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Guest Editorial

The bibliometrics of urban creativity and CCS

Introduction

An important part of the production of knowledge is the analysis of the ways in which concepts are created, diffused and assembled into networks of shared information. The availability of digital data has encouraged new ways to summarize these processes and precise ways to measure the impact of academic ideas. The tools of bibliometrics (also known as scientometrics and webometrics), are now widely available via powerful informational databases such as the Web of Science (Thomson Reuters) or SciVerse Scopus (Elsevier), which permit precise analysis of many facets of the academic enterprise.

Most familiar are citation analyses, which aggregate data on the presence (or absence) of citations for a specific journal article, book or report. These in turn permit the comparison of individual authors via measures such as the h-score (Hirsch, 2005). Increasingly, citations counts are aggregated, allowing the comparison of research journals via single year and five year Impact Factors (IFs), which can be used to indicate which journals have a place of influence within a field.

Publications and their relevant citations can also be employed to evaluate research institutes and university departments, cities and even the academic trajectory of entire countries.

Recent examples of bibliometric analyses

In a recent review, Frenken, Hardeman, and Hoekman (2009) have proposed an ambitious program of work to understand what they term spatial scientometrics or the "spatial aspects of the science system" (Frenken et al., 2009, p. 222). As they indicate, this can be imagined at almost any scale and with different relational qualities. Fig. 1, for example, is an example of scientific productivity captured from data provided by the editors of Nature in cooperation with Elsevier. It is a complex diagram (for full interactive possibilities, see nature.com for October 20, 2010). It permits a comparison of productivity of scientific researchers, for instance in the UK and US (in red)[1] and in other countries (Chinese cities are shown in blue at the bottom of the diagram). We can see that while researchers in Europe and the US tend to overcite each other, those in China are concomitantly excluded. Japanese researchers are virtually at the global mean; the diagram indicates the trajectory of universities in Kyoto and in Tokyo over the period 2000–2008, which held steady in their research productivity.

While this is a display arranged temporally, it is also useful to display interaction data, and this has been done by Lyesdorff in numerous contexts (see www.lyesdorff.net). In Fig. 2, we can see the relations between different urban research centers, in the context of what he terms information sciences (this is a small data set used for illustrative purposes but the method can be applied to any or all fields, given sufficient computing power). In this instance, we can see connectivity between Chinese, Korean and Japanese researchers. There are some cities whose researchers have no connections via citations, and there are other links that transcend neighbors, extending to Europe, the US and Australia.

These kinds of analysis provide confirmation of some obvious geopolitical realities (the disconnection of North Korea, for instance), but can also be used for evaluative purposes, for instance at other scales, say, to gauge the outcomes of regional investment efforts to enhance specific universities.

A bibliometric analysis of CCS

While it is common to use bibliometrics to assess relations (between researchers, for example), it is also useful to use publication information for more detailed purposes, for example how a field, such as political geography, has evolved over time (Kirby, 2012a). It also valuable to show how a journal is contributing to a discipline, and we can illustrate this by a simple device such as a world cloud. In Fig. 3, for example, we can see a word cloud for the journal City, Culture and Society; this was created by analysis of the keywords of all the papers so far published in the journal. [1] Keywords mentioned more frequently are given greater prominence in the display, proportionate to their frequency.

We can see, from Fig. 3, that the journal is focused on key themes such as creativity, culture and social inclusion.

[1] (For interpretation of the references to colour in this text, the reader is referred to the web version of this article.)

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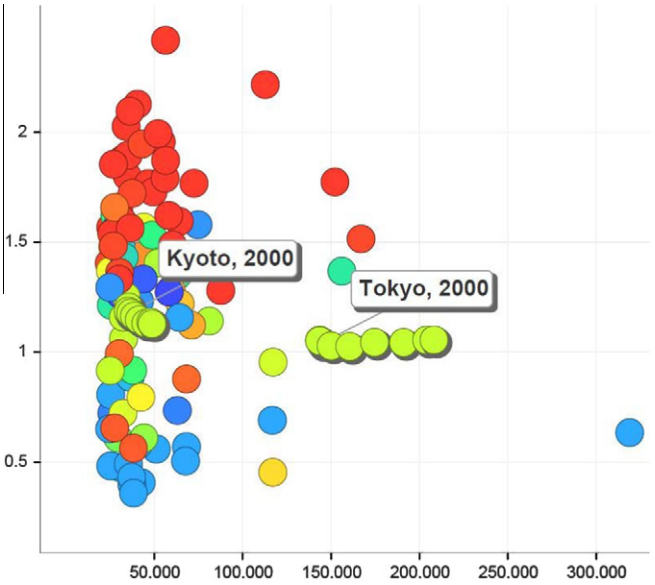

Fig. 1. Using citations to analyze the relations between 'science cities'. Compiled by the author from interactive information presented in Nature (retrieved from http://www.nature.com/news/specials/cities/best-cities.html). The "relative citation impact" measures the average number of citations received by publications aggregated to an individual city (horizontal axis). These publications are weighted for the various research fields (some publish a lot, some less) and then normalized to a global average of 1 (vertical axis). The data show trends for each city from 2000 to 2008.

[2] Papers such as those by Chen (2011), Jakob (2010), Nakagawa and Suwa (2010), Okano and Samson (2010), Rosenstein (2011) and Sasaki (2010) all promote these key themes; in due course, we will be able to track the ways in which these same articles are cited and the impacts that they have within this field and beyond—into perhaps communication, or social work.

Conclusions

Bibliometrics permit us to identify the commonalities within a field [who speaks to whom] and the disconnections between those using different methodologies or different languages. This paper draws on the information within the Scopus database to illustrate these arguments, indicating the different streams of information that are now coalescing.

Necessarily, this brief paper cannot address the many immanent developments in this field. For instance, it is now possible to analyze the millions of clickstreams which allows us to begin to understand how researchers actually use bibliographic data to search for topics and to aggregate information. Such analyses permit us to re-characterize the links between disciplines and the emerging interdisciplinary fields—perhaps those that deserve new funding in the future (Bollen, Hagberg, Chute, & Balakireva, 2009). The demands of such emerging fields also indicate the value of different sorts of information provision—such as meta-journals, which are deliberately designed to provide coverage of topics for interdisciplinary researchers, and which use bibliometrics to establish the coverage that is required. Current Research on Cities is such a journal in the field of urban studies (Kirby, 2012b).

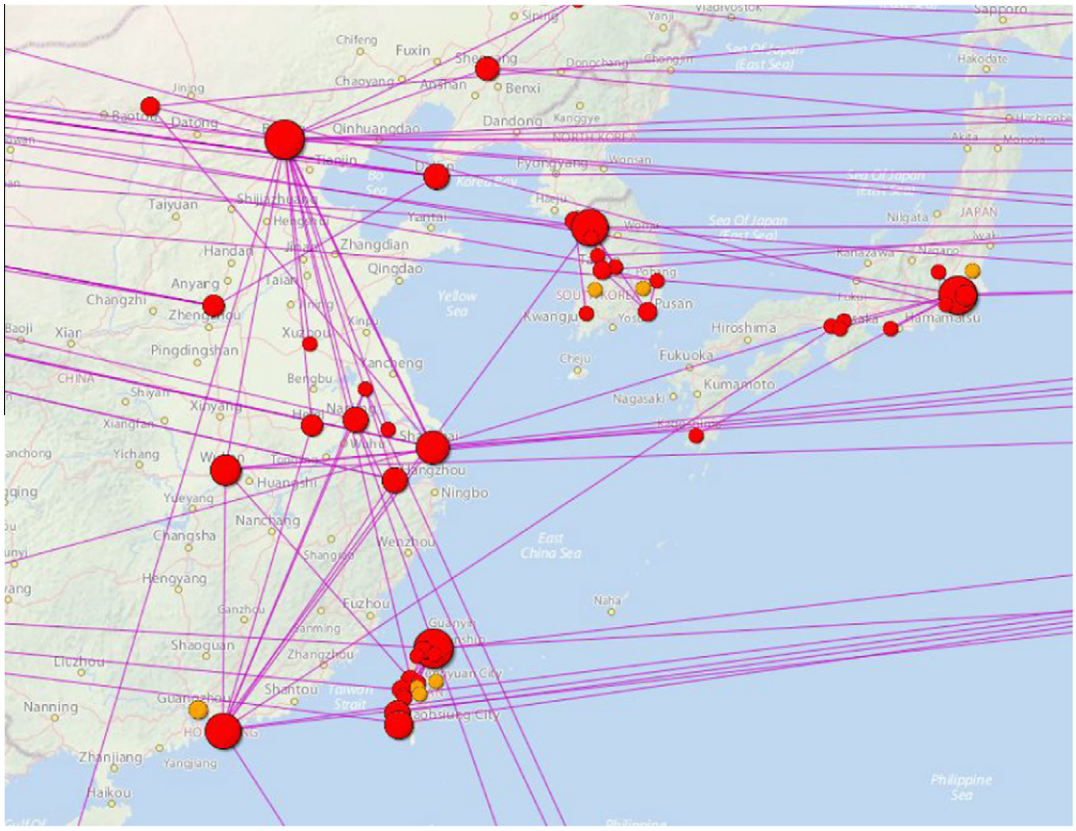

Fig. 2. Connections between researchers in different urban universities, in the field of Information Sciences. Compiled by the author from interactive data presented at http://www.leydesdorff.net/. The analysis, focused on citations in the field of IS, is also discussed in detail in Leydesdorff and Persson (2010).

Fig. 3. Word Cloud of keywords in CCS papers 2010–11. Compiled by the author from keywords created by authors of all papers published in City, Culture and Society in 2010–11, and a 2010 supplement to Cities. The keywords were aggregated and processed at www.wordle.net and used with permission.

With a move towards greater computing power and the ability to examine vast data sets, it can be seen that the precision of bibliometrics is now poised to become central to the way in which we understand the production of knowledge and its artifacts. We can see from this very simple analysis just how City, Culture and Society has begun to evolve; soon, with more data available, we will be able to examine its place within the field of urban studies and within the broader social sciences.

Notes

1. This display covers all the publications that have appeared in City, Culture and society in addition to a Supplement to the journal Cities.
2. Topics such as health and health care feature prominently in the broad range of social science journals which publish material with an urban focus: for a recent analysis see http://www.curr-entresearchoncities.com/2011/07/urban-word-cloud.html.

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