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The role of China's English-language scientific journals in scientific communication

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ABSTRACT: Between 1929 and 2002 over 200 English-language scientific journals were founded in China. The number of China's English edition journals in each discipline is, however, not correlated to the corresponding output of China's articles listed in the ISI's Science Citation Index. Clearly, the goal of these journals is to be internationally recognized. It is shown that this goal is rarely achieved. We think that lack of good-quality papers, low international visibility and a citation 'Matthew effect' are the main causes for the small role played by China's English-language journals.

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English-language journals in China

The role of English-language journals published (or sponsored) by peripheral countries is a topic of interest for science editors, policy-makers and scientometricians alike. The term 'peripheral countries' refers here to countries outside North America and Western Europe. In this sense countries such as Mexico, Russia, Israel, India, China, South Africa and even Spain are all considered peripheral.[1–3] As English has become the *lingua franca* of contemporary science,[4] some peripheral countries have been paying special attention to their own English-language journals in order to enhance the international visibility of their research achievements.[2,5–7] This is also the case for China. Since 1999, the National Science Foundation of China (NSFC) has been allocating Y3 million (about £220,000) annually to support scientific journals. More than half of this money goes to English-language journals, especially those indexed by the ISI's Science Citation Index (SCI).[8] For the period 2003–2004, for instance, 32 journals received support and 20 of these are published in English.

Journals published in China and their linguistic content

There are basically two types of Chinese journals: English-language ones and Chinese-language ones. Overall the majority are Chinese-language ones, but among the journals indexed by ISI the majority are in English. Thus among the 63 Chinese journals indexed by ISI in the year 2000, 45 were published in English. Chinese-language journals rarely or never (less than 10% of the articles) publish articles in English but many do include English abstracts. That is the case for all those Chinese-language journals covered by ISI. *Acta Petrologica Sinica* (*Yanshi Xuebao*), for example, is covered by

ISI and publishes articles in Chinese (with English abstracts). Among the 91 articles published in 2003, only two were in English (with Chinese abstracts).

Some journals exist in a Chinese and an English version (the English title being just the translation of the Chinese title), but in such cases ISI never covers both versions. If an English edition exists, it is always that which is covered. Seven of those journals produce both Chinese and English editions (the latter covered by ISI), and publish a substantial number of articles in both languages. These journals are *Chinese Science Bulletin* (its Chinese counterpart is *Kexue Tongbao*), and *Science in China* (*Series A, B, C, D, E*) (*Zhongguo Kexue, Series A, B, C, D, E*). In these six journals, almost all Chinese articles are translated and published in English editions. One other journal of this type is *Progress in Natural Science* (*Ziran Kexue Jinzhan*), in which about 20% of the Chinese papers are translated and published in the English edition. Apart from these seven journals, all the other journals that produce both Chinese and English editions are completely different in each version. Journals such as *Chinese Medical Journal – Peking* and *Zhonghua Yixue Zazhi*, although having the same names in translation, have completely different content. Indeed, journals of this type are generally operated from two separate editorial offices.

since 1929, 203 English-edition scientific journals have been established in mainland China

We confine our study to English-language scientific journals published in mainland China. The analysed data include recent history, disciplinary distribution, citation patterns and the country of origin of the papers. Our purpose is to discuss the role of China's English journals in science communication within China as well as abroad.

Distribution of China's English-language scientific journals over different disciplines

Since 1929, 203 English-edition scientific journals have been established in mainland China. Sixteen of these have stopped publication and 186 were established after 1980.[9,10]

Table 1 shows the number of new English-language journals established from 1929 to 2002 in China. The peak in the number of newly launched journals occurs in the period 1990–1992. From the mid-1990s, the Chinese government began to control the establishment of new journals, resulting in a decline in the number of new English-language journals.

Table 1. Number of new English-language journals established from 1929 to 2002 in China

Year	No. of new journals
1929–80	4
1981	4
1982	9
1983	5
1984	5
1985	11
1986	11
1987	6
1988	14
1989	10
1990	16
1991	16
1992	16
1993	10
1994	11
1995	10
1996	12
1997	4
1998	3
1999	5
2000	8
2001	5
2002	8
Total	203

Figure 1 shows the disciplinary distribution of English scientific journals in China compared with the number of articles published in SCI-covered journals by Chinese authors (confined to first authors with Chinese addresses) in the year 2000. Sixteen Chinese English-language multidisciplinary journals are not considered here, because articles published in multidisciplinary journals (including such journals as *Nature* and *Science*) are assigned to their respective discipline. From this figure, we can see that the percentages of English journals in Physics and Chemistry are much lower than those of China's SCI articles (less than 6% versus more than 19%). For Geosciences and Biology, on the other hand, the reverse is the case.

In the year 2000, the SCI indexed 22,608 papers with Chinese first authors. More than 40% of these (9,208) were published in Chinese journals. Among the 9,208 Chinese SCI articles published in Chinese journals, 57% are published in English-language journals.[11] SCI-expanded indexed 63 Chinese journals in the year 2000, 46 of which were included in the *Journal Citation Reports* (*JCR*). Of these 63 journals, 71% are published in English. Recall that Chinese language journals included in SCI-expanded always have English abstracts.

These data illustrate the following facts:

1. The number of English edition journals for each discipline in China is not correlated to the corresponding output of Chinese SCI articles.
2. China's English-language journals play a leading role in the output of China's SCI articles.

In fact, under pressure from the Chinese evaluation system, some important Chinese journals, such as *Acta Botanica Sinica* and *Acta Pharmacologica Sinica*, have been completely transformed into English-language ones.

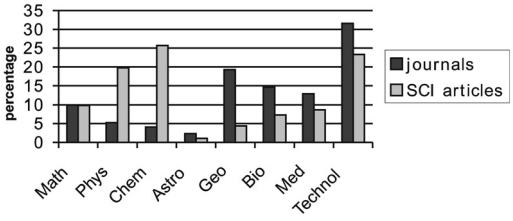

Figure 1 Disciplinary distribution of English scientific journals in China and Chinese-authored SCI papers published in the year 2000.

Scientific impact of China's English-language scientific journals

Table 2 shows summarized citation data from the *JCR*, published in the years 2000 and 2001 by ISI. This table shows that the average and the median impact factor (IF) and the average and median number of total citations (TC) of all *JCR*-covered journals are much higher than the corresponding numbers for Chinese journals. Concretely, the median IF of all covered journals is more than 0.75, but for Chinese journals, it is less than 0.35; the median number of total citations of all covered journals is more than 600, but for Chinese journals it is fewer than 300. Similar observations can be made for average numbers. The data shown in Table 2 have one positive feature with respect to Chinese journals: comparing indicators for the year 2000 with the corresponding ones for 2001 shows that each of them has increased.

some important Chinese journals have been completely transformed into English-language ones

Among the 39 Chinese English journals covered in the 2001 edition of the *JCR*, 21 have a Chinese-language counterpart, i.e. the same journal title. Only seven of them publish articles in the two languages (translated). For the other journals, the contents are completely different. A previous study showed that a large percentage (about 32%) of the citations to Chinese English-language journals comes from the Chinese-language counterpart.[12]

We further note that the average and median number of total citations of English-language journals are lower than those of

Table 2 Summarized citation data from the JCR, 2000-2001 (ISI)

	No. of journals	Mean IF/ median IF	Mean TC/ median TC
All journals in the *JCR* (2000)	5,683	1.381/0.779	2,890/628
Chinese journals in the JCR (2000)	46	0.317/0.250	295/167
Chinese English-language journals (2000)	36	0.329/0.250	274/171
Chinese-language journals (2000)	10	0.276/0.266	370/135
Chinese journals in the *JCR* (2001)	55	0.399/0.294	380/242
Chinese English-language journals (2001)	39	0.424/0.324	338/234
Chinese-language journals (2001)	16	0.338/0.291	483/275

Chinese-language journals. Chinese journals are mainly cited by Chinese authors,[12] and Chinese-language journals have a higher visibility in China. Hence, in the long run, they receive more citations.

Moed[13] showed that, over the period 1990–1999, the average number of citations (not including author self-citations) of articles with Chinese first authors published in English-language Chinese journals is only 0.24 (based on data from the SCI, CD-ROM version). This number is much lower than that of Chinese articles published in journals outside China (namely 1.93). For that period, the percentage of uncited papers in Chinese journals is more than 86%, again much higher a percentage than the corresponding value for journals outside China (58%). As for articles (with Chinese first author) in SCI journals published in China, no matter whether they are in Chinese or English editions, more than 95% of the citations (during the same period, 1990–1999) originated from China.

Chinese scientists tend to publish their more important work in journals outside China

The Chinese Science Citation Database (CSCD), published by the Documentation and Information Center, CAS, indexed 633 local, i.e. Chinese journals, in 2000. Of these journals, 34 are published in English. Among these, only four have more than 100 citations in total, while more than half of them (53%) have fewer than 50 citations in total. For comparison: the most cited journal in this database was *Kexue Tongbao* (with 2,389 citations in total), followed by *Zhiwu Xuebao* (1,745 citations) and *Gaodeng Xuexiao Huaxue Xuebao* (1,721 citations). Only 146 journals, i.e. 23%, had a fewer than 50 citations in total. (We thank Professor Jin Bihui for this information.) For more information about the CSCD, and its derived indicator database we refer the reader to Jin and Wang,[14] Jin and Rousseau,[15] and Jin *et al.*[16]

The distribution of the sponsoring organizations of English-language Chinese journals is illustrated in Figure 2. Journals are either sponsored by departments of the government, universities, institutes or associations. Of the 49 journals sponsored by institutes, about 20 are sponsored by CAS institutes. In China, journals (including social and scientific ones) are not allowed to be sponsored by the private sector. Hence all of China's journals are, directly or indirectly, sponsored by the government.

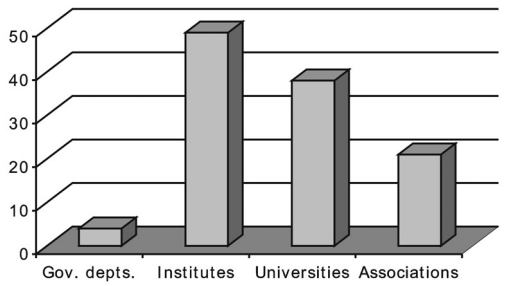

Figure 2 Sponsoring organizations of English-language Chinese journals

Authors of Chinese English journals are mainly (often more than 90%) from mainland China. For university-sponsored English journals, more than 80% (and sometimes even all) of the first authors are from the sponsoring university.

Ending this bleak picture, we should mention that about 80% of China's English journals have print runs of 200–500 copies,[17] and most of these journals have fewer than 100 subscribers.

Discussion

Our statistics show that articles and citations of China's English journals come mainly from China, the average number of citations of these journals being very low. The disciplinary distribution of Chinese English journals is not proportional to China's output of SCI papers.

One may say that China's English scientific journals, even those covered in the SCI, play a small role in international and even national scientific communication. Why is this the case? We distinguish the following three reasons.

First, the influence of scientific evaluation procedures: under the pressure of scientific evaluation procedures in China (e.g. journal impact factors are often used as a reward factor) Chinese scientists tend to publish their more important work in journals outside China. As a result, Chinese journals are encountering serious difficulties in receiving good quality articles.[18,19]

A second factor is the low international

visibility of Chinese scientific journals. This factor includes the small market outside China for Chinese-language scientific journals, and the fact that English-language Chinese journals have very low subscription numbers and thus very low visibility.[10]

Finally, we should also consider the detrimental influence of the 'Matthew effect'. This term refers to the socio-psychological phenomenon related to the success-breeds-success or cumulative advantage effect. It was given its name by Robert Merton,[20] referring to the gospel according to St Matthew:

> For unto everyone that hath shall be given,
> And he shall have abundance;
> But from him that hath not shall be taken away
> Even that which he hath.
> (Matthew, 13.12)

The Matthew effect as it was understood by Merton refers to the habit people (not only scientists!) have of giving credit to already famous people, and minimizing or withholding recognition for scientists who have not (yet) made their mark.[21]

When Chinese authors have a choice they cite more notable journals and authors, concentrating on prestigious English-language journals, and famous US universities (giving them more credit than they deserve). By carefully selecting references, they hope to gain membership of the peer group of these famous authors. An example: articles published in *Science in China – Series B* in 1997 were cited 56 times in 1998 and 1999. Of these, 48 (86%) were authors' self-citations, and the other eight all came from overseas authors.[22] Clearly, Chinese scientists have been refused (by their fellow countrymen) the credit they deserved.

Considering the situation of China's English scientific journals, we think that the 'birth' or 'death' of China's English journals should not only be decided by academic authorities or policy-makers, but also the development of China's English-language journals should meet the real needs of scientific communication.

Similar results have been reported in recent years for English-language journals published in other peripheral countries, such as India and Mexico.[23–25] What is the function of these journals in the science communication process? Which communication and publication strategies should be developed in order to increase the impact of these journals, particularly in the Western, English-speaking world? Such questions should not only be studied (and answered!) by informetricians and scientometricians, but also be a source of concern for policy-makers and science editors in peripheral and developing countries.

How may the role of China's English-language journals in international scientific communication be improved? Given the world-wide pressure on library budgets, it seems improbable that printed journals published in a peripheral country will attract more subscriptions. It has, however, been shown that a presence on the World Wide Web greatly increases the visibility of journals and articles.[26] Consequently we propose a new strategy for Chinese English-language journals. Editors of these journals should seriously consider joining the open access movement,[27,28] where authors pay a certain amount of money to be published (if accepted after serious peer review!), and from then on articles are freely available on the Internet. As Chinese journals do not operate on a purely commercial basis, this proposal is quite feasible. Of course, variations of this proposal, leading to the same goal, are also feasible, such as putting articles on the Web for a fee during a restricted amount of time, and, for example, after a year or two making them freely available. Certainly the combination of Web-presence and being freely available is the way to increase China's role in the international scientific network.

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