

The effect of several versions of one and the same manuscript published by a journal on its Journal Impact Factor

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Abstract

In the discussion paper on this issue, Vanclay (in press) describes and uncovers several weaknesses of the JIF based on a thorough literature review and detailed empirical analyses. In this short comment we would like to add the results of two studies to the discussion around the JIF. In these studies we investigated the effect of several versions of one and the same manuscript published by a journal on its JIF.

Key words

Journal Impact Factor; *Atmospheric Chemistry and Physics*; *Angewandte Chemie*

Journal impact factors (JIFs), which are calculated by Thomson Reuters (Philadelphia, PA, USA), are one of the most important indicators in evaluative bibliometrics. They are used in the scientific community as a basis for decision making on research grants, hiring, and salaries (Kumar, Upadhyay, & Medhi, 2009; Retzer & Jurasinski, 2009). To establish the JIF, the publications of a journal within a period of two years are taken into consideration and their citations are determined over the following year by using the journal title matching procedure (the JIF specific method to determine the citations of all papers of a given journal). The number of citations is then divided by the number of citable items (articles and general reviews only).

In the discussion paper on this issue, Vanclay (in press) describes and uncovers several weaknesses of the JIF based on a thorough literature review and detailed empirical analyses. In this short comment we would like to add the results of two studies to the discussion around the JIF. In these studies we investigated the effect of several versions of one and the same manuscript published by a journal on its JIF.

Bornmann, Neuhaus, and Daniel (2011) took the case of the interactive open access journal *Atmospheric Chemistry and Physics* (ACP) to examine a new problem that can limit the validity of the JIF for a journal: the publication of several versions of one and the same manuscript when a journal uses a two-stage publication process. The process of peer review and publication in ACP differs from traditional scientific journals (Koop & Pöschl, 2006; Pöschl, 2004). This means that papers that are published in ACP were previously published as 'discussion papers' in a more or less

different version in *Atmospheric Chemistry and Physics Discussions* (ACPD) on the ACP website. Manuscripts that after the discussion phase are *not* published in ACP appear in ACPD even so.

The publication of several versions of a manuscript during and after the ACP peer review process could lead to a higher JIF, in that only the ACP papers enter into the denominator, whereas citations of both the papers in ACP and the papers in ACPD enter into the numerator. The results of Bornmann, et al. (2011) indicate that when calculating the JIF of ACP, Thomson Reuters distinguishes relatively well between two different editions of this journal. The comparatively highest JIF of ACP in the JCR subject category 'Meteorology & Atmospheric Sciences' (at 5.309 in the 2010 edition) is thus calculated correctly and is not an effect of the two-stage publication process. The result of Bornmann, et al. (2011) is a first indication that JIFs are not inflated in the case of journals that provide open access to submissions for peer review.

In case of *Angewandte Chemie* (AC), the journal has been published since 1962 not only in the original German edition but also in an English-language edition, the *Angewandte Chemie International Edition*. Some authors cite articles published in AC with reference to both the German edition and the International Edition. As a result, citations to the AC are counted twice, thus artificially inflating the impact of AC. Several studies have found evidence that the JIF of AC as published in the JCR is overrated (Braun & Glänzel, 1995; Moed, van Leeuwen, & Reedijk, 1996). Marx (2001) shows that the JIF is obviously valid for both AC editions together and not only for the International Edition. This largely explains the differences found by various authors when they compare the JCR data with their own results. The journal title

matching procedure of Thomson Reuters counts the citations from both AC editions of the same paper (double citations) resulting in an overestimation of the AC JIF of about 15%. In contrast to the results of Bornmann, et al. (2011), Marx (2001) detected an influence of several versions of one and the same manuscript on a journal's JIF. The results of Marx (2001) seem to support the application of the citation matching approach (instead of the journal title matching procedure) where the complete references including the numerical data are matched (named as G_{11} by Vanclay (in press)). However, the citation matching approach also has its limitations.

The journal title matching method used by Thomson Reuters investigates how often a given journal name (in all the different variations in which it has been cited) occurs in combination with the two relevant publication years in the reference sections of the publications of the subsequent publication year. Many source journals have rather complicated journal names and the various name variations (including their abbreviations) appearing in the cited reference works are hardly predictable (Marx, 2011). In such cases we may expect two sources of errors: (1) the matching algorithm may fail to include all journal name variants and (2) some variants (in particular their abbreviations) may be multi-meaning. The first problem may cause some loss of relevant citations and the latter problem results in the inclusion of the citations of other journals with similar names. In general, the more complex the journal names are (complicated name, more than one edition, change of name, etc.), the more we must expect errors caused by the unspecific journal title matching method. The AC is a good example in this respect.

In consideration of the reference error rates reported in the literature (e.g., Buchanan, 2006) we must expect problems even in the case of ordinary journal names (journal titles). For example, citing authors may not distinguish between *Journal of Chemical Physics* (J. Phys. Chem.) and *Chemical Physics* (Phys. Chem.). Such citation errors can only be revealed by matching the complete references including the numerical data (citation matching). Establishing JIFs on the basis of citation matching – the G₁₁ approach of Vanclay (in press) – rather than journal title matching, however, results in a substantial loss of citations due to its fault intolerance (Marx, 2001). The use of one-to-one links to calculate JIFs would indeed require a considerable amount of quality control by authors, editors, and the database producers.

Since the different approaches for calculating the JIF have their advantages and disadvantages, we need a comprehensive study that compares the JIFs for all journals (and not only a selected small sample) based on different approaches. This study should point out the journals where the different approaches bring about similar or different JIFs. Journals with very different JIFs should be studied in more detail to elicit common characteristics that lead to the differences. The identified characteristics can give hints for possible changes to the JIF calculation by Thomson Reuters.

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