

Use of Journal Impact factor in peer review of individual applications

At the November Research Committee meeting, I proposed that NHMRC cease to use impact factors of journals as part of our assessment process. The Impact Factor (IF) of journals has been a formal assessment factor in the Program Grant Record of Research Achievement (RORA) and in our people support grants. Increasingly, project grant applicants list the journal IFs. The proposed Model of Research Impact and Achievement (MORIA) also uses it.

Research Committee members may remember that I argued that journal IFs were in effect unscientific and gave the reasons below. Research Committee was supportive of this argument, and agreed to discuss alternatives.

Reasons for not using journal Impact Factor to judge the impact of individual papers

- The IF of the journal does not describe the impact, importance or quality of individual papers. The IF of a journal describes the overall citations of all papers in that journal, and thus is not a description of the impact on each paper. Citations of individual papers in a journal range from zero to many hundreds in so-called high impact journals.

Journal A – number of citations of individual papers	Journal B – number of citations of individual papers
12	28
15	7
7	56
2	15
21	12
23	34
12	15
3	155
27	11
Mean=13.6	Mean=37.0

If we use the journal IF (equivalent to the mean in the simple example above), we are concluding that every paper in Journal B (IF 37) has a greater impact than every paper in Journal A (IF 13.6). This is not a sustainable argument – e.g. if applicant X lists the last paper in Journal B and applicant Y lists the last paper in Journal A, it is unjust to conclude that the former is a better paper than the latter.

- The impact of an individual paper is better assessed by the citation rate of the individual paper, though there is not of course a 1:1 relationship between the citation rate of a paper and either its quality or impact, and some papers have enduring citation rates while others are only cited for a short period. Reviews are more highly cited than individual papers, but the latter are the truly creative end of publications and the former are totally reliant on them.
- The quality and importance of a paper is, in the end, a peer review judgment. It needs to take into account many factors, including but not limited to the ambition of the research (small salami publication or magnum opus), the quality of the methodology, how much the field is advanced, where there is a direct outcome of its publication, whether or not it is an individual effort or each author just contributing a small slice, and so on. For these and other reasons, some systems restrict the assessment of publication output to just 5 papers, which each reviewer is expected to have read and evaluated.

- High impact journals themselves do not support use of the IF in judging individuals. A Nature editorial in 2005 (Nature 435, 1003-1004) pointed out that 89% of the 2004 impact factor was generated by just 25% of all published papers in Nature that year. The mouse genome published that year had already generated over 1000 citations but, as the Nature editorial pointed out, this paper is “an important point of reference rather than an expression of unusually deep mechanistic insight”. They point out that “The great majority of our papers receive fewer than 20 citations”, and that “the citation rate varies sharply between disciplines”. Finally, they conclude that “the net result of all these variables is that impact factors don’t tell us much as people think about the respective quality of science that journals are publishing.None of this would really matter very much were it not for an unhealthy reliance on impact factors by administrators and researchers’ employers worldwide to assess the scientific quality of nations, institutions, and even to judge individuals”.
- Simplistic use of journal IF (or for that matter citation rates) to rate individual papers is also inconsistent with what we know about bibliometrics. There are major differences between the referencing/citing practices in different fields. Expert bibliometricians (e.g. Linda Butler) take this into account, but members of Grant Review Panels (GRPs) or Fellowships review panels are not expert bibliometricians.
- A further complication is that many journals often do not publish a single discipline.
- Over-emphasis on IFs may also reinforce the market dominance of certain publishers, built on public research money, at the expense of new “open access” journals.

Our current system can thus be unfair – for example, a paper published in, say, the Journal of Biochemistry with 100 citations, or Medical Journal of Australia with 50 citations, will be undervalued compared to a Nature paper with less than 20 citations (the vast majority of all Nature papers)

This is not to argue that we should not encourage our grantees to publish in high impact journals. It’s just that, for individual papers, high impact is not equivalent to the IF of the journal.

There will be a review of how the NHMRC uses impact factors and other publication metrics in order to establish a more appropriate way of evaluating the quality, value and impact of published works, by applicants for NHMRC research funding, and for appointment, promotion and re-appointment to NHMRC’s Fellowships schemes.

Attachment A

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