

The Science of Scientific Writing

September 30, 2015

If the reader is to grasp what the writer means, the writer must understand what the reader needs.”

-Gopen and Swan (1990), The Science of Scientific Writing

Graduate school is like a juggling performance. Successful jugglers need not only keep the balls from hitting the ground but simultaneously amalgamate new and old tricks, mixing the standard material with the fancy pick-ups. When it comes to academic writing, this juggling is difficult. Depending on your writing experience (or lack thereof), it might feel like tossing two balls back and forth is a laborious challenge, and a complicated routine with [more sophisticated tricks](#) may seem entirely out of the question.

Once you’ve gained experience as an academic writer, you may find a variety of things to juggle. In one hand, you might find the need to write for the journal editors and reviewers, and in the other hand, the need to cater to an audience with less understanding of the subject. You also might experience balancing the field’s expectations in one hand and your own writing preferences in the other. These issues are doubly challenging for a beginning student who hasn’t yet found her voice as a writer. Fortunately, with self-exploration, attention to detail, and practice (practice, practice), students at any skill level can begin learning how to give an inspiring performance in academic writing.

In hopes of further identifying the essential tools needed to bolster a graduate student’s writing skills, I asked APS Fellow Eli Finkel, a Northwestern University social psychologist and an op-ed contributor to *The New York Times*, for advice. Finkel gave insight into his writing process:

Every time I write anything, I first think about the target audience. In particular, I think about what background the target audience is likely to have, and I calibrate my efforts at clarity with the background in mind. I also attend to the likely level of interest and attention span of the target audience, and I try to calibrate the technicality and length of the piece accordingly.

Learn the Basics Early

Writing centers are an invaluable resource for writers of all levels. Many academic institutions have an affiliated writing center staffed with graduate and faculty writers trained to provide one-on-one tutoring and assistance in the planning, drafting, revising, and editing stages. Sometimes, exercises in revision are extremely helpful for budding scholars. Consider this editing example from *The Journal of Neuroscience*’s website:

Limit the use of the verb “to be.”

Original: This mechanism is an important factor in our understanding of cytomegaloviral infections in

the brain.

Revised: This mechanism will help us understand how cytomegaloviruses infect the brain.

This is just one example from a [full list](#) of helpful tricks for making your writing more palatable to readers. Before finishing a first draft, some writers might find these tips hard to follow. If you find yourself struggling to begin writing, try starting with an outline and add comments in areas of uncertainty. It is entirely okay to write your first draft badly if it puts words on paper. Mark it up and keep going.

“Don’t try to write well on the first draft,” Finkel recommends. “Just get all of your ideas down as quickly as possible. Only then can you start to be confident that you know how the logic and the narrative should cohere. Then start revising. When you’re done, start revising again. Then again. Then one more time. Then get feedback from people you admire. Then revise again and again. Then consider getting additional feedback. Then submit your piece.”

Stick With Simplicity

Avoiding jargon can be difficult, especially if doing so results in a longer string of words. However, consider the circulation of the five APS journals alone. APS members from many subdisciplines of psychological science receive these journals, and the knowledge base of this population varies considerably. Academic journals with broad circulation necessitate thoughtful writing. Can you describe your empirical findings simply without overselling or underselling their importance? Pay close attention to similar work. A helpful exercise involves reading through a journal’s recent publications before submitting your manuscript. See if you can integrate the style of these papers into your own writing. Look for things that you as a reader do not understand or would do differently — especially in the discussion section. As APS Past President Henry L. Roediger, III, noted in a 2007 *Observer* column, “authors often wander far afield in their general discussions, dilating on possible ramifications of their results into far-flung domains. Rein yourself in for journal articles and stick to the point. Keep it short and snappy whenever possible” (Roediger, 2007).

Don’t Be Afraid to Learn New Tricks

You don’t need to be a creative genius to enhance your work for the reader. Indeed, little modifications can go a long way. Vary short and long sentences. When possible, choose the active voice in your results and discussion sections and omit unnecessary words. Little changes can make your writing much clearer. Consider the advice of Harvard psychologist and APS Fellow Steven Pinker in his recent book *The Sense of Style: The Thinking Person’s Guide to Writing in the 21st Century*. Pinker, whose academic prowess spans the areas of visual cognition and psycholinguistics, notes that “style earns trust. If readers can see that a writer cares about consistency and accuracy in her prose, they will be reassured that the writer cares about those virtues in conduct they cannot see as easily ... Style, not least, adds beauty to the world. To a literate reader, a crisp sentence, an arresting metaphor, a witty aside, an elegant turn of phrase are among life’s greatest pleasures” (p. 6).

Reading the advice of writer–scholars such as Pinker can enrich your professional work. For example, you may choose to borrow the useful tool of metaphor from creative academic writers. Metaphors,

though seldom used in academic work, capitalize on well-understood common experiences to facilitate understanding of complex or abstract concepts. Finding the right figurative language can enhance your ability to effectively communicate ideas to your audience.

‘Clarity Is King’

Gopen and Swan (1990) wrote, “We cannot succeed in making even a single sentence mean one and only one thing; we can only increase the odds that a large majority of readers will tend to interpret our discourse according to our intentions” (p. 554). A writer must attend to both form and content. I often try to write as if I am explaining my work to my younger brother. Though he’s a remarkably intelligent 16-year-old, I have to make sure I write in a straightforward manner in order for him to both understand and pay attention. Writing as if you are explaining your work to audiences outside your field can give you practical experience both in communicating your work and in giving people an understanding of the importance of your findings.

Finkel offers similar advice for novice writers. “Focus on clarity above all else,” he says. “For every word in every sentence, double-check that a reader who lives outside of your head can readily understand what you’re saying. Efforts to be funny, clever, or engaging are secondary. Clarity is king.”
œ

References and Further Reading

Duke Graduate School Scientific Writing Resource. (2011–2013). *Resources*. Retrieved July 30, 2015, from <https://cgi.duke.edu/web/sciwriting/index.php?action=resources>

Gopen, G. D., & Swan, J. A. (1990). The science of scientific writing. *American Scientist*, 78, 550–558.

The Journal of Neuroscience. (n.d.). *Techniques for clear scientific writing and editing*. Retrieved July 30, 2015, from <http://www.jneurosci.org/site/misc/publishingpointers.xhtml>

Lightman, A. (2006). *A sense of the mysterious: Science and the human spirit*. New York, NY: Random House.

Pinker, S. (2014). *The sense of style: The thinking person’s guide to writing in the 21st century*. New York, NY: Penguin.

Plotnik, A. (2006). *Spunk & bite: A writer’s guide to punchier, more engaging language & style*. New York, NY: Random House.

Roediger, H. L., III. (2007). Twelve tips for reviewers. *Observer*, 20, 41–43.

Strunk, W., Jr., & White, E. B. (2000). *The elements of style* (4th ed.). New York, NY: Longman.

Swales, J. M., & Feak, C. B. (2004). *Academic writing for graduate students: Essential tasks and skills* (2nd ed., Vol. 1). Ann Arbor, MI: University of Michigan Press.

Zinsser, W. (2006). *On writing well: The classic guide to writing nonfiction*. New York, NY: HarperCollins.