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On the self-evaluation of a journal's impact factor

Klaus D. Kubinger[1], *Nina Heuberger*[2] *& Herbert Poinstingl*[2]

Abstract

The self-evaluation of the impact factor of a journal using Google Scholar search is suggested. This allows a less established journal to offer a submitting author some objective information of the journal's visibility and reception within scientific community. Though self-evaluation is costly in terms of labor, it is a viable procedure – as illustrated through the example of the journal *Psychology Science Quarterly*.

Key words: impact factor, Google Scholar, ISI Web of Knowledge

[1] *Correspondence concerning this article should be addressed to:* Prof. Klaus D. Kubinger, PhD, Head of the Division of Psychological Assessment and Applied Psychometrics, Faculty of Psychology, University of Vienna, Liebiggasse 5, A-1010 Vienna, Austria, Europe; email: klaus.kubinger@univie.ac.at

[2] University of Vienna, Faculty of Psychology, Division of Psychological Assessment and Applied Psychometrics, Vienna, Austria

Introduction

This paper is in no way attempting to criticize the well-known impact factor evaluation system established by the *Institute for Scientific Information* (ISI), which is widely used for benefit systems at universities and for measuring a scientist's qualification in promotion acts, above all in tenure procedures – though many counter-arguments and illustrations of abuses might be given and have already been given elsewhere (e.g. Hecht, Hecht & Sandberg, 1998; Jacsó, 2001; Keul, Gigerenzer & Stroebe, 1993). We will also not deal with the issue that becoming indexed in ISI *Web of Knowledge*^{SM} (publ. by THOMSON REUTERS) is very difficult for a new or specially themed journal. The aim of this paper is only to offer a strategy for evaluating the visibility and reception of a journal – particularly a less established journal – within the scientific community. We will illustrate this with an example.

As is well-known, the impact factor of a journal is defined as follows (see, for example, Garfield, 2006): Take the number n of times that articles of journal J being published in the year x-1 or x-2 are cited in calendar year x by any ISI-indexed journal published; then take the number N of the total number of citable items (articles, reviews, proceedings, or notes) of journal J being published in the year x-1 or x-2; finally calculate the impact factor $IF\ (x) = n/N$. That is, the impact factor of a journal is the average number of citations of those papers which were published during the two preceding years.

Method

An evaluation analysis might be simply done by performing a Google search (Google Scholar): All one has to do is to systematically search for each of the papers of the journal in question from the respective calendar years. Most of the time, it suffices to list all the authors' surnames and the publication date. Figure 1 gives an example of the paper Rasch and Guiard (2004). The search results in a list of findings where it is necessary to decide whether a finding should be taken into account or not. Most of the time – particularly if one inserts the accurate title of the paper, the title of the journal included[3] – one gets the paper itself as the first result (this is true for our example in Figure 1). In the last line of this finding, "Cited by **" announces how many times the paper in question – or precisely: the inserted search content – has been found within the Google data bank. This link can be clicked, while the other listed findings usually do not bear any detailed information – the sources of citations are then listed (see, for our example, Figure 2). Now every source is checked, to see whether it refers to an ISI-indexed journal or not; this check may be done via www.isiknowledge.com. In our example, the first source happens to stem from such a journal and the second source does not (by the way, this source leads in our case directly to the respective original paper). However, it seems preferable not just to trust in only the sources by its own but better to review the original paper to see whether it accurately cites the paper one is looking at.

[3] However, be aware that incorrectly cited citations would be not discovered in this way.

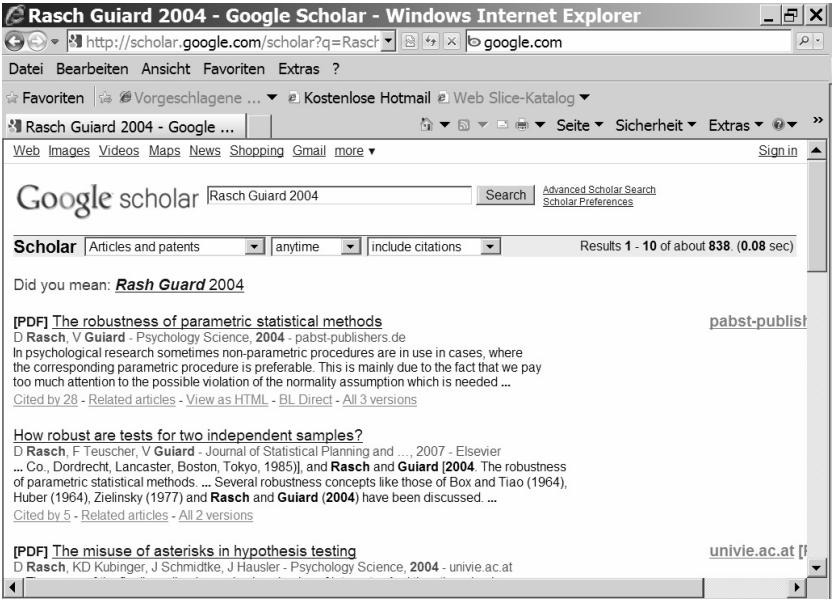

Figure 1:
Screen-shot of the Google Scholar search of Rasch & Guiard (2004)

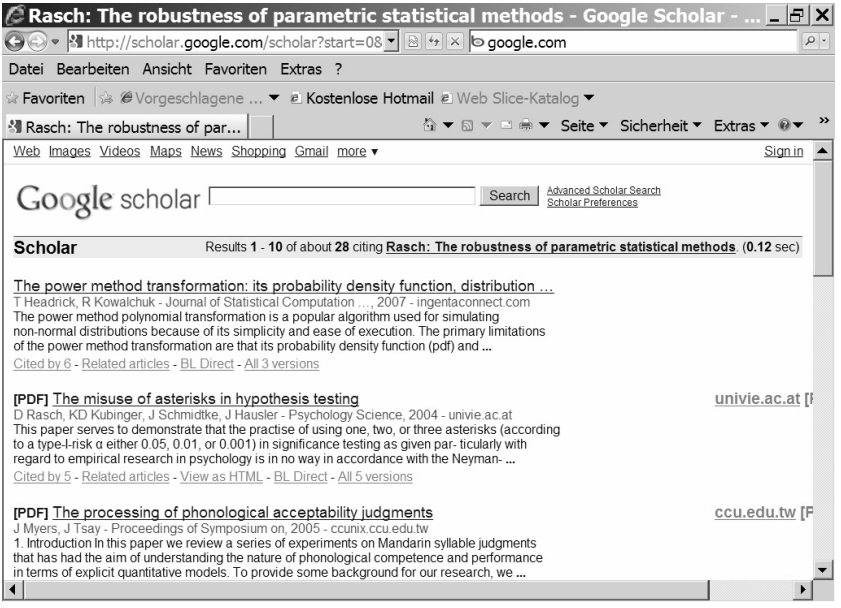

Figure 2:
Screen-shot after clicking link “Cited by **” of the Google Scholar search in Figure 1

Take into account that this procedure does not guarantee a calculation of the correct impact factor. As this is only a Google search, the number of factual citations might be even larger, so that the resulting "self-evaluated" impact factor is just an estimation of some lower bound for the actual impact factor.

We exemplify this procedure using the journal *Psychology Science Quarterly*, ISSN 1866-6140. This was a local (German) journal, *Psychologische Beiträge*, from the first volume in the late 1950s until 2003 (ISSN 0033-3018), when it was internationalized and renamed *Psychology Science*. In 2008, the title was changed again.[4] It is now at the stage of Volume 52. It is still not ISI-indexed with an impact factor.

Results

The Google Scholar research was completed on February, 13th in 2010. We aspired to calculate the self-evaluated impact factor of that journal for 2005 to 2009; that is, research started with the issues of 2003 and came up to 2009. In addition to the calculation of the self-evaluated impact factor as suggested, we also tried to determine a "virtual" impact factor, which is the self-evaluated impact factor that would result if the journal in question were ISI-indexed. Of course, the latter bears the taint of self citation; nevertheless, it serves as an interesting elucidation of the journal's policy.

Table 1 gives the results. Columns 2 and 3 indicate the number of published papers from *Psychology Science (Quarterly)* (PSQ) in the relevant calendar years, columns 5 and 6 show the number of citations of PSQ-papers in either ISI-indexed journals or in PSQ itself within the relevant period, and both the last columns reveal the self-evaluated and the virtual impact factor – as indicated, the latter includes PSQ-self-citations. Column 4 is of special interest because it discloses the number of papers being cited during the year of publication – citations that are not scored for the impact factor.

[4] This occurred because of the realization that some articles only cite *Psychology Science* papers abbreviated as "PsycholSci", which however scores for the ISI-indexed journal *Psychological Science*.

Table 1:
Papers and citations of *Psychology Science (Quarterly)* (PSQ) with respect to self-evaluated (the next to last column) and virtual impact factor (the last column) from 2005 to 2009.
IF … impact factor, *x* … calendar year

IF calendar year *x*	Number of PSQ-papers published in *x*-1	Number of PSQ-papers published in *x*-2	Number of citations in *x*-1 of PSQ-papers published in *x*-1 plus … *x*-2 published in *x*-2	Number of citations in ISI journals in *x* of PSQ-papers published in *x*-1 or *x*-2	Number of citations in PSQ in *x* of PSQ-papers published in *x*-1 or *x*-2	IF based on ISI journals only	IF based on ISI journals plus PSQ
2005	35	25	3	5	7	0.083	0.200
2006	34	35	10	21	4	0.304	0.362
2007	29	34	9	23	7	0.365	0.476
2008	24	29	1	13	9	0.245	0.415
2009	35	24	3	15	7	0.254	0.373

Discussion

In the first instance we do not deal with the special situation of *Psychology Science Quarterly* but rather like to point out that the suggested procedure actually works. When taking the potential intention of any impact factor seriously into account, that is, some objective information of a certain journal's visibility and reception for submitting authors, then a self-evaluated impact factor is quite useful. We therefore encourage journals which are not ISI-indexed to publish their self-evaluated impact factor. The described procedure enables an author looking for a suitable journal to inspect any published existing or non-existent impact factor of a specific journal. That is, there is no longer lack of transparency of a journal's qualification due to its exclusion by some self-appointed power (of ISI).

In the second instance, we briefly deal with the situation of the exemplified journal, *Psychology Science Quarterly*. Obviously its (self-evaluated) impact factor is very low. On the other hand, there are quite a number of other psychology journals which are ISI-indexed and don't have a substantially higher or even have a lower impact factor. Concerning the ISI-category "Psychology, Mathematical" – which is most appropriate, as *Psychology Science Quarterly* has focussed on psychometrics, statistics in psychology, and psychological assessment in the last years – there are only 11 journals indexed, whose impact factor ranges from 2.159 to 0.200. Hence, this journal fits the frame of reference in some ways. And it should be noted that the virtual impact factor does not differ very much from the actual (self-evaluated) one. That is, the PSQ-papers are far from being received primarily by this journal itself. What is of special interest is the up-and-down movement of the (self-evaluated) impact factor, with a peak in 2007 (and

2006). Further examination of the papers in 2005 discloses that in this year a special issue "Perspectives on number processing" (see Nuerk, Willmes & Fias, 2005) was published; these 13 papers have been cited by ISI-indexed journals 16 times in 2006-2007. Of course, neuro-psychological topics reveal high citation frequencies nowadays, but this no longer fits the current scope of PSQ. Finally, one should take into account that there is quite a large number of citations of PSQ-papers published in calendar year *x* and already cited in *x* as well; that is, *Psychology Science Quarterly* actually seems handicapped by the ISI-impact factor system, which penalizes the very fast or immediate reception of a paper, as citations where publication year and citation year coincide are not scored.

Of course, the suggested calculation of a journal's self-evaluated impact factor is costly in terms of labor. However, it might become an important means of elucidation and reconsideration of its publishing policy.

Appendix: In order to exemplify the extent to which the suggested calculation of a journal's self-evaluated impact factor underestimates the actual impact factor, we applied the procedure to the *European Journal of Psychological Assessment* (EJPA), ISSN 1015-5759, an ISI-indexed journal with an impact factor 1.262 for 2008.[5] As concerns the first four columns of row 2008 in Table 1 the respective counts are the following (Google Scholar research was completed on February, 27th in 2010): 31, 34, 26, 63. Based on these numbers, the self-evaluated impact factor amounts to 0.969, which is considerable lower than the actual impact factor.

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