A LANGUAGE PROFILE OF SOURCES CITED IN THE JOURNAL *KINEZIOLOGIJA/KINESIOLOGY* FROM 1971 TO 2010

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Abstract:

The goal of this paper was to provide a diachronic survey of the language of sources cited in the journal *Kineziologija/Kinesiology* from 1971 to 2010. Also, interactions were sought between various variables regarding various aspects of article publication – publication year, language of sources cited, number of sources cited, author's country of origin and gender. The population was comprised of 760 articles published in the journal *Kineziologija/Kinesiology* throughout forty years of its publication. Results of the analyses were expressed in frequencies and by interaction plots of the analysed variables. The allocation of the total number of sources cited showed that the largest number of papers cited between 10 and 19 sources. The highest average number of sources cited per paper was in English, followed by the average number of sources in Croatian. The number of all sources cited per article significantly increased in the last decade of the journal's publication as did the number of sources in the English language. Most papers were authored by researchers from the Slavic language-speaking countries. The number of non-English sources used by the authors from Slavic language-speaking countries was larger than the number of non-English sources used by the authors from countries in which languages other than English, German, Romance and Slavic languages are spoken. Most of the 760 papers were written by men, followed by the number of papers written in co-authorship of men and women. The number of papers written exclusively by women was the lowest. This type of analysis could be regarded not only as a mirror of the journal's development, but also as a mirror of the development of a society.

Key words: *citations, visibility, journal, language, author's country of origin, gender*

Introduction

The first languages of science were Greek and Latin. According to Rosandić (2008), in the 19th century it was German that had a very important position as the language of science, even more important than French and partly English, due to the fact that many new scientific perceptions appeared in the German-speaking areas of the world. At the beginning of the 20th century scientific literature was published mostly in German, English, French and Russian. Ammon showed (2001a, p. 344), for the period of one hundred years between 1880 and 1980, that scientific literature written in German significantly increased between 1890 and 1920, the latter being the year of peak production of scientific publications in German. The number of scientific publications written in French was even higher between 1880 and 1890 than the number of those written in German, but then significantly declined in the 1920s. The number of scientific publications written in Russian started to increase significantly around the 1950s, and saw its peak in the 1970s. Such a development probably occurred due to political reasons. The political hegemony of the former USSR in northern Asia and Eastern Europe in that period eventuated in the supremacy of teaching and learning Russian as a foreign language in many countries under its political dominance, and also in writing scientific texts in this language. Not at a single point in the analysed period of one hundred years (Ammon, 2001a, p. 344) was the number of scientific publications written in English low. In fact, in the analysed period English lost its primacy in scientific writing only once – to German between 1910 and 1925. Nowadays scientific literature is increasingly more frequently published in Chinese, Japanese, Persian, Russian, Spanish, Turkish, etc. (Biglul & Umstätter, 2007).

The language of sources cited

An analysis of citation characteristics in various scientific fields has been done for several decades. Swales (1990) found that there is less call upon locally bound scientific disciplines (e.g. literature

or history) to publish in English than upon more universally based ones (such as the so-called exact sciences). According to Ammon (2006: 4), English is "by far the preferred language in the social sciences and the humanities" on a global scale, i.e. it has become dominant as the language of science (Ammon, 2001b) and of research scientists (Wood, 2001). In other words, "English far out-shadows other languages as the *lingua franca* of academic publication" (Flowerdew & Li, 2009). Li and Flowerdew (2007) also found that the trend toward publishing in English is more pronounced in the hard sciences. Hamel (2007) analysed the share of scientific publications written in different languages in several natural sciences (physics, mathematics, biology, medicine, chemistry) in the year 1996 and found that the number of scientific texts written in English averaged the highest. Today more and more non-English speaking scholars publish in English so that e.g. in Spain the publication in Spanish-language journals declined strongly from 5,309 articles in 1996 to 2,744 in 2006, and the number of articles published in English-language publications in international journals increased from 19,820 articles in 1996 to 39,115 in 2006 (COTEC, 2008, in Pérez-Llantada, Plo, & Ferguson, 2011). According to Moreno (2010), researchers who publish in international-level publications receive greater recognition. Pérez-Llantada, Plo and Ferguson (2011) say that "one of the most important criteria for academic promotion is publication in indexed journals (e.g. JCR and ISI), which are, as it happens, almost invariably English language journals". Additionally, these authors identify the growing trend toward using English as a language of instruction in universities throughout Spain as another indicator of the increased importance of English.

Jernudd and Baldauf (1987) worked out the *Model of Language Selection in Scientific Communication* and posited three factors relating to publication language selection. The first factor implies the macro-sociolinguistic level which refers to institutional constraints and the role they have in the choice of resources, to contacts as well as the demands, expectations, language practices in a community, etc. The second one relates to the individual level implying that one's feelings, skills regarding language competence, but also ideologies be taken into account. Finally, there is the micro--sociolinguistic level which refers to the availability of resources in certain languages, the actual setting or a community, the role of an individual in the network of relationships, model of discourse, etc.

This English-centred publication and referencing paradigm is reflected in many researches. For example, Cullars (1998) analysed the references from 183 single-authored philosophy monographs, all published in 1994, as to language, among other things. He reported 15.4% of the citations to be to non-English language sources and 25.4% of the 456 citations to English-language sources were to translations into English. In other words, the total of 36.9% of citations was to non-English language sources (which will prove to be rather high in comparison to some other research results as will be shown further in the text). The sources written in other languages amounted to 8.4% in the German language, 2.6% in Latin, 2.0% in French, 2.0% in Greek and .4% in other languages. The languages in which the translated sources were originally written were German (66.4%), Greek (13.8%), French (9.5%), Latin (6.0%) and other languages (4.3%). He concluded that, as for philosophical literature, the citation language analysis reflected the diminishing mastery of languages other than English among the highly educated in the English-speaking world. Very similar situations were reported for fine arts criticism by Cullars in 1992, by Batts in the humanities in 1972, by Peritz in 1983, etc.

The analysis of citing behaviour in 9,317 citations in 21 PhD and 180 MSc theses submitted in 1988, 1996 and 2004 by geomatics postgraduate students at the Wuhan University in China (Gao, Yu, & Webster, 2007) showed the domination of the English-language sources in the years 1996 (59.9% compared to 36.2% of Chinese-language sources, 3.4% of German-language sources, .4% of Japanese--language sources and .1% of French-language sources) and 2004 (54.1% compared to 46% of Chinese-language sources, and none in any other language). The situation in the year 1988 was as follows: 39.4% of English-language sources, 53.1% of Chinese-language sources, 6.7% of German--language sources, .7% of Japanese-language sources and .2% of French-language sources. Wu and others (2003) explained the increase in citations to English-language sources in China by the enhanced ease to access English-language materials in that country, and by the fact that the research policies in many countries, thus also in China, urge more international exposure of research outputs which is nowadays more frequently than before achieved by publishing in English-language journals, both domestic and international. Additionally, according to Webster, Lewison and Rowlands (2003), "China's presence in the Science Citation Index in the field of biomedicine (indexing predominantly English--language materials) more than doubled between 1989 and 2002".

Gao, Yu and Luo (2009) analysed 10,222 citations in 56 PhD theses in library and information science, biology, photogrammetry and remote sensing, and dental medicine, submitted in 2005 at Wuhan University in China. They found that English-language sources prevailed in biology and dental medicine-related theses (Japanese-language sources amounted to .66 and .61%, German .07

and .18%, French .14 and .31%, respectively), and Chinese in library and information science–related ones (Chinese- to English-language ratio was 73.70 to 26.30%; there were no citations in Japanese, German and French). English-language (51.05%) and Chinese-language (47.76%) sources were equally frequently cited in photogrammetry and remote sensing (Japanese 1.04%, German .15%; no citations in French). The high rate of English--language citations is explained by the fact that English is recognized as the international language of scholarship. Gao, Yu and Luo (2009) identified three possible reasons for such results. Firstly, they specified, as did Wu and others (2003), that after the Cultural Revolution in China, English-language publications are easier to obtain. Secondly, libraries acquire resources that report on international-level research results and these resources are published predominantly in the English language. Lastly, the foreign language mostly learned in China is English, so that most PhD candidates have the command, if only of the reading-level, of English.

Zhang (2007) analysed 29,862 citations in international relations journal articles (published between 2000 and 2005) and found that English--language citations were predominant. Non-English language sources accounted for only 3.7%, followed by German- (1.1%), French- (.8%), Russian- (.6%), Spanish- (.5%), Korean- (.3%) and Swedish-language sources. Konur (2011) analysed the characteristics of the literature (indexed in Science Citation Index Expanded and Social Sciences Citation Index) on the algae and bio-energy published in the last three decades and found that the sources written and published in English prevailed (97.6%). Shadgan, Roig, HajGhanbari and Reid (2010) found that the 100 top-cited papers in the field of rehabilitation were all published in English-language journals.

Frequently, however, it happens that a discovery is made by non-English speaking researchers and that its results are published in a non-English language journal. The perception resulting from this is that important discoveries are also published in non-English language journals. However, such discoveries become known to the global scientific community at large and receive global recognition only after they have been published in an internationally indexed publication (Liu et al., 2008). Hence there are several reasons for citing in English (Fung, 2008). Some authors are simply not proficient in languages other than English, so that the articles written in languages other than English are not accessible to them. Further, authors may fear that by publishing in languages other than English they might lose their English-reading audience. As for editors of journals, they "may find it difficult to find reviewers who can verify non--English citations" (Fung, 2008). Thirdly, there is a question of how to cite sources that are not written in English, e.g. should the titles of these sources be written in English translation near the original titles or not, etc.

In general, it may be hypothesized that since English has become the *lingua franca* at the global level, consequently it has become the language of scientific inquiry as well. If one cannot read the language in which publications are written, "one might miss relevant publications" (Boell & Cecez-Kecmanovic, 2010). Thus, for example, according to Danishevski (2006), less than 5% of physicians in Russia can read English. Namely, during the Soviet era, Russian was the only scientific language in the former USSR, and after its collapse, some of the newly independent countries embraced English terminology (e.g. the Baltic countries and Georgia), while others continued to use Russian (e.g. Central Asia, Azerbaijan, Belarus). Some countries, e.g. Ukraine, "tried to create a national scientific language in addition to English" (Vlassov & Danishevskiy, 2008). Additionally, a higher visibility of a publication is achieved by publishing in a language that is globally read. Publishing in languages that are not widely read implies that the research results are seldom *visible* and hence "seldom seen or commented on in the mainstream publishing community" (Salager-Meyer, 2008). In other words, they are less frequently read and less frequently cited (Cunha-Melo, Santos, & Andrade, 2006). In the research conducted by Gentil (2005) the results of the analysis of French biologists showed that "even journals that provide non-English publication opportunities are affected by English dominance".

Authors react in various ways to the call for publishing in English. Hence the situation in this respect seems to vary from one scientific community to the other. On one hand there are scientific communities which are of the opinion that scientific research need not, unconditionally, be published in English. Biglu (2005) found that, in the period from 1988 to 1996, 93.3% of all publications in Tabriz University of Medical Sciences were published in Persian. Duszak and Lewkowicz (2008) found that the majority of respondents in their research published in Polish; however, most used two or more languages to communicate their research. On the other hand, some corporations, e.g. Thomson Reuters Corporation, have included, by introducing the *regional diversity* criterion, new scientific journals that are mostly published in non-English languages into journal databases (e.g. Thomson Scientific – ISI) (Mali, 2010). Still, according to Winkmann, Schlutius and Schweim (2002), English-speaking authors dominate the Science Citation Index and rarely cite non-English literature. There are also those who are of the opinion that the journals published in non-English speaking environments must be published in

English and enter, as an English-language journal, an international database, and to be able to do that the quality of the journals should be increased "to a level sufficient to be translated into English and published by international publishing houses" (Guz, 2006).

Egghe and Rousseau (2000) found that own--language preference depends on two parameters – the first one is the publication share of the language and the second one the self-citing rate, although they emphasize that the latter is not a perfect measure of own-language preference. Some authors claim that the international language bias extends further than simply the language of publication (Kurmis, 2003). Li and Flowerdew (2009) found that scholars in Hong Kong regard it as a privilege to be able to publish in journals that are internationally indexed on one hand. However, on the other hand there is significant resistance to this type of publication which is also the result of the assessment criteria requirements placed before the members of academia by their universities. Still, "given recent globalisation processes, it is expected that social scientists in a small scientific community would be strongly oriented to the international arena" (Mali, 2010) which consequently implies that they publish in English-language journals.

Gender – a breakdown variable in scientific publications' authorship

According to Frank (2006), Eurostat has conducted a research in which, amongst other things, the share of research and development personnel has been analysed in Europe and other regions in the world. Gender was one of the breakdown variables and it showed that the highest proportion of women in research and development in the year 2003 was found in Latvia (53.1%) and Bulgaria (46.6%), whereas the lowest proportion of women in this area was in Germany (19.2%) and Luxembourg (17.4%). As for Croatia, Prpic (2002) found that the difference between men and women as regards research productivity has lately increased. According to Frietsch, Haller, Funken-Vrohlings and Grupp (2009), in the years 1996, 2000 and 2005 the share of women's contributions as regards publications increased in twelve European countries, the USA and New Zealand. The highest share of female authors in scientific publishing was to be seen in Spain in 2002 (30.4%) and Italy in 2005 (30.5%), and the lowest in New Zealand (10.9%) and Ireland (13.7%) in 1996, in Germany in 1996 and 2002 (15.2%), and in Switzerland (15.5%) in 1996. However, the highest share being the one of 30.5% across the years and countries shows that the share of female authors of scientific publications is still low.

The goal of this paper was to provide a diachronic survey of the language of sources in the journal *Kineziologija/Kinesiology* from 1971, the year of its first publication, to the year 2010. Further, the analysis will try to show interactions between various variables regarding various aspects of article publication – publication year, language of sources, number of sources, author's country of origin and gender.

Methods

The population was comprised of 760 articles published in the journal *Kineziologija/Kinesiology* throughout **forty** years of its publication (1971-2010). The papers were authored by researchers from 38 countries (the United Kingdom, the USA, Australia, South Africa, Canada, Croatia, Slovenia, the Czech Republic, Slovakia, Bulgaria, Russia, Belarus, Serbia, Bosnia and Herzegovina, Poland, Ukraine, France, Italy, Spain, Portugal, Brazil, Germany, Austria, Hungary, Sweden, the Netherlands, Belgium, Israel, Iran, Greece, Lithuania, Estonia, the Philippines, Finland, China, Botswana, Turkey and New Zealand).

Results of the analyses were expressed in frequencies and by interaction plots of the analysed variables.

Interactions between the *publication year* on one hand and, on the other, *the total number of sources cited per paper* (condensed into 4 ranges: range 1 = 0-9 sources cited; range 2 = 10-19 sources cited; range 3 = 20-29 sources cited; range 4 = 30 and more sources cited), *the number of English* as well as *the number of non-English sources cited per paper* (in both cases condensed into 4 ranges: range 1 = 0-9 sources cited; range 2 = 10-19 sources cited; range 3 = 20-29 sources cited; range 4 = 30 and more sources cited), and *the author's country of origin* were presented, as were the interactions between the *author's country of origin* and *the number of English* and *non-English sources cited per paper* (condensed in the same way as in the breakdown by publication year). The variable *author's country of origin* was categorized as follows: 1 = a Slavic language-speaking country (Croatian, Slovenian, Czech, Slovakian, Bulgarian, Russian, Serbian, etc.), 2 = an English language-speaking country, 3 = a Romance language-speaking country (Italian, French, Spanish, Portuguese), 4 = a German language-speaking country, 5 = some other language-speaking country (Hungarian, Swedish, Dutch, Hebrew, Greek, etc.), 6 = co-authorship of authors from different language-speaking countries.

The second aspect that was in the focus of the analysis in this paper was the gender-related authorship of papers published in the journal *Kineziologija/Kinesiology*. This aspect was selected for the analysis due to the fact that the first part of the research addressed a topic related to the language aspect of referencing, and language, i.e. verbal language, is one of the very frequently

addressed topics when analysing the similarities and difference between genders. In the breakdown by *gender* (*men*, *women, men & women*), the interaction of this variable and the variables *the publication year*, *the total number of sources cited per paper* (condensed as described previously), *the number of English* as well as *the number of non-English sources cited per paper* (condensed as already described) was analysed.

Results

In 40 years of publication the average number of articles per year was 19, and the number of authors varied from one (38.9%) to nine (.1%) (Table 1).

The number of sources cited in 760 papers totalled 14,785 and ranged from no sources at all (17 papers, i.e. 2.2%) to 258 sources (1 paper, i.e. .1%) (Figure 1). The average number of sources cited was 19.454.

The allocation of the total number of sources into four ranges showed that the largest number of papers contained a range 2 number of sources cited, i.e. between 10 and 19 sources (Figure 2).

Table 1. Number of authors

Number of authors per paper	Frequency	Percentage
1	295	38.9
2	179	23.6
3	156	20.5
4	72	9.5
5	33	4.3
6	16	2.1
7	4	.5
8	4	.5
9	1	.1

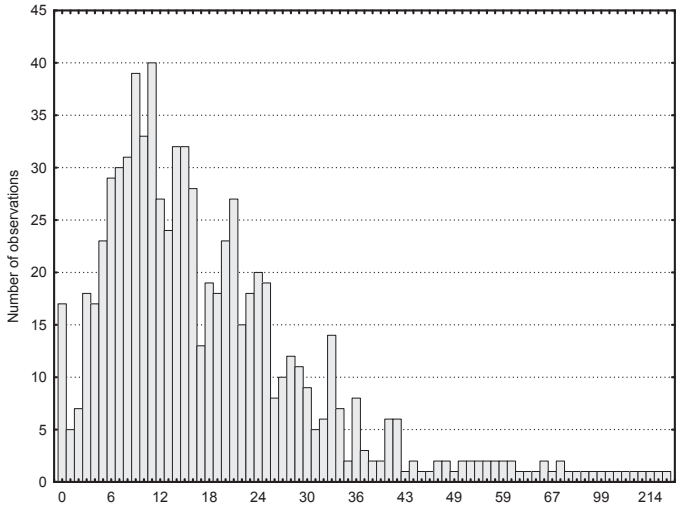

Figure 1. Number of sources cited per paper.

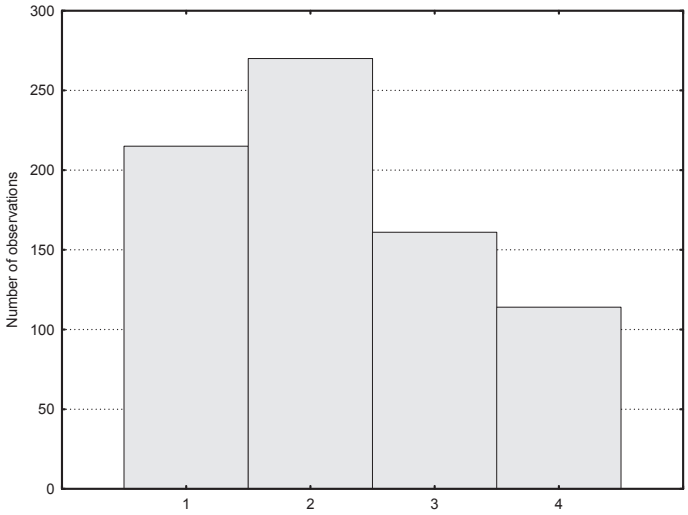

Figure 2. Frequency of the 1, 2, 3, and 4 number of cited sources ranges (range 1=0-9 sources cited; range 2=10-19 sources cited; range 3=20-29 sources cited; range 4=30 and more sources cited).

The total number of sources' ranges served as a comparison point for the number of English and non-English sources' ranges. The data in Table 2 shows that the highest average number of sources cited per paper was in English (10.743), followed by the average number of sources in Croatian (4.932). The frequency of cited sources published in other languages was significantly lower than the frequency for English and Croatian sources.

Table 2. Average number of sources in a certain language per paper

Language	Average number of sources per paper
English	10.743
German	.814
French	.157
Italian	.042
Russian	.568
Croatian	4.932
Czech	.157
Slovenian	.788
Polish	.191
Bulgarian	.021
Slovakian	.034
Hungarian	.061
Spanish	.016
Dutch	.051
Portuguese	.017
Serbian	.437
Chinese	.024

The frequencies of non-English sources' ranges are presented in Table 3. It is evident that the frequency of the range 1 number of non-English references was the highest.

Table 3. The frequency of non-English sources ranges

Frequency of non-English sources ranges	Frequency	Percentage
1	504	66.3
2	187	24.6
3	42	5.5
4	25	3.3

The interaction plot of the publication year and the frequencies of range 1, 2, 3, and 4 number of sources cited (Figure 3) showed that the range 1 and range 2 number of sources cited were predominant throughout thirty years of the journal's publication, i.e. approximately by the year 2000, when the range 3 and 4 number of sources cited per article significantly significantly increased.

The number of sources in the English language was 0 to nine, i.e. the range 1 number of sources cited prevailed from 1971 to the year 2010. After the year 2000 the number of sources in the English language increased (Figure 4).

The frequency of the range 1 number of non--English sources oscillated throughout forty years of the journal's publication. However, it is interesting that the frequency of this range constantly increased from the year 1998 (Figure 5).

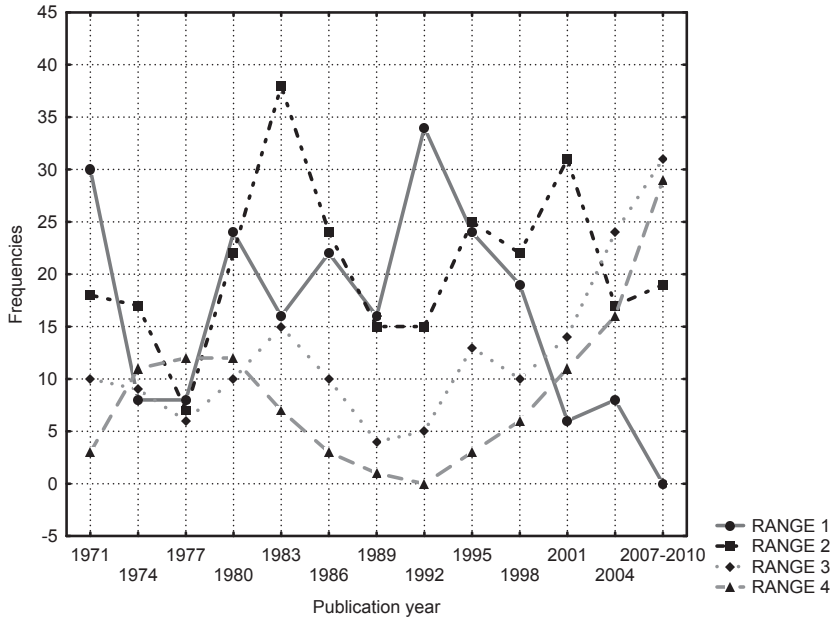

Figure 3. Frequency of 1, 2, 3 and 4 number of cited sources ranges (range 1=0-9 sources cited; range 2=10-19 sources cited; range 3=20-29 sources cited; range 4=30 and more sources cited) by publication year of the journal Kineziologija/Kinesiology.

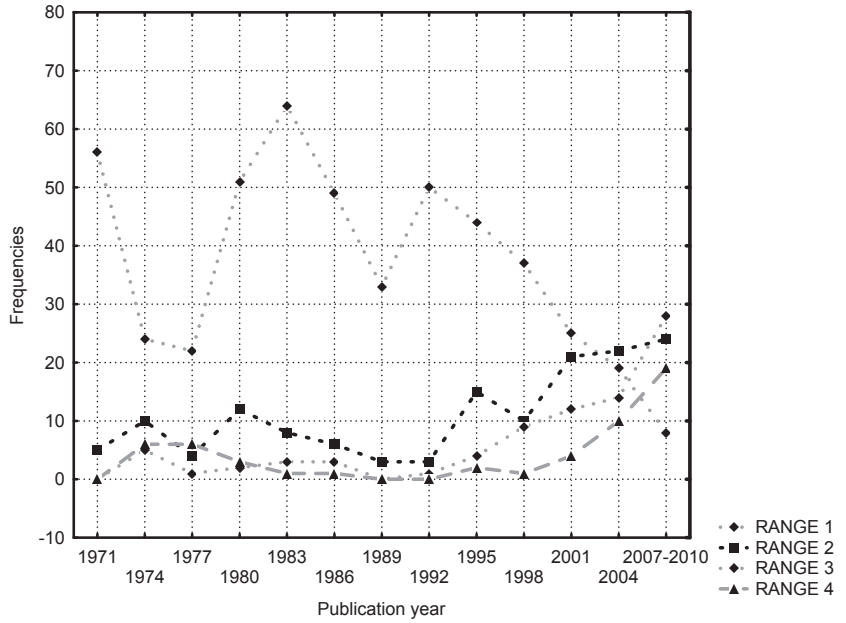

Figure 4. Interaction plot of the frequency of 1, 2, 3 and 4 number of cited sources ranges (range 1=0-9 sources cited; range 2=10-19 sources cited; range 3=20-29 sources cited; range 4=30 and more sources cited) of English-language sources by publication year of the journal Kineziologija/Kinesiology.

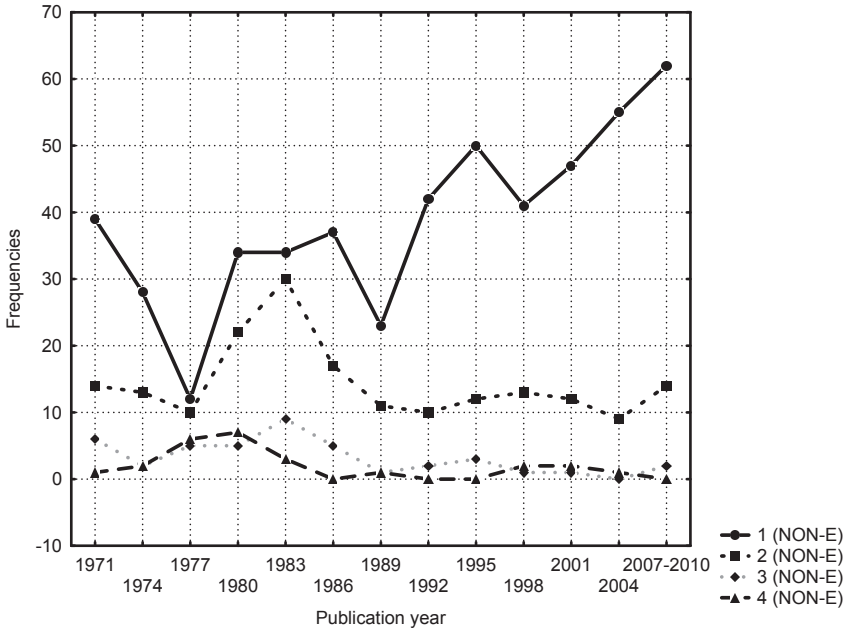

Figure 5. Interaction plot of the range of non-English sources frequencies by publication year – NON-E=non-English sources cited; 1 (NON-E)=range 1 /0-9 sources cited; 2 (NON-E)=range 2/10-19 sources cited; 3 (NON-E)=range 3/20-29 sources cited; 4 (NON-E)=range 4/30 and more sources cited.

Most papers were authored by researchers from Slavic language-speaking countries followed by papers written by authors from other language--speaking countries, then papers written by English--speaking researchers and those written in co--authorship of authors from different countries (Table 4).

Figure 6 shows that most papers throughout the forty years of the journal's publication were authored by researchers from Slavic language--speaking countries, which is a logical consequence of the data presented in Table 2, and that from the year 1992 the number of papers co-authored by researchers from *other language-speaking countries*, as well as the number of papers written by authors from the English language-speaking and a Romance language-speaking countries increased.

Table 4. Papers written by authors and co-authors from different natural language-speaking countries

Papers by authors from different language-speaking countries	Frequency	Percentage
Slavic language-speaking country	640	84.2
English language-speaking country	36	4.7
Romance language-speaking country	14	1.8
German language-speaking country	6	.8
Other language-speaking country	40	5.3
Co-authorship of authors from Slavic-, English-, German-, Romance- and other language-speaking countries	24	3.2

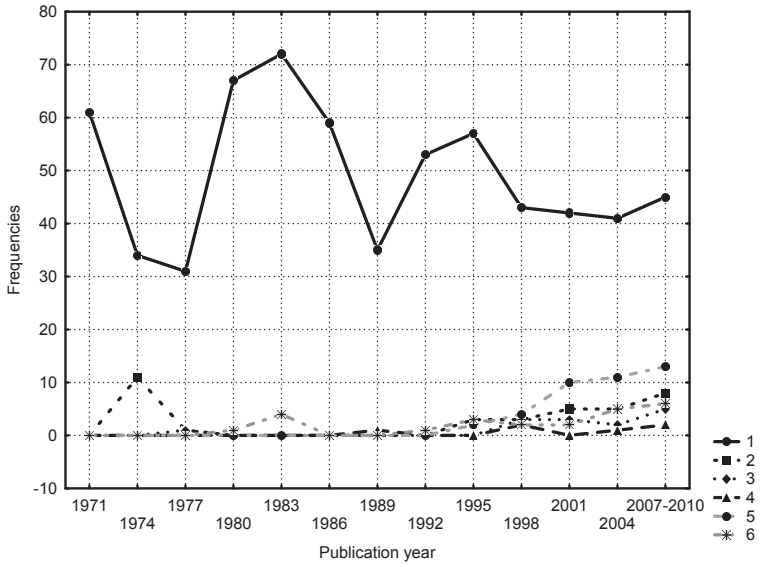

Figure 6. Interaction plot of papers by category of authors from different language-speaking countries (1=Slavic language--speaking country; 2=English language-speaking country; 3=Romance language-speaking country; 4=German language-speaking country; 5=other language-speaking country; 6=co-authorship of researchers from different language-speaking countries) by publication year.

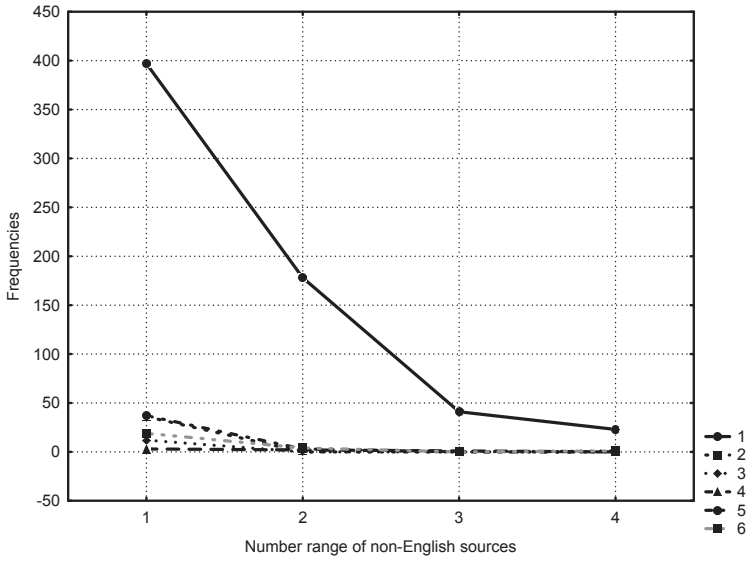

Figure 7. Interaction plot of papers – category of authors from different language-speaking countries (1=Slavic language--speaking country; 2=English language-speaking country; 3=Romance language-speaking country; 4=German language--speaking country; 5=other language-speaking country; 6=co-authorship of researchers from different language--speaking countries) by the non-English cited sources range.

The data presented in Figure 7 show that throughout the forty years of publication the number of non-English sources used by authors from Slavic language-speaking countries was larger than the number of non-English sources used by the authors from other language-speaking countries.

However, due to the fact that the number of authors from Slavic-speaking languages was the largest as regards the total number of authors from various countries, the number of cited sources published in English was also the largest in all ranges (Figure 8).

Table 5 shows that most of the 760 papers were written by men, followed by the number of papers written in co-authorship of men and women. The number of papers written exclusively by women was the lowest.

The interaction plot of the number of male authors of papers by publication year (Figure 9) shows that papers whose author was at least one male author dominated the publication years of the journal except for the period around the year 1983 in which the papers were written by at least two male authors and except for the period after the

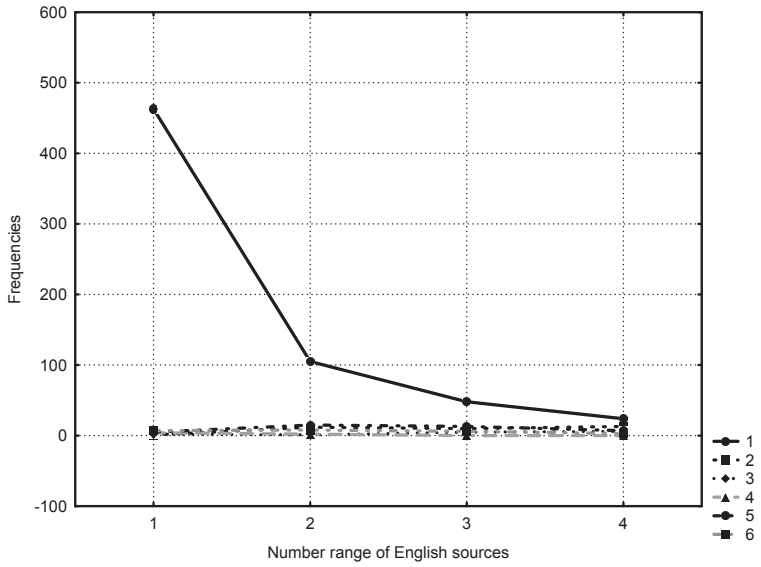

Figure 8. Interaction plot of papers – category of authors from different language-speaking countries (1=Slavic language--speaking country; 2=English language-speaking country; 3=Romance language-speaking country; 4=German language--speaking country; 5=other language-speaking country; 6=co-authorship of researchers from different language--speaking countries) by the range of cited sources published in English.

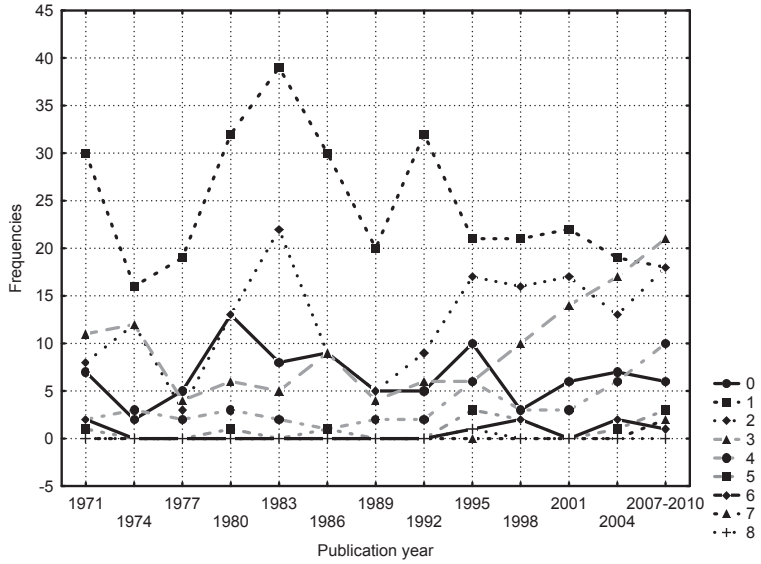

Figure 9. Number of male authors per article by publication year (0, …, 8 – number of male authors per article).

Table 5. The rate of papers authored by men, by women, and by men and women

Authors	Frequency	Percentage
Men	458	60.3
Women	89	11.7
Men & women	213	28.0

year 2004 when the number of papers authored by at least three men increased.

The whole 40-year publication period saw the highest rate of papers that were not co-authored by at least one woman except for the period between 1980 and 1987 when the papers written by at least one female author prevailed (Figure 10).

The interaction plot in Figure 11 shows that the number of papers written by male authors and the number of papers written both by male and female authors approximated after the year 2007.

The interaction plot displayed in Figure 12 indicates that male authors most frequently used on average about 10-20 sources per paper, whereas female authors equally frequently used between 0 and 30 sources, and more than 30 sources per paper only a little less frequently than the range 1, 2 and

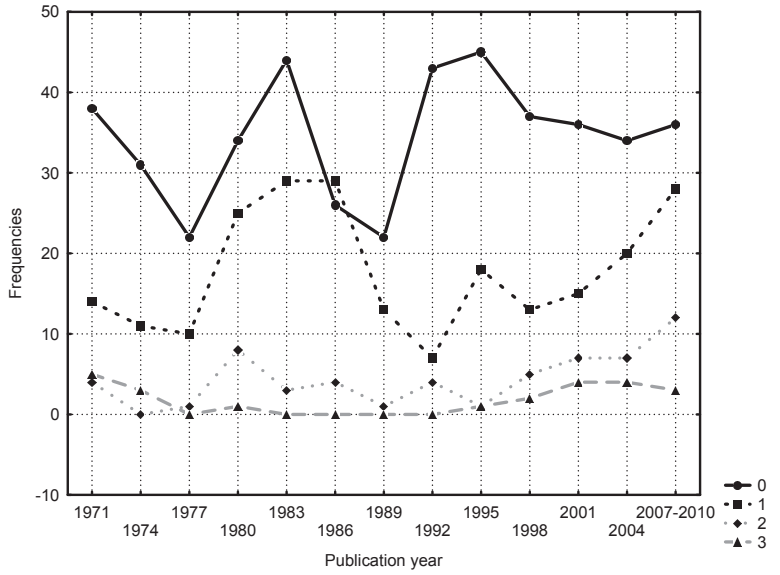

Figure 10. Number of female authors per article by publication year (0, ..., 3 – number of female authors per article).

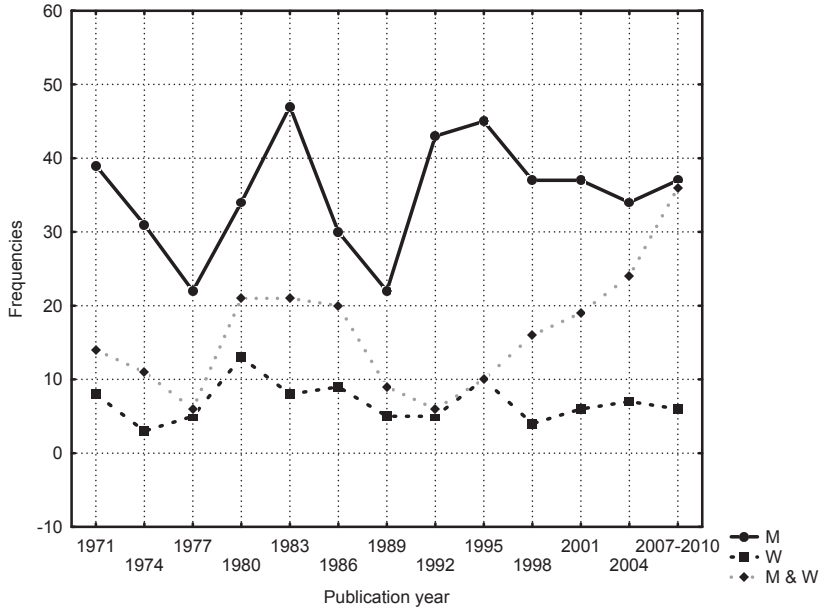

Figure 11. Papers authored only by men (M), only by women (W) and by men and women (M & W) by publication year.

3 number of sources. When papers were written both by male and female authors, then the range 2 number of sources cited per paper was the most frequent, i.e. the same as when the papers were written only by male authors.

The range 1 number of sources written in the English language was by far the most frequent as regards the papers written only by male authors, whereas this range was also frequent as regards the papers written exclusively by female authors, as well as regards the papers written both by men and women (Figure 13). However, the frequency of other ranges of the number of sources cited in papers written only by women was not so much lower than the range 1 frequency in comparison to the papers written only by men.

A similar situation is in case of the ranges 1, 2, 3 and 4 number of non-English sources (Figure 14).

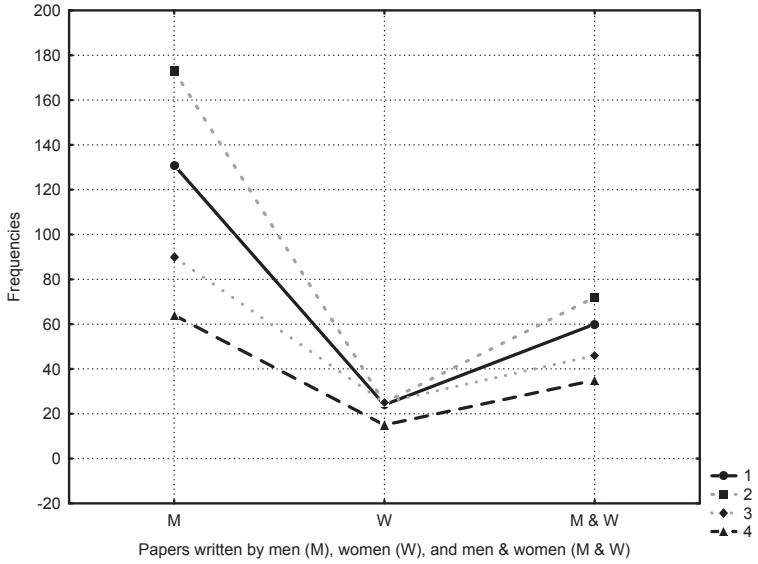

Figure 12. Interaction plot of papers authored by men (M), women (W), and by men & women (M & W) and the frequency of the range 1, 2, 3 and 4 number of sources cited per paper.

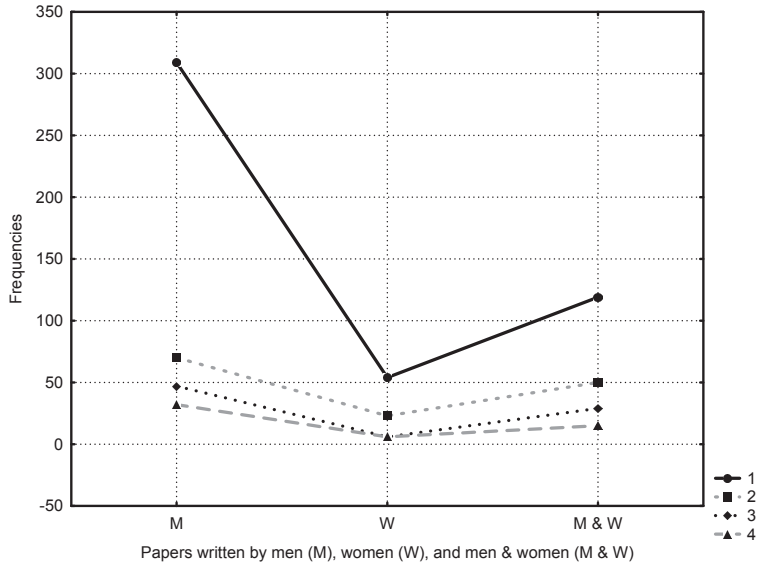

Figure 13. Interaction plot of papers authored by men (M), women (W), and by men & women (M & W) and the frequency of the range 1, 2, 3 and 4 number of cited sources written in English.

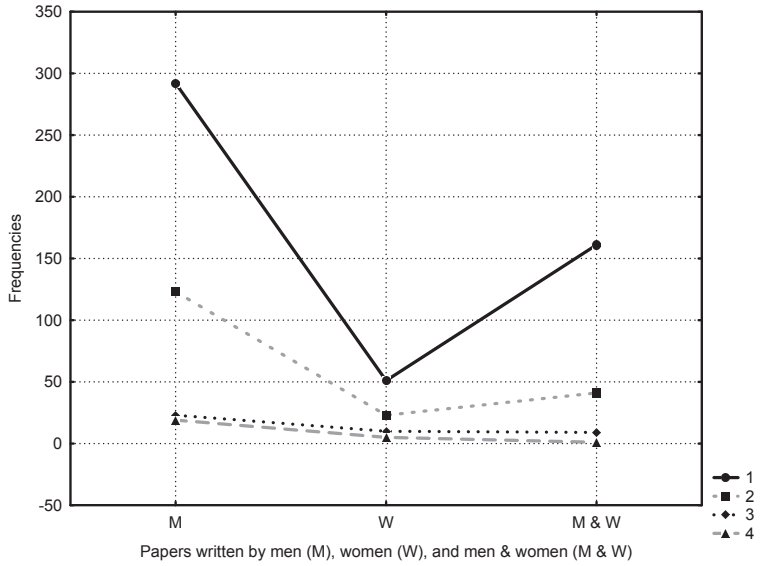

Figure 14. Interaction plot of papers authored by men (M), women (W), and by men & women (M & W) and the frequency of the range 1, 2, 3 and 4 number of non-English sources cited.

Discussion and conclusions

The 1960s in the former Yugoslavia and in almost the whole of Eastern Europe saw the spreading of the concept of *physical culture*. Limited as regards communication with other parts of the world due to political reasons, this part of the world intensively worked out the theoretical basis of the science of human movement subsumed under the concept of *physical culture*. In this paradigm-forming context, the amount of relevant scientific information, which increases the potential applicability of a scientific discipline, was advocated by many scientists (Viskić-Štalec, Omrčen, & Štalec, 2007). One of the efforts of researchers in Croatia at that time was to fulfil the requirements necessary for a domain to be recognized as a scientific discipline. These requirements imply the existence of university subjects, or departments and faculties in which a research domain in question is studied, the existence of doctoral theses written on the topics from the domain of research of a scientific discipline, the foundation of associations of experts who are active in this domain of research, and the existence of journals that publish research texts whose topics address the issues essential in a particular scientific discipline (Lelas, 2000, p. 17). Consequently, the efforts of researchers from the Faculty of Physical Education in Zagreb to set up the foundation stones and to present the science of human movement to the established scientific community in this part of the world resulted in publishing the first issue of the journal under the name *Kineziologija* in 1971.

Publication year and author's country of origin publication profile

Due to the previously mentioned political reasons but also due to the need of this region to set the foundation stone of a scientific discipline which saw its rather rapid development all over the world, the journal was, in the first years of its publication, limited to publishing papers written by authors mostly from ex-Yugoslavia. However, since efforts were made, despite the unfavourable political situation, to gain insight into research results published elsewhere in the world, the papers written by authors from the so-called Western world were also admitted to the journal. Still, their number was significantly lower than the number of papers written by Croatian authors, as well as by the authors from other parts of ex-Yugoslavia.

The bibliometric analysis of the journal *Kineziologija/Kinesiology* from the year 1971 to the year 2000 showed that out of the total of 334 authors only 38 were authors from countries other than Croatia (Jaklinović-Fressl, et al., 2000). This number remained the same until the year 2010. However, Jaklinović and colleagues (2000) included no data regarding the interaction between the authors' country of origin and the language of sources cited into their research.

The analysis of authors by their country of origin in this paper on the other hand showed that journals are geography and culture bound. Although most scientific journals seek international recognition, thus implying their international character of the

widest extent, rarely can a journal claim to be completely free from and independent of certain environmental factors. The journal *Kineziologija/ Kinesiology* is a journal which is recognized as having an international character. However, it also possesses some regional characteristics that make it interesting for researchers from a particular geographical and cultural area. Hence, for example, the number of authors from Slavic language--speaking countries, but also from Romance language-speaking countries in this journal is rather high. After the year 1992, and it was in 1991 that Croatia declared its independence and opened its borders, geographical and intellectual, to the inflow of scientific thought from all over the world, the number of papers co-authored by researchers from other language-speaking countries, as well as the number of papers written by authors from the English language-speaking and a Romance language-speaking countries increased. The decline of socialism and the disintegration of the former Yugoslavia gave impetus to Croatian scientists to communicate their research results to researchers all over the world, but also to gain an insight that they had long yearned for into the research results of their colleagues from different areas of the globe. Hence the mutual horizontal communication of ideas and research results started. Croatia sought not only for its political recognition, but also for its recognition in science and technology. This desire to become visible in worldwide terms was, as regards Croatian kinesiologists, reflected in the fact that in the year 1996 the journal *Kineziologija/ Kinesiology* started to be simultaneously published both in Croatian and in English. Strong efforts were made to increase the quality of the journal to be able to enter relevant databases, and one of the key factors was for the journal to become readable for a wide scientific community. The only way to achieve this was to start publishing the papers in the English language. After the transition period of four years, in 2000 the journal started to be published only in English.

The factors that affected the development of the journal were reflected in several characteristics, one of them being the language-related referencing profile.

As for the total number of sources cited in the papers published in the journal Kineziologija/ Kinesiology, the data showed that this number was rather low from 1971 till 2000, and that it significantly increased after the year 2000. This is approximately the year of the increased dissemination of scientific journals' articles through the newly created databases accessible in the Internet. Since access to the most popular databases enables the access to millions of research papers, the increasing number of sources cited in the papers published after the year 2000 is not surprising. Likewise, the total number both of the English and of the non-English references in the papers was rather low in the same period. Although the number of non-English references oscillated over the publication years, the fact that it increased from the year 1998 onwards may probably be attributed to two facts. The first one is that more authors from non-English speaking countries started to publish their papers in this journal, and the second one is that increasingly more authors started to publish their papers in other journals in the world, thus contributing to the dissemination of scientific thought and perceptions published in languages other than English. There is a third possible explanation and it addresses the desire to cultivate one's own language tradition. Still, the establishment of the English language as the language of communication and, consequently, of scientific communication, resulted in its emanation as the language of indisputable supremacy in science. Apart from the English sources, the authors of papers most frequently cited the sources written in Croatian, German, Slovenian and Russian. Such allocation of sources cited showed that, compared to the number of authors from Slavic language--speaking countries which showed to be the greatest throughout the forty years of the journal's publication, the authors from these Slavic-speaking countries mostly cited the non-English sources. Such a result should be regarded with care since it refers to the forty-year publication period, i.e. it subsumes the period in which the journal was published predominantly in Croatian and which is characterized by a limited input-output of scientific research results in the then Croatia.

Men and women – who writes and reads more

First of all, the analysis of the authors of papers in terms of gender showed that men authored papers more frequently than women. The share of female authors overlapped with the share of female authors in natural sciences as obtained by Frietsch, Haller, Funken-Vrohlings and Grupp (2009). This shows that the journal *Kineziology/Kinesiology* is nowadays somewhere within the average European range in this respect.

The data in this analysis showed that, out of the total number of 760 papers, most were written by men, followed by the number of papers written in co-authorship of men and women. The number of papers written exclusively by women was the lowest. If these figures are compared e.g. to the ratio of male and female kinesiology students (2 : 1 or 3 : 1) at the Faculty of Kinesiology (University of Zagreb), as a ratio that is used in this paper as an approximate indicator of the number of male and female kinesiology researchers, at least in Croatia, then it is obvious that the ratio of papers

published in the journal *Kineziologija/Kinesiology* and authored exclusively by men and those written exclusively by women is even lower. As already said, the papers authored by at least one male researcher dominated all the publication years of the journal except for the period around the year 1983 in which the papers were (also) written by at least two male authors, and except for the period after the year 2004 when the number of papers authored by at least three men increased. The years from the period between 1980 and 1987 belong to the set of years in which the journal was still published predominantly in Croatian (only several papers were published in languages other than Croatian). These are the years in which papers containing research results of important research projects conducted at the Faculty of Physical Education in Zagreb were published. In the year 1983 several papers communicating research results from an important scientific project which addressed the analysis of sport-related subject matters were published in *Kineziologija/Kinesiology*. Since the head of this project was a faculty member who was prominent in scientific research done into team sports, predominantly football, it is logical that the published papers were predominantly authored by male researchers (Viskić-Štalec, Omrčen, & Štalec, 2007). However, since women were not excluded from this project (on the contrary, they were very much involved in it, particularly in the statistical analysis of the data obtained), their participation in writing of the papers is reflected in co-authorship of papers written with their male peers. Although in the period from the year 1977 to the year 1986, as well as in the period after 1992 the number of papers written in co-authorship of male and female authors continuously increased, in the year 1992 to such an extent that it equalled the number of papers written exclusively by men, the disappointing fact remains that throughout the 40 years of publication the number of papers written only by male researchers prevailed without a single exception. The number of papers written exclusively by women exceeded 10 in the years 1980 and 1995. The former is the year in which important papers addressing sport psychology, anthropology, statistics and sociology were published. Obviously, women participated in these analyses on a larger scale. Psychology, research into the topics related to the basic concepts of kinesiology, as well as research into the so-called feminine sports (e.g. rhythmic gymnastics) (Koivula, 2001) and physical recreation resulted in a greater number of female authors in certain points in time. Since its beginning the journal has been published by the Faculty of Kinesiology (the Faculty's previous name was the *Faculty of Physical Education*) and the scientists from this faculty were the prime movers of the kinesiological thought in this micro area. It is therefore not surprising that the results of their researches have been published in this journal. However, it must be stressed that although the journal *Kineziologija/Kinesiology* is today still published by the Faculty of Kinesiology, efforts are made to publish in it the papers of authors from the whole world to avoid the stigmatization of being a faculty-employees-only journal. As for such a possible objection, a significant number of authors from other countries of the world, and these being predominantly non-English speaking countries, complained that many journals published e.g. in the USA, and many of them have been indexed in relevant databases, rejected the papers of author's coming from non-English speaking countries on account of the topic of the paper being of a regional--interest character and thus not being of interest for the journal. Still, the *Kineziologija/Kinesiology's* papers in the publication years of 1980 and 1995 were written by authors who taught the subjects that corresponded to the papers' topics. Therefore, the authorship of papers published often reflected the gender distribution of teachers teaching certain subjects at the Faculty of Physical Education. Ultimately, the number of papers written by male authors and the number of papers written both by male and by female authors approximated after the year 2007.

The data showed that female authors used more sources in their papers than their male peers. The fact that the number of sources cited correlated with the gender of authors was also reflected in the fact that the number of sources written both by male and by female authors was between 10 and 19, i.e. they were in the medium range. The range 1 number of English sources seemed to have been approximately equal in papers written by men, by women as well as in papers written by both male and female authors, i.e. most papers contained between no English sources at all up to nine English sources. As already said in the *Results* section of the current paper, the range 2, 3 and 4 number of sources frequency in papers written only by women was not so much lower than the range 1 frequency in comparison to the papers written only by men. In other words, the number of sources cited in papers authored and co-authored by women was higher on average than the number of sources used in papers authored exclusively by men. These results could be interpreted in the light of the traditional point of view that women exceed men in verbal language (Sabbatini, 1997/2000; Du, Weymouth, & Dragseth, 2003) which might perhaps be explained by saying that the number of sources cited in the papers authored by women is the result of the fact that perhaps women read more. And they read more because reading more is in compliance with the reflexive style of learning that is a characteristic of women (Oxford, 1995) which means that they think longer and in more detail about a task they

have to do. This finding could by no means be interpreted in the way as to claim that women know more than men because they read more. It simply means that the style of writing of women is in compliance with their style of learning. This consequently means that women think more about the task that is before them, e.g. about writing a text in which references to previous similar research should be used, whereas the learning style of men is more impulsive, i.e. spontaneous. These results are substantiated by another finding in this analysis which addresses the authors by gender and the number of non-English sources and which did not differ from the finding related to the number of English sources cited in the published papers. To paraphrase – this last finding speaks in favour of the two already mentioned aspects. The first one is the verbal language supremacy of women over men, and the second is the reflexive style of learning in women and the fact that, due to thinking longer about the task they have to realize, they reach for sources written in various languages.

In all, the development of a journal may be traced through many aspects, thus also through the number of sources cited per published paper, the language of sources, etc. Such analysis could be regarded not only as a mirror of the journal's development, but also as a mirror of the development of a society.

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JEZIČNI PROFIL REFERENCA U ČLANCIMA ČASOPISA KINEZIOLOGIJA/KINESIOLOGY OD 1971. DO 2010. GODINE

Cilj je ovoga rada bio dati dijakronijski pregled jezika referenca članaka objavljenih u časopisu *Kineziologija/Kinesiology* od 1971. do 2010. godine. Tražilo se i moguće međudjelovanje među različitim varijablama s obzirom na razne aspekte publiciranja članaka – godina objavljivanja, jezik reference, broj referenca, zemlja autorova podrijetla te spol autora. Populacija se sastojala od 760 članaka objavljenih u časopisu *Kineziologija/ Kinesiology* tijekom 40 godina njegova izlaženja. Rezultati analiza su izraženi kao frekvencije i interakcijski dijagrami analiziranih varijabla. Raspored ukupnoga broja referenca je pokazao da je većina članaka sadržavala između 10 i 19 referenca. Najveći prosječan broj referenca po članku bio je na engleskome, a zatim na hrvatskome jeziku. Broj svih referenca po članku, kao i broj referenca na engleskomu jeziku značajno su se povećali tijekom posljednjega desetljeća izlaženja časopisa. Većina je autora članaka bila iz zemalja slavenskoga govornoga područja. Broj referenca s govornih područja izvan engleskoga, a koje su u svojim radovima rabili autori iz slavenskoga govornog područja bio je veći od broja referenca na jezicima izvan engleskoga u radovima autora koji su dolazili iz zemalja u kojima su se govorili jezici koji nisu bili engleski jezik, njemački jezik te neki romanski ili slavenski jezik. Većinu su članaka napisali muškarci, a potom muškarci u koautorstvu sa ženama. Broj članaka koje su napisale isključivo žene bio je najmanji. Ova vrsta analize može se smatrati ne samo zrcalom razvoja časopisa, već i zrcalom društvenih promjena.

Ključne riječi: *reference, vidljivost, časopis, jezik, zemlja podrijetla autora, spol*