

Published in: The multidimension world of Tibor Braun (ISSI e-zine), 2007, p. 23-26.

Hungary – and Tibor Braun – on top!

Dedicated to Tibor Braun on the occasion of his 75th birthday

Ronald Rousseau
KHBO (Association K.U.Leuven), IWT, B-8400 Oostende, Belgium
UA, IBW, B-2600 Wilrijk, Belgium

Introduction

Using topic searches in the Web of Science we collected a number of topics in which Hungary was among the top producers (as a country). In particular, we determined the influence of Tibor Braun on these results.

Methods

We first collected all publications by Tibor Braun and considering title words, tried to determine 'topics' in which Hungary ranked high as a country. This list was augmented by five words, which were not directly related to Tibor Braun, but were, of course, related to Hungary or Hungarian science. The list of these topics is shown in Table 1 (first column). For each of these topics we further determined the total number of published articles (in the Web of Science), the h-index (based on citations to these articles) (Hirsch, 2005), the position of Hungary in the ranked list of countries (using the ANALYSE feature of the Web of Science), the percentage contribution of Hungary, and the most productive country (often Hungary itself). Finally we determined the number of articles about the topic, written by Tibor Braun. Data were collected on a special day: Valentine's Day, 2007. Recall that an h-index for topics, as used in this article, has been proposed by Banks (2006).

Results and comments

Results are summarized in Table 1, ranked according to Tibor Braun's contribution. They are further discussed in this section.

Table 1. Queries related to Hungarian science and numerical results

A: topic; B: number of articles (T); C: Hirsch index;
D: rank occupied by Hungary according to production;
E: percentage of articles published by Hungary;
F: most productive country; G: number of articles published by Tibor Braun

A	B	C	D	E	F	G
scientometric*	535	22	2	11.6	USA	24
scientometric* AND indicator	143	15	1	25.3	HU	18
“world flash”	19	5	1	89.5	HU	17
scientometric* AND countr*	91	11	2	13.2	INDIA	11
version AND fact* (in title)	218	24	12	3.7	USA	7
hungar*	20,669	67	1	37.8	HU	6
“world science”	166	12	4	3.6	USA	6
gatekeep* AND chemistry	9	3	1	55.6	HU	5
citation AND rank*	507	27	12	1.6	USA	5
radiofulleren*	5	1	1	80.0	HU	4
gatekeep* AND editor*	51	9	2	5.9	USA	3
“British science”	194	10	4	2.1	ENGL	3
gatekeep* AND scientom*	2	0	1	100.0	HU	2
Hirsch AND journal*	28	8	3	7.1	USA	2
“publication lapse”	2	1	1	100.0	HU	2
hungar* AND science	707	27	1	58.0	HU	1
version AND fact* AND world	3	2	1	33.3	HU	1
interneuron* AND hippocamp*	3236	136	6	6.4	USA	0
“SCF theory”	237	39	2	16.0	USA	0
Balaton	421	26	1	71.5	HU	0
puszta	23	8	1	69.6	HU	0
Erdos OR Erdoes	1449	27	2	8.8	USA	0

Not surprisingly, Tibor Braun contributed, in absolute numbers, the most to the topic “scientometric*”, and this often in combination with the word “indicator* “. On his own he puts Hungary on the number one spot for the topic “world flash”. Clearly, he is also very active as a gatekeeper. We further notice two special “Tibor Braun” topics: namely “publication lapse” and “radiofulleren* “.

535 articles on “scientometric* “ are included in the WoS. Among these the most-cited one is an article co-authored by Tibor Braun: the famous scientometric datafiles, published in the journal *Scientometrics* in 1989 (Schubert et al., 1989).

This same article is also the most-cited one on the topics “scientometric* AND indicator” and “scientometric* AND countr* “. Not surprisingly, also on the topic “world flash” an article co-authored by Tibor Braun heads the list (Braun et al., 1988).

Table 1 further shows that as a country Hungary performs excellent on the topics “interneuron* AND hippocamp* “, a topic in neurology, and “SCF theory“, (self-consistent field theory), a topic in molecular physics. From earlier investigations (STIMULATE-6, 2007) we knew that countries usually perform well in relation to geographical locations situated in the country. This turned out to be the case for Hungary when considering the topic “Balaton”.

When performing these searches we found a number of false hits (which we did not remove). Using the search query “Hirsch AND journal* “ we were aiming at the h-index for journals, as introduced by Braun et al. (2005). Yet, this search query also retrieved articles containing the words *Hirschmann* and *journalism*. Similarly, the query “gatekeep* AND editor* “ retrieved many editorials using the word gatekeeper(s). The most-cited article on “citation AND rank* “ is Garfield’s article published in *Science* in 1972 (Garfield, 1972).

The relation between the total number of publications (T) and the h-index is not linear at all. Removing the data for hungar*, interneuron* AND hippocamp* and “SCF theory” yields a good fit for $h = \sqrt{T}$. Indeed, using non-linear regression we find $h = T^{0.494}$, with $R^2 = 0.83$, as best fitting power relation. This corresponds nicely with the power law model for citations, for which it has been shown that $h = T^{1/\alpha}$ (Egghe & Rousseau, 2006). The square root corresponds to Lotka’s inverse square law. We further note that the Spearman rank correlation between T and h is 0.96 (using all data).

Conclusion

Not considering topics with less than twenty published articles we see that Hungary, a country with a population of slightly more than 10 million people, publishes more than 10% of all articles in the WoS about the topics: “scientometric* “, “scientometric* AND indicator”, “scientometric* AND countr* “, “hungar* “, “hungar* AND science”, “SCF theory”, “Balaton” and “puszta”. While for some of these topics, such as “hungar* “ this is quite expected, it is less expected for a topic such as “SCF theory”. Thanks to the influence of Tibor Braun Hungary also leads in topics related to scientometrics.

References

Banks, M.G. (2006). An extension of the Hirsch index: indexing scientific topics and compounds. *Scientometrics*, 69, 161-168.

- Braun T., Glänzel, W., and Schubert A. (2005). A Hirsch-type index for journals. *The Scientist*, 19(22), 8.
- Braun T., Glänzel, W., and Schubert A. (1988). World flash on basic research – The newest version of the facts and figures on publication output and relative impact of 100 countries 1981-1985. *Scientometrics*, 13, 181-188.
- Egghe, L. and Rousseau, R. (2006). An informetric model for the Hirsch index. *Scientometrics*, 69, 121-129.
- Garfield, E. (1972). Citation analysis as a tool in journal evaluation. *Science*, 178, 471-479.
- Hirsch, J.E. (2005b). An index to quantify an individual's scientific research output. *Proceedings of the National Academy of Sciences of the USA*, 102(46), 16569-16572.
- Schubert, A., Glänzel, W. and Braun, T. (1989). Scientometric datafiles – a comprehensive set of indicators on 2649 journals and 96 countries in all major fields and subfields 1981-1985. *Scientometrics*, 16, 3-478.
- The STIMULATE - 6 Group (2007). The Hirsch index applied to topics of interest to developing countries. *First Monday*, 12(2).