Female researchers in Russia: have they become more visible?

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Abstract
This study is based on the fact that the surnames of many Russian scientists have gender endings, with "a" denoting a female, so that the sex of most of them can be readily determined from the listing of authors in the Web of Science (WoS). A comparison was made between the proportion of females in 1985, 1995 and 2005, with a corresponding analysis of the major fields in which they worked, their propensity to co-author papers internationally (which often necessitates having the opportunity to travel to conferences abroad to meet possible colleagues), and their citation records. We found, as expected, that women had a higher presence in the biological sciences and a very low presence in engineering, mathematics and physics. Their citation scores, on a fractionated basis, were lower than those for men in almost all fields and years, and were not explained by their writing of fewer reviews and papers in English (both of which lead to higher citations), or their lower amount of international collaboration in 1995 and 2005 after Russia had become a more open society.

Introduction

Women in Russian science

Before the revolution of 1917, in Czarist Russia, women were totally unable to enter higher educational institutions or participate in science. Consequently, many Russian women went to western Europe (France, Germany and Switzerland particularly) to go to university and subsequently carry out research. This discriminatory policy ended in 1917, and women enjoyed equality of access to high schools and universities. Despite formally being equal, nevertheless women suffered many of the same barriers to success that afflicted their sisters in the west.

Miskaya & Martynova (1993) identified three "waves" of feminisation in Russian science, each of which had a particular social cause. The first took place in the early 1920s, with new legislation giving equality to women in education and choice of career. Women coming to the cities from peasant life in the countryside were given additional benefits if they were accepted by a university, and went on to pursue a career in research. The proportion of women in research rose from 13% in 1918 to 23% in 1928 (Agamova & Alakhverdyan, 2000).

The second wave took place in the 1960s, with a big expansion of research organizations and the creation of many new ones, and a concomitant demand for scientists. Women represented about half of all graduates; they were attracted to research by good pay and flexible working hours. Their share of the scientific labour force rose slightly from 37% of 243,000 in 1960 to 40% of 1,033,000 in 1988, but their absolute numbers more than quadrupled (Agamova & Alakhverdyan, 2000).

The third wave was caused by the collapse of the Soviet system in the early 1990s. During the economic turmoil of those years, Russian science was kept alive mainly by the generous support of the American financier, George Soros. Many researchers were forced to improvise in order to continue their work, but a large number left Russia to work abroad, and others sought a career change. Most of the emigrants were young people, mostly men, and other men went into business or the civil service. Those left in research were so badly paid that they needed to find second jobs and consequently their research suffered.

Studies on the place of women in science

There have been a number of studies of female researchers (Rossi, 1965; Wenneras & Wold, 1997; Tobias *et al*., 2002; Jagsi *et al*., 2006; Sanchez-Guzman & Corona-Vazquez, 2009; Gomez *et al*., 2010; Mendlowicz *et al*., 2011), who often face difficulties in their scientific careers because of male prejudice and the problems implicit in balancing work and family life. Some of them are based on large databases of researchers employed by state organisations which give the sex of their members, and other particulars such as their status and field of work (Lewison & Leta, 2003; Mauleon *et al*., 2008; Abramo *et al*., 2009). These will be accurate but are unlikely to include other researchers such as academics and authors in industry and so may not give a full picture of the situation in a country. Other studies look at how women can best be encouraged to participate more in science with new initiatives (Carrell *et al*., 2010) or use survey data to tease out differences in publication patterns and difficulties faced by both sexes (de Cheveigne, 2009; Snell *et al*., 2009)

The use of names to identify males and females

An alternative is to rely on information given directly on the published papers. The WoS often gives the first names of the authors of the papers that it processes, but these names are not included in the standard downloads and the details of the papers would need to be inspected individually to ascertain their authors' sex. Even so, some first names are not reliably male or female, and in some countries convey no information on sex. Small-scale detailed studies, such as that for Iran in 2003 (Mozaffarian & Jamali, 2008), can yield excellent data on the sex of authors and so on their relative scientific performance.

However in a few countries, surnames or family names have gender endings, and they can be used to reveal the sex of the scientists concerned. This is true for Iceland (Lewison, 2001) where patronymics are used instead of family names, so that female names end in "dottir" and male ones in "son". It is also true for Poland (Webster, 2001) where many of the female names end in "ska", "cka" or "owa" and male ones in "ski", "cki" or "owy". We have applied a similar approach to Russian names, where again female names mostly end in "a", but there are some names, mostly non-Russian in origin, where the surname does not change with sex.

Methodology

Selection of the papers

We identified and downloaded all papers (articles, notes, proceedings papers and reviews) from the Russian Federation in three years: 1985, 1995 and 2005, in the Science Citation Index Expanded through the WoS. These years were chosen so that they would span the major change in Russia with the collapse of the Soviet government in 1990-91 and the progressive adoption of a free-enterprise system, initially with acute shortages and many hardships in the early 1990s and latterly with relatively much more support for science because of the exports of oil and gas, and international programmes. The 2005 papers are the latest that would have five-year citation scores available. We downloaded the full details of all the papers, including addresses and citation scores, year by year, which were downloaded as separate files and then matched to the details of the papers themselves – either on the bibliographic sources, or, where such a match was not possible, on their titles.

A geographical analysis was carried out on the addresses, with each country's contribution to each paper being recorded as a fractional count in a separate column of the spreadsheet. For the 1985 papers, this allowed papers from Russia to be separated from those from the other countries that formed the former Soviet Union, such as the Baltic states, Belarus, Georgia, Ukraine (the largest of the other contributors), Kazakhstan, etc. Papers from that year without a Russian address (26% of the total) were discarded from the study.

Analysis of surnames

For the analysis of names, only papers from Russia alone were retained, *i.e*., those for which the fractional Russian contribution was unity. These represented 94% of the total in 1985, but only 78% in 1995 and 62% in 2005, as Russia became more outward-looking. All the surnames on the 61,787 purely Russian papers were listed in descending order of frequency of occurrence, and those ending in "a" were marked as female (F). The others were marked as male (M), unless (on the advice of Dr Sergei Kudryashov, a Russian historian) they ended in any of the following: ai, an, ar, ch, dze, er, id, k, kh, o, od, oi, s, ts, ts, ub, un. These names were marked as "U" for unknown.

A special Excel macro was then applied to the authors' names in all the Russian papers, including the ones with foreign co-authors, and surnames appearing in the marked list were then credited fractionally for each paper as F, M or U; the latter included any names (usually foreign co-authors) not in the marked list. [New names ending in "a" were not attributed to females, as they might well be from countries where such names occur without gender implications.] This worked satisfactorily, but the U contribution increased from 20% of the total (fractional count) in 1985 to 31% in 2005.

Attribution of major fields

Since one of the objects of the study was to see if the familiar association of females with the biological rather than with the physical sciences also applied in Russia, it was necessary to categorise each paper by its major field. This was done on the basis of the journal in which it had been published, with the journals each uniquely assigned to one of 12 major fields. The assignment was carried out with a thesaurus initially provided by CHI Research Inc, but subsequently added to as new journals were included in the WoS on the basis of their names, the titles of their papers (and sometimes, the addresses of their authors). This was actually a relatively difficult exercise as many journals were not in the thesaurus, only had a few papers or their names were not in English. The fields were as listed in Table 1, which also contains short codes used in the tables and figures that follow.

Table 1. List of major fields used for the analysis, with short codes.

Field	*Code*	*Field*	*Code*
Biology	BIO	Health Sciences	HSC
Biomedical Research	BMR	Mathematics	MAT
Chemistry	CHE	Physics	PHY
Clinical Medicine	CLM	Professional Fields	PRO
Earth and Space	EAS	Psychology	PSY
Engineering and Technology	ENG	Social Sciences	SOC

In practice, there were very few papers in Health Sciences and the last three fields, and the analysis was confined to just eight of them.

Five-year citation counts (actual citation impact, ACI) in each field have been attributed to males, females and unknowns on a fractional count basis, so that a paper with 10 citations and five authors of whom four are males and one female would count 8 citations for males and 2 for females. The total citation counts for the different groups are then divided by the fractional total contributions to give the mean cites per paper for each group and major field.

Other parameters of the papers

We were interested to discover whether any possible difference in the citation scores of men and women could be accounted for by the language in which they were written – since papers

in languages other than English are normally far less cited than ones in English (Bookstein & Yitzhaki, 1999; van Leeuven *et al*., 2000; Lewison & Markusova, 2010). Some of the papers in all three years were in English, but had been translated from Russian on a cover-to-cover basis, often not that well except in physics. In this field, as a result of many years' collaboration between Soviet Russian and US scientists, the translation was carried out by the American Physical Society and was done well – from 1956 until 2006, when the contract was switched to the US company translating journals in other fields. The fact that the journals were translated rather than published in English was not apparent from the full journal name, but the short title, also available in the downloaded data, contained the expression "ENGL TR" after the abbreviated title as an indication that this had occurred. Journals were translated in all fields, and in all three years, but the selection was clearly not of the best ones as citation scores of the translated journals were normally lower than those in the original Russian in the same major field. Moreover, the translated journals were much more expensive than US journals covering the same sub-fields, and had fewer papers, so they would not have circulated widely (Pudovkin, 2011).
Finally, we recorded the document type for each paper, with interest attaching to the numbers of women writing reviews (a mark of esteem from journal editors; Lewison, 2009) and (in 1995 and 2005) proceedings papers. These are papers read at conferences (such as this ISSI one) and then published in regular journals, sometimes in special issues. This indicator would show to what extent women were able to attend conferences, many of which would be held outside Russia.

Results

Women's presence in the major fields in the three years

Only eight of the major fields had enough papers to make the determination of female presence possible with confidence. The results are shown in Figure 1 for the three years.

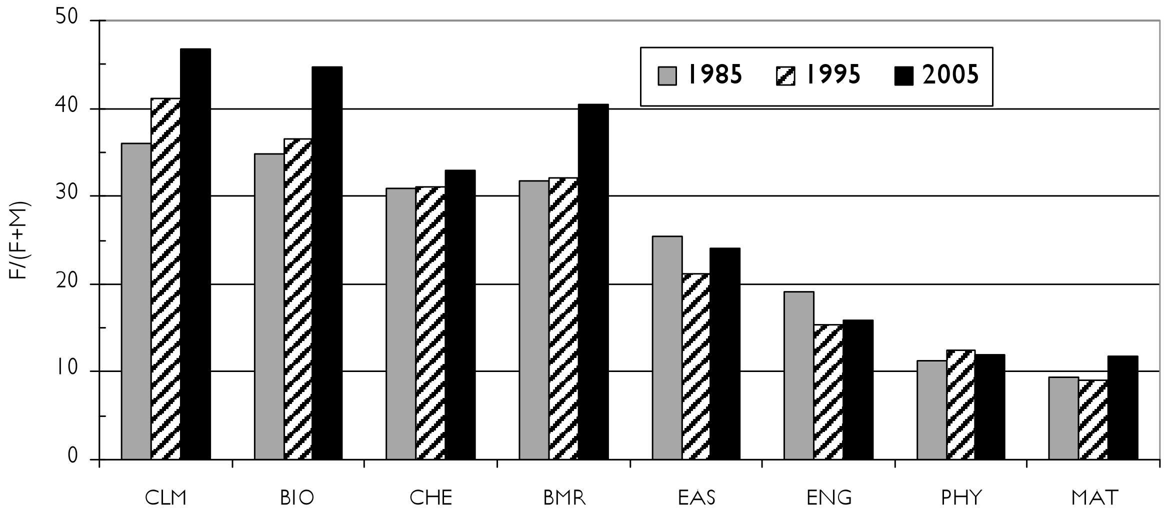

Figure 1. Presence of female names within Russian papers in eight of the 12 major fields (for codes see Table 1) in 1985, 1995 and 2005; fractional counts.

As expected, females were most prominent in clinical medicine and biology, and recently in biomedical research, in all of which their presence has increased. By contrast, it is much lower in earth & space, engineering, physics and mathematics. This indicates that the traditional concentration of female scientists in the biological fields has also occurred in Russia, and that the effect has actually increased. Women are also active in chemistry and have maintained their share of papers at about 30%.

Citation scores of males and females in the major fields

Over the 20-year period, there has been a major increase in the percentages of Russian papers written in English (not translated) and a corresponding increase in their mean five-year citation scores, see Table 2.

Table 2. Eight major fields, with percentages of Russian papers written in English and mean five-year cites per paper (ACI), in 1985, 1995 and 2005.

Field	*% papers in English*			*5-year mean cite score*		
Year:	*1985*	*1995*	*2005*	*1985*	*1995*	*2005*
BMR	11	28	70	1.7	3.4	9.5
PHY	22	55	83	2.3	3.9	6.4
CLM	4	30	34	0.5	2.3	6.2
EAS	15	63	96	1.1	2.7	5.1
BIO	22	45	65	0.6	1.4	4.3
CHE	24	41	83	1.0	2.0	3.4
ENG	8	50	69	0.4	1.2	2.5
MAT	13	45	70	0.4	1.0	1.6

Using these data as background, we can now see whether women are performing as well as, or better than, men because the analysis has to be carried out for each major field separately. Table 3 shows that, with only one exception (clinical medicine in 1985) females' citation scores were on average only about 70% those of men, and much inferior to those of authors of unknown sex (probably mostly non- Russians), particularly in the latter two years when co-authorship with western countries became much more frequent.

Table 3. Eight major fields, with mean five-year cites per paper (ACI) for females (F), males (M) and authors of unknown sex (U), fractional counts, for Russian papers in 1985, 1995 and 2005.

Year:	*1985*				*1995*				*2005*		
	F	*M*	*U*		*F*	*M*	*U*		*F*	*M*	*U*
BMR	1.1	1.8	1.7		2.2	2.7	6.0		4.5	8.3	15.2
PHY	1.3	2.2	2.7		1.9	3.0	6.2		3.6	4.7	9.5
CLM	0.5	0.4	0.6		1.0	1.5	5.7		1.9	3.4	14.0
EAS	0.8	1.1	1.4		1.7	1.9	4.5		3.1	3.8	7.8
BIO	0.5	0.7	0.7		1.0	1.2	2.7		2.1	3.2	8.2
CHE	0.8	1.1	1.1		1.4	1.9	3.0		2.3	2.8	5.7
ENG	0.4	0.4	0.5		0.8	1.0	2.1		1.6	1.9	3.7
MAT	0.2	0.4	0.5		0.3	0.8	1.7		1.1	1.4	2.1

But was this because the women were writing papers in Russian, or in journals where they were translated into English, rather than writing them in English? Most of the papers in the translated journals were poorly cited, see Table 4, although the superior quality of the physics translated journals in 1985 and 1995 (see above) shows up in their citation scores relative to those of biomedical research journals, for example. Even though the practice of publishing in international journals has been steadily increasing (Markusova *et al*., 2009), women were less likely in all three years of our study to publish papers in English, see Table 5. This may have been for psychological reasons – women being perhaps less self-confident about expressing themselves in English – but also they were more isolated, with less internet access than men, particularly in its early years.

Table 4 . Mean 5-year citation scores (ACI) of Russian papers published in three types of journal: EN = English, RU = Russian, R>E = translated, in 1985, 1995 and 2005. Least cited papers shaded.

Year:	*1985*			*1995*			*2005*		
Field	*EN*	*RU*	*R>E*	*EN*	*RU*	*R>E*	*EN*	*RU*	*R>E*
BIO	1.27	0.56	0.11	2.40	0.81	0.33	6.14	0.76	1.12
BMR	6.17	1.22	0.10	9.91	0.96	0.56	12.76	0.94	2.38
CHE	1.42	1.20	0.05	3.32	1.39	0.47	3.76	2.29	1.20
CLM	3.45	0.39	0.06	7.10	0.35	0.01	17.23	0.36	0.68
EAS	3.38	0.73	0.46	3.66	1.07	0.03	5.29	1.73	0.68
ENG	2.22	1.19	0.04	2.17	0.65	0.05	3.41	0.06	0.37
MAT	1.83	1.11	0.14	1.93	0.10	0.20	2.06	n.a.	0.54
PHY	5.36	1.65	0.98	6.22	1.03	1.09	7.24	n.a.	2.09

Table 5, below, rather suggests that this may have been a factor in the poorer citation performance of females compared with males and authors of unknown sex.

Table 5. Languages used for publication of their papers by Russian females, males and authors of unknown sex: EN = English, RU = Russian, R>E = translated, in 1985, 1995 and 2005.

	Females			*Males*			*Unknown*		
	EN	*RU*	*R>E*	*EN*	*RU*	*R>E*	*EN*	*RU*	*R>E*
1985	12.4	64.5	22.9	16.4	57.6	25.6	20.3	55.1	23.6
1995	33.8	42.2	24.0	42.5	34.7	22.7	63.5	22.1	14.0
2005	66.7	10.9	22.3	75.0	4.7	20.2	86.7	3.0	10.2

Females also tended to write fewer reviews than males, and this also put them at a disadvantage as reviews are usually better-cited than articles, notes and proceedings papers, see Figure 2, except in clinical medicine.

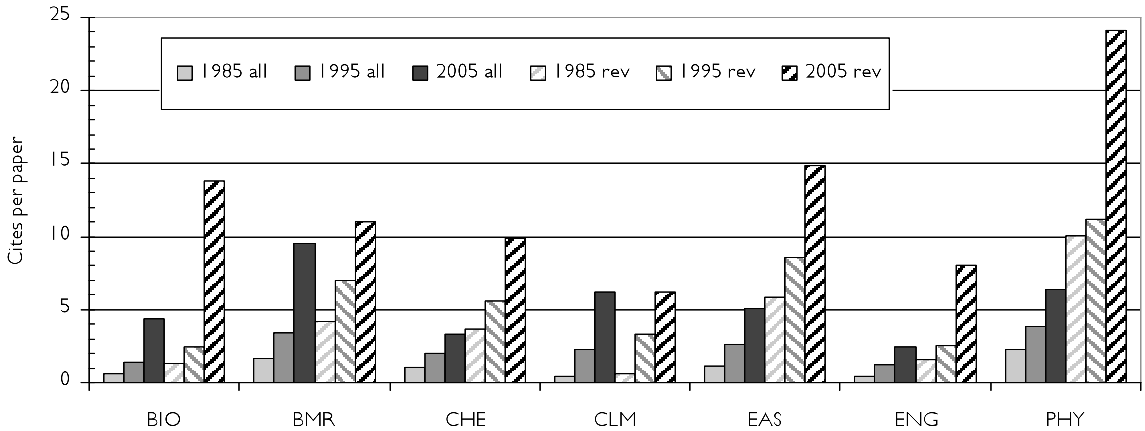

Figure 2. Mean 5-year cite scores of all Russian papers in seven major fields, 1985, 1995 and 2005, and the scores of reviews in these fields.

Table 6 shows, for fields and years where there were at least 40 Russian reviews, the relative presence of females in reviews as compared with the other document types. In almost every case, the ratio is lower for females than for males, showing that they are less prominent as writers of reviews.

Table 6. Fractional presence of females and males in reviews (r), and in articles, notes & proceedings papers (anp), and the ratio between them, for fields and years with 40+ reviews.

Year	*Field*	*Paps*	*Revs*	*% revs*	*F r*	*M r*	*F anp*	*M anp*	*F r/anp*	*M r/anp*
1985	BMR	4927	76	1.54	0.25	0.56	0.25	0.54	0.99	1.03
1985	CHE	6776	144	2.13	0.17	0.70	0.26	0.56	0.67	1.24
1985	CLM	4396	207	4.71	0.24	0.57	0.29	0.51	0.82	1.11
1985	PHY	6695	90	1.34	0.04	0.76	0.09	0.70	0.44	1.08
1995	BMR	3330	86	2.58	0.25	0.54	0.24	0.51	1.03	1.05
1995	CHE	5564	185	3.32	0.19	0.58	0.25	0.55	0.76	1.06
1995	CLM	1596	59	3.70	0.30	0.53	0.32	0.45	0.95	1.18
1995	PHY	8778	113	1.29	0.06	0.63	0.09	0.61	0.68	1.02
2005	BIO	1075	49	4.56	0.13	0.53	0.32	0.38	0.40	1.38
2005	BMR	1902	129	6.78	0.28	0.49	0.27	0.40	1.03	1.24
2005	CHE	5230	155	2.96	0.20	0.59	0.26	0.51	0.78	1.15
2005	CLM	1612	98	6.08	0.31	0.34	0.32	0.37	0.96	0.92
2005	EAS	2623	58	2.21	0.11	0.51	0.16	0.49	0.70	1.04
2005	PHY	8139	152	1.87	0.04	0.65	0.08	0.56	0.52	1.16

Females also participated less in international papers, which tend to be the most cited ones. This was particularly true in the two later years, when collaboration tended to be mostly with western European and north American countries. In 1985 females co-authored internationally almost as much as males (albeit very few Russian papers, only 6%, were international) when collaboration was mostly with countries in the Soviet bloc, such as Ukraine, Belarus, Uzbekistan and Kyrgizstan, see Table 7.

Table 7. Fractional presence of females as a proportion of females + males, for Russia-only papers (RU) and international ones (Int'l) in 1985, 1995 and 2005.

Year:	*1985*		*1995*		*2005*	
Field	*RU*	*Int'l*	*RU*	*Int'l*	*RU*	*Int'l*
BIO	0.35	0.41	0.37	0.30	0.48	0.28
BMR	0.32	0.25	0.32	0.31	0.43	0.32
CHE	0.31	0.22	0.32	0.24	0.34	0.25
CLM	0.36	0.38	0.42	0.30	0.49	0.33
EAS	0.25	0.30	0.22	0.17	0.26	0.19
ENG	0.19	0.11	0.16	0.11	0.17	0.13
MAT	0.09	0.15	0.10	0.01	0.13	0.08
PHY	0.11	0.11	0.13	0.09	0.13	0.10

The effect of the independent variables on citation scores

We are now able to examine the apparently inferior citation performance of Russian female scientists and see if it has been caused by their inability to publish in English, their lack of seniority (which would impede their selection to write reviews) and their difficulties in travelling abroad and so in co-authoring papers internationally. For each of the three years, a multiple linear regression analysis was carried out, with citation score (ACI) for each paper being the dependent variable, and the independent variables being the number of authors (and its square), the number of addresses (and its square), the major field (only six were used), whether the paper was a review, whether it was in English or translated from Russian, the extent to which it was co-authored with a “western” country (Canada, the USA or western Europe), and the fractional presence of men and women. Limitations of the SPSS program used for the analysis meant that the work for each year had to be conducted in two parts: one for chemistry and physics papers, and one for four other fields: biomedical research, clinical medicine, earth & space, and engineering & technology.
The results of the analysis are shown in Table 8, where they are statistically significant.

Table 8. Values of β found by multiple linear regression analysis of Russian papers from 1985, 1995 and 2005 in chemistry and physics (C & P) and in four other major fields. For all values in Roman type, p < 1%, for values in *italic type*, p < 10%.

	1985		*1995*		*2005*	
	C & P	*Others*	*C & P*	*Others*	*C & P*	*Others*
A = no. of authors				0.09	*0.07*	
AA			*0.06*	*-0.05*		
D = no. of addresses		-0.08		*0.06*		-0.23
DD		0.11	0.12	0.06	0.27	0.35
Review?	0.12	0.04	0.08	0.06	0.16	*0.02*
English?	0.13	0.26	0.10	0.15	0.15	0.08
RU > EN	-0.08	-0.07	*-0.02*	*-0.02*	0.10	*0.03*
Foreign co-authorship	0.07	0.05	0.20	0.21	0.16	0.14
F/(F+M)	-0.04	-0.04	-0.03		-0.02	-0.04

The effects of number of authors and number of addresses is somewhat variable, although for 1985 and 2005 in the “other” fields, the initial effect of more addresses is *negative*, as has been observed elsewhere (Lewison & Dawson, 1998; Lewison, 2003). However, reviews are always associated with higher values of ACI, as are papers in English and papers with more foreign co-authorship (with the selected countries). In each of the three years, physics papers out-cited chemistry ones, and in the “other” group, biomedical research papers were the most cited, the same result as was found in Table 2. The effect of female participation in Russian research (higher F/(F+M) ratio) was almost always negative, showing that their contribution was associated with lower ACI values, even when account is taken of these other independent variables.

Discussion

Other data on female presence in scientific research

Probably the nearest data to those in the present study are the ones obtained by Webster (2001) for Poland. She also found a high concentration of females in the biological sciences, but at least over the period 1980-99, their presence was almost static whereas Figure 1 shows steady increases for females in Russia. On the other hand, she found an increase in their presence in engineering where we found a decrease. This may reflect a continuing concentration on the physical sciences in Russia, where medical and biological research are regarded as of minor importance (Presidential Decree N576 of 2002; Wilson & Markusova, 2004), and so these fields may be less attractive to ambitious males. It was certainly very much harder for women than for men to gain entrance to the Moscow Medical University or the biology faculty of the Moscow State University, so competition was intense and graduates would have been very able.

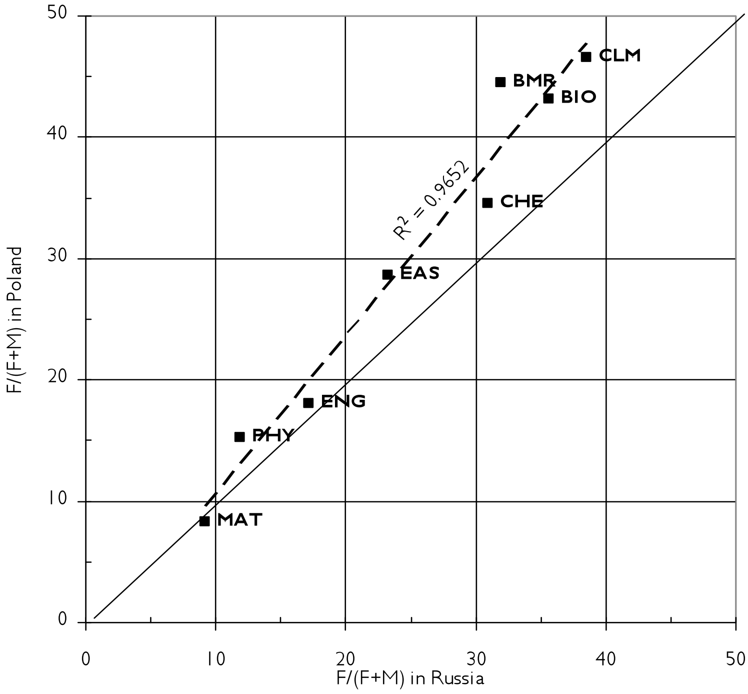

Figure 3. Mean percentile presence (females / (females + males)) of Polish women in major scientific fields compared with Russian women, 1985-95.

But the overall patterns are very similar, see Figure 3 above, except that Polish women seem to have done rather better than Russian women in the biological sciences.

Data on scientific employment in Russia (Markusova, 1997) for female scientists in 1993 suggested virtual equality with men in terms of total numbers – again with more in the life sciences and chemistry. However the more senior scientists tended to be male, and the female presence declined at higher levels. Thus those with DSc degrees (higher than a PhD) showed a similar concentration of females in the life sciences: biology 28%, medicine 26%, chemistry 19%, earth sciences 15%, engineering 9%, physics and mathematics 6%. Scientists with the highest degree, qualifying them for a professorship, amounted to 15% of men, but only 5% of women (Indicators on Science, 2006). Markusova's data from the International Science Foundation (set up by George Soros to support science in the countries of the former Soviet Union) on its grant distributions for 1995 showed a similar preference for women for the life sciences, but lower percentages: biology 23%, chemistry 16%, earth & space 13%, maths, engineering and physics 4%. Similar percentages (but higher in the life sciences) occurred with the grants from the Russian Foundation for Basic Research (RFBR) in 1994-99 (Markusova *et al.*, 2000). The percentages were lower yet again for academicians of the Russian Academy of Sciences (7 out of 436), and corresponding members (16 out of 736). This progressive diminution of the presence of women at the higher levels of science was noted also in Brazil (Leta, 2003) and Canada (Kondro, 2002), and action to promote women is taking place in Norway (anon, 2010), Hungary (Prijic-Samarzija *et al.*, 2009), the USA

(Stewart *et al*., 2007; Cech & Blair-Loy, 2010; Walters & McNeely, 2010) and other countries.

Another factor that contributes to the maintenance of the "glass ceiling" is the continuing preponderance of men on the committees that oversee research grants. Thus the Council of the RFBR has 28 members and none of them are women, and the Russian Humanitarian Foundation (RHF) has only one among its 27 members.

In recent years, when oil and gas prices have greatly increased, Russia has lost the status of an under-developed country, so that travel to international conferences is no longer supported by conference organisers. This makes it particularly hard for women to attend as they are less likely to be grant-holders on research projects. Secondly, the INTAS programme of the European Union no longer supports projects in Russia, only in the other countries of the Former Soviet Union (FSU). And third, the current policy of the Russian government is to be suspicious of foreign Non-Governmental Organisations (NGOs) that might step into the gap. For example, the J & C MacArthur Foundation no longer offers travel grants as it has changed its priorities in favour of promoting freedom for local mass media.

"What is to be done?"

There have been several initiatives aimed at helping women to write competitive grant applications, organised by NGOs such as the Association to Support Women in Science and Humanities (ASWISH), Women for Global Security, and Women in Higher Education on Mathematics. A special programme for female scientists working in the closed nuclear cites was run for the American Association for the Advancement of Science (AAAS) under a scheme directed by Dr Elizabeth Kirk, the US National Science Foundation (NSF) and the US Department of Energy (DOE), by ASWISH and trained over 500 women in local workshops, and three went to the USA for intensive training in grant-writing. As a consequence, the percentage of competitive research grants given to women in Russia in 2000 reflected the number of applications quite accurately, whereas in 1994 it was noticeably less than proportionate (Markusova *et al*., 2000).

Perhaps the best opportunity for women scientists in Russia to be able to collaborate internationally lies in the Internet. [For example, one of the present authors recently published a paper in *Scientometrics* with another person whom he had never met, nor spoken to on the telephone.] A necessary pre-condition, however, will be the ability to communicate fluently in English (Vasconcelos *et al*., 2007), and this may even benefit women who have traditionally been rather better at learning foreign languages than their male colleagues. This, more than excellence in science, may be the key to the further advancement of women researchers in Russia.

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