

Uses and Misuses of the Journal Impact Factor

Most faculty members have heard the term, *impact factor*, yet many can neither define it nor describe its relation to scholarly communications.

According to the Institute for Scientific Information, a journal's *impact factor* is "the average number of times articles from the journal published in the past two years have been cited in the Journal Citation Reports in a given year"¹. The institute adds "The impact factor is calculated by dividing the number of citations in the Journal Citation Report for a given year by the total number of articles published in the two previous years. An impact factor of 1.0 means that, *on average*, the articles published one or two years ago have been cited one time. An impact factor of 2.5 means that, on average, the articles published one or two years ago have been cited two and a half times."

The impact factor has risen to an elevated status. Many believe that the higher the impact factor, the higher the quality of the journal. Faculty members want to publish in the best possible outlet for their work. Sometimes the journal with the highest impact factor is the best outlet, sometimes it is not. Newly emerging online and open access journals, which are not yet well-established, will inevitably be rated "low impact." Therefore, the use of the high-impact factor index tends to inhibit scholars, especially junior scholars, from publishing their work in alternative, less expensive publications. As with any metric, the impact factor is only as good as the conditions under which it has been created. Perhaps surprisingly, many influences (conditions) affect its computation. These conditions include: journal subject content, the average number of authors per article, the type of journal, the type of article, and journal size (average number of articles published annually).

How do these conditions affect the calculation of the impact factor? Journals in fundamental life sciences (e.g., biochemistry and cell biology) and neurological science *on average* have higher impact factors than do journals dealing with earth or biological sciences, which, in turn, have higher impact factors than do journals dealing with social or computer sciences. Impact factors vary more within fields than between fields. Because authors tend to cite their own work, articles with more authors are cited more often than are articles with fewer authors. Generally speaking, then, the greater the number of authors, the greater the number of citations, and the greater the journal's impact factor.

Type of journal and type of article both affect the calculation of the impact factor because short articles tend to be cited more quickly than longer articles and review articles tend to be cited more often than other article types. Journals that publish letters tend to have higher impact factors than those that publish only full-length feature articles. Recall that only the preceding two years are considered in the impact factor formula. For this reason, articles that are cited relatively quickly after publication increase a journal's impact factor. Journals that publish only review articles or that publish a special issue of review articles tend to have very high citation rates (and thus higher impact factors) than do journals that publish only feature articles. Even the single

¹ Retrieved from http://jcr01.isiknowledge.com/JCR/help/h_glossary.htm#JCR_year_g

publication of a review issue will increase the impact factor over a two- to three-year period because of the frequency with which review articles are cited.

Journals that publish fewer than 35 articles annually typically have more variable impact factors than those that publish 150 articles or more. According to Amin and Mabe (2000)², impact factors for small journals vary as much as $\pm 40\%$ from year to year whereas impact factors for large journals vary as much as $\pm 15\%$ annually.

The Faculty Senate Library Committee's recommendations for the use of impact factors are:

- Because of disciplinary differences, comparisons of impact factors are only appropriate within the same subject area.
- Because average number of authors per article is correlated with the impact factor, the size of a journal within a given field should be considered when assessing the impact factor.
- All things being equal, rapid-publication outlets and journals of review articles should be expected to have higher impact factors than journals that publish full-length articles. The type of article published in the journal, then, within a given field, should be considered in interpreting the impact factor.
- Because a journal's impact factor is likely to vary from year to year, especially for smaller journals, caution should be exercised in drawing conclusions regarding a change in the impact factor of a journal in any given field. Rather than using single-year impact factors, it may be preferable to use an impact factor average over a period of five years.
- Because of variability in impact factors, Amin and Mabe (2000) proposed that "journals with impact factors that differ by less than 25% belong together in the same rank" (p. 5).
- Amin and Mabe (2000) also suggest that "The use of journal impact factors for evaluating individual scientists is even more dubious, given the statistical and sociological variability in journal impact factors" (p. 5).

Amin and Mabe (2000) state very clearly that, "Impact factors, as one citation measure are useful in establishing the influence journals have within the literature of a discipline...they **are not** (emphasis added) a direct measure of quality and **must** (emphasis added) be used with considerable care. Additional information on journal impact factors, including comparisons for specific scientific fields can be found at the OSU Library Web site at http://osulibrary.oregonstate.edu/scholarly_communication/.

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² Amin, M. & Mabe, M. (2000, October). Impact factors: Use and Abuse. *Perspectives in Publishing*, 1, 1-6.

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