Impact Analysis of a Regional Scientific Journal (1980–2000): Supporting Promising Local Researchers Pays the Greatest Dividends

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ABSTRACT

During the past 28 years, the journal »Collegium Antropologicum« has continuously served as one of the main disseminators of anthropological scientific production in Central and Eastern Europe. The journal was committed to its role of a multidisciplinary platform for presenting wide range of research topics relevant to anthropology, from investigations within social and cultural anthropology and archaeology to those covering contemporary population genetics, human evolution and biomedical issues. Two key strategies aimed at sustaining and increasing the impact of this journal were oriented towards: i) identification of promising local groups of researchers who were at disadvantage by many aspects (e.g. educational curricula, financial supports, language barriers etc.) when trying to publish their research internationally, and ii) invitation and encouragement of already established international scientists to make contributions for »Collegium Antropologicum«. From 1980–2000, 89 articles (or 6.3% of all published papers during that period) were cited 6 or more times, contributing disproportionately to journal's impact (nearly a third of all citations received). In an attempt to identify such papers more readily among the submissions to the journal in the future, we analyzed research topics and affiliations of the authors among the 89 papers receiving most citations in comparison to all papers published. Among the papers most frequently cited, we found greater-than-expected prevalence of Croatian researchers (especially when publishing in collaboration with international scientists) and studies of special populations. Several papers received more than 25 citations or had overall citation intensity greater than 2 per year. This implies that an interesting article from a local group of researchers can still resonate with international audience although published in a regional journal. Present analysis supports current editorial strategy that with a help of the international consulting editorial board continuously improves international recognition of this journal. The results imply that a balanced encouragement to promising local groups of researchers and to contributions of already established international scientists is a strategy superior to others in maintaining and increasing the impact of this regional journal.

Key words: scientific journal, editorial policy, citation analysis

Introduction

»Collegium Antropologicum« was founded on the occasion of the First Congress of European Anthropologists, held in Zagreb on September 1–3, 1977. The founders of the journal, H. Maver, P. Rudan, A. Sujoldžić and D. Dimov, expressed their feelings about the pressing need for the practical application of scientific progress by indicating¹ »... the evident want for a place of ongoing discussion, which has long been present in biological anthropology and in all natural sciences...«. Linking various national and international anthropo-

logical societies was also one of the excellent ways to bring people with similar interests together, and to resolve a number of current problems in this discipline¹. Creation of the scientific journal was imminent and »Collegium Antropologicum« was founded. Founders regarded »Collegium Antropologicum« as a journal of anthropology as contemporary science which will actively try to become a forum for the discussion of important issues providing information about the results of current investigations, and a place of permanent education.¹

The future showed that their aims were successfully achieved.

During the past 28 years, the journal »Collegium Antropologicum« has continuously served as one of the main disseminators of the results of scientific research for Central and Eastern Europe. This journal acted as a multidisciplinary platform for presenting wide range of research topics relevant to anthropology, from current issues within fields of social and cultural anthropology, archaeology to those dealing with issues in population genetics, human evolution and biomedicine. The key strategies aimed at sustaining and increasing the impact of the journal were on one side to identify promising local researchers who find themselves at a disadvantageous position when trying to publish their results internationally, and on the other to invite and encourage already established international scientists to make contributions for the journal.

In this paper, we performed an analysis of citations received by all papers published in our journal between 1980 and 2000. The aim of the analysis was to identify the contributions that, over this 21-year period, have been the most cited, and to analyze if those articles were different in terms of research topics and authors' affiliation from other submissions to the journal. We expect that such an analysis of both topics and authors of the articles that resonated with issues occupying the broader scientific community could help Editors to recognize potentially influential contributions in the future. Specifically, in the terms of the impact of the journal on the international scientific community we wish to address the question whether it is a better strategy to support interesting papers from promising local researchers, or to give more weight to submissions from international contributors, and how to balance those two strategies.

Materials and Methods

Citation analysis

The analysis included the identification, through search of Web of Knowledge databases, of all papers published by the journal »Collegium Antropologicum« between January 1, 1980 and December 31, 2000. The information on the papers was sorted according to ascending year of paper publication and ascending page numbers in an Excel data file. The search of the Web of Knowledge database available at the University of Edinburgh in Scotland, UK, was performed, and a total number of citations received by December 31, 2004 were assigned to each paper published during the period of study. »Citation intensity per year« was also computed for each published paper, by defining the exact number of months between the month of publication of each paper and December 2004, so that the absolute number of citations could also be expressed in relative terms as »citations received per each 12 months since publication date«, which was the measure of citation intensity.

Analysis of research topics and authors' affiliations

Within the database constructed in this way, we defined the following variables for each paper: (i) the research topic (e.g. archaeology, biomedical research, human biology, social science, etc.); (ii) the country (or the group of countries) from which the authors originate; (iii) the institution to which the authors were affiliated. In this way, the expected share of the papers by research topic, country of origin of the authors and type of institution (e.g. academic, industry, etc.) could be defined. This was useful, as it allowed to statistically test whether the papers receiving most citations differ in their topic and authors' affiliation from the rest, and in which way. We aimed to identify overrepresentation of certain research topics and authors' affiliations among the most frequently cited papers, to guide our future editorial strategy.

Results

After the completion of the database construction, we used descending sort option for variables »Absolute number of citations« and »Citation intensity«. We noted that, from 1980–2000, 89 papers (6.3% of all papers published in our journal during that period) received 6 or more citations, contributing disproportionately to the journal's impact (31.4% of all citations received) (Table 1).

TABLE 1
ANALYSIS OF RESEARCH TOPICS AND AUTHORS'
AFFILIATIONS IN 89 PAPERS PUBLISHED IN »COLLEGIUM
ANROPOLOGICUM« BETWEEN JANUARY 1, 1980 AND DECEMBER
31, 2000 AND CITED 6 OR MORE TIMES BY DECEMBER 31, 2004

Distribution by research topic	N (%)
Human Biology	33 (37.1%)
Special Populations Research	*30 (33.7%)
Biomedicine	$12\ (13.5\%)$
Social Science	6 (6.7%)
Methodology	*4 (4.5%)
Public Health	3 (3.4%)
Archaeology	1 (1.1%)
Distribution by country of authors' origin	N (%)
Croatia	48 (53.9%)
Croatia in collaboration with EU or USA	*17 (19.1%)
EU only	14 (15.7%)
USA only	6 (6.7%)
Canada	*3 (3.4%)
Israel	1 (1.1%)
Share in all published papers	6.3%
Share in all citations received	31.4%

st Statistically significant overrepresentation (p<0.05) in comparison to expected distributions based on all papers published within the period 1980–2000

Statistically significant overrepresentation (p<0.05) with respect to research topic among the 89 papers cited 6 or more times was noted for interdisciplinary papers studying special populations (33.7% of most cited papers) and describing original research methods (4.5% of most cited papers). As the large majority of contributors (>95%) were affiliated to academic institutions as opposed to industry or private institutes or health care facilities, this variable was not studied due to low statistical power to reach meaningful conclusions. Significant overrepresentation with respect to country of authors' affiliation was noted for a category "Croatia in collaboration with EU or USA" (19.1% of most cited papers) and for Canadian authors (3.4%) (Table 1).

Table 2 shows the top 20 papers (i.e., top 1% of all published papers) in terms of absolute number of citations for the entire period of study (1980–2000). It is

clear that the most cited papers, in the large majority of cases, come from Croatian authors (frequently in collaboration with EU partners). The domination of collaborative papers between Croatian and international scientists becomes even more clear when the very top 1% is analyzed: such collaborative papers form a half of the top 20 most cited papers, and those from solely Croatian groups about a third. Also, the domination of interdisciplinary special populations' studies as the most cited research topic becomes even more striking: 14 of 20 most cited papers in terms of absolute citations had this research topic.

Table 3 shows the top 20 papers (i.e., top 1% of all published papers) in terms of citation intensity for the entire period of study (1980–2000). Although the main findings from the previous tables were also observed in this analysis, another trend was also revealed with an

Authors	Volume/ Pages	Year	Research field	Country of affiliation	Times cited
1 Rudan, P., D. F. Roberts, A. Sujoldžić, B. Macarol, E. Žuškin and A. Kaštelar		1982	Special Populations	Croatia and EU	44
2 Rudan, P., D. F. Roberts, A. Sujodžić, B. Macarol, N. Smolej and A. Kaštelar		1982	Special Populations	Croatia and EU	32
3 Rudan, P.	4 (Suppl): 35–39	1980	Special Populations	Croatia	28
4 Rudan, I., H. Campbell and P. Rudan	23 (2): 531-546	1999	Special Populations	Croatia and EU	20
5 Sujoldžić, A., P. Rudan and A. Chaventré	7 (1): 49–60	1983	Special Populations	Croatia and EU	19
6 Sujoldžić, A., P. Rudan, V. Jovanović, B. Janićijević and A. Chaventré	11 (1): 181–199	1987	Special Populations	Croatia and EU	18
7 Iscan, M. Y. and P. Miller-Shaivitz	8 (2): 169–175	1984	Human Biology	USA	18
8 Bindon, J. R., D. E. Crews and W. W. Dressler	15 (1): 101–110	1991	Special Populations	USA	17
9 Sujoldžić, A., V. Jovanović, A. Chaventré and P. Rudan	8 (2): 185–199	1984	Special Populations	Croatia and EU	17
10 Bennett, L. A., J. L. Angel, D. F. Roberts and P. Rudan	7 (2): 195–198	1983	Special Populations	USA, EU and Croatia	17
11 Turek S.	14 (1): 137–150	1990	Human Biology	Croatia	15
12 Špoljar-Vržina, S. M., D. Šimić, A. Sujoldžić, L.A. Bennett and P. Rudar	13 (1): 85–95	1989	Special Populations	Croatia and USA	14
13 Jovanović, V., P. Rudan A. Sujoldžić and A. Chaventré	8 (1): 41–47	1984	Special Populations	Croatia and EU	14
14 Smolej, N., M. Gomzi, H. Maver, A. Chaventré and P. Rudan	7 (2): 117–123	1983	Special Populations	Croatia and EU	14
15 Jongbloet, P. H.	16 (1): 99-107	1992	Human Biology	EU	12
16 Chaventré, A. and P. Rudan	6 (2): 225–227	1982	Special Populations	EU and Croatia	12
17 Čelebić, A., M. Valentić-Peruzović, J. Stipetić, Z. Delić, T. Staničić and L. Ibrahimagić	24 (Suppl): 71–77	2000	Biomedical Research	Croatia	11
18 Thaller, V., M. Vrkljan, Lj. Hotujac and J. Thakore	23 (2): 611–619	1999	Biomedical Research	Croatia and EU	11
19 Sujoldžić, A.	15 (2): 309–320	1991	Special Populations	Croatia	11
20 Babler, W. J.	11 (2): 297–303	1987	Human Biology	EU	11

		(I ER TEAR SINCE I	OBLICE	TION DATE)		
	Authors	Volume/Pages	Year	Research field	Country of affiliation	Cites per year
1	Rudan, I., H. Campbell and P. Rudan	23 (2): 531–546	1999	Special Populations	Croatia and EU	4.00
2	Tolk, H. V., M. Peričić, L. Barać, I. Martinović Klarić, B. Janićijević, I. Rudan, J. Parik, R. Villems and P. Rudan	24 (2): 267–280	2000	Special Populations	Croatia and EU	2.50
3	Čelebić, A., M. Valentić-Peruzović, J. Stipetić, Z. Delić, T. Staničić and L. Ibrahimagić	24 (Suppl): 71–77	2000	Biomedical Research	Croatia	2.44
4	Turek, S., I. Rudan, N. Smolej-Narančić, L. Szirovicza, M. Čubrilo-Turek, V. Žerjavić-Hrabak, A. Rak-Kaić, D. Vrhovski-Hebrang, Ž. Prebeg, M. Ljubičić, B. Janićijević and P. Rudar		2001	Public Health	Croatia	2.29
5	Thaller, V., M. Vrkljan, Lj. Hotujac and J. Thakore	23 (2): 611–619	1999	Biomedical Research	Croatia and EU	2.20
6	Stipetić, J., A. Čelebić, V. Jerolimov, I. Vinter, S. Kraljević and Z. Rajić	24 (Supp1): 25–29	2000	Biomedical Research	Croatia	2.00
7	Rudan, P., D.F. Roberts, A. Sujoldžić, B. Macarol, E. Žuškin and A. Kaštelan	6 (1): 39–46	1982	Special Populations	Croatia and EU	1.96
8	Lovrenčić-Huzjan, A., V. Demarin, M. Bosnar, V. Vuković and S. Podobnik-Šarkanji	23 (1): 175–181	1999	Biomedical Research	Croatia	1.64
9	Doko, M., M. Zovak, M. Ledinsky, A. Mijić, M. Perić, M. Kopljar, R. Čulinović, B. Rode and B. Doko	24 (2): 381–390	2000	Biomedical Research	Croatia	1.50
10	Fureš, R., D. Buković, B. Hodek, P. Klarić, R. Herman and G. Grubišić	23 (1): 189–194	1999	Biomedical Research	Croatia	1.45
11	Rudan, P., D. F. Roberts, A. Sujodžić, B. Macarol, N. Smolej and A. Kaštelar	6 (1): 47–67	1982	Special Populations	Croatia and EU	1.42
12	Stini, W. A.	22 (2): 411–425	1998	Human Biology	USA	1.33
13	Weber, G. W., W. Recheis, T. Scholze and H. Seidler	22 (2): 575–584	1998	Methods	EU	1.33
14	Trninić, S. and D. Dizdar	24 (1): 217-234	2000	Human Biology	Croatia	1.33
15	Bindon, J. R., D. E. Crews and W. W. Dressler	15 (1): 101–110	1991	Special Populations	USA	1.26
16	Trninić, S., A. Perica and D. Dizdar	23 (2): 707-721	1999	Human Biology	Croatia	1.20
17	Forenbaher, S.	23 (2): 521–530	1999	Archaeology	Croatia	1.20
18	Rudan, P.	4 (Suppl): 35–39	1980	Special Populations	Croatia	1.16
19	Aurer, A., J. Aurer-Koželj, A. Stavljenić-Rukavina, S. Kalenić, M. Ivić-Kardum and V. Haban	23 (1): 117–124	1999	Biomedicine	Croatia	1.09
20	Ulijaszek, S.	21 (1): 3–15	1997	Public Health	EU	1.07

even greater domination of Croatian researchers, especially those from the field of biomedical research, among the 1% of most intensively cited papers.

Figure 1 and Table 4 illustrate the considerable growth in the number of papers published in »Collegium Antropologicum« (1977–2004) as well as the diversity of international participation in terms of first authors' country of affiliation.

Discussion and Conclusions

The analysis undertaken in this paper clearly revealed the "architecture" of the impact of an internationally recognized regional journal committed to publishing interdisciplinary research, especially topics related to anthropology, human biology and social sciences. Clearly, in this area of science, which has relatively expected impact in comparison to other scientific disciplines, mainly

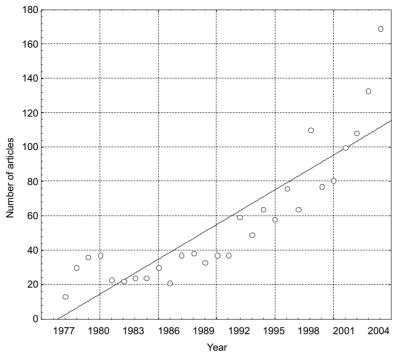


Fig. 1. Number of published articles in Collegium Antropologicum per year (1977–2004).

	Country	N		Country	N
1	Croatia	949	27	Lithuania	4
2	USA	152	28	Iran	4
3	France	44	29	Estonia	4
4	Italy	43	30	Serbia and Montenegro	2
5	India	40	31	Norway	2
6	Austria	39	32	Finland	2
7	Poland	38	33	Bulgaria	2
8	Germany	37	34	Australia	2
9	Slovenia	30	35	United Arab Emirates	1
10	United Kingdom	24	36	Switzerland	1
11	The Netherlands	21	37	Portugal	1
12	Israel	17	38	Peru	1
13	Spain	15	39	Mali	1
14	Hungary	13	40	Malawi	1
15	Russian Federation	12	41	Kuwait	1
16	Czech Republic	12	42	Jordan	1
17	Canada	10	43	Ireland	1
18	Sweden	8	44	Greece	1
19	Japan	8	45	Denmark	1
20	China	8	46	Cuba	1
21	Bosnia and Herzegovina	7	47	Cameroon	1
22	Belgium	7	48	Belarus	1
23	Saudi Arabia	6	49	Argentina	1
24	Slovakia	5	49 50	Argentina Albania	1
25	Turkey	4	อบ		
26	Mexico	4		Total	1590

due to relative scarcity of funding and authors attracted to publishing in this topic, only a minority of published papers over a long period of time (less than 7% of all publications) received 6 or more citations. However, those very rare papers contributed to the total impact of the journal by nearly one third, thus also being mainly responsible for the steady increase in the journal impact factors in late 1990's and in the first years of 21st century. Those papers helped our »Collegium Antropologicum« to earn the title of the most improved social science journal in the world in 2002^2 .

Historically, the steady base of the journal's impact was ensured by the holistic studies of eastern Adriatic island isolates of Croatia, encompassing both their biological and sociocultural dimensions. Those special populations were continually studied for more than 30 years by the staff of the Institute for Anthropological Research³, or in the case of the most extreme isolate of Susak, for more than 50 years⁴. The papers clearly cited above the rest were those in which the strategies of studies of Croatian island populations were laid out^{5–8}, especially when this was performed in collaboration with international scientists. However, it should be stressed that the studies of special populations of Croatia were not the only ones receiving citations and contributing to the core of our journal's impact. Among the 89 most cited papers, we also found the ones about Samoa islanders⁹, isolate populations of Saguenay Lac Saint Jean, Quebec¹⁰, Ethiopian immigrants to Israel¹¹, Morocco villagers¹², Pyrenean isolates of France¹³, Arctic and Sub-Arctic populations¹⁴, Basques of Europe¹⁵ and isolates of Aland, Finland¹⁶. Therefore, one conclusion is that the core of our journal's impact is defined by

interdisciplinary and transdisciplinary studies of special populations, both in Croatia and across the world.

However, the analysis of citation intensity helped explain the steady increase in the impact factor of our journal over the recent years. It was not determined by special population studies, but by intense citation of the papers by local Croatian scientists in the research topic of cultural anthropology and biomedicine. Scientometric analysis for the period 1980-1996 revealed that scientists working within the scientific field of anthropology participated with approximately 2% in the overall scientific output of the Republic of Croatia^{17–18}. This finding was unexpected and encouraging, and it will certainly dictate the editorial policy in the future. Relying on the studies of special populations in both Croatia and internationally, supplemented by publication of interesting biomedical research by promising Croatian groups, seems to be the best strategy to continue the increase in impact of our journal. This analysis also showed that an interesting paper from a local group can still reach the public internationally when published in a regional journal with international recognition, and that supporting such promising local groups of researchers is a strategy superior to others in maintaining and increasing the impact of a regional journal.

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ANALIZA ODJEKA REGIONALNOG ZNANSTVENOG ČASOPISA (1980–2000): PODRŠKA KVALITETNIM LOKALNIM SKUPINAMA ISTRAŽIVAČA DONOSI NAJVEĆI DOPRINOS ODJEKU

SAŽETAK

Časopis »Collegium Antropologicum« održava ulogu jednog od vodećih promotora znanstvene proizvodnje u srednjoj i istočnoj Europi tijekom proteklih 28 godina. Časopis je ostao dosljedan izvornoj ulozi multidisciplinarne platforme za prezentiranje širokog raspona istraživačkih tema od interesa za izučavanje čovjeka – od kulturno-antropoloških, arheoloških i evolucijskih istraživanja do suvremene biomedicinske problematike. Osnovne strategije koje su težile održavanju i unaprjeđivanju odjeka časopisa bile su izdvajanje lokalnih skupina istraživača s originalnim idejama, no u podređenom položaju pri pokušaju objavljivanja rezultata svog znanstvenog rada u inozemnim časopisima, kao i pozivanje i podržavanje utemeljenih međunarodnih znanstvenika na doprinos u ovom časopisu. Od 1980. do 2000. godine, 89 objavljenih radova (6.3% od svih članaka objavljenih u tom razdoblju) bilo je citirano 6 ili više puta, doprinoseći time nesrazmjerno odjeku časopisa (gotovo trećina svih citata). U nastojanju da lakše prepoznamo takve radove među onima koji pristižu na recenziju u budućnosti, analizirali smo teme istraživanja i mjesto uposlenja istraživača među 89 radova koji su bivali najčešće citirani u usporedbi sa svim radovima objavljenima u istom razdoblju. Među najčešće citiranim radovima, učestalost veću od očekivane imali su radovi hrvatskih istraživača (posebno kada su objavili radove u suradnji sa znanstvenicima iz inozemstva), kao i istraživanja neobičnih populacija u Hrvatskoj i u svijetu. Nekoliko je radova bilo citirano više od 25 puta i/ili imalo intenzitet citiranosti više od 2 citata godišnje. Ova analiza navodi na zaključak da zanimljivo istraživanje koje je provela lokalna skupina istraživača može doprijeti do međunarodne znanstvene javnosti i kada je objavljeno u međunarodno priznatom regionalnom časopisu. Također, podrška uspješnim lokalnim skupinama istraživača je strategija bolja od ostalih u održavanju i povećavanju čimbenika odjeka regionalnih časopisa.