While I did not research this rigorously, I do know that the students who took my course tended to graduate six months to a year prior to the members of their cohort who did not take a structured writing course. Plus, I worked with many students who had been unengaged with their dissertations for a few years and they admitted they would have remained ABD had they not taken a structured writing seminar. Since I have been in graduate school, many more programs are offering writing seminars, and for this I am thrilled. And from exchanging anecdotal evidence, many of the faculty members in these programs state the same thing: The students finish quicker (that is, with reduced time-to-degrees) and more of them complete their degrees (that is, with reduced attrition rates).

Along with the students, the faculty members get a "win." As I mentioned earlier, faculty members have plenty on their plates. The demands of an academic job only seem to be increasing; especially during the current economic downturn, the external resources and supports seem to be decreasing. The many faculty members that I know really enjoy advising doctoral students. They find it stimulating and fun to interact with doctoral students on new projects and research. Although, many of them have confided in me that they just don't know what to do when they have a student who struggles with the writing process and misses writing deadlines, as many doctoral students do. So, when I started teaching my dissertation writing seminar at UVM, I was pleasantly surprised when the faculty

members who were advising doctoral students made a point of contacting me to thank me for offering the seminar. They told me how much it was helping their students. They also shared that they were freed up to provide advice and direction on the dissertation topic and the methodology without also having to be a writing coach.

I would say that the faculty members who lead a writing seminar get an even bigger win. I wrote my book to help students with their writing and to facilitate the offering of such seminars. You can develop a seminar around the ten chapters in the book. Plus, if you decide to teach a dissertation writing seminar, I can assure you that it will be one of your favorite courses. The students are highly motivated to make progress on their dissertations. You get to learn from students passionate about their dissertation topics. They learn from one another and you will get to learn from them. The nature of the course seems to foster a spirit of collegiality and shared mission, with plenty of opportunities for good-natured ribbing and comic relief.

Ah yes, and the university benefits. Students are becoming increasingly savvy about choosing graduate programs. In addition, organizations are encouraging programs to publish time-to-degrees and attrition/completion rates. While I have never seen a research project addressing the outcomes associated with programs offering structured writing seminars (hum, a possible dissertation topic??), the anecdotal evidence weights heavily toward showing that students graduate more quickly and more of them graduate. So the university gains a "win" also. I am hoping that more doctoral programs will begin sponsoring dissertation writing seminars. Eventually, I am hoping that every program offers such a seminar. So, I guess I don't see it as a win-win after all. Rather I view it as a win-win-win for the students, the faculty members, and the university.

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