

## Impact of the impact factor in Spain

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Spanish researchers have observed with interest and no little irony the debate on the virtues and vices of the impact factor and its potential use in the UK Research Assessment Exercises beginning in 2008. Perhaps Spain is not so different from other European countries, since the same debate took place in our country more than 15 years ago.

In Spain publication of research reports in journals with a high impact factor has, since 1989, been an official part of the national system for evaluating researchers' productivity. As stated in the Spanish parliamentary record (1), a bonus is awarded only for "those articles of scientific worth in journals of recognized prestige, which shall be accepted to mean those that occupy relevant positions in the lists for science fields in the Subject Category Listings of the Journal Citation Reports of the Science Citation Index (Institute for Scientific Information (ISI), Philadelphia, PA, USA)". This criterion, which is the determining factor in the government's evaluation of a researcher's output, has become the key which opens the door to a professional career, public funding, and favourable judgements of scientific productivity (2).

The aim of this reward system was to improve the quality and the international visibility of Spanish science, but what effects has this system, based almost entirely on a bibliometric criterion, actually had in Spain?

The most immediate effect was mass emigration of the best research articles to foreign journals. The increase in the number of Spanish source items in the Thomson Scientific databases since this policy came into effect has been spectacular (3). The mean increase in Spanish source items in the ISI database was 592 items per year until 1990, but jumped to 1512 items per year between 1991 and 2004, a 255% increase. Nevertheless, this huge increase beginning in the 1990s coincided with a freeze in public investment in research and development (R&D), which decreased in real terms after adjustment for inflation, to the point that the unit cost per published article declined steadily in Spain for several years.

Other effects of the change in policy were the internationalization of Spanish science, and its incorporation into mainstream research, a process which has enhanced the rigour and quality of work done in this country, and has raised the

bar in terms of the range and scope of the goals the research aims to achieve. Articles authored by Spanish researchers have increased not only in quantity but also in expected and observed impact.

However, progress toward international-quality research has been accompanied by increasing neglect of Spanish journals, to which researchers rarely submit their best work (4). Another negative effect has been the destruction of Spanish as a language of science. These negative consequences obviously cannot be extrapolated to the UK, a country which speaks English and whose scientists were not cut off from the rest of the international scientific community during most of the 20th century. However, other, more worrisome and unpredictable consequences have begun to appear which may eventually infect UK research activity and assessment:

1. Many research groups have altered their research agendas. In Spain, research with potential practical applications, and research on topics that are local, regional and national in scope, has been replaced by basic research in topics more likely to be better received by the international research community, and therefore more likely to have a greater impact in terms of citation counts.
2. Impactitis (5), a new disease, has become epidemic in Spain. Its symptoms are altered publication and citation behaviour in response to an obsessive compulsion to use the impact factor as the single, incontrovertible quality criterion for scientific articles. This epidemic has been propagated by all types of academic institutions and researchers, invading all tissues of science and infecting all those who take part in scientific communication. Numerous cases are diagnosed daily in authors and editors. Among the former, the signs of illness are choosing the target journal on the basis of the impact factor alone without considering which audience is most appropriate for their work, hypertrophic self-citing, joining invisible citation colleges intended to increase the impact of their publications, and deliberately omitting to cite their scientific rivals or enemies. Infected editors, determined to see their journal indexed in Thomson Scientific's databases, sink to manipulating editorial policies in order to increase the journal's repercussion both among scholars and in the mass media.

Publishing in journals that occupy the leading positions in the Thomson Scientific impact factor rankings has become the fuel which fires Spanish science. Although the reasons why the impact factor should be used with caution have been spelled out (6), and even though Garfield himself has warned against this type of abuse of the ranking (7), the impact factor has become the number that is devouring Spanish science (8).

The consequences, both positive and negative, of using bibliometric criteria to evaluate research in Spain may be predictive of some of the effects that such a policy could have for science in the UK in the next few years if a similar method of research evaluation is adopted.

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