Is it enough to change the language? A case study of Croatian biomedical journals

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ABSTRACT: The language barrier is a factor in the low visibility and significance of scientific journals produced by small and scientifically peripheral countries. In order to reach an international audience, both as consumers and producers of scientific information, many journals abandon their national language and start publishing in English. Six Croatian biomedical journals that went through this transition were examined on their editing and publishing characteristics and their international visibility before and after the language shift. The analysis showed that this change influenced the journals' characteristics in general. Two journals enhanced their international visibility, but only one journal showed improvement in all analysed indicators.

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Introduction

English has steadily replaced other languages in research literature and has become the international language of scholarly publication. Former national practices, the use of native languages, and the roles of domestic publishers have changed completely in the last two decades and there has been a transition from 'national' models to the 'transnational' model. That model has been described by Zitt and Perrot as 'constituting a set of individual and collective behaviours and strategies among scientists seeking to improve their visibility in the mainstream of scientific activity, through the use of appropriate publication and communication channels'.[1] The 'national' model, especially in respect of the use of the national language, proved to be a restrictive factor in international visibility. Despite the conflicting discussion among researchers on the giving up of scientific communication in national languages,[2–4] especially if science is viewed in the broader cultural context of a nation, a significant number of scholarly journals have moved from non-English to English language publication.

Croatia still belongs to the group of scientifically peripheral countries whose economic potential is small and where the financial support of science is relatively small. Most Croatian researchers tend to publish their results in internationally visible journals because they believe that thereby they will achieve faster verification of the validity and relevance of their research results and integrate those results more quickly into the corpus of global scientific knowledge.[5] The increasing pressure on small academic and research communities, such as Croatia, to publish in leading journals or the culture of 'publish in high-profile journals or perish'[6] has therefore often had an adverse effect on scientific communication in local languages.

A bibliometric analysis of Croatian scientific journals published in 2000 showed that there were 241 active journals,[7] with 43 of them in the field of biomedicine. The analysis of those biomedical journals according to their editing and publishing characteristics revealed that in respect of the number/quality of articles, the reliability of the peer-review process, and coverage by the indexing/abstracting services, Croatia has the characteristics of a small scientific community.[8] These journals are in a sort of a vicious circle originating from the relative scientific inadequacy of the environment in which the journals are produced.[9] They cannot attract high-quality papers, because the authors know that those journals will not make their work visible. Besides, there is a lack of reliable reviewers, there is the language barrier (local language or poor English) and there are low visibility and significance (citation score, number of subscriptions, etc.).[9] On the other hand, Croatian scientific journals are not published on a commercial basis and their publishing is mainly financed by government funds. Among the criteria for financial support are regular coverage by the relevant international indexing and abstracting services and international collaboration (as exemplified by the contributing authors, the list of referees, and the membership of editorial boards).[10] Croatian rules for academic promotion put papers published in the journals covered by international bibliographic databases as a prerequisite to promotion in all disciplines. For example, in the field of biomedicine, publication in journals covered by the ISI-Thompson databases are obligatory. For local journals to achieve better international visibility, i.e. better coverage by the relevant bibliographic databases, transition to publishing in English seems to be one possible solution.

The aim of this study was to investigate whether the shift in publication language, in our case Croatian to English, changed the scientific efficiency of biomedical journals. Is there a direct relationship between publication language and visibility and impact? Does the change of language, as an indicator of the editorial policy change, 'open' a biomedical journal to the international audience, both as consumers, and producers of biomedical information? Does it also indicate a change of editorial priorities or preferences?

Methods

In the group of previously analysed Croatian biomedical journals[9] we identified 13 journals publishing in English. We examined their publishing histories and selected six for further analysis. These six journals have been leading journals in their fields in the Croatian medical community (three of them being general medicine and three specialized journals). All of them had been published in Croatian for at least 20 years, and they all transferred to English before 1995. This time limitation was posed because of the methods used for the analysis. The analysis was performed in two five-year periods. The first period covered five years before the transition to English. As we estimated that possible effects of the language change would take a minimum of five years to manifest themselves, the second five-year period analysed was the sixth to tenth years of their being published in English.

In both periods we examined two sets of indicators:

1. Editing and publishing characteristics (internal indicators).
2. International visibility (external indicators).

Editing and publishing characteristics

Editing and publishing characteristics for all six journals were identified according to the general information on the profile of the journal as published in each issue and the instructions to authors. We analysed information in the last issue before language transition and the first issue in the sixth year after language transition on: title, publishing profile (editorial board/council, scope and coverage, peer review, periodicity), language of publication (Croatian, English, others). For selected five-year periods we analysed and summarized language of the articles, types of content (original article, preliminary report, review article, case report, conference paper, editorial), and authors' affiliation (domestic authors, foreign authors, mixed).

International visibility

As indicators of a journal's international visibility we analysed coverage by the most important bibliographic databases in the field of biomedicine (Medline, Scopus, and Web of Science [WoS]) and citation score (number of times papers are cited in the WoS and Scopus databases). Scopus covers more biomedical journals then WoS, especially those published in developing countries (for example, WoS covers four Croatian biomedical journals and Scopus 27). The WoS (ISI-Thompson, Philadelphia) database was searched for the period 1991–2004 (the period covered by the national licence), and Scopus (Elsevier BV, Amsterdam) for the period 1987–2004. We also separated self-citations and citations received by others presuming that the latter indicate visibility of the papers published. The most serious methodological limitation was the journals' unequal publication and citation windows (Table 3).

The statistical significance of results was tested by chi-square tests whenever possible.

Results

The analysis of editing and publishing characteristics (Table 1) revealed that three journals changed their titles and one introduced a parallel English title, but their scope and coverage remained the same. The

Table 1 Editing and publishing characteristics before and after the language transition

Old and new title	Year	Editorial board/council	Coverage	Peer review	Periodicity	Language	Indexed by
Acta Medica Igoslavica	1991	national/national	general	?[a]	4	Croatian + English	Medline, Scopus
Acta Medica Croatica	1997	national/ international	general	?	5	English	Medline, Scopus
Acta clinica Croatica	1995	national/ national	clinical medicine	+(2)	4	Croatian + English	Scopus
Acta clinica Croatica	2001	national/ international	clinical medicine	+(2)	4	English	Scopus
Arhiv za higijenu rada i toksikologiju	1992	national/national	toxicology and industrial hygiene	?	4	Croatian + English	Medline, Scopus
parallel title in English added	1998	national/ international	toxicology and industrial hygiene	+(2)	4	English	Medline, Scopus
Libri oncologici	1992	national/ international	oncology	+(2)	3	Croatian + English	Scopus
Libri oncologici	1998	national/ international	oncology	+(2)	3	English	Scopus
Neurologija	1990	national/ international	neurology	+	4	Croatian + English	Scopus, Medline
Neurologia Croatica	1996	national/ international	neurology	+	4	English	Scopus, SCI-Expanded
Radovi Medicinskog fakulteta	1991	national/national	general	+	4	Croatian + English	Scopus
Croatian Medical Journal	1997	international/ international	general	+(2)	4 (6 since 2001)	English	Scopus, Medline, SCI-Expanded, Current Contents

[a]There is no explicit indication on peer review in the instructions to authors.

Table 2 Type of published papers and their authors' affiliation

Title (old and new)	Period	Σ papers	Language total (% of total)			Type of papers						Papers by authors' affiliation		
			Cro	Eng	Other	E	RP total (% of total)	PR	R	CR	CP	National[a]	Foreign	Collaborative
Acta clinica Croatica	1991–1995	118[b]	92 (78%)	26 (22%)	0	1	49 (42%)	6	24	38	0	94	8	16
	2001–2004	181	0	181	0	4	49 (27%)	1	41	69	17	154	23	4
Acta medica Iugoslavica	1987–1991	199	108 (54%)	88 (44%)	3 (2%)	0	199 (100%)	0	0	0	0	191	2	6
Acta Medica Croatica	1997–2001	195	0	195	0	39	72 (37%)	0	29	55	0	174	13	8
Arhiv za higijenu rada i toksikologiju	1988–1992	179	128 (72%)	51 (28%)	0	7	72 (40%)	17	18	36	29	156	21	2
	1998–2002	150	39 (26%)	111 (74%)	0	0	34 (23%)	26	35	25	30	109	36	5
Libri oncologici	1988–1992	137	103 (75%)	34 (25%)	0	11	77 (56%)	3	20	4	22	125	6	6
	1998–2002	66	0	66	0	2	37 (56%)	0	12	7	8	53	11	2
Neurologija	1986–1990	109	45 (41%)	64 (59%)	0	2	47 (43%)	4	28	14	14	87	20	2
Neurologia croatica	1996–2000	54	0	54	0	0	13 (24%)	5	19	11	0	43	5	6
Radovi Medicinskog fakulteta	1987–1991	190	165 (87%)	25 (13%)	0	9	164 (86%)	1	13	3	0	185	0	5
Croatian medical journal	1997–2001	393	0	393	0	55	264 (67%)	2	27	45	0	185	154	54

E = editorial; RP = research paper; PR = preliminary report; R = review; CR = case report or clinical observation; CP = conference paper.
[a]Including all authors affiliated to ex-Yugoslavia in the first analysed period.
[b]Excluding 1995; no. 4 (transition to English).

Table 3 Impact of the published papers by their citation rate

Title	Period	Scopus				Web of Science			
		Papers indexed	Papers cited (% of indexed papers)	Citations		Papers indexed	Papers cited	Citations	
				Total (average no. of citations per article)	By others			Total (average no. of citations per article)	By others
Acta clinica Croatica	1991–1995	80	16 (20%)	27 1.69	3 (11%)	0	18	22 1.22	12 (55%)
	2001–2004	220	17 (8%)	26 1.53	11 (42%)	0	4	5 1.25	0 (0%)
Acta medica Iugoslavica	1987–1991	199[a]	42 (21%)	73 1.74	44 (60%)	0	1	1	1 (100%)
Acta Medica Croatica[b]	1997–2001	195	89 (46%)	199 2.24	173 (87%)	0	73	145 1.98	135 (93%)
Arhiv za higijenu rada i toksikologiju	1988–1992	178	46 (26%)	87 1.89	67 (77%)	0	38	76 2	70 (92%)
	1998–2002	165	68 (41%)	137 2.01	92 (67%)	0	45	84 1.86	81 (96%)
Libri oncologici	1988–1992	20	2 (10%)	3 1.5	2 (67%)	0	4	6 1,5	3 (50%)
	1998–2002	30	1 (3%)	1 1	0 (0%)	0	2	4 2	0 (0%)
Neurologija	1986–1990	92	25 (27%)	50 2	46 (92%)	0	22	46 2.09	41 (89%)
Neurologia croatica	1996–2000	56	16 (29%)	24 1.5	8 (33%)	70	19	30 1.58	11 (37%)
Radovi Medicinskog fakulteta	1987–1991	22	1 (5%)	1 1	0 (0%)	0	13	14 1.08	2 (14%)
Croatian Medical Journal	1997–2001	421	293 (70%)	1061 3.62	803 (76%)	273	298	1043 3.5	784 (75%)

[a]Without no. 4/5, vol.
[b]The journal title changed with no. 4/5, vol. (1991).
[c]Conference abstracts included.

periodicity was changed by one journal. All journals say they have both editorial boards (executive role) and editorial councils (advisory role). The editorial board members were from the local community in both analysed periods for all journals, except for the *Croatian Medical Journal* which had an international editorial board in the second analysed period. On the other hand, the composition of the editorial councils changed to international (including members from different countries) for all journals in the second analysed period; before half of them consisted of local members only. The peer-review process was declared by four journals in both analysed periods. One journal gave no information on peer review. In the second analysed period four journals stated that two reviewers were used.

All journals occasionally published papers in English (13–59%) even in the first analysed period (before declared language transition) (Table 2). The close inspection of their information for the authors revealed that the authors were instructed to send manuscripts in Croatian or English (one journal recommended English for research papers; and one also accepted manuscripts in French, German and Russian). In the second period only a single journal (*Arhiv za higijenu rada i toksikologiju*) left open the possibility of publication in Croatian and then not for original articles (research papers and preliminary reports). All journals were covered by at least one relevant international bibliographic database in both analysed periods (Table 1).

Papers published in both analysed periods were summarized by language, type and author affiliation in Table 2. The second analysed period showed a decrease in the total number of published papers for four journals, in two of them (*Libri Oncologici*, *Neurologia Croatica*) by more than 50%. The share of research papers decreased significantly for three journals (*Acta medica Croatica*, *Arhiv za higijenu i toksikologiju*, *Croatian Medical Journal*), and remained the same in one (*Libri Oncologici*). The analysis of papers by their authors' affiliation showed that the number of articles from foreign authors increased for five journals and collaborative papers (mixed authorship) for four. Figures for four journals are statistically significant and the *Croatian Medical Journal* shows the highest increase ($P = 0.0$, $\chi^2 = 140$).

The citations of analysed papers were checked in the WoS and Scopus databases (Table 3). In the period before the language transition none of the six journals were covered by Science Citation Index Expanded (a component of WoS), but all of them were covered fully or partially by Scopus. In the second analysed period, two journals were covered by the ISI-Thomson bibliographic service (SCI-Expanded). The number of citations significantly increased in the second analysed period for the papers published by three journals, and decreased in the case of one journal. The average number of citations per cited article more then tripled in the second analysed period for the *Croatian Medical Journal*. There was no significant difference in the average number of citations per cited paper between Scopus and WoS (Table 3).There also was no significant difference in the ratio of citations 'by others' in the total number of citations in two analysed periods in four journals. This ratio increased in one journal only and decreased in one as well.

Discussion

The analysis of six Croatian medical journals revealed that the language change was paralleled by an improvement in their publishing and editing characteristics. The process of peer review is stated in the authors' guidelines of five journals, but only one of them (*Croatian Medical Journal*) thoroughly describes the review process and manuscript acceptance criteria. Decrease in total number of published papers, especially in the number of research articles (Table 2), could be indicative of a more rigorous review process and consequently of an improvement in a journal's quality. However, it could also be a consequence of insufficient number of manuscripts received, or authors' inclination toward publishing in foreign journals.[7,9] All analysed journals brought international members to their editorial committees. Four journals publish annual lists of referees and there were some names

affiliated to foreign institutions in the second analysed period. But our results do not reveal if these changes are only formal and a consequence of the criteria for the governmental financial support.[10] In other words, this analysis did not reveal the status of the international editorial members, the level of involvement of external peer-reviewers or the factors influencing foreign authors' decisions to publish in Croatian journals. All these issues have to be further investigated.

Internationalization of a journal includes the internationalization of the authors, editorial committee, peer reviewers, and readers. Bibliometric analysis of German psychology journals[11] showed that the rate of foreign authors increased from 14.6% (German-language biannual period) to 52.7% (English language biannual period). Our analysis showed that the rate of papers by foreign authors or in collaboration with them increased in four journals. This rate changed from 2–20% (Croatian language five-year period) to 10–54% (English language five-year period). The share of foreign authors changed impressively in the case of the *Croatian Medical Journal* (from 2% to 39%).

The increase in visibility to the global medical community through inclusion in relevant bibliographic databases and the improvement of a journal's citation score are the most important indicators of language change effects.[1] Only two analysed journals achieved the transition from non-SCI to SCI-Expanded journals.

The analysis of the effects of change from French to English of the Pasteur Institute journals revealed that the change of language did not increase the impact factor of the journals or improve their ranking in the respective disciplines.[12] Despite some methodological limitations, our analysis showed that WoS citation score for two analysed journals (*Acta medica Croatica* and *Croatian Medical Journal*) significantly increased (Table 3). Although Scopus covers more biomedical titles from developing countries than SCI/SCI-Expanded, the average number of citations per cited paper published in analysed Croatian journals was almost the same (Table 3). Our results show that, despite the fact that all analysed journals were covered (selectively or fully) by Elsevier's bibliographic database in both

analysed periods and were consequently visible to the respective international medical community, only 37% of all covered papers were cited in the analysed period. After the change of language, the Scopus citation score improved significantly for two journals (*Croatian Medical Journal* and *Acta medica Croatica*).

Conclusions

Despite stern warnings that the demise of non-English medical journals could lead to a loss of innovative potential, medical tradition, and diversity for the medical community at large,[12] the process seems to be irreversible. Our results show that the language transition may produce positive changes in the editing and publishing characteristics of the journals (internationalization of editorial councils and the pool of authors, and more scrupulous categorization of published papers). An improvement in international visibility and impact is also detectable. The analysed period is too short to draw far-reaching conclusions, but our results showed that a small and scientifically peripheral, non-native English speaking community,[13] despite limited human, financial and infrastructural resources,[9] is able to produce a journal competitive on the international scene.

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