The Habits of Successful Ecologists: How to write right, right!?

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Did you ever want to be an author when you grew up? You may have wanted to be an astronaut, a chef, prime minister, even a scientist. Reading this ***Bulletin***, you probably ended up as an ecologist. Did you know that this is mere subterfuge for what you really are? A writer. As scientists, we have an inordinate number of things to write. Essays, PhD theses, papers, grant proposals, reviews, blogs, tweets. Some of these are easier (and shorter) than others. But they are still writing.

And writing is something that rarely features in our training. We have lessons on how to do a t-test, how to randomly throw a quadrat over your shoulder, even how to give a good presentation. The closest we often get to being taught writing is programming data analysis software. But the mechanics of how to write, how to make writing happen, is left in the dark. So, if you are among the multitude, those of us who struggle to write, fear not. You are not alone (Upper 1974, Didden *et al.* 2007). Furthermore, there is hope. Read on.

Box 1. Studying writing

Few scientists have studied how writers write, especially academic writers. Robert Boice is one of those, and has shown very convincingly that the habit of regular daily writing is extremely productive. In one long-term observational study, newly hired professors in the US who said they wrote every day published significantly more papers than those who wrote irregularly (Fig 1). In an experiment, academics who were instructed to write 3 pages a day or face a financial penalty also wrote significantly more than academics who were instructed to write only when they felt like it. Further, those academics who wrote 3 pages a day had significantly more 'creative ideas' than the control (Boice 1990).

Most research on writing involves examining the habits of disgustingly productive writers (such as Anthony Trollope who frequently wrote 10 pages a day whilst holding down a full-time job at the Post Office), and trying to work out what makes them different. Looking at such outliers can be useful, although a more rigorous sampling strategy would be better. Roald Dahl wrote all his books with a yellow pencil, but I doubt this trick will work for everyone. There are, however, several proven techniques to help writers such as ourselves write more. First, the most important thing is to write. This may sound facetious, but writing does not involve checking your colleagues' / fellow PhD students' current status on the social network de jour. More seriously, it is much easier to go back, edit, and improve what you wrote yesterday rather than spend hours searching for the perfect paragraph. Write, and do not worry so much about crafting each sentence right now. Second, write regularly and write frequently. Faculty at universities who were instructed to write for a short period every day wrote more pages and submitted more manuscripts per year than those who engaged in the more traditional 'binge-writing' process that I am sure we are all familiar with (Figure 1). Third, keep track of how much you write a day. Make a chart. Preferably in R.

There you go. Simple, isn't it? Keep writing; apparently it's the most fun you can have by yourself.

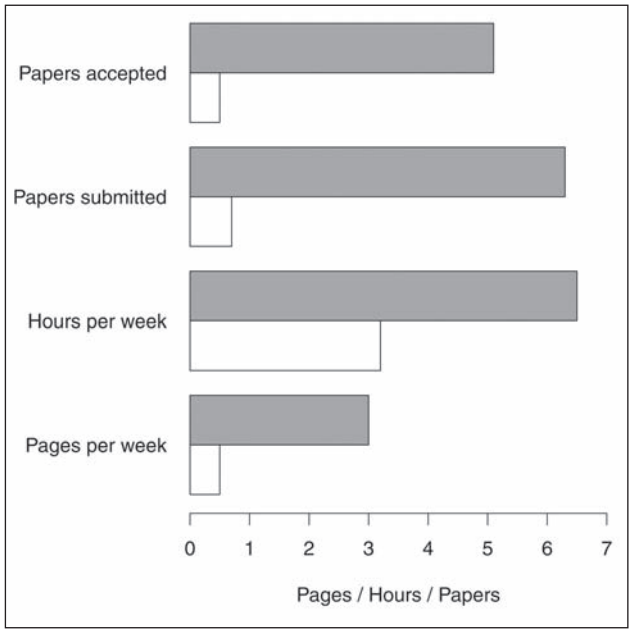

Figure 1. *Differences in mean productivity between 16 academics who wrote every day and 16 who habitually binge wrote. Shaded bars denote academics that wrote every day, white bars denote those who wrote sporadically. Data from Boice 1990 – I am afraid he appears not to have heard of variance.*

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Box 2. Michael Kaspari's 7 steps toward making headway on that manuscript

1. **Close email.** Don't just close the window. Close the program.
2. **Open up your software:** MS Word, Google Scholar (only that window), any digital notes, and bibliography. Arrange them so that the written page is at eye level and everything else is a click away. This is your last chance for OCD-ish procrastination; don't blow it.
3. **Print out your latest figures and tables.** Keeping figures/tables/appendices in a document separate from the manuscript improves the performance of MS Word. It also removes the need to flip back and forth (or, worse, scroll) when you should be typing.
4. **Set your timer to 25 minutes.** If you really want to know why, google 'Pomodoro technique'. The general principle is to divide your work into 25 minute chunks of pure concentration, broken up by 5 minute intervals when you goof off, relax, tidy up the office etc. and it just seems to work. For many, 25 minutes is a nice block of time to get into the flow of writing. Moreover, because you are using a timer, you can see how much time you have remaining and you may actually end up working harder because you find yourself racing the clock...
5. **Write.** Write damn it! Write like your life depends on it! The wolves are chasing the sled! The T-Rex is in your rear-view mirror! Your timer is watching!
6. **Take a 5-minute break.** Twenty-five minutes of uninterrupted work will have generated at least a few sentences. Or some serious editing. And when the alarm goes off, you may need a break. Finish the sentence, stand up, and stretch. If you don't hear the alarm you are in the zone – so just keep writing!
7. **Go to 5.**

Michael Kaspari is Director of the Ecology and Evolutionary Biology programme at the University of Oklahoma. His lab studies the macroecology and community ecology of brown food webs. He has a particular fondness for ants. These 7 steps are adapted from an entry in his blog "Getting Things Done in Academia". You can see the full version along with lots of other good advice and interesting info on http://eebatou.wordpress.com/

REFERENCES AND FURTHER READING

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Ruth Gates is a Research Professor at the University of Hawaii

PROLIFIC PROFILE: Ruth Gates

Ruth Gates is a Research Professor (tenured) at the Hawaii Institute of Marine Biology, SOEST, University of Hawaii at Manoa, and was also a recent sabbatical fellow at the National Center for Ecological Analysis and Synthesis, University of California, Santa Barbara. Dr. Gates and her group focus their research on coral reefs, marine ecosystems that protect coastlines, support tourism and provide nutrition to many island nations. Their goal is to contribute basic and applied scientific knowledge that expands understanding of how coral reefs function, and inform the management and conservation of these beautiful but threatened ecosystems.

1. *How soon in your career did you author your first publication?*
I published my first paper the year I graduated from my PhD. It was like pulling teeth!

2. *How important do you think it is for young academics to publish early and often?*
Publishing early and often is extremely important, the earlier the better. I encourage my students to write their theses as a series of publications (there are still many labs that do not do this), and most students will have a paper or two submitted, if not published, before graduating. In order to convince post-doc employers, students need to demonstrate that they can undertake the full scientific cycle from idea to research to publication. During my PhD I was told that science doesn't exist until it is published, which I vehemently disagreed with at the time. I very much agree with it now!

However, I do not mean to say that quantity outweighs quality. In a committee appointing post-docs here at the University of Hawaii, we invariably employ the young post-docs with few high quality publications in excellent journals over the post-docs with a larger number of lower impact contributions.

3. *How do you maintain a good publication record while pursuing major research projects that may take years to complete?*
The key to maximising productivity is to have a diverse range of projects running at the same time, both short and long-term. My short studies are discreet projects answering specialised questions that can be addressed quickly. The long-term studies lasting years are often much more informative, but are also designed to allow papers to be published throughout their duration, rather than all at the end. The need for this diversity of research is especially true at early career stages. Science is becoming more entrepreneurial, more business-like, and I feel it is important for young researchers to consider their research endeavour with this context in mind.

4. *How important are collaborations in maximising research efficiency, and does this change as one gets further along in one's career?*
Collaboration is everything! Collaboration expands the scientific questions you can address, the skills that you can call on, and the geographical range of your research. The quality of your collaborators is however, of utmost importance! Good collaborators are reliable, responsible and productive, as well as nice people to work with. Many of my most productive collaborations are with colleagues from my PhD days, although I very much enjoy working with post-docs and early faculty who tend to be more open-minded and have good ideas. Now, I often find collaborators at workshops or meetings, people with shared interests but complementary skills to mine. That said, I have also been known to cold-call scientists who have specific skills or tools that I think are perfect for a particular question!

5. *What motivates you in your work?*
Three things. First, a passion for learning. I am awed by the unpredictability of biology and the process of discovery. Corals are extremely complex organisms and I enjoy the transition from not knowing to an understanding of this complex system. Some scientists attempt to reduce complexity, but I am fascinated by it. Complexity is biology. I try and ask simple questions of complex systems. Second, the freedom of a scientific career is unbounded. The luxury of choosing what to study, with whom to work and the flexibility with which to go about it is unparalleled. Third, training, which relates back to my first motivation. I enjoy training others and being trained in the process and feel that I am learning all the time.