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## Juniors Seek an End to the Impact Factor Race

FRANÇOIS BRISCHOUX AND TIMOTHÉE R. COOK

**A** debate is emerging over the increasing difficulty that scientists face in publishing their work as a result of the rise of “impact factor fever,” an unhealthy obsession with publishing only in high-impact-factor journals (e.g., Colquhoun 2003, Lawrence 2003, Cherubini 2008, Raff et al. 2008). Discussion of the matter can be found in a variety of journals (*Ethics in Science and Environmental Politics* and *BioScience*, for example). The problem is an appropriate one for scientists to address, since it represents the application of scientific thinking to science itself. Because this debate is being conducted mostly by senior scientists, we think it necessary to provide the point of view of two junior scientists.

Obviously, the pressure to publish is cultural. It can be experienced differently depending on the country you live in or the type of institution you work for. If you work for a private lab, you might not be expected to publish anything. In public ones (in governmental agencies, in particular), you might have to write official internal reports but never publish your findings. You might work for a lab that publishes systematically in a few very specialized journals that are in a language other than English. You might have to teach a lot, which is a job in itself but doesn't require publishing. Eventually, you might do research full time in a very competitive lab and feel the pressure to publish full bore. Although situations are diverse, the advent of English as the universal scientific language and the present flow of scientists (most often PhDs and postdocs) between labs and countries tend to normalize practices. Customs developed within the academic circles of the Anglo-Saxon world have given birth to today's international publishing policies.

Thus, the pressure to publish in English-language journals with high impact factors applies to the global scientific com-

munity (Alberts et al. 2008). There seems to be widespread agreement that it represents an extension of the infamous maxim that scientists must “publish or perish” (Cherubini 2008). However, the pressure is exacerbated for junior scientists (PhDs and postdocs) because they need to obtain a postdoctoral position or build a competitive publication list in order to find a research position (Raff et al. 2008). The fact that the number of PhD candidates is increasing worldwide is only part of the problem. Candidates for research positions know that their chances are poor unless they can point to papers they have published in leading journals such as *Science* or *Nature* (Notkins 2008), or unless they work on something fashionable.

This isn't proper, because you cannot judge a candidate for a position only by his or her capacity to publish in big-name journals. Judging someone's research is a complex matter because quality depends on a wide variety of criteria. It should not be a subjective decision, but in practice it usually is. A PhD candidate or a postdoc working under the supervision of an influential researcher, on a big research project involving many collaborators, or in a lab with financial means is perceived to have a more attractive curriculum vitae than others and so has a better start. But this does not necessarily mean that the researcher is more proficient. It could simply mean that he or she was in the right place at the right time. Science is supposed to attract people who are passionate. How, then, has it become a game of chance, politics, calculation, and marketing?

Clearly, the stress associated with publishing can drain some of the joy of practicing science (Raff et al. 2008). The most dramatic effect is inside research labs, where the atmosphere among

junior scientists is deteriorating. Competition is more than rough. It insidiously undermines relations between colleagues who work together or are friends. Self-esteem is jeopardized. “Do you work on something sexy and have you published in a leading journal?” is always the unspoken question. If the answer is “no,” are you unfit for science, or only unfit for fashionable science?

Fitness for science becomes unimportant because of the dominance of the impact factor race. Junior scientists think they have no choice but to join the stampede if they wish to survive. Only a few years ago, junior scientists felt that obtaining high-impact-factor publications was a game that had to be played occasionally to keep their research visible. This is not a bad habit because it forces some researchers to try to address more general questions than they usually would and to make their work available to a wider community of scientists, not just to the specialists in their field. But the present generation of junior scientists sees the impact factor race as the norm. They feel that career advancement depends more on how much and where you publish than on what you publish. Quality has been reduced to fashionable science and to quantity. Careers hang in the balance of column totals (Raff et al. 2008).

This has terrible consequences. The short-term consequence is a noticeable increase in recent years of plagiarism, “salami slicing” of articles, and other kinds of research misconduct (Lawrence 2003, Cherubini 2008). Many young researchers are now reluctant to spend time writing papers that have little chance of being accepted in high-impact-factor journals (Notkins 2008). This failure to publish valid research is inappropriate scientific conduct as it reduces the amount of information available to the scientific community (and to

the public that finances research through taxes).

The long-term consequence will be far worse. Science's core creativity will suffer if scientists focus only on their publication records. The impact factor race is selecting for a generation of researchers who steer their scientific path by the probability of successfully publishing in famous journals. In time, because they will publish articles, review scientific manuscripts and projects, work as editors for journals, and train students, these researchers will become the fulcrum that will decide the future orientation of their fields.

Anybody who has written scientific articles knows that publication is a slow and difficult process. From the writing of the first draft to final acceptance, it is an ordeal that tends to make you feel modest (and it's an even longer and more difficult process for those who are

not native English speakers). Unless you are a genius, rushing a paper usually leads to incomplete reasoning and poor discussion. An accomplished paper, like a good wine, needs to rest before you can really taste its flavor. So publishing cartloads of articles in only the best journals is impossible. Furthermore, some of us enjoy private lives as well. As Phillip Clapham (2005) points out, "papers are your legacy to science." But writing up research properly, as he advises, takes time. If you have unpublished data that are new but are not going to be a blockbuster, isn't it your duty to publish them? What's more important: to shine and burn or to develop your theories and defend them? As long as the data are hidden, you are the only one who knows you are right.

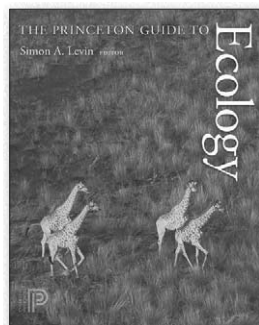
One can feel sympathy for researchers who see around them evidence that surviving in the academic world means

becoming fanatical about nurturing an impact factor score. However, the issue is a moral one. Success in obtaining a research position in the present context is a Pyrrhic victory. You win a job, but you may feel you have lost your soul. This is the opposite of the original philosophy of scientific research.

We, junior scientists, are the main victims of the present crisis. We are the hostages of a situation that we cannot change because we lack the authority. In consequence, we ask senior researchers to help us develop an antidote to the impact factor fever, before an unhealthy degeneration of scientific research becomes permanent. We must all ask ourselves, How did we come to this? As in an arms race, everybody fears to stop, in case a neighbor continues the escalation. Who will be the first to call a halt?

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