



SURVEY OF WOMEN IN THE ACADEMIES OF THE AMERICAS

REPORT PREPARED BY FRANCES HENRY
FOR THE IANAS WOMEN FOR SCIENCE PROGRAM

MAY 2015



*Sciences Academies working together to promote
science and technology for development,
prosperity and equity in the Americas*

FOCAL POINT OF THE WOMEN FOR SCIENCE PROGRAM

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IANAS WOULD LIKE TO ESPECIALLY RECOGNIZE THE WORK OF **ANNEKE SENGERS (US)** AND THE **WOMEN FOR SCIENCE CHAPTER IN VENEZUELA** FOR TAKING THE FIRST STEPS TOWARD THE DEVELOPMENT OF THIS CENSUS IN 2011.

WE ARE ALSO GRATEFUL TO THE IAP AND THE SOUTH AFRICAN ACADEMY OF SCIENCE FOR THEIR SUPPORT FOR THIS PROJECT.

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SURVEY OF WOMEN IN THE ACADEMIES OF THE AMERICAS

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I. INTRODUCTION, HISTORY, METHODOLOGY

For some time, the Inter-American Network of Academies of Sciences (IANAS) Women for Science group had wanted to conduct a census of its member Academies in order to determine their proportion of women members. There was an earlier attempt at collecting these data but these were now in need of updating. Accordingly at its meeting in Santiago, Chile in 2013, a committee was struck to develop a census and the task was headed by Frances Henry who, as a social scientist had considerable experience in the design, analysis and write up of surveys. A series of questions were developed and some, from an earlier census undertaken by the South African Academy of Science were included. The final questionnaire was concluded in December 2013 and sent out to the Presidents of the nineteen member Academies in January 2014. After several reminders, seventeen were returned although some of the newer Academies who had just been organized were not able to answer all of the questions. Two were not returned.¹ Most of the questionnaires were filled out by Presidents of the Academies, some by staff members with the help of Presidents and some by IANAS focal points also helped by staff or their Presidents. Analysis of the data collected began in June 2014.

A final report was presented to the Women for Science meetings in Ottawa, Canada on Sept. 21, 2014. Some additional data and a few revisions were requested at this meeting. These were incorporated into the report. Subsequently, two academies who had not replied to the initial questionnaire submitted data now included in this report which was sent to the IANAS secretariat at the end of December 2014. IANAS sent this version to the Academies for approval and two requested minor changes which were incorporated and sent to IANAS on January 21, 2015. After some delay, two further changes were requested and this final version was sent to IANAS on May 28, 2015.

¹ One of these, the National Academy of Sciences in the U.S. has subsequently provided some data which has now been included in this report. Similarly, Peru has also now submitted some data.

II. LIMITATION AND CONSTRAINTS OF THESE DATA

In the first instance, the sample is very small and results can therefore not be overly generalized nor can more sophisticated statistical analysis be undertaken. Moreover, as in any study which attempts to compare institutions which are located in different countries and have had different histories, exact comparisons cannot readily be made because not all differences can be controlled. Our Academies under study differ in many ways; they have different structures, are organized in several ways, some include all disciplines while others have a more limited number of disciplines; have different rules and regulations in their

governance structure; include several types of membership and the like. For example, in the case of Panama the study was done by an Association- the Panamanian Association for Advancement of Sciences (APANAC) which is not an Academy. Given our small number of answers, we are not able to control for all of these differences. This constraint or disclaimer is common to comparative analysis and should not be viewed as undermining the study's results. Despite all the variations within our sample, the main finding in this study - as in most other gender related research - is that women are under-represented.

TABLE 1: ACADEMY MEMBERSHIP

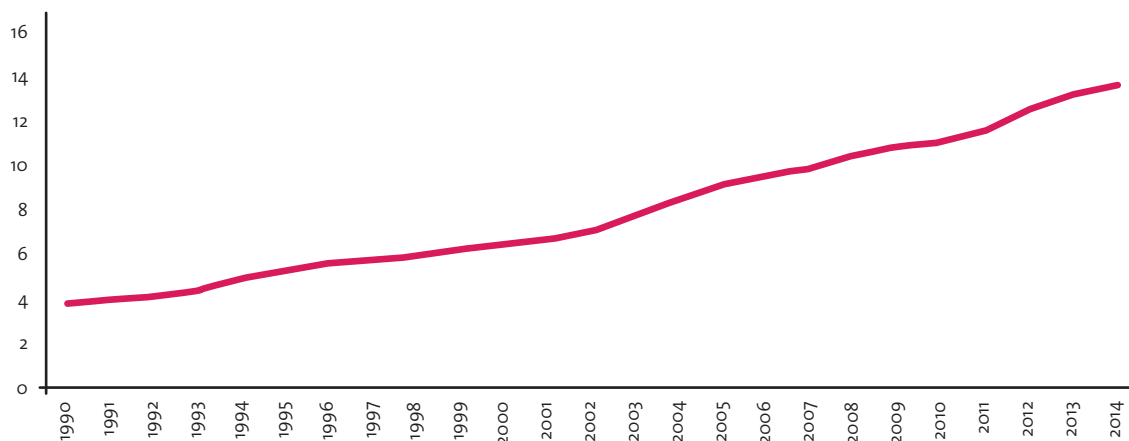
Academy	Number of Women Members	Total Number of Members	Percentage of Women Members	Type of Membership ²	Has Gender Policy
Argentina	4	34	11.76	Capped	
Bolivia	4	47	8.51	Open	
Brazil	64	506	12.65	Open	
Canada	346	2108	16.41	Capped	
Caribbean	57	223	25.56	Open	✓
Chile	9	75	12.00	Capped	✓
Colombia	26	190	13.68	Open	
Costa Rica	10	53	18.87	-	
Cuba	85	313	27.16	Open	✓
Dominican Republic	22	168	13.10	Capped	
Guatemala	8	68	11.76	Open	
Honduras	5	29	17.24	Open	
Mexico	587	2499	23.49	Open	✓
Nicaragua	7	30	23.33	Open	
Panama ³	50	124	40.32	Open	
Peru	23	114	20.18	-	-
United States (NAS)	294	2252	13.06	Open	
Uruguay	5	26	19.23	Capped	
Venezuela	7	50	14.00	Capped	
TOTAL	1613	8909			
AVERAGE TOTAL	18.11%				
MEDIAN⁴	22				

2. Costa Rica and Peru did not provide information on whether their membership is capped or open.

3. It should be noted that Panama's entry process into the Scientific Association is by application rather than election which accounts for their higher number of women members.

4. The median denotes the middle value in a distribution. In this particular case the median was chosen over the mean due to the wildly varying sample of women members in the 19 Academies (Range from 4-587). The mean is sensitive to outliers in a way that the median is not. In order to get the median, the number of women members were arranged from lowest to highest and the middle number was selected using the formula $\frac{n+1}{2}$.

GRAPH 1A: PERCENTAGE OF WOMEN IN THE NATIONAL ACADEMY OF SCIENCES (US) BY YEAR



III. ANALYSIS OF RESULTS

Table 1 illustrates that Mexico, the United States, Canada and Brazil are the larger Academies with over 500 members. Five Academies: Uruguay, Honduras, Nicaragua, Argentina and Bolivia have fewer than 50 members.

Women represent less than 20% of total members in the Academies. Panama, Cuba and the Caribbean have the highest proportion of women members whereas Bolivia, Argentina and Guatemala have the fewest (see Graph 1). Panama has the highest proportion of women members.⁵ Of its total of 124 members, 50 or slightly more than 40% are women. Mexico has the largest numbers of total members at 2499 and a significant number of women at 587 (24%) whereas the smallest Academies in our sample are Uruguay with 26 members of whom 5 or 19% are women and Honduras with 29 members and only 5 women but that translates to 17% of its total membership. These new and smaller Academies nevertheless have a higher proportion of women than do many of the larger and more established Academies. Other large Academies include Cuba which also has the second highest proportion of women members at 27%; the Caribbean where 26%

of its members are female; Brazil which has the fourth highest total number of members but only 13% of whom are women. Canada is a special case because its Royal Society contains three separate Academies including Arts and Humanities, Social Sciences and Science. Its total membership is 2108 of whom 346 or 16% are women. However the number of women within each Academy vary considerably with Arts/Humanities having the highest (28%) but Science the lowest at a mere 9%.

The National Academy of Sciences in the United States is in a similar position since it has the second highest total number of members but only 13% of its members are women. The National Academy of Sciences has provided figures to show the rate of increase in female membership over the years as well as the numbers of women (and men) elected in the last 24 years. We have graphed these numbers below. Looking at Graph 1a (see below), we can see that there has been a steady increase in women members over the years, from just under 4 percent in 1990 to under 14 percent in 2014. Graph 1b looks at the number of women and men elected each year into the US National Academy of Sciences from 1990

5. Panama is a special case since it does not have an Academy but an Association called "La Asociación Panameña para el Avance de la Ciencia". As such, membership is open to anyone who applies by sending in an application form and a curriculum vitae. The application is reviewed by a committee who evaluates the application. There is no cap on potential members and applicants are not voted on in the rigorous peer assessments used by many of the Academies. This open and easier selection procedure is the reason for the substantial number of women members in this science association.

TABLE 1B: ELECTED WOMEN MEMBERS FOR THE NATIONAL ACADEMY OF SCIENCES (US) 1990-2014

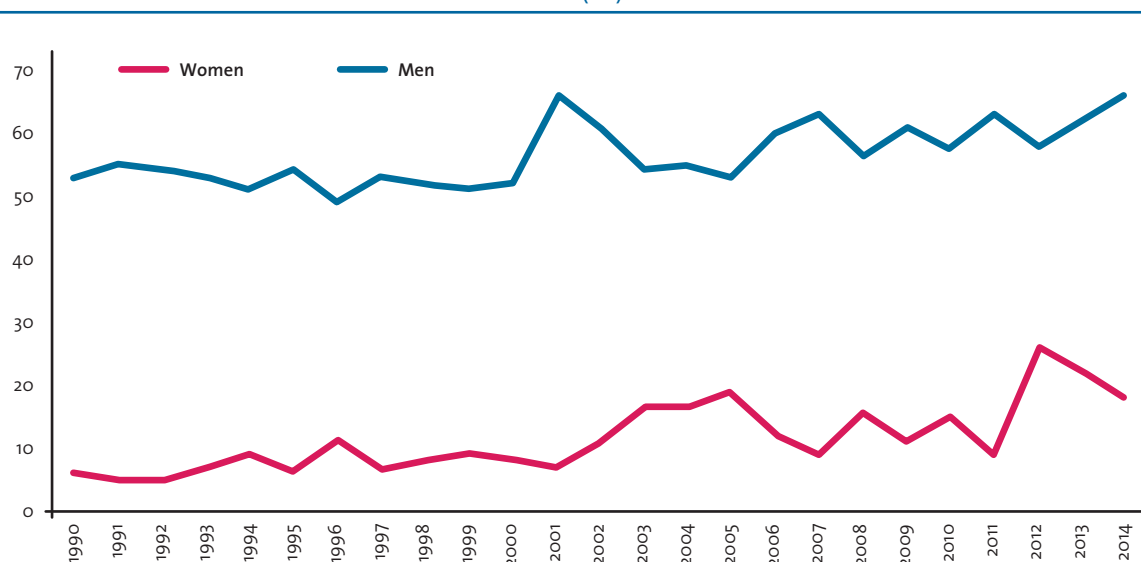
Election Year	Total Elected	Women Elected	Women (%)
1990	59	6	10.2
1991	60	5	8.3
1992	59	5	8.5
1993	60	7	11.7
1994	60	9	15.0
1995	60	6	10.0
1996	60	11	18.3
1997	60	7	11.7
1998	60	8	13.3
1999	60	9	15.0
2000	60	8	13.3
2001	73	7	9.6
2002	72	11	15.3
2003	71	17	23.9
2004	72	17	23.6
2005	72	19	26.4
2006	72	12	16.7
2007	72	9	12.5
2008	72	16	22.2
2009	72	11	15.3
2010	72	15	20.8
2011	72	9	12.5
2012	84	26	31.0
2013	84	22	26.2
2014	84	18	21.4

to 2014. These two graphs (Graph 1a and 1b) confirm that the National Academy of Sciences is now more actively increasing its female membership.

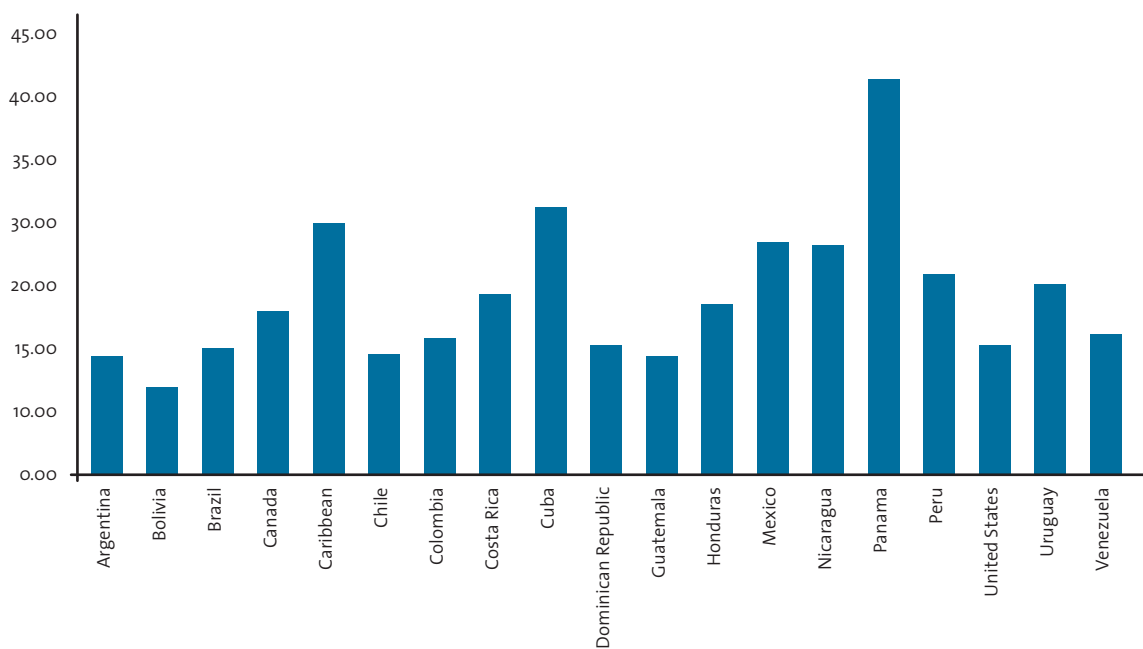
Going back to the figures presented in Table 1, we can see that there does not seem to be a correlation between the size of Academies and the number of women members. Some very large Academies have relatively small proportions of women members but for a few such as Panama, Cuba and the Caribbean, women constitute about one quarter or more of their total membership. It might have been expected that the two large and very scientifically advanced countries in North America – the U.S. and Canada – would have far more female members in their science Academies, yet that does not seem to be the case. Similarly, it might have been expected that Brazil, with its immense size and its increasing role in the global economies of the world might also have a far larger proportion of women members in its science Academy than it does. It must also be noted that 100% of the Academies currently have a male president although Cuba, Canada, Guatemala and Mexico have had female presidents in the past and some of its vice presidents are women.

Age of the Academy may have some significance since some of the larger ones with relatively small proportions of women may have been influenced by the barriers and restrictions placed on women not having similar access to higher education as men and

GRAPH 1B: NUMBER OF NATIONAL ACADEMY OF SCIENCES (US) MEMBERS ELECTED BY YEAR AND SEX



GRAPH 1: PERCENTAGE OF WOMEN MEMBERS BY ACADEMY



this was, and still is, particularly true of the science disciplines. More recently established Academies, limited in size because of their lack of educational and economic resources, are nevertheless open to the increasing ideology of feminism and the importance of educating women in their societies.

An important variable that influences the overall numbers of Academy members and may also play a role in assessing their numbers of women is that some limit or cap their membership while others are open to all new qualified persons. In our sample, seven Academies maintain a limit on their membership whereas the rest maintain open membership. There is a slight trend in these data indicating that most, but not all, of the larger Academies maintain open membership.

A question of some importance to us was whether an Academy had established a gender policy as part of its guiding legislative or policy framework. Only 4 out of the 18 Academies surveyed (22%) indicated that they had a gender policy (see Table 1). It might also be assumed that Academies with gender policies in place might have larger numbers of women members but this also does not always seem to be the case. Three of the Academies who do have such policies - Cuba, Mexico and the Caribbean - do have fairly high numbers of women

members. However, Chile also has a gender policy in place yet only 12% of its total members are women. Moreover, Panama which has the highest proportion of women members does not have a gender policy but as noted earlier, their organization is a science association rather than an Academy. It is probably safe to assume that local economic, social and political conditions play a more significant role in increasing women's membership than does merely having a gender policy.

Another important dimension of women's participation in the work of Academies of science is their role in management or governing councils. Governing councils (see Table 2) vary in size from very large ones such as Nicaragua, which seems to include all its members on its council to smaller ones such as Honduras. The range is between 3 to 30 members. On average, women make up a little more than one-quarter of all those on the governing council. The United States (47%), Cuba (40%), Canada (38%) and Panama (38%) have the largest proportions of women council members whereas Brazil has the lowest at 8% followed by Bolivia (11%) and Costa Rica (13%). Of the four countries with the highest proportion of women on the governing council, Cuba is the only one with a gender policy (see Table 1). It is noteworthy again that the size

of the Academy does not necessarily predict the council participation of women. For example, Brazil which has over 500 total members (as seen in Table 1) also has the lowest proportion of women on the governing council. It should also be noted that the number of women members in an Academy does not necessarily predict the participation rate of women on the governing council. For example, of all the Academies surveyed, Canada has one of the highest proportion of women on its governing council yet does not have a high proportion of women who are members of the Academy. This is also the case with the US National Academy of Sciences.

Since governing councils are the active governing and policy making bodies of Academies, increasing women members in governance would probably be of critical importance. At this point in time, none of the Academies surveyed had a female president although

at least four, Canada, Cuba, Guatemala and Mexico have had women presidents some years ago. Canada had, until recently, a female president of the Royal Society and some of the disciplinary sub-sections such as social science have been women (However, the science academy has not had a woman president). Almost all the Academies indicated that they were actively promoting the interests of women although very few had gender policies in place. Of interest also is that 4 out of the 18 Academies (22%) surveyed stated that they were not actively promoting women and gender issues. Panama, which not only has the largest percentage of women members (see Table 1) but also the largest percentage of women on their governing council, indicated that they did not actively promote women and gender issues.⁸

In addition to governing councils, most Academies have, as part of their infrastructure, a

TABLE 2: GOVERNING COUNCIL⁶

Academy	Men on Governing Council	Men on Governing Council (%)	Women on Governing Council	Women on Governing Council (%)	Total Number on Governing Council	Actively Promoting Women and Gender Issues ⁷
Argentina	5	71.43	2	28.57	7	
Bolivia	8	88.89	1	11.11	9	✓
Brazil	12	92.31	1	7.69	13	✓
Canada	10	62.50	6	37.50	16	✓
Caribbean	5	71.43	2	28.57	7	-
Chile	5	83.33	1	16.67	6	-
Colombia	5	71.43	2	28.57	7	
Costa Rica	7	87.50	1	12.50	8	✓
Cuba	6	60.00	4	40.00	10	✓
Dominican Republic	12	70.59	5	29.41	17	✓
Guatemala	5	83.33	1	16.67	6	✓
Honduras	2	66.67	1	33.33	3	
Mexico	7	70.00	3	30.00	10	✓
Nicaragua	23	76.67	7	23.33	30	✓
Panama	5	62.50	3	37.50	8	
United States (NAS)	9	52.94	8	47.06	17	-
Uruguay	4	80.00	1	20.00	5	-
Venezuela	5	83.33	1	16.67	6	✓
TOTAL	135		50		185	
AVERAGE TOTAL	72.97%		27.03%			
MEDIAN	5.5		2.0			
MEAN	7.5		2.78			

6. Peru did not provide information on its governing council.

7. The Caribbean, Chile, Uruguay and the NAS in the United States did not answer this particular question.

8. Although this appears to be anomalous, there may be a particular reason for this or it may simply be the result of an error in answering the question.

secretariat which handles its day to day business. 17 of the total sample of 18 Academies stated that they had secretariats.⁹ On average, women comprise 71% of its staff and are therefore highly represented

in the secretariat (see Table 3). In fact, almost half of the Academies reporting, that is, 7 out of 15 have a secretariat comprised only of women (see Graph 3 for an illustration). Only Argentina and Cuba

GRAPH 2: PERCENTAGE OF WOMEN AND MEN ON GOVERNING COUNCIL BY ACADEMY

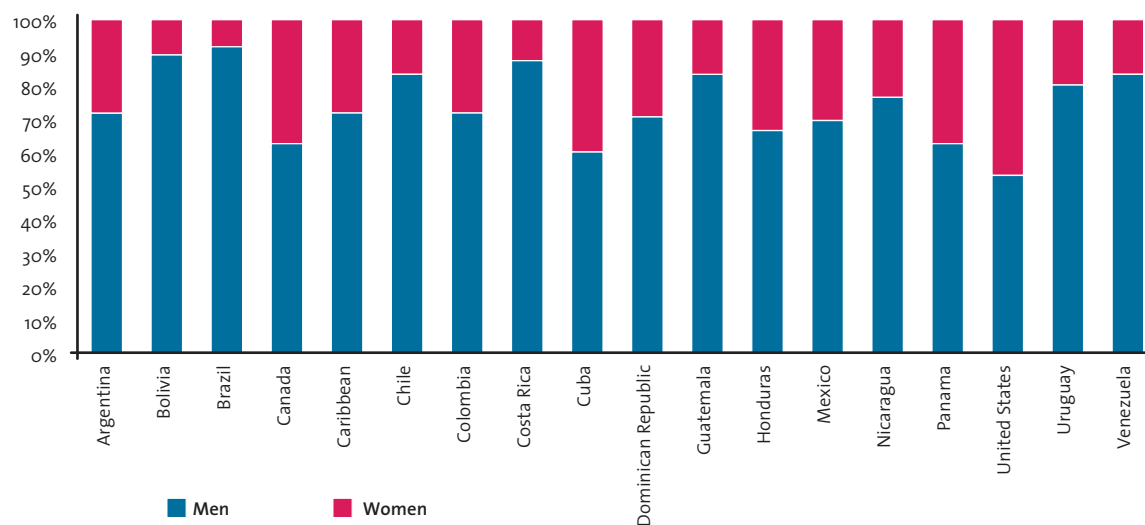


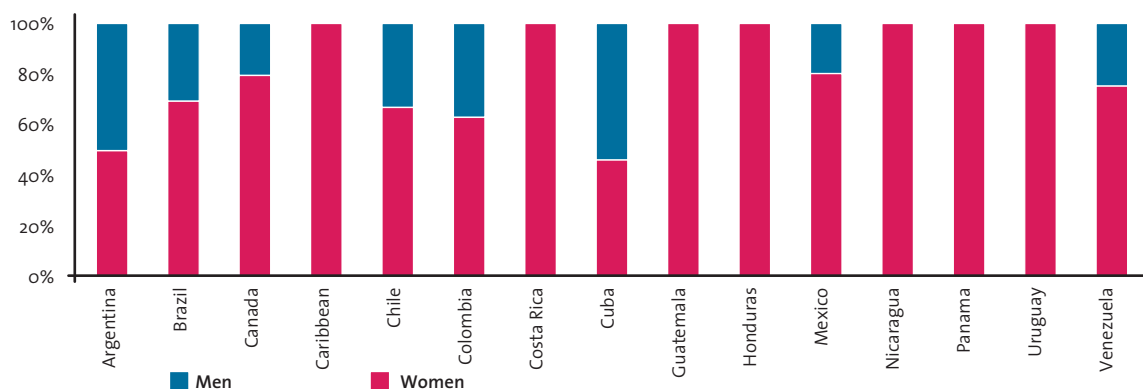
TABLE 3: SECRETARIAT¹⁰

Academy	Total	Number of Women	Women (%)	Men (%)
Argentina	2	1	50.00	50.00
Brazil	36	25	69.44	30.56
Canada	10	8	80.00	20.00
Caribbean	1	1	100.00	0.00
Chile	3	2	66.67	33.33
Colombia	8	5	62.50	37.50
Costa Rica	4	4	100.00	0.00
Cuba	11	5	45.45	54.55
Guatemala	2	2	100.00	0.00
Honduras	1	1	100.00	0.00
Mexico	5	4	80.00	20.00
Nicaragua	1	1	100.00	0.00
Panama	1	1	100.00	0.00
Uruguay	1	1	100.00	0.00
Venezuela	4	3	75.00	25.00
TOTAL	90	64		
AVERAGE TOTAL		71.11%		
MEDIAN		2.00		
MEAN		4.27		

9. Bolivia did not have a secretariat. The National Academy of Sciences in the United States and the Dominican Republic do have a secretariat but did not report the number of women working in the secretariat and therefore was omitted from Table 3.

10. Bolivia did not have a secretariat. Peru did not answer this question. The National Academy of Sciences (US) and the Dominican Republic did not report the number of women working in the secretariat and therefore were omitted from Table 3.

GRAPH 3: PERCENTAGE OF WOMEN AND MEN IN SECRETARIAT



have an almost equal number of men and women in the secretariat. As the secretariat is essentially a corporate office, the high proportion of women workers is to be expected as much of the work is routine and secretarial.

13 of the 19 Academies surveyed are also structured in terms of different categories of membership. In addition to full members, many Academies are differentiated by disciplines such as divisions of Life Sciences, Earth Sciences, Applied Sciences, etc or by specific divisions such as Mathematics, Physics and Astronomy. Other common categories of membership include Corresponding members who are typically foreigners, Honorary members chosen for their unique achievements,

Affiliates or Associates and a few Academies have a special division for younger scientists.

In terms of disciplinary affiliations, there were some clear cut trends (see Table 4 and Graph 4). Men were most likely to be working in the areas of Physics (15%), Life, Health, Medical Sciences (15%), Biology (13%) and Social Sciences (13%). Men were, however, least likely to be found in Astronomy and Computer Sciences as compared to other scientific disciplines. These areas were also the least likely for women.

The majority of women (71%) were working in four fields: Social Sciences (21%), Biology (18%), Life, Health, Medical Sciences (16%) and other (16%). The hard sciences such as Physics, Mathematics, Computer Science and others have attracted far fewer women. These findings are entirely consistent with overall world wide trends. An interesting exception is that the field of chemistry, usually considered a hard science is the only one in which there is a fairly substantial female representation. The higher numbers of women in Biological Sciences may be due to the belief that these areas of study are more closely related to emotions such as the desire to help people and thus considered to be 'feminine'.¹²

Looking at the disciplinary differences for the US National Academy of Sciences (Table 4a), we can see that the majority of women members are from the Social Sciences (21%). This is followed by Applied Biology and Ecology (19%) and the Biological Sciences (18%). This is similar to the results found above for

TABLE 4: DISCIPLINARY PROPORTIONS BY GENDER¹¹

Discipline	Men (%)	Women (%)
Physics	15.05	5.28
Chemistry	8.04	9.24
Mathematics	8.29	3.39
Astronomy	1.99	1.60
Biology	13.32	18.10
Life/Health/Medical	15.33	16.12
Social Science	13.14	21.02
Earth Science	6.54	4.15
Engineering	10.75	5.00
Computer Science	0.22	0.38
Other	7.33	15.74

11. Nicaragua was omitted from Table 4 and Graph 4 due to the fact that they do not organize their Academy by discipline. Peru did not provide complete information on disciplinary differences and therefore were omitted from Table 4 and Graph 4.

12. <http://gendersociety.wordpress.com/2013/09/13/why-scientists-think-there-are-more-women-in-biology-than-physics/>

GRAPH 4: DISCIPLINARY PROPORTIONS BY GENDER

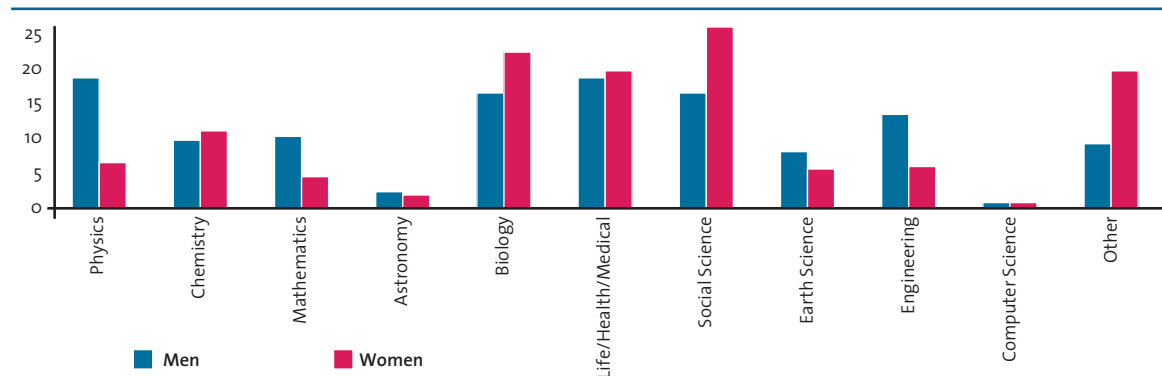


TABLE 4A: NUMBER OF WOMEN BY DISCIPLINE FOR NATIONAL ACADEMY OF SCIENCES (US)¹³

	Total	Women	Women (%)
Class I (Physical)	662	63	9.52
Class II (Biological)	589	108	18.34
Class III (Applied Physical)	260	23	8.85
Class IV (Biomedical)	269	25	9.29
Class V (Social sciences)	228	49	21.49
Class VI (Applied Biology, Ecology)	180	34	18.89
TOTAL	2188	302	13.80

TABLE 5: WHERE WOMEN WORK

Academy	Do Women Members Work in the Following Institutions:				
	Universities	Research Centers	Private Laboratories	Government Agencies	Other
Argentina	✓			✓	
Bolivia	✓	✓		✓	
Brazil	✓	✓			
Canada	✓	✓	✓	✓	✓
Caribbean	✓	✓	✓	✓	
Chile	✓				
Colombia	✓	✓			✓
Costa Rica	✓	✓	✓		
Cuba	✓	✓		✓	✓
Dominican Republic	✓	✓	✓	✓	
Guatemala	✓				
Honduras	✓		✓		
Mexico	✓	✓		✓	
Nicaragua	✓	✓			✓
Panama	✓	✓	✓	✓	✓
United States	✓	✓	✓	✓	
Uruguay	✓				
Venezuela	✓	✓			

13. The US data for disciplinary differences was organized differently and so it was made into a separate table.

the aggregated data of disciplinary differences for the remaining Academies.

The Academies surveyed were also asked to indicate in what institutions women members currently worked in. Results indicated that women members of the Academies worked primarily in

universities (see Table 5). Every Academy surveyed had women members who were academics. Some Academies had women members working in a mix of university and research institutes and a few worked for government and/or private industry. Women were least likely to work in private laboratories.

IV. SUMMARY OF QUANTITATIVE RESULTS

Table 6 summarizes the results of women's participation as members of Academies and as members of the Governing Council and the Secretariat cross referenced by whether or not the Academies actively promote women's issues and have gender policies. Despite the large number (71%) of Academies that indicated that they were promoting women and gender issues in their respective Academies, only 4 of the 18 Academies

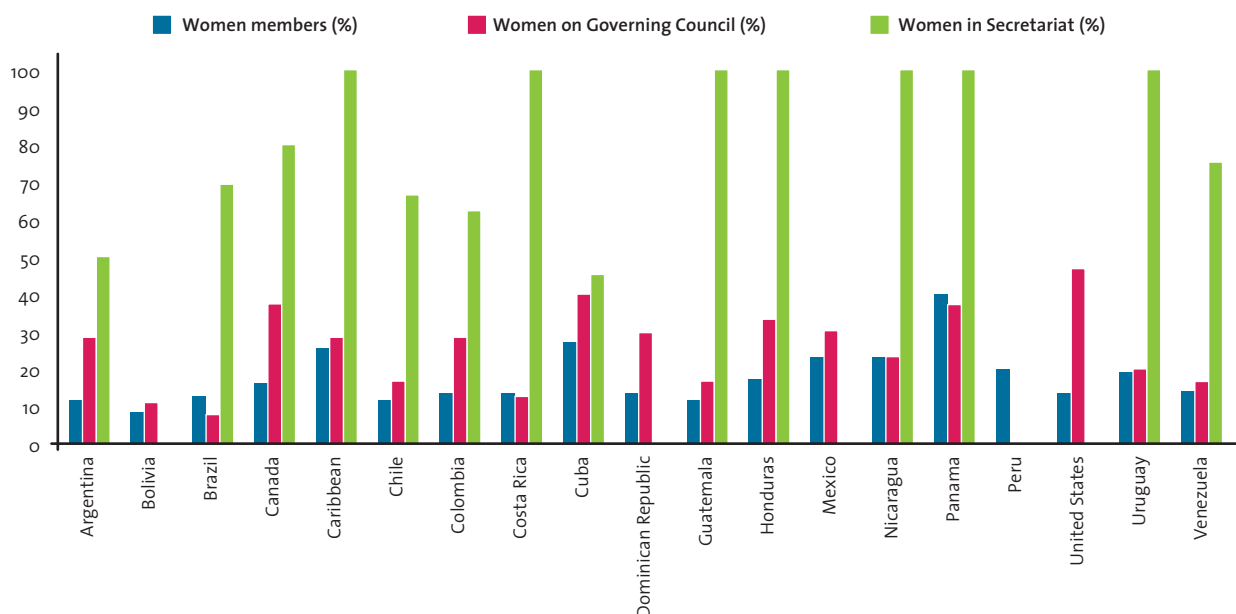
(22%) had a gender policy in place.¹⁴ Moreover, we can see that having a gender policy in place does not necessarily amount to equal representation of women as members in the Academy or as members on the governing council. Looking at Graph 6, we can clearly see the high representation of women in the secretariat in comparison to their representation on the governing council and/or as members of the Academy.

TABLE 6: WOMEN AND PARTICIPATION

Country	Women Members (%)	Women on Governing Council (%)	Women in Secretariat (%)	Actively Promoting Women and Gender Issues	Has Gender Policy
Argentina	11.76	28.57	50.00		
Bolivia	8.51	11.11	Not Applicable	✓	
Brazil	12.65	7.69	69.44	✓	
Canada	16.41	37.50	80.00	✓	
Caribbean	25.56	28.57	100.00	-	✓
Chile	12.00	16.67	66.67	-	✓
Colombia	13.68	28.57	62.50		
Costa Rica	18.87	12.50	100.00	✓	
Cuba	27.16	40.00	45.45	✓	✓
Dominican Republic	13.10	29.41	-	✓	
Guatemala	11.76	16.67	100.00	✓	
Honduras	17.24	33.33	100.00		
Mexico	23.49	30.00	80.00	✓	✓
Nicaragua	23.33	23.33	100.00	✓	
Panama	40.32	37.50	100.00		
Peru	20.18	-	-	-	-
United States (NAS)	13.06	47.06	-	-	
Uruguay	19.23	20.00	100.00	-	
Venezuela	14.00	16.67	75.00	✓	
AVERAGE TOTAL	18.11%	27.03%	71.11%		

14. Peru did not answer this question.

GRAPH 6: PERCENTAGE OF WOMEN WHO ARE MEMBERS, GOVERNING COUNCIL AND SECRETARIAT BY ACADEMY



V. QUALITATIVE QUESTIONS

As part of our survey, a number of open-ended questions were asked in which the respondents were able to elaborate on their answers. Answers were read and categorized into major themes to reflect their content.¹⁵

IS YOUR ACADEMY AWARE OF THE LOW PARTICIPATION RATE OF WOMEN IN SCIENCE AND WHAT ARE THEY DOING ABOUT IT

This question elicited a 100% affirmative response. All Academies are therefore aware of the need to recruit women into science and ultimately into science Academies as members. When asked what attempts were being made by their Academy, one Academy said “no” attempts were being made and three Academies did not answer the question. Several varied answers were given by the remaining 13 Academies. In fact, three Academies stated that their participation in the IANAS Women for Science program were indicators of their Academies’ concern and support for gender issues.

One of the most popular answers cited by four of the Academies surveyed was that they liaise and lobby ministries of government to make

greater attempts at promoting women in science. For example one Academy indicated that “As a society we lobby to influence government bodies to increase the participation of women in science and invest in science and technology”. Another said that their Academy, “ Actively participate as members, in the meetings of the National Council for Science and Technology to try to influence national policy for Science and Technology”. Or, “we promote gender policies in science and technology inside the Academy and also with the Federal agencies that run S&T policies”. Another Academy stated that they coordinate with the vice minister in charge of Science and Technology in Belarus and China “to strengthen scientific and technological projections. Among these efforts, we scheduled the exchange of scientists and doctoral training in S & T”.

Another popular response relates to the internal work of the Academy in promoting women’s issues. For example, some Academies indicated that they were supporting research and work on women’s issue in various disciplines such as Medicine, Environmental and Social Sciences and Linguistics or promoting forums on Women’s issues. One small

15. Peru and the US did not answer these questions.

Academy cited its goals of requesting that 75% of newly elected members should be women which resulted in the election of three new women in the last three years. Another said that they had instructed their new fellows selection committee to take special notice of diversity and gender. Also mentioned were visits to primary and high schools by Academy members and two Academies noted that they sponsored prizes to young women scientists or school children studying Science and Technology. Promoting women onto various internal and external scientific committees was also mentioned.

IS YOUR ACADEMY ACTIVELY PROMOTING WOMEN AND GENDER ISSUES IN ITS STRUCTURES, DECISION MAKING AND PROGRAMS

Five Academies answered 'no' to this question and three did not answer it. One stated that although they were not actively promoting women, they do not discriminate and welcome all members who are interested in pursuing science, regardless of race or gender. Of the remaining eight, the most common answers revolved around a number of internal and external efforts that were being made. Increased participation of women in the board of directors was mentioned several times as was the increasing participation in national and international events through personal activity as well as the Academy's support in their publication of scientific papers. Supporting and nominating women for positions in larger international organizations was also mentioned. Another popular strategy was providing for prizes to be given to women scholars and especially younger scholars. Several Academies have such programs in effect including Brazil's well known support of the L'oreal prize for women scientists. Several Academies mentioned that they had established committees for women and gender and implemented activities on themes related to women. Two Academies specifically noted that they had had a woman president in the past and that women had served as vice presidents and/or directors of scientific divisions. One Academy reported that they had created a Task Force on Diversity to study the ways more women and racial minorities could be appointed and following its recommendations, a nine-member Committee on

Equity and Diversity was established to implement their recommendations. (A 30% quota for women was recommended).

WHAT MEASURES ARE ALREADY IN PLACE IN YOUR COUNTRY TO PROMOTE INCREASED PARTICIPATION OF WOMEN

More than half of our sample said either 'none', or again cited the IANAS program, or did not answer this question. Of the remainder, one specifically mentioned that their universities were actively recruiting women to enter the engineering programs and another noted that there were more research awards and grants being given to young people. Another country specifically mentioned that one government prize was given annually to a woman. Also cited was the work of their Academies in attempting to promote participation of women by visiting and lecturing in schools. Five countries mentioned specific grant, research and equity related programs initiated by ministries of government to encourage and promote women in science. These countries are also those who have explicitly recognized the need for gender parity at all levels of government and society. All told, only about one third of our sample described ministerial or government actions.

WHAT MEASURES DO YOU THINK WOULD BE MOST EFFECTIVE TO ENCOURAGE YOUNG WOMEN TO ENTER A CAREER IN SCIENCE

This questions elicited many answers and the most often mentioned was that encouragement should be provided through schools by teachers, counselors and other educational officers. The provision of role models for young women students was also considered important and it was specifically noted that there should be increased interaction between established women in science and younger women and students in order to make them more aware of the life stories of women scientists and technologists. Another set of answers stated that governments should take a bigger role in implementing policies directed to scientific and technological programs. Providing more funding to schools and universities to promote science education was considered an important step. Eliminating political discrimination and bias in the allocation of research was also

mentioned. Identifying the barriers against women's participation such as discrimination in Science, Technology and in particular Physics and Mathematics was referred to, as was the need for non-sexist and inclusive language policies.

WHAT ACADEMY ACTIVITIES WERE WOMEN INVOLVED IN

Evidence based panels and especially committees were identified by 12 Academies and some mentioned the specific panel/committee by name. Thirty to 60% of these committee/panel members were women. In regard to women chairing such committees, five respondents cited between 25-100%.¹⁶ Five Academies cited Geography and Environment, Environment and Health, Women in Science and Education, Social Sciences and Humanities Awards Committee 2013, The Commission of Women in Sciences and Women in Science as the largest of the committees/panels.

Again, these results support the kinds of interests and disciplines that women are involved in which includes Health, Environment, Education, and the specific focus on women and science that is characteristic of a few countries. Women are not involved in committees and structures that involve sciences such as Physics, Mathematics, Engineering and related subjects to any great extent.

WERE WOMEN INVOLVED IN ACADEMY SCIENCE ENGAGEMENT ACTIVITIES SUCH AS LECTURES AND SCHOOL OUTREACH PROGRAMS

This question received a positive response from seven Academies primarily those with larger numbers of members. Presenting lectures on science and science education at schools was cited by most of them but other activities included, evaluating the content of science books for use in primary schools, and the writing of a book. One Academy cited a special Science Teachers Training Programme where 90% of the facilitators were women. Another mentioned the science in education program inspired by IANAS. One Academy sponsors public lecture series, symposia and other meetings on a

wide variety of topics ranging from studies of the brain to historical analysis of important events in history to discussions of feminism in which many of the participants and chair persons were women.

AWARDS AND PRIZES COMMITTEE MEMBERS AND RECIPIENTS

About half the sample of Academies had women members on their prize and awards committees ranging from 4-6 in one case to only one in another. Nine Academies provided information on the number of their prize recipients who were women. The numbers ranged from 15 women recipients in the last three years, to 5, 12 and 17 (over a given time period) with several saying that about 2-5 awards had been given to women in recent years. In one Academy out of a total of 60 prizes, 25 were awarded to women. In another, 54 women had received a prize specifically for women ever since its inception many years ago. Although the giving of awards and prizes to men and women was a common form of honoring achievement by Academies, the range of awards varied considerably and it was difficult to determine how many awards were given within a specific time period.¹⁷

WHAT WOULD YOU ESTIMATE IS THE AVERAGE PERCENTAGE OF FEMALE INVOLVEMENT IN THE ACADEMY ACTIVITIES SELECTED ABOVE

This question was answered by the total sample surveyed. One Academy stated "25%"; 8 Academies selected "25-50%" and the same number chose "less than 25%". There was therefore almost an even split. Among those who chose the category of "25-50%" for average female involvement, several noted that the rate of involvement was closer to 25%, perhaps within the 30-35% range. None of the Academies surveyed self reported that the percentage of female involvement exceeded 50%. The conclusion that one can reach is that although some Academies are doing better on various criteria related to women's activities, most still have a long way to go to reach even parity with male members.

¹⁶ This question seems to have been poorly understood and the numerical replies should not be considered reliable.

¹⁷ These kinds of questions require a more detailed formulation than the present format allowed.



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