Strategies for revision

It's important to recognize that writing is a highly iterative process; rarely, if ever, do scientists sit down, bang out a single draft and submit it (or if they do, the draft is likely to be terrible!). In other words, good writing always involves revision.

So, below, I've offered a recommended approach to drafting and revising. The stages in this approach obviously intertwine and overlap, but it's the overall direction of their flow that's important: From a focus on you (as the writer) to your readers, and from larger, global issues to specific, local ones.

- **Drafting stage.** At this stage, you discover what you want to say, and get your thoughts and ideas down on paper and roughly organized. In a perfect world, little or no revising happens at this stage.

- **Revising stage 1: Global issues and audience needs.** Once you capture your initial thoughts on paper, you typically do things such as expand and refine your ideas, clarify your points, look for holes in your logic, and reorganize, add or delete text.

  But have you ever thought about *why* you do those things or *who* you're doing them for? *You do them for your readers*; you design your prose so that it can be read and understood by people other than you (see below for strategies on how to do this).

  Getting feedback at this stage is very helpful (actually, I think it's critical), but it can be hard to find reviewers who will focus appropriately on big picture issues, rather than on details, such as grammar.

Note that these first two stages encompass the bulk of the writing process and may involve several rounds of feedback and revising.

- **Revising stage 2: Local issues.** Once you have a solid draft that includes all the critical pieces and is designed for readers, then – and only then – should you begin polishing your prose in earnest (e.g., correcting grammar, pruning unnecessary words, tweaking sentence structure).

Below, I elaborate on these points.

Deducing readers' needs

If an important goal of revision is to produce prose that serves readers, how do we decide what readers need?

1. Choose your target journal before you start writing. Then, read the guidelines for authors and analyze the writing of some papers from the journal (preferably well written ones!) to get a feel for how authors frame their work, the background they include, and the language they use.
2. As Paul Halmos says in *How to Write Mathematics*, ask yourself whom you want to reach and then write to that person. That is, picture a smart,

interested reader who has very little background in your field and might be skeptical of your approach. Then ask yourself: What background might this person need to grasp the significance of my research? What hard questions might he/she ask about my methods or results? What difficulties might he/she have understanding my work, and how can I phrase things to avoid these difficulties?

3. Ask a general reader to review your writing. Your advisor and co-authors are excellent reviewers of the scientific content of your paper. But because they're just as familiar with the research as you are, they may miss places where you're being unclear, making leaps in logic, or using too much jargon. That's where a general reader – your spouse, or a graduate student friend in another field – can really help.

Designing your writing for readers

These tips for designing your writing to meet readers' needs are modified from Flower, L. 1989. "Writing Reader-Based Prose" in *Problem- Solving Strategies for Writing*, 3rd ed., pp. 187-212.

1. Organize your paper around a main message you want to leave with readers or a problem you share with them, instead of around your own discovery process or the topic. Have a point, in other words, that readers can relate to.
2. With that message at the top, organize the ideas that support it in a hierarchy. Begin with your major points and then follow with minor ones, making sure the relationship between them is explicit.
3. If you want readers to draw certain conclusions from your work, state those conclusions directly. Don't make your audience guess what your results mean.
4. Once you've developed and organized your ideas in a hierarchy focused on both yours and the reader's needs, use cues to guide the reader and make that organization clear. These include:
    a. Cues that *preview* your main points, such as your title and abstract; headings and subheadings; the problem/question posed in your introduction; the topic sentences of paragraphs.
    b. Cues that *summarize* your points, including summary sentences at the end of paragraphs; a conclusions section.
    c. Visual cues such as graphs and tables, typefaces (bold or italics), numbering.
    d. Connecting words (thus, however, then, for example), pronouns (*these* or *our* models), repetitions of key words and phrases.

Think globally, then locally

It's always preferable when revising to focus on "global" issues first – those concerned with the overall message, argument and organization of a piece – before tackling "local" problems, such as grammar, word choice, sentence structure and so on. Nevertheless, less experienced writers and reviewers often can't let local issues

go; their tendency is to polish, polish, polish as they write, or to tinker with sentences compulsively as they review someone else's work.

What's wrong with this? The main problem is that it can be very inefficient. Often we spend a lot of time refining a sentence, paragraph or section only to throw it out later because it doesn't fit. What's more, focusing on local issues too early can interrupt our train of thought, so that we end up forgetting where we're going overall, or fail to capture key insights on paper.

Doing some polishing as we write is inevitable. But during the early stages of drafting and revising, try to stay focused on the big picture by asking yourself these kinds of questions:

- What am I trying to say? Have I discovered my main point or "bottom line"?
- How is my overall argument or message taking shape? Where am I including too much information – or not enough? Are there any leaps in my logic?
- Is the content organized in support of my main point or message?
- Am I keeping the needs of my readers in mind?

I just can't see what's wrong…

Putting "fresh eyes" on a piece of our own writing, so that we can see the problems and fix them, is tough. If you count yourself among those who struggle with this (and you're not alone), here are a few strategies to help you:

1. Put your work aside for a time. At least a week is good, longer if you can spare the time. Try it, and you'll likely find yourself saying, "I wrote that? It doesn't make any sense!"
2. Ask a friend or colleague to read a passage from your work, and then explain out loud what she thinks you were trying to say. This should not only give you a sense of how clear your main points are, but it should also help keep the reviewer from picking on grammar, word choice and other "local" issues (see above).
3. Read your writing aloud to yourself. Nothing exposes convoluted, wordy and confusing prose faster than hearing it spoken aloud.
4. Get a good critique. Everyone needs to learn how to evaluate his or her own work, but nobody in the end can do without a good editor or reviewer. Just make sure to pick one carefully: Someone who'll focus on larger issues; who'll give specific feedback (Comments like, "I get lost in this section," or "This is great!" don't cut it); someone, in short, who is exacting and honest but kind, whose feedback encourages rather than discourages you from revising. Note that you may need to explain what you're looking for in a critique.

References

N Sommers (1980) Revision Strategies of Student Writers and Experienced Adult Writers. *College Composition and Communication* 31(4): 378-88