

Brief Communication: The Czech System of Evaluation of Science Research Handicaps Interdisciplinary Science

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Šolc, Roman. **Brief Communication: The Czech System of Evaluation of Science Research Handicaps Interdisciplinary Science** *Knowledge Organization*. 41(5), 410-413. 2 references.

Abstract: The system of evaluation of scientific outputs in the Czech Republic has been established by viewing all outputs which are registered in the database called Information Register of R&D results. Every output gets some points which are allocated to individual authors and institutions. The procedure is established in the material called Methodology of Evaluation of Research Organizations and Evaluation of Finished Programmes (valid for an actual year or years). This article shows how one changeover in that algorithm which was carried out between the years 2009 and 2010 handicaps interdisciplinary science. As an example, the data about publications from Charles University in Prague, Faculty of Science are used. The data from more or less interdisciplinary disciplines are compared using the algorithm from different versions of methodology. The results show that the changeover handicaps interdisciplinarity and mainly publications in prestigious journals.

Received: 15 July 2014; Accepted 23 July 2014

Keywords: journals, RIV-points, methodology,

The system of evaluation of scientific outputs in the Czech Republic has been established by viewing all outputs which are registered in the database called Information Register of R&D results (further only "RIV"). Every output gets some points (further only RIV-points) which are allocated to individual authors and institutions. They are done according to a procedure which is appointed in the material called Methodology of Evaluation of Research Organizations and Evaluation of Finished Programmes (valid for an actual year or years) (further only Methodology). According to obtained RIV-points, the money for science is distributed from the state budget to the institutions. More points are given to the articles published in the journals with the highest impact factor. These points are given according to the mathematical algorithm which is appointed for the actual year. This article would like to show how one changeover in that algorithm which was carried out between years 2009 and 2010 handicap interdisciplinary science.

The algorithm is

$$\text{RIV-points} = 10 + 295 * [(1-N)/(1+(N/0,057))]$$

where N is the normalized ranking of the periodical, and

$$N = (P-1)/(P_{\max}-1)$$

where P is the periodical's ranking according to the Journal Citation Report in a series sorted in the descending order by IF and P_{\max} is total number of periodicals in the given field according to *Journal Citation Reports* (Research, Development and Innovation Council 2009; (Research, Development and Innovation Council 2010).

The difference in situation is shown when a single journal is rated in more than one series. The older version of Methodology (Research, Development and Innovation Council 2009) and the older ones say, that "if the peri-

Departments	Abbreviation	RIV-points (Methodology 2009)	RIV-points (Methodology 2010)	Difference	Difference towards to RIV-points (Methodology 2010)	
Anthropology and Human Genetics	DAHG	1147,11	648,47	-498,64	0,7689	76,89 %
Botany	DBOT	5931,86	5078,09	-853,77	0,1681	16,81 %
Cell Biology	DCEB	2300,81	1973,91	-326,90	0,1656	16,56 %
Ecology	DECO	4493,81	3921,51	-572,30	0,1459	14,59 %
Experimental Plant Biology	DEPB	2040,51	1987,37	-53,14	0,0267	2,67 %
Physiology	DPHY	651,34	628,09	-23,25	0,0370	3,70 %
Genetics and Microbiology	DGEM	1622,70	1485,19	-137,51	0,0926	9,26 %
Parasitology	DPAR	3311,40	2710,42	-600,98	0,2217	22,17 %
Zoology	DZOO	7181,47	6058,06	-1123,41	0,1854	18,54 %
altogether	ALL	28681,01	24491,11	-4189,90	0,1711	17,11 %

Table 1. Overview of RIV-points for publications which given departments participate on.

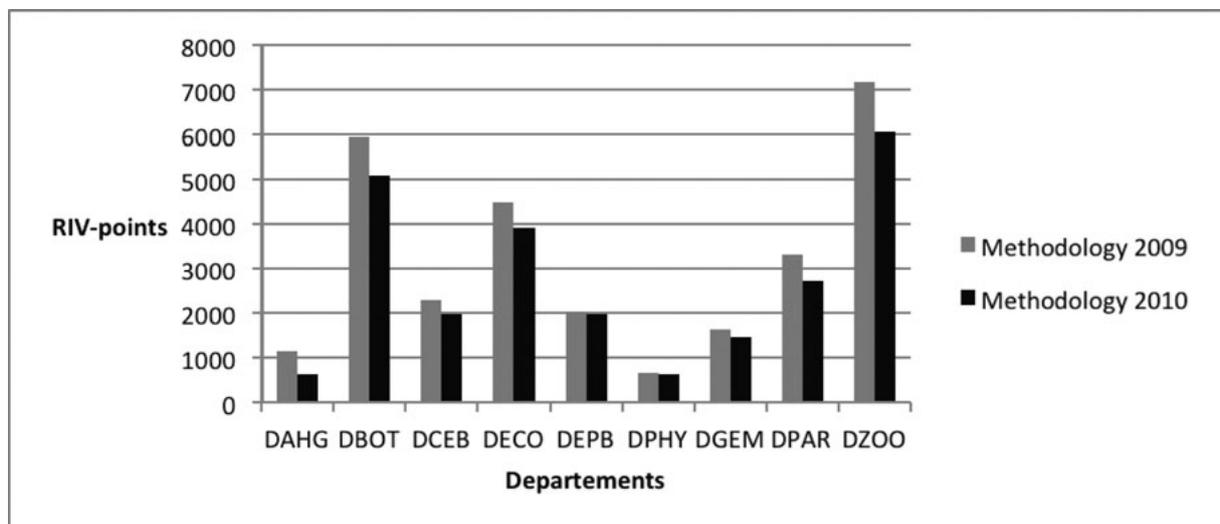


Figure 1. The sum of RIV-points according to Methodology 2009 compared with sum of RIV-points according to Methodology 2010.

odical is registered for several fields, that field will be used for evaluation, in which the periodical achieves better order in a relation to total number of periodicals in the field.” Methodology (Research, Development and Innovation Council 2010) and the newer versions say, that “if the periodical is registered for several fields, the normalized ranking of the periodical N will be calculated as the arithmetic average of the normalized rankings of the periodical in all fields where it is registered.”

For an illustration, let’s take all the publications which were produced in nine biological departments of the Faculty of Science, Charles Univerzity in Prague during the year 2013 (summarized in the OBD database) and calculate how many RIV-points these publications would get according to Methodology (2009) and Methodology (2010). (See Table 1 and Figure 1).

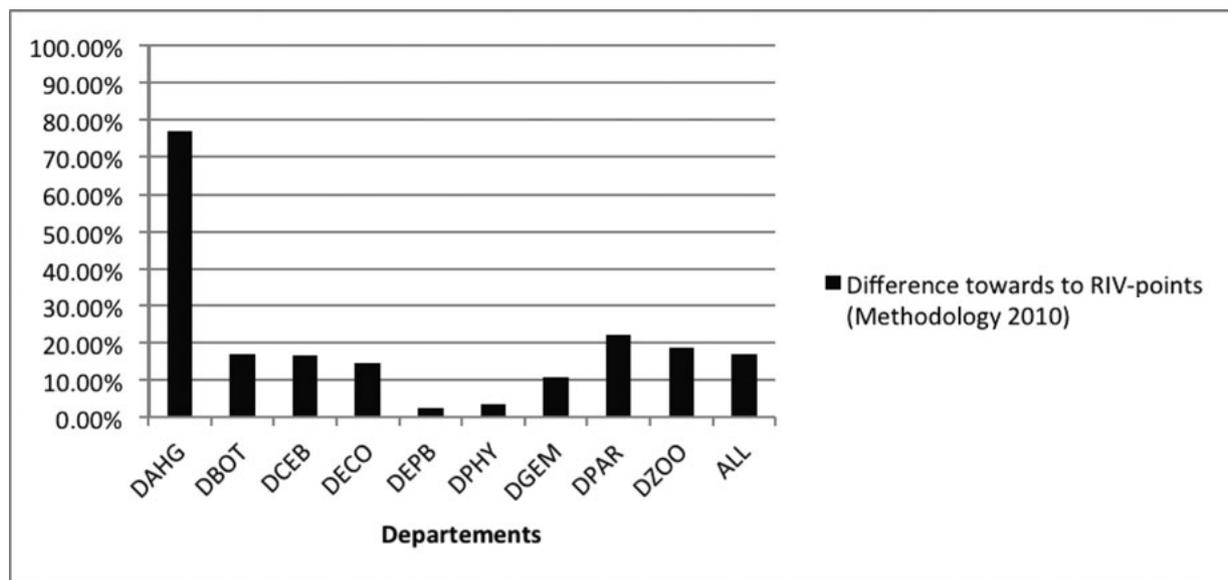


Figure 2. Percentual expression of loss of RIV-points (the lost RIV-points towards to sum of RIV-points according to Methodology 2010).

We can notice quite a big dissimilarity in the relative difference between the Department of Anthropology and Human Genetics (76.89 %) and the other departments (from 2.67 % to 22.17 %) (see Figure 2). How does it take place? The reason is that anthropology is a very interdisciplinary discipline and anthropologists publish their articles in journals which are rated in several fields of *Journal Citation Reports*. This is where the problem takes place, because each field has a different “culture of citation.” This means that the same journal which is on the top in one series can be average in another series because of different contexts—hardly any journal rates between the top ones in several fields of *Journal Citation Reports*.

In the case of publishing in journals which are more specialized and which rate in only one field, the top journals stay the top ones. The changeover in Methodology does not affect them (the best N value and the average N value are the same thing). But in case of publishing in journals with a larger spectrum of interest which rate in more fields, the situation is different. Even the journal which is the best one in one field is a little bit worse in another field or fields, so the changeover in Methodology affects them quite a lot (the best N value and the average N value could be quite different). Because of the algorithm, the effect of the changeover involves mainly the best journals—even a small change of N value inside the interval (0; 0.25) can markedly change the RIV-points in the range (50; 305). Journals which are at the bottom of the series are almost not involved (e.g. the journals, whose N value is inside the interval (0.75; 1), get a number of RIV-points from range (10; 15) (see Figure 3).

As an example, let’s take the periodicals *American Journal of Physical Anthropology* and *Journal of Human Evolution*, two of the most prestigious anthropological journals. Table 2 contains the comparison. We can see that because of the changeover of the algorithm, the number of RIV-points was reduced on around 1/3 in case of both journals.

Finally, we can observe that this element in the algorithm (which stays in the Methodology until today) handicaps the interdisciplinary science and these disciplines which are predisposed to connecting with other disciplines and to viewing the world in a wider context.

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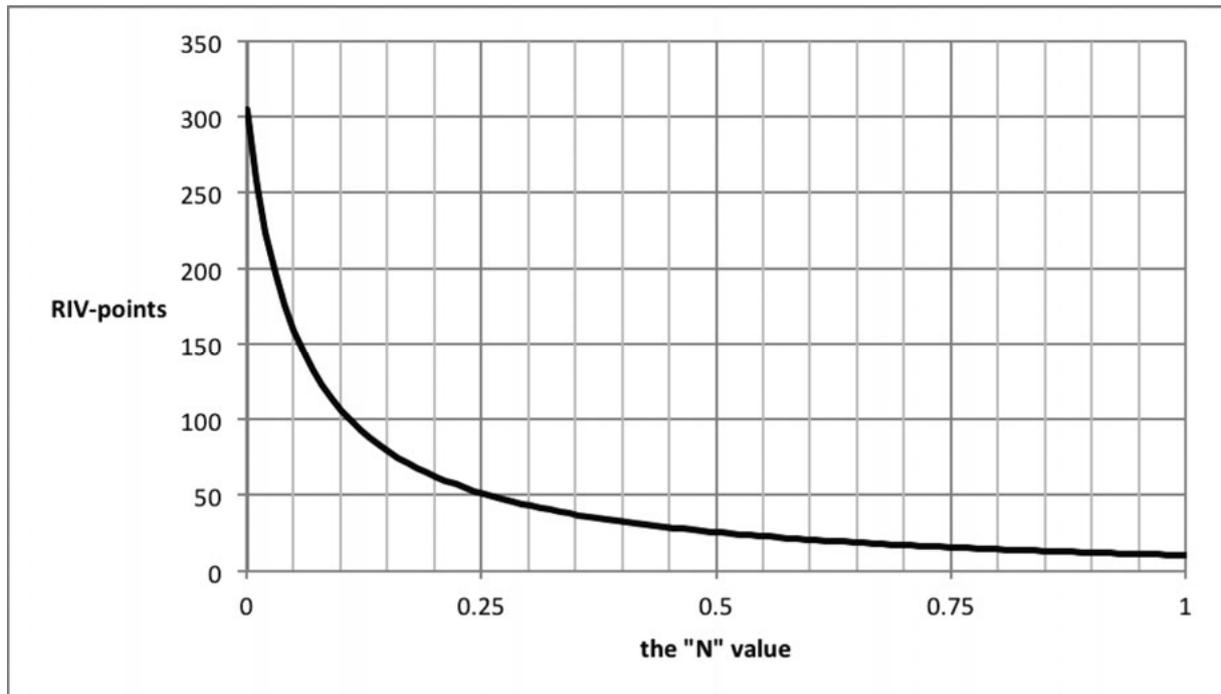


Figure 3. The curve of dependency of RIV-points on the N value.

Journal	American Journal of Physical Anthropology		Journal of Human Evolution	
Impact factor	2,481		4,094	
JCR: Anthropology	7 th from 83		2 nd from 83	
JCR: Evolutionary Biology	25 th from 47		14 th from 47	
N value ("the best"; Methodology 2009)	0,07317		0,01220	
N value ("average"; Methodology 2010)	0,29746		0,14740	
RIV-points ("the best"; Methodology 2009)	129,72		250,04	
RIV-points ("average"; Methodology 2010)	43,33		80,14	
Difference on account of the changeover	-86,39		-169,90	
Difference towards to RIV-points (Methodology 2010)	1,9938	199,38 %	2,1200	212,00 %

Table 2. Characteristics of two concrete journals.