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Review of *The Craft of Scientific Communication*. Joseph E. Harmon and Alan G. Gross, Chicago: The University of Chicago, 2010. 225pp.

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Science is a truly global endeavor, one that traffics in the world of abstract theory and practical implications. Bridging the chasm between theory and practice is one thing but communicating it from one mind to the next takes clarity and concision. Harmon and Gross' latest book, *The Craft of Scientific Communication* (Chicago: The University of Chicago), helps scientists and laypersons alike do just that.

The book is divided into two roughly equal sections with two very different audiences. The first section, *The Scientific Article*, is written for scientists who are concerned about communicating with other scientists. The second section, *Beyond the Scientific Article*, is written for scientists who are concerned about communicating with a general audience. Because of this partition, and the different audiences that are addressed, the book appears to have a somewhat confusing function, a problem that is partly relieved by its scope and depth.

The book starts off with the most likely of subjects, the introduction. Here, Harmon and Gross address the main ingredients of the introduction—problem, question, and solution. All good introductions, we are told, should contain some combination of what the topic or thesis is about, how the problem generates certain kinds of questions, and how the authors plan on resolving to provide a solution. It is this interplay between problem and solution that is the subject matter of a good introduction.

This advice may sound rather banal until you hit page 11, which has one of the funniest examples of an introduction I have ever read.

> *Actually, this paper doesn't need an introduction, since anyone who's the least bit competent in the topic of the paper he's reading doesn't need to be introduced to it, and otherwise why's he reading it in the first place? Therefore, this section is for the referee.*

This passage was pulled from a 1986 paper by physicist Warren Siegel. The humor of this excerpt, of course, is that it does exactly what one should not do in a good introduction. In truth, all good introductions should state what the paper is about, but in a slightly condensed form. If the paper is written by scientists for other scientists then the introduction should literally spell out the contents of the paper. If the paper is written by scientists for the layperson then the introduction should provide a hook and maybe some mystery. The function of an introduction depends on the context of the situation, namely that of the audience.

Of all the chapters in the first section—topics ranging from distillation to titles to arranging and varying matters—the most important is perhaps chapter six, *Framing Your Methods*. I found this chapter especially useful for a section that addressed the level of detail one should include in a scientific paper. In my mind, detail (or lack thereof) is of the utmost importance when considering how best to communicate science. A scientist who is communicating with other scientists has few worries with regard to detail. A neurologist, for instance, can freely throw around terms like orbitoprefrontal cortex and anterior cingulate cortex. Such scientific terms are typical in neurology, but one would be making a hefty mistake by using them with people who are not neurologists. This means that the level of technical detail should be reduced for non-specialists.

The authors handle the problem of detail superbly with an example from chef Julia Child. This might seem like a blazing mistake, but using Child's recipe for leek and potato soup, which sounds quite good, shows that the authors have a solid command of procedural writing. Food recipes are important because they may be the most popular type of scientific writing in the entire history of instructions. After all, everyone has to eat. (By the way, some of the best chefs around have an excellent understanding of chemistry, which helps explain the field of molecular gastronomy.) But Harmon and Gross do an equally good job of explaining how communication works between scientists. Their use of Bligh and Dyer's paper on extracting and purifying lipids is especially helpful for scientists who must organize, or frame, their work for peers and colleagues.

All of this may seem like the book is nearly perfect. In fact, the second section, which addresses how best to communicate with a general audience, feels slightly less inspired. While the attempt to meet the needs of a general audience is one that is probably more important than the first section, their chapters on using PowerPoint slides, while good, is not without a minor flaw. These chapters largely rely on the work of Edward Tufte, the statistician who is responsible for advancing the story of the Space Shuttle Columbia disaster (think O-ring malfunction). Tufte's main criticism of PowerPoint is that it is not an ideal candidate for presenting mountains of data because its limited screen real. Concern with the advice in these chapters is that they are far too lenient on traditional practices used in presenting scientific information, which may be partly blamed on what some people have called the "Tufte effect." On page 169, for instance, the authors critique a slide that contains a whopping 172 words: "To the concluding slide (fig. 23), however, Tufte's criticisms of bulleted lists might seem to apply." It is a curious statement because this hedge appears to nearly condone the most egregious problems of presentation software, which is treating a slide like a document. Hence, the Tufte effect.

In truth, a presentation (and this is not really about PowerPoint; any presentation software applies) is about the speaker and what they have to say. All too often, presentation slides are designed for the speaker and not the audience. This means that some slides follow what is now known as the 1-7-7 rule, which translates to 1 idea, 7 bullet points, and 7 words for each bullet point per slide. This adds up to roughly 50 words per slide. There is only one problem with following this rule; it is far too complex because it places undue demands on the audience. The 1-7-7 rule is the driving principle that asks an audience to read while the presenter speaks. Much as we like, most people are unable to both listen to a speaker and read at the same time, which is why slides should be visual and not textual. The authors' light criticism of this packed slide gives way to a slightly larger problem in scientific communication, one that sheds light on a glaring gap between the theory of communication and its practice. This deficit may lead to all kinds of problems, such as the densely-packed scientific slide.

While Harmon and Gross' *The Craft of Scientific Communication* (Chicago: The University of Chicago) is not entirely self-sufficient for novice writers who must deliver complex information to a general audience, it is an excellent book for scientists who would like to communicate with each other. It just so happens that this makes all the difference in the increasingly global infrastructure of scientific communication.