

Mohamed Gad-el-Hak's Opinion piece is one of several articles extolling the maintenance of high standards in research publications in the face of the increasing publish-or-perish frenzy in modern-day academia.¹

Gad-el-Hak wrote that "the number of citations per publication is a fairer index of competence than the total number of citations." Yet, in his Opinion piece and in the letters that followed, there was no suggestion of any measure to address multi-author papers or the increased number of citations as a paper ages. I recently introduced the concept of the author impact factor (AIF) as a more precise measure of the impact of an individual author's published work.

In spring 2004, a committee in our department at the University of Florida suggested using the total number of citations (TC), along with the total number of papers, amount of funding, and other factors, as a measure for evaluating faculty performance for a specific purpose. I suggested a combination of the AIF, the TC, and the author's average journal impact factor (JIF) as a better way to evaluate a researcher's publication record.

Because the TC depends on various factors—among them age of papers, number of papers, and number of authors—it would be better to use additional measures. I defined the AIF as the average of the equivalent single-author annual citation rate (ESAACR) of all of an author's papers. For each paper, the ESAACR is the number of citations (NC) divided by the number of authors (NA) and the age of the paper (AP). That is,

$$\text{ESAACR} = \frac{\text{NC}}{(\text{NA})(\text{AP})}$$

Averaging the ESAACR of all papers published by an author gives that author's AIF. For example, a particular paper published in the *Journal of Applied Mechanics* in 1986 has the following data as of June 2004: NC = 145 citations, NA = 2 authors, AP = 18 years, and ESAACR = 4.028 citations a year for each author.

The AIF is a normalization not unlike what we do in science and engineering: When we talk about weight, we introduce the concept of mass (normalization with respect to acceleration of gravity) and density (normalization with respect to volume); when we talk about distance, we also consider speed (normalization with respect to time).

The concept of AIF is restricted to a particular field. To allow a comparison across fields, such as mechanical engineering and chemistry, we can consider the relative ESAACR, which is defined by dividing the ESAACR of a paper by the recent or current JIF of the journal in which that paper was published. For example, the above-mentioned paper in the *Journal of Applied Mechanics*, which had a JIF of 0.628 in 2002, has an ESAACR of 4.028 and a relative ESAACR of 6.414. Then the relative AIF is obtained by averaging the relative ESAACR over all papers published by a given author, using the JIFs in the same recent or current year for all journals in which that author's publications appeared.

An author with a relative AIF of 1 would have equivalent single-author publications with impact, on average, close to the JIFs of the peer-group journals in her field. On the other hand, because the AIF and the relative AIF are measures related to a single author, her own papers would actually have an impact higher than the JIFs of her peer-group journals, since papers are generally written by at least two authors.

The computation of the AIF and relative AIF can be done easily with any spreadsheet software, and could even be provided as an additional feature in the ISI Web of Science webpage at <http://www.isinet.com>.

Surely, the AIF and relative AIF would speak volumes about the publication impact of the dean that Gad-el-Hak mentioned, the one who published one paper a week.

Reference

1. For more articles related to scientific and engineering publications, see the website Publish or Perish . . . at <http://aemes.mae.ufl.edu/~vql/publish.or.perish.html>

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Georg Rumer: A Microbiography

The August 2004 issue of PHYSICS TODAY contains two interesting articles (page 45 and page 51) devoted to the legacy of Edward Teller. They supplement his own recently published memoirs and help the reader to better understand this central figure in 20th-century physics and politics.

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