

On Bibliometric Analysis of Chinese Research on Cyclization, MALDI-TOF, and Antibiotics: Methodical Concerns

In the January issue of *J. Chem. Inf. Model.*, Jiang Li and Peter Willett presented their bibliometric analysis¹ of the Chinese footprint in three independent areas of chemical research and compared it with research conducted in three other countries. Similarly to the other authors,² they concluded that the output of Chinese research is improving in number, and to lesser extent in the quality. Besides that, the authors had shown dramatic improvement of research output in the other countries tested, the majority of which was supposed to have happened in 1991 and in 1973, despite the lack of substantial stimulus in terms of higher science funding or new policies.

Here, I repeated the protocol used by Li and Willett, and, using incremental steps, I tested whether the reported increases are methodical artifacts or whether they reflect the real trends. Detailed description of the protocols used and of their results is described in the Supporting Information. Briefly, an initial search was done as described¹ and confirmed the previously reported one-point increases in the scientific productivity (Supporting Information, Figure S1 and S2, Table S1). Thus next I shifted my focus on the experimental design of the search protocol used. I postulated three hypotheses, which had a potential to decrease the risk of errors of omission and commission and tested them accordingly.

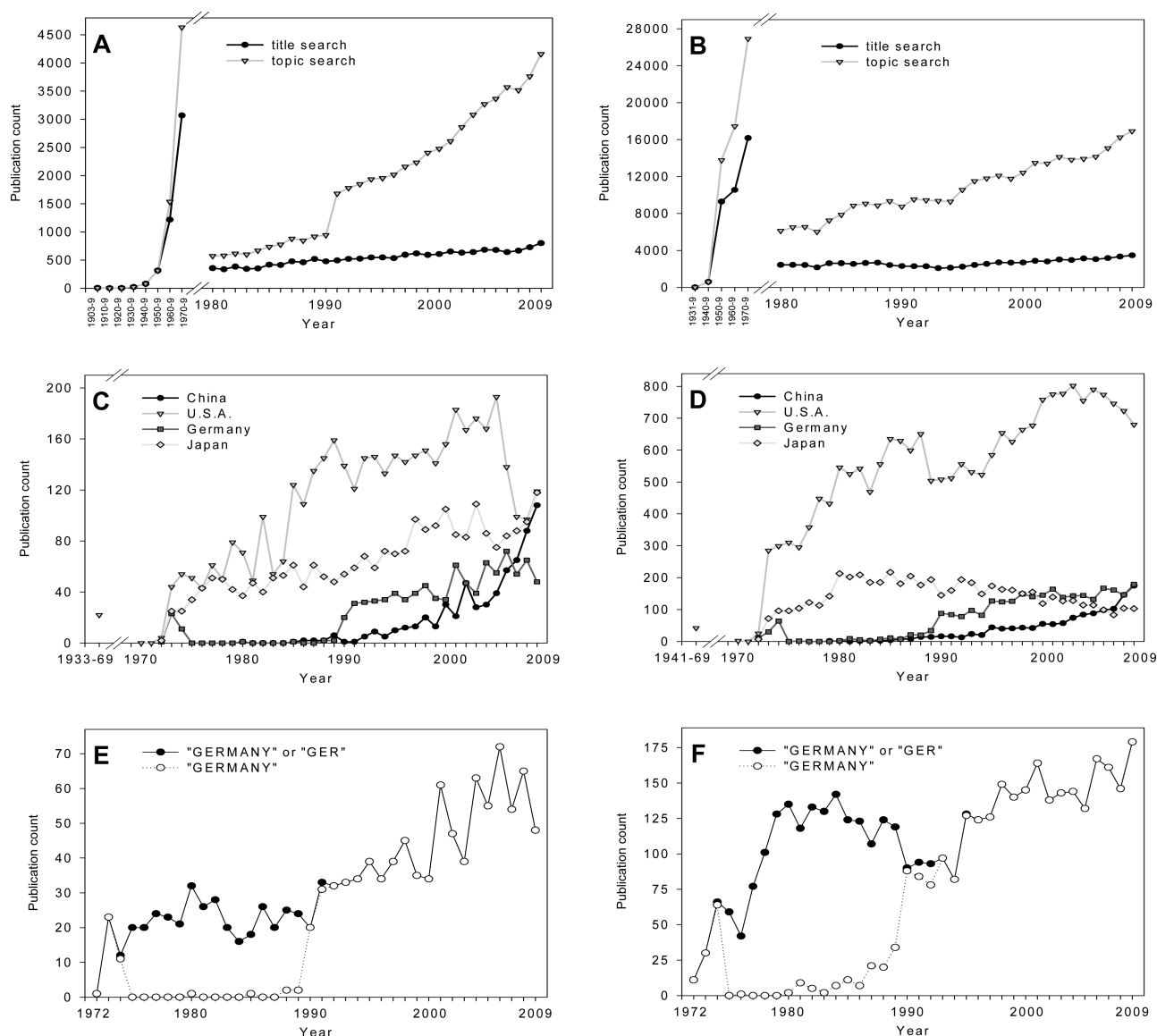


Figure 1. WoK title search. Comparison of WoK topic and title search for cyclization (A) and antibiotics (B). Detailed WoK title search for cyclization (C) and antibiotics (D) in selected countries. Comparison of WoK title search for German publications on cyclization (E) and antibiotics (F) using only country name Germany (white circles) compared with combined search for country name Germany and the formerly used country symbol GER (black circles).

The results confirmed that the reported trends may be largely explained by the nonrandom absence of abstracts and address fields in some references. Replacing the “topic” search with a “title” search resulted in complete elimination of the reported one-point increase in publication output in 1991 (Figure 1A). The difference between topic and title searches emerged as early as in 1966, when abstracts started to be included to some of the WoK references. Comparison of the title search with a combined title and address search has shown that the combined search highly underestimates the number of papers indexed until 1973, as the country information is almost completely absent in a vast majority of them (Figure 1A–D). The last variable taken in account was the proper use of country names and codes. Among the changes influencing protocol used by Li and Willett¹ is German reunification in 1990. Various codes were used for the western and eastern parts of Germany; inclusion of country code GER in the search protocol completely abolished the supposed change in number of German papers in 1990/91 (Figure 1C–F).

It is important to be aware of the critical elements of scientometric evaluation, as they are increasingly used by national and international funding and statistical agencies. However, inappropriately designed search procedures may lead to confusing or false-positive results. In its recent form, WoK was found to be biased when using the address field before the year 1973 and the topic field before the year 1991.

Suggested is complete disclosure of the databases or indexes used for bibliographical research, as scientists may have access only to parts of these commercial products³ based on what is paid by their home institution or library.

Petr Heneberg

Third Faculty of Medicine, Charles University in Prague, Ruská 87, CZ-100 00 Prague, Czech Republic

* Corresponding author. Tel.: ++420-775 311 177. E-mail: Petr.Heneberg@lf3.cuni.cz.

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Supporting Information Available: Detailed description of results and of the protocols used. This information is available free of charge via the Internet at <http://pubs.acs.org/>.

REFERENCES AND NOTES

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