THE A&A EXPERIENCE WITH IMPACT FACTORS

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1. Introduction

There is a widespread impression that the scientific journal *Astronomy & Astrophysics* (A&A) has a smaller impact, as measured by citations to articles, than some of the other major astronomy journals. This impression is apparently supported *and probably created* by the Journal Citation Report (JCR), which is prepared annually by the Institute of Scientific Information (ISI) Web of Knowledge. In the JCR statistics, A&A has over a number of years shown a considerably lower impact factor than some of the other main journals in the field. For example, Abt (2003) presented a table in last year's volume of this series (Organizations and Strategies of Astronomy - Vol. 4) in which A&A was in 15th place (behind such journals as "Acta Astron." and "Astrophys. Lett. & Comm."). The published poor impact factor of A&A is in fact due to a serious flaw in the method used by ISI Web of Knowledge to determine it. The resulting damage inflicted upon A&A by the JCR is incalculable. Attempts to correct the wrong impression are now proceeding (Sandqvist 2003, Heck 2003).

2. JCR's Erroneous Method and Its Correction

Owing to the short abbreviation (A&A) with which articles in *Astronomy & Astrophysics* are usually cited, and the possible non-uniqueness of this abbreviation among the scientific journals covered by the JCR, these were not counted. Instead, such old abbreviations as "Astron. Astrophys." were used by JCR. Anyone active in the astronomical literature will realize the catastrophic effect of this choice. As noted by Abt (2003), a similar situation occurred with The Astrophysical Journal, for which the three-letter abbreviation (ApJ) had been considered too challenging. After accounting for citations with ApJ, the impact factor of The Astrophysical Journal increased by more than a factor of two from 2000 to 2001.

As chairman of the A&A Board of Directors, I contacted the ISI Web of Knowledge in the fall of 2002, as soon as we had discovered the erroneous abbreviation that JCR was using for A&A. After some hesitation, the ISI Web of Knowledge decided to change its routines, and in the future the abbreviation A&A would be taken into account. In-house studies at the ISI Web of Knowledge showed that very little confusion arose through this, and more importantly, after accounting for these citations, the impact factor of A&A became comparable to that of the other major astronomy journals and the total number of citations second only to The Astrophysical Journal. Apologizing, the ISI informed me in the fall of 2003 that it had made a reconstruction of what A&A's impact factor would have been in the year 2000, if the proper Journal abbreviation had been used. The result was heartening for A&A: the A&A impact factor had rebounded from a wrong value of 2.79 to a corrected value of 4.352 with a resulting change of rank from a wrong value of 11th to a corrected value of 4th out of 37 in the category of Astronomy and Astrophysics!

Since the impact factor is defined as the number of papers cited for a given journal divided by the total number of papers published in that journal, averaged over the past two years, the true positive effect of this correction for A&A will be slower than desired.

3. Confidence in ISI?

How trustworthy are the citation statistics published by JCR? Given that ISI is a commercial enterprise, expensive, and that evaluations of individuals, institutes and scientific disciplines are based on their data, their consumers have a right to expect absolute professionalism. We have seen one example of gross failure in the previous section. Another example (which, however, does not involve A&A directly) is detailed below.

On ISI, a January 2004 search for citations of SCHNEIDER P in 2001 yielded:

2 Schneider P. PHYS REP 340 292 2001

where "2" is the total number of citations.

A similar search on the NASA Astrophysics Data System (ADS) yielded:

2001 PhR 340 ...291B 113.000 01/2001 Bartelmann, M.; Schneider, P. Weak gravitational lensing

where "113" is the total number of citations.

This huge difference in the total number of citations reported by the ISI and ADS is due to an error in the ISI data base which claimed the first page number of the article to be "292", whereas its correct value should be "291" as properly stated by ADS. A search using the name of the first author (Bartelmann) did give the correct number of citations for this article at both ISI and ADS, but this does not help Dr. Schneider, though. When informed of this error, the ISI responded that a correction could take "up to 4 weeks". This reply does not show the level of professionalism that one would expect from a company which has taken a large influence in shaping the careers of scientists. Whether the astronomical funding agencies should continue to rely heavily upon ISI when other citation tools have become available now appears questionable.

4. Damage Inflicted Upon A&A

Although the A&A Board of Directors is gratified by the new development in the JCR with respect to A&A, we are extremely concerned about the damage inflicted upon our Journal by ISI, in particular since it also has had detrimental personal and institutional consequences for A&A's authors. Also serious is the fact that it will take some time before the full impact of this change in the ISI software will have been made, so that it correctly reflects the proper citation index and impact factor for our Journal. And how long will it take before the Astronomical Community has been made fully aware of the JCR error and its correction, not to mention the difficulty of reaching financing agencies which make ample use of journal impact factors?

Problems that have come to our attention vary in different countries:

(1) Some libraries are considering cancelling subscriptions to A&A since they only want the astronomical journals with the ten highest impact factors. The erroneous published value of 15th place for A&A would thus disqualify it for these libraries' acquisition lists.

(2) Some ministries naturally turn to impact factors when making comparative studies between scientific disciplines and their general impact, with the purpose of drawing up priority lists for future large-scale financing. Such studies, making use of the erroneous published values, will have had very serious effects upon the efforts of some A&A authors to achieve future financial support.

(3) Some institutes do not select A&A papers in their top ten list in their annual reports due to the erroneous published value of the A&A impact factor.

(4) Some astronomers use the low erroneous published value for the A&A impact factor as a reason for not publishing in A&A which, of course, is highly detrimental to our Journal.

5. Conclusion

The damage to A&A has been done. The error has been found. The error has been corrected by ISI. This information must now be disseminated throughout the Astronomical Community, the Institutional Libraries, the Financing Agencies, the General Society of Impact Factor Consumers. This short communication is one such attempt. The A&A Board of Directors is grateful if you, the reader, will do the same.

6. References

Abt, H.A. (2003) The Institute for Scientific Information and the Science Citation Index, in *Organizations and Strategies in Astronomy - Vol. 4*, Ed. A. Heck, Kluwer Academic Publishers, Dordrecht, pp. 197-204

Heck, A. (2003) WRONG IMPACT!, *European Astronomical Society Newsletter*, **Issue 26**, December 2003, pp. 4-5

Sandqvist, Aa. (2003) Remark on Impact Factor, *A&A*, **Vol. no. 402**, p. E1

To be published in "Organizations and Strategies in Astronomy – Vol. 5", Ed. A. Heck, Kluwer Academic Publishers, Dordrecht (2004)