

How to Make Scientific Writing Easier

 simplyblood.org/2018/10/how-to-make-scientific-writing-easier.html

ISEH Headquarters

October 31, 2018

We have all felt the inertia when we need to write – whether it's an abstract, paper, report or grant – and it can feel daunting and hard to get started. We feel like we need a big slot of time, or we need to have all the conditions just right (if you are anything like me - quiet, a cup of tea, and tidy desk) or that there's just one more experiment that we need to complete before we sit down and begin.

What is the writing process?

No matter where you are in your research, you are in the writing process.

*Strategies for **generating** ideas:*

- Consume – Scientific papers, podcasts, programs. Include consumption that is outside of your regular programming.
- Interact – Talk to your colleague and talk to people outside of your field.
- Create – Doing experiments and generating data.

| *TIP* Consuming and interacting outside of your “bubble” will create opportunities for cross-pollination of ideas.

*Strategies for **capturing** ideas:*

Do a mind dump. When you are starting a writing project, or you are getting a lot of ideas all at once, it can become overwhelming. It's time to consider a mind dump i.e. write down all of your ideas in one place, for example, on a piece of paper, a whiteboard, or a searchable notes app like Simplenote or Evernote.

| *TIP* Notice and honor how your ideas appear for you. If your ideas come up like lists, write lists. If your ideas come up like popcorn, or bubbles, do a mind map.

- Treat every idea as neutral and write them ALL down. We are trained to evaluate and criticize ideas automatically, so this can be a challenge for scientists. If you practise being neutral and open to all your ideas, more ideas will inevitably follow and statistically this results in more useable ideas.
- Constantly capture your ideas. Create an ongoing Universal Capture List (see Getting Things Done by David Allen). For example, a notebook or app on your phone (I use Simplenote.com) that is with you at all times so that you may capture your ideas whenever they strike.

Filter – Deciding which ideas to include

Now that you have all of your ideas gathered in one place, it's time to think about which

ideas you need for your specific writing project. What is your filter for choosing which ideas to include and how will you apply it? From my observations, you can create the best filter by answering the following 3 questions related to your writing project: 1) Who is your audience? 2) What is your message? and, 3) What does your audience need to know to understand your message?

Questions to ask to create and use your filter to decide which ideas to include:

- Who is your audience and what are their characteristics? What is their knowledge within the field? What are they interested in learning? What do they care about?
- What is the knowledge gap you are filling with your data? What do you want to communicate about how your data fills this gap and changes the field? What is your message?
- What shift will they need to make in their thinking to understand and believe your message? What ideas would they need to discard to understand and believe your message?
- How can you use your data and knowledge of how it fits into the field to shift how your audience thinks or perceives your findings?

Filtering your ideas to only those that are necessary for your audience to understand and accept your message can be a complex and iterative process. A common flaw in scientific writing that leads to reader confusion is presenting too many ideas, not too few. By filtering your ideas at this stage, you are not only making it easier for yourself to write, you will also make it easier for the reader to understand your message.

“A common flaw in scientific writing that leads to reader confusion is presenting too many ideas, not too few.”

Organize – Creating a structure for your filtered ideas

Now that you understand what ideas will best convey your message to your audience, it's time to organize your ideas to provide a structure for the reader to understand your message. The structure of your writing project is like a coat rack for your reader to hang all of your ideas on. If there's no coat rack, then everything just ends up on the floor. With a structure in place it allows your reader to see where you are taking them and how all of your ideas come together to create a compelling story. How you organize your ideas is also an opportunity to create interest for the reader through contrast. You can compare and contrast ideas, problems and solutions, or advantages and disadvantages.

Questions to ask to begin to organize your filtered ideas:

- How do my ideas connect together?
- How can I group them together to create sections or topics?
- Could I draw a diagram of how my ideas fit together?

| *TIP*: Write your ideas down on sticky notes or slides so that you can move them around and see how they connect.

Expand – Getting into the flow of writing

When writing is coming easily to someone you may hear them say they are in the “flow” or in the “zone”. The state of flow is a phenomenon that was extensively studied by psychologist Mihaly Csikszentmihalyi who describes it as “a state of concentration or complete absorption with the activity at hand and the situation.” Flow was extensively studied in sports, and it also applies to writing. To support yourself to get into the flow of writing, move through all of the steps of the writing process until you reach a point where you feel like you have the right ideas and in the right order and you are ready to expand on them into sentences and paragraphs. Be ready for the flow to emerge and ensure that you allow and create space for it.

Consider these 3 strategies for getting into the flow of writing more easily:

- **Practice.** Write something else that you find easier to write and practice getting into the flow.
- **Reduce distractions** ahead of time that may disrupt the flow.
- **Take the flow seriously.** Do not sacrifice the flow.

Refine – Polishing your writing

In this stage of the process you are ensuring that what you have written is correct and complete. This typically involves two types of editing: macro-editing and micro-editing. Macro-editing involves an iterative process of filtering, organizing and expanding ideas whereas micro-editing involves word usage, grammar, punctuation, sentence structure. Refinement is an ongoing process and will progress as you share and continue to edit your writing project i.e. the goal of refinement is completion, not perfection.

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Consider these 3 strategies to ensure that your writing project is refined and complete:

- Most importantly, ensure that all of your data is correct.
- Ensure that all of your grammar, word usage and sentence structure is correct.
- Ensure that all of your transitions (sentence to sentence, paragraph to paragraph and section to section) are smooth.

Share – Create confidence throughout the process by sharing your ideas and drafts

There are many ways to share during the writing process. Sharing can be discussions and brainstorming ideas early on, presenting data at different stages of the project (posters, lab meeting, conferences), sending completed manuscripts or grants to colleagues to be proofread and edited before submission or to actually submit your paper or grant for review.

As you share and discuss your ideas throughout the process, the more confident you will be when you are writing them down and the easier it is to share your completed draft.

If you are like me and tend to get stuck here, consider these 3 strategies to grow your ability to share your ideas:

- Practice sharing your ideas throughout the writing process by talking to colleagues and those outside of your field.
- Create meetings (one-to-one, small group, large group) throughout the writing process to leverage deadlines for yourself to share and review your progress.
- Be specific about what kind of feedback you would like to receive.
- Create a motivating reason for yourself that explains why you want to share. For example, when I am resisting sharing, I tell myself if I can help one person, it is worth sharing my ideas.

Rest – Creating some space around the writing process

Have you ever noticed how you can feel frustrated with a sentence or paragraph, you decide to walk away, and when you come back the writing comes more easily? This is an example of the importance of rest in the writing process. Rest is not necessarily sleeping; it is just not writing. The goal of this stage is to allow your mind to rest, to create room for new ideas, connections, and create space to allow the solutions to come up for you.

Consider these 3 strategies to incorporate rest into your writing process:

- Notice where and when you have “a-ha” moments so that you can create opportunities for them on purpose
- Notice whether you work to exhaustion and how you might use rest to best serve you during the writing process. For example, create habits to ensure that you rest throughout the process.
- Notice whether you take breaks too easily i.e. procrastinating and consider how you might support yourself to use rest more effectively to complete your writing projects. For example, set a timer to write for 20 min and then set a timer for a 5 min non-writing break.

| “Rest is not necessarily sleeping; it is just not writing.”

Design a writing process that works for you

Now that you understand how the writing process works, you can begin to design your own unique approach to the process. Is there a strategy here that especially resonated with you? I encourage you to experiment with it and begin to see how designing your own writing process can make writing easier for you.

Acknowledgements

I would like to thank Eugenia Flores-Figueroa and Amanda Mitchell for reviewing this post and providing constructive feedback to further refine and improve it.

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And, what happens when we do not get started? We lose the momentum of our greatest ideas. We end up working closer to deadlines and under pressure, which may not create our best work. Or worse, if there's no deadline (for example, when you are writing a paper), we end up putting it off and suddenly we've been scooped, or the data has lost its vitality.

During my 15 years of organizing, editing and developing grants with leading scientists, I have learned that writing is a process. Learning how we approach writing and the roadblocks that come up for us has captivated me and I have been learning how to make it easier.

Here, I'd like to share with you how the writing process works, as well as strategies for getting started, maintaining your momentum and completing your writing projects.

The writing process consists of seven steps: 1) generating and capturing, 2) filtering, 3) organizing, 4) expanding, 5) refining and 6) sharing your ideas, followed by 7) rest (Figure 1). As you move through the writing process there are catalysts that can practically support you to stay engaged and maintain momentum.



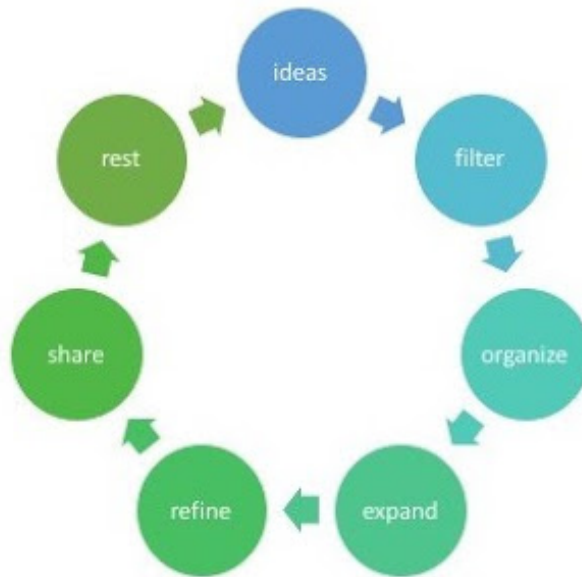


Figure 1: A) The writing process. Adapted, based on my own experiences and observations, from “The Creative Cycle” by Chris Kay Fraser, “Resonate” by Nancy Duarte and “Guidebook for New Principal Investigators” by Rod McInnes and Brenda Andrews

Ideas – The starting point of every writing project

How do you generate and capture your ideas? How do you manage them? Do you have a flood of ideas or do you feel like the well is dry? Try treating your ideas like little treasures that you are collecting. I am not always sure where or when I will use them, but I have created a space where they are easily accessible, searchable and honored. Since I have started this practise of capturing all of my ideas, I have found that ideas come more readily, and I am generating more of them or, maybe, just noticing more of them. By generating and capturing your ideas you effectively eliminate the blank page as you always have somewhere to start.

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