

Losing the numbers game: abundant self-citations put journals at risk for a life without an impact factor

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Abstract To counteract impact factor manipulations by editors, in 2008 Thomson Reuters started suppressing journals with abundant self-citations and excluding them from the Journal Citation Reports® for two years. The number of banned journals rose from 9 in 2007 to 66 in 2012. Abundant journal self-citations can be due to the nature of the journal or unethical strategies of editors, such as coercive citations or citation cartels. Regardless of whether unethical behaviour was involved, journals with excessive self-citations are suppressed by Thomson Reuters. While unethical behaviour should be discouraged, depriving the accused journals of the benefit of the doubt can lead to unfair treatment.

Keywords Publication ethics; Journal Impact Factor; journal suppression; manipulation; Thomson Reuters

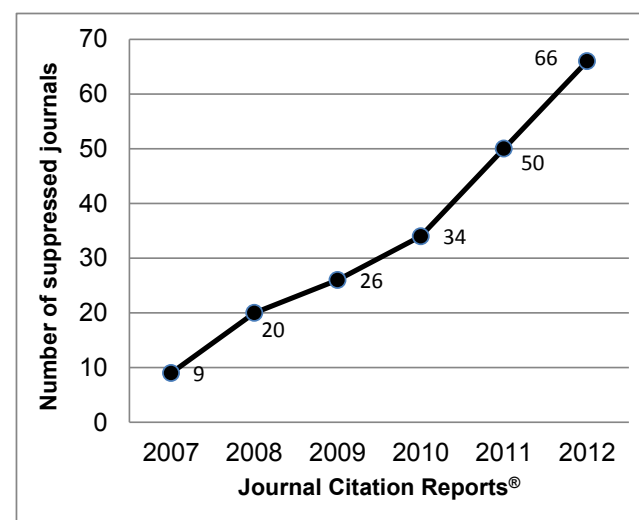
The Journal Impact Factor, calculated and published annually by Thomson Reuters, is the most influential metric in academic publishing. It is widely used to judge the performance of scientific journals and is still widely misapplied to assess individual scientists. It influences decisions on journal subscriptions, scientists' career advancement, research grant funding, and even the amount of personal monetary rewards.^{1,2} This is why it is in the utmost interest of journal publishers and editors worldwide to obtain the highest possible Impact Factor for their journals. The ethical limits of how to achieve this are undefined, fluid, and contentious. The temptation "to play the system" can be high. However, in the past few years, it has become apparent that crossing such limits bears a high risk of losing the Impact Factor. This loss can also happen inadvertently, when a high rate of journal self-citations legitimately contributes to an increased Impact Factor.

Thomson Reuters's suppression of journals from Journal Citation Reports

Since 2007, Thomson Reuters has temporarily suppressed journals from its Journal Citation Reports® (JCR) when "excessive self-citation" was detected.^{3,4} Thomson Reuters states "The Journal Impact Factor provides an important measure of a journal's contribution to scholarly communication, and its distortion by an excessive concentration of citations is a serious matter. Titles are suppressed from JCR based on analysis of the prior year's data, leaving the reasons for suppression visible. Thomson Reuters does not assume motive on behalf of any party. Journals are suppressed for two consecutive years and re-evaluated in the third year using new data."⁴ The data considered for determining excessive self-citation are the percentage of journal self-citations in the Impact Factor

numerator, the proportional increase of the Impact Factor with versus without journal self-citations, and the effect of journal self-citations on the rank of the journal in its subject category. "Suppressed journals represent extreme outliers in citation behavior".⁴ Journals in the bottom 10% of a category are not suppressed. Lately, cases of citation cartels, or "citation stackings", came to light, where one journal was cited excessively by another solely to increase the first journal's Impact Factor.⁵ Thomson Reuters has developed a program to spot such patterns, and suppresses both donor and recipient journals for one year, after which they are re-evaluated with the next year's data.⁴ The number of suppressed journals has increased from 9 in 2007 to 66 in 2012 (Figure 1).

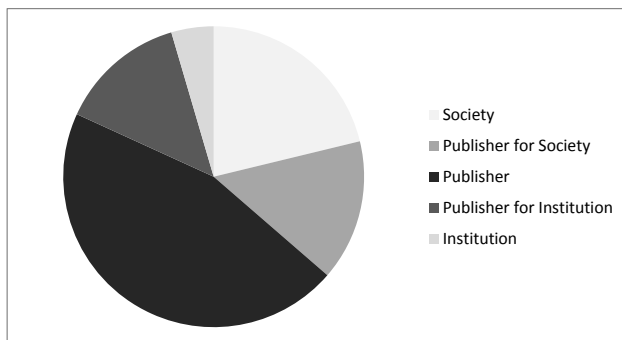
Figure 1. Number of journals suppressed from the Journal Citation Reports® 2007–2012. Data from Journal Citation Reports® Notices® (previous versions available from web.archive.org)



What kind of journals are suppressed?

Of the titles suppressed from the 2012 edition of Journal Citation Reports®,⁶ 36% are open-access and 64% follow a subscription model. They comprise journals published by academic institutions, societies and professional publishers (Figure 2). None of those publishers is on Jeffrey Beall's notorious list of potentially predatory open-access publishers.⁷ The majority of suppressed titles published by professional publishers come from traditional, reputable houses, such as Taylor & Francis (7 titles), Elsevier (6), Sage (5), Springer (2), Wiley (1), de Gruyter (1), Hans-Huber-Verlag (1) and Thieme (1). Many of the journals have a specialized focus or are published in non-English language communities.

Figure 2. Types of journals suppressed from the Journal Citation Report® 2012⁶



Are high journal self-citation rates always irregular or fraudulent?

As recognized by the creators of the Journal Impact Factor, a high rate of journal self-citations can be legitimate:⁸ journals that have a novel or highly specific or regionally relevant topic or are the central organ in a tightly-knit community (such as a small non-Anglophone community) cannot avoid a comparatively high rate of journal self-citations. Among the journals that were recently excluded from JCR, I find several that fit those criteria. A higher proportion of self-citations is expected in a journal that publishes in Czech and Slovak about sugar and sugar beet as the number of journals covering this topic in these language communities is limited (*Listy Cukrovarnické a Řepářské*). Equally, a South African journal of lexicography with an African focus, published partly in Afrikaans, can hardly avoid self-citation (*Lexicos*). The same is true for journals with a regional focus and a near monopoly of the field (*Irish Political Studies*; or *Aerosol and Air Quality Research* focusing on Asia). These are just a few examples. As those journals are excluded from JCR, their metrics are not visible in the JCR database, but we do not have to trust that Thomson Reuters made the right decision. We can explore the metrics of suppressed journals in the SCImago Journal & Country Rank database.⁹ The journal self-citation rate of many suppressed journals has indeed been over 50% in one or more recent years; this looks suspicious, but without examining the details of the particular journal's citations, one cannot judge whether any wrongdoing was involved. Some editors were surprised and upset about the suppression of their journals, including the editors of the leading German radiological journal.¹⁰ "Thomson Reuters does not assume motive on behalf of any party";⁴ but the journals are suppressed anyway. The accused does not enjoy the benefit of the doubt.

Is journal self-citation a real problem?

Journal self-citations undeniably increase Impact Factors.¹⁵ The question is to what extent they increase the Impact Factor, and whether this misrepresents the contribution of the journal to the field. Whether an increase in the Impact Factor can be judged by using citation metrics alone is debatable. Studies on the extent of journal self-citations' influence on the Impact Factor have produced inconsistent results. Having analysed 35 journals that increased their Impact Factor by at least four times in a few years, Andrade

and colleagues¹¹ found no proof of a massive contribution of journal self-citations to this increase, and hence no indication of a targeted editorial strategy in this respect. In other cases, editorial manipulations were identified, such as the publication of an editorial with a large number of journal self-citations, which more than doubled the Impact Factor of the journal.¹² Citation cartels with the sole purpose of increasing Impact Factors of the journals involved⁵ are certainly unethical, as is "coercive citation"¹³ if editors force authors to add journal self-citations¹⁴ or give the impression that disobedience to such suggestions may influence manuscript acceptance.

Since the inception of metrics-based suppression, the number of affected journals has continually increased (Figure 1). Losing the Impact factor either was an insufficient deterrent for unethical editors, or a high journal self-citation rate was due to the nature of the journals.

Impact Factor manipulations without consequences – a world of double standards?

The Impact Factor is based on all citations that a journal receives in a two-year period (numerator), but only part of the published items in the journal count towards the denominator, namely "articles", "reviews" and "proceedings papers."¹⁶ Editorials do not count, nor do correspondence items or other less than "substantive" contributions. Despite not being counted as "citable items" in Thomson Reuters's database Web of Science™, such contributions attract a substantial number of total citations, for example 6.9% for *Nature* and up to 18.5% for the *Croatian Medical Journal*.¹⁷ Increasing the numbers of such smaller contributions in a journal or calling them editorials or correspondence items almost guarantees an increase of a journal's Impact Factor.

The classification of countable and non-countable items is fluid, and sometimes Thomson Reuters gets it wrong, at least in the minds of some journal editors. In these cases, the journals have discussed the matter with Thomson Reuters with the aim of excluding some types of items from the denominator and increasing the journals' Impact Factors.^{18,19} As a prime example, *PLoS Medicine* succeeded in negotiations with Thomson Reuters and received its first Impact Factor of 8.389 instead of the initially calculated "less than 3".¹⁹ The 2003 Impact Factor of the *Canadian Medical Association Journal* was 4.783 instead of 4.363 after 24 papers were removed from the denominator that had been included in the denominator the year before. Journals look after their Impact Factors in various ways, and discussions over the denominators with Thomson Reuters might well be legitimate; at least it has never been condemned like the practice of editors pushing their journal self-citations. What editors can also do with impunity is to publish more reviews, which generally boosts the Impact Factor substantially, or to allocate accepted papers with the potential of attracting many citations to the beginning of a year, expanding their exposure to the readers and potential citers. None of these actions and strategies seems to upset authors. The excitement is focused on editors suggesting, coercing or otherwise arranging for journal self-citations.

The ethics of the citation process

If the citation process were objective and governed by strict policies on scientific relevance and priority, it would be easy to determine unethical behaviour, but it is definitely not. Authors cite literature sources on the basis of a wide range of considerations, most of them subjective or based on convenience.^{14,20} Conscious and subconscious “manipulations” are always at the heart of the citation process. For example, papers in a language one happens to understand are cited more often than those in foreign languages, irrespective of their scientific relevance. Papers of friendly colleagues are cited more easily than papers of fierce competitors. A source that has frequently been cited as an authoritative reference will often be cited automatically without being read. As long as scientists are humans, such practices will not change.

In conclusion, the list of references is a critical part of a scientific manuscript, for which the authors bear the ultimate responsibility. They should have the last word on what to include in their reference lists. Referees and editors are free only to suggest additions, omissions and replacements of references in their role as caretakers of journals’ quality and evidence-base.¹⁴ Such editorial actions become unethical only when they ignore the authors’ rights and force them to include citations, particularly with the sole purpose of inflating the journal’s Impact Factor. Elsevier’s advice to its editors is perhaps the best all science editors can follow: “Take care of the journal and the Impact Factor will take care of itself”.²¹

We can still lose the numbers game, though.

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