

The Journal Numbers Game

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This editorialist wears two hats. Having published his first scientific paper in 1976, he continues to write in biomedical periodicals; he is also a conscientious editor. On the face of it, might not an author's interest clash with that of an editor? After reading the paper by Ha et al,¹ and many other related articles, however, I believe that an editor has more than enough interests in common with an author to consciously offset any likely bias.

After all, both the author and the editor share an intention to capture the reader's attention, both intend to publish a worthy article as rapidly as practicable, and both desire the biomedical community to give due credit to the work represented in the article. Sometimes authors and editors alike feel that unidentified readers 'out there' are the ones who cause problems, either by making an unreasonable critical attack or, worst of all, by ignoring the work represented in the article. Are these tensions the source of the heat swirling around the journal impact factor (JIF)?

Whatever the real source, here is the rub: even those faceless readers share, or ought to share, a vested interest in raising standards in the continuing debate which we call bioscientific research. We ought to discover effective ways to overcome the sometimes local and often petty barriers to the maturation of the bioscience and medical community in Singapore. The article by Ha et al¹ sets out clearly the evidence which undermines the credibility of both the JIF,²⁻⁵ and the article citation rate, the other icon of the Institute of Scientific Information (a Thomson Scientific company and a major player in the science knowledge market). The authors, all active researchers, encapsulate a belief shared by this editor in the following statement: "*Citation statistics for articles and journals should never be given precedence over careful reading and thoughtful analysis of the quality of research...*". Most importantly, Ha et al¹ expound some compelling reasons why research grant review panels and academic promotion or tenure panels need to curb their reliance on a single number, such as the JIF, to evaluate a candidate's publication list.

Research review panels may argue that they consider JIFs and citation ranks because these numbers encapsulate

in some sense the standing of the submitted work. However, this writer considers that it reflects a failure of the peer evaluation system to cope with the sheer overload of data and, to some extent, expediency replacing effectiveness. A careful review takes appreciable effort, and thus each reviewer decides how much effort to contribute against his or her own research output. This "Catch 22" is at the root of the problem. Which way out? Perhaps science administrators should employ disinterested high achievers as professional reviewers, with proper oversight.

Is not bioscience publishing, therefore, essentially a numbers game? The numbers in this context describe many different quantities, from the size of a journal's circulation to surrogate measures of the influence of an article (science citation index) or of a journal (impact factor). Add to this equation the number of hours (or dollar equivalents) of review effort, and the chaos increases. The relations between the different numbers are very complex and it is probably not valid to assign real biological value to them. This writer also discerns some parallels between the psychodynamics of scientific publishing and those of a stock exchange in the global market. Subtract the speculation factor from the commercial stock exchange, inject a large dose of professional ethics, impose stringent rules, and what results is something very akin to a 'stock exchange' of bioscience journals, including those concerning human bioscience (also known as medicine).

The "big ten" journals of medicine appear to have a disproportionate influence over the behaviour of the players in the 'numbers game' of bioscience, just as the "big five" stock exchanges influence corporate behaviour and probably the individual investor's behaviour around the world. Since the sheer number of readers must affect the frequency with which a well-known journal is cited, some might argue that the dollar number of a journal's resources in part determines that journal's standing in the minds of bioscientists, who are no less easily influenced by market penetration of brands and subtle advertising than the ordinary non-scientist.

But the analogy should not be carried too far. Suffice to say that scientists are as lacking in financial savvy as their

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fellow citizens; bioscience publishing is but a seamless part of the lucrative publishing world; and today's journal market is enormous yet entirely self-regulated, in contrast to the pharmaceutical market. Mature investors do not rely on market indexes, because human behaviour on any scale cannot be predicted reliably on any single day. Similarly, the results of biological experiments, however well controlled, are too complex to allow simplistic analyses to dominate our judgement. As Ha et al imply, expressing research quality or journal quality using inappropriate numbers such as the JIF insults the scientist's intelligence. More importantly, chunks of valuable work may get ignored through biased selection.⁶ No research community has a real monopoly of good fresh ideas and approaches.

How can the *Annals* contribute to fighting the bias inherent in actions based on JIFs? The *Annals* rapidly rejects unsuitable articles, but despite publishing worthy articles as soon as practicable, the *Annals* is sometimes attacked for tardiness. What readers need to know is that the bottleneck in publication is almost invariably caused by delays in reporting by its independent reviewers. Only when the quality scores diverge wildly does the journal seek another report or, alternatively, does the duty editor make a decision – usually after judicious consultation with experts. Some might say the *Annals* goes to extraordinary lengths to be fair and unbiased, but in a small community of specialists, the Editorial Board believes that balance and objectivity are paramount.

And therein sits a paradox. When peer specialists critique a paper to a high standard, the process consumes effort and time, and some peeved authors then complain. Some complainants themselves, in their reviewing mode, take their own time to return an expert review.

All parties in the local writing arena, who genuinely wish to raise standards in bioscience and medicine, therefore need to work together. There is no reason why local physicians and scientists cannot cease working against one another and, instead, push the country's bioscience knowledge consortium into the forefront, just as the Singapore Stock Exchange has positioned itself for growth in Asia.

Many scientists and physicians, not just in Singapore, feel that the time is overripe for a sea change in the bioscience publishing world.⁷ In a world made borderless by the Internet, intellectual hegemony gives way to openness.

It is up to us to use the new open market of ideas to promote the life sciences. The possibilities of the World Wide Web may not immediately yield a fresh dynamic for science debates between peers. *Wikipedia* is not yet taken seriously as a reliable knowledge source. However, vehicles such as *Public Library of Science (PLoS)* and *BioMed Central* may not take off until electronic journals become cheaper. We want efficiency, but we humans also want to touch (and smell) our knowledge icons. The day that we can fold journals into our pockets and fire them up anywhere, is not yet here.

Beyond open access, whose promise is yet to be tested, we crucially need to alter the ways in good science research is rewarded before the systematic imbalances and biases will fade. People who judge and decide things at high levels of academic authority could learn a thing or two from the world of commerce, in which brands and companies vanish over time. In the long run, the ordinary citizens out there, not bioscience stars, will judge medicine by the outcomes of treatment founded on our bioscience research.

There is a widespread yearning for, and a heartening movement towards, a new model for honest, fair, and effective debate in the construction of systematic biomedical knowledge. May that rebirth of the science 'debate' come soon.

REFERENCES

1. Ha TC, Tan SB, Soo KC. The journal impact factor – too much of an impact? *Ann Acad Med* 2006;35:911-6.
2. Seglen PO. Why the impact factor of journals should not be used for evaluating research. *BMJ* 1997;314:498-502.
3. The PLoS Editors. The impact factor game. It is time to find a better way to assess the scientific literature. *PLoS Medicine* 2006;3:e291. DOI: 10.371/journal.pmed.0030291. Accessed 9 December 2006.
4. Vakil N. The journal impact factor: judging a book by its cover. *Am J Gastroenterol* 2005;100:2436-7.
5. Dong P, Loh M, Mondry A. The 'impact factor' revisited. *Biomedical Digital Libraries* 2005;2:7. DOI 10.1186/1742-5581-2-7. Accessed 31 October 2006.
6. Cheek J, Garnham B, Quan J. What's in a number? Issues in providing evidence of impact and quality of research(ers). *Qualitative Health Res* 2006;16:423-35.
7. Markovitz BP. What's wrong with how we judge science? *BMC New and Views* 2001;1:12. Available at: <http://www.biomedcentral.com/1471-8219/1/12>. Accessed 22 November 2006.