

Letter to editor:

The Journal Impact Factor: Myths & Truths

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Introduction

Evaluating scientific quality is a notoriously difficult problem which has no standard solution . so the methods for evaluating research are being sought, such as citation rates and journal impact factors. The citation data are obtained from a database produced by the Institute for Scientific Information (ISI) in Philadelphia. The references list are rearranged in the database to show how many times each publication has been cited within a certain period, and by whom, and the results are published as the *Science Citation Index (SCI)*. On the basis of the *Science Citation Index* and authors' publication lists, the annual citation rate of papers by author or researcher can thus be calculated. So the journal impact factor is the citation rate of that scientific journal. It is calculated as the mean citation rate of all the articles contained in the journal⁴. In other words the **impact factor (IF)** of an academic journal is a measure reflecting the average number of citations to recent articles published in the journal. It is frequently used as a proxy for the relative importance of a journal within its field, with journals with higher impact factors deemed to be more important than those with lower one. The impact factor was devised by Eugene Garfield, the founder of the Institute for Scientific Information to help select journals for the Science Citation Index (SCI).

Calculation:

For example, for 2015 impact factors the following formula was used:

$$\text{Impact Factor} = \frac{\text{citation of article published in 2013-14}}{\text{article published in 2013-14}}$$

New indexed journals, will receive an impact factor after two years of indexing; in this case, the citations to the year prior to Volume 1, and the number of articles published in the year prior to Volume 1 are known zero values. Journals that are indexed starting with a volume other than the first volume will not get an impact factor until they have been indexed for three years.

Myths

1. IF is readily use for evaluating individual scientists or research groups
2. IF is one of the most important metrics of an article's scientific credibility.
3. IF measure anything but "prestige"

4. IF was recently advocated to remedy the purported subjectivity and bias in appointments to higher academic positions,
5. IF is used as a tool in the evaluation of institutions .
6. IF is used as a basis for allocation of resources to universities in many countries.⁹

Truth

1. IF basically the arithmetic mean ie number of citations per paper. But citation counts follow a Bradford distribution (i.e., a power law distribution) and therefore the arithmetic mean is a statistically inappropriate measure.
2. IF highly dependent on the academic discipline so cannot be used to compare journals across disciplines.
Eg.
3. IF Can be affected by editorial policy :
 - i. Publish a larger percentage of review articles
 - ii. Setting submissions policy to "by invitation only"
 - iii. Limit the number of "citable item: either by declining to publish articles

Other measures of impact

Some related values, also calculated and published by the same organization, include:

- Immediacy index: the number of citations the articles in a journal receive in a given year divided by the number of articles published
- Cited half-life: the median age of the articles that were cited in *Journal Citation Reports* each year. For example, if a journal's half-life in 2005 is 5, that means the citations from 2001-2005 are half of all the citations from that journal in 2005, and the other half of the citations precede 2001^[30]
- Aggregate impact factor for a subject category: it is calculated taking into account the number of citations to all journals in the subject category and the number of articles from all the journals in the subject category

These measures apply only to journals, not individual articles or individual scientists, unlike the H-index. The relative number of citations an individual article receives is better viewed as citation impact. It is, however, possible to examine the impact factor of the journals in which a particular person has published articles. This use is widespread, but controversial. Garfield warns about the "misuse in evaluating individuals" because there is "a wide variation from article to article within a single journal". Impact factors have a large, but controversial, influence on the way published scientific research is perceived and evaluated. One thing is for sure, the IF has become a great headache for the entire scientific community, which has no idea how to deal with it.

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