

About surveys on the situation of women in science

1. Main results of the UNESCO report “Science, Technology and Gender” (UNESCO released in 2007, coordinated by Eduardo Martinez)

2. Example case: Data about the situation in Argentina, with results of a survey we conducted some years ago.

3. Survey we conducted some years ago (description and results).

Silvina Ponce Dawson, Universidad de Buenos Aires



Science, Technology and Gender has been coordinated by UNESCO's Division for Science Policy and Sustainable Development. Based on empirical research and data, the report (published in 2007) incorporates substantive input from institutions involved in science and technology (S&T), gender studies and policy.



Main conclusions:

The participation of women in science at the higher levels of education has increased in the past ten years in most regions of the world. However, once they have finished their studies, only 25% of researchers in science and technology are women and 75% men.

Whereas Central Asia and, the post-Soviet countries and many countries in Latin America have good gender parity, the same cannot be said of Africa and the rest of Asia. It is also clear that in the major part of Europe, above all in Western Europe, research is still predominantly male.

In the case of Western Europe, for example, many researchers work for industry, where the percentage of women is low.

Percentage wise, there are more women science students than researchers. After their studies, women change directions. This is reflected in a “scissor diagram”: worldwide, the number of women decreases at the higher levels of scientific research. In certain countries, very few women are heads of department or academics, whereas there are more female than male graduates.

The life sciences often attract more women than men but women soon strike a ‘glass ceiling’ when they try climbing the career ladder.

In the field of engineering, there are few women. In the computer sciences also there are more men...the information society is still a society of men.

Women represent just one-quarter of the world’s researchers, roughly 10% of university professors and fewer than 5% of members of Academies of Sciences. As for Nobel Prize laureates in science, fewer than 3% have been women.

Figure 4.1: Women as a share of the total number of researchers (headcount), 2005



Source: OECD, March 2007.

Some data from Europe

Figure 2.1: Proportions of men and women in various stages of a typical academic career

Figure 2.1a: EU-25, 1999 and 2003

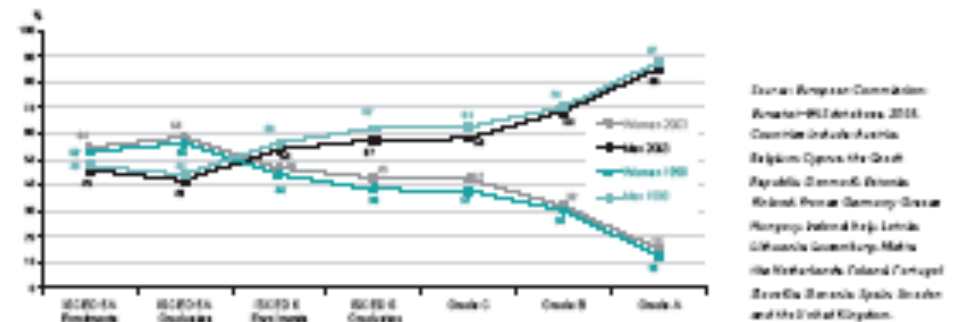


Figure 5.3: Proportion of woman on scientific boards, 2004

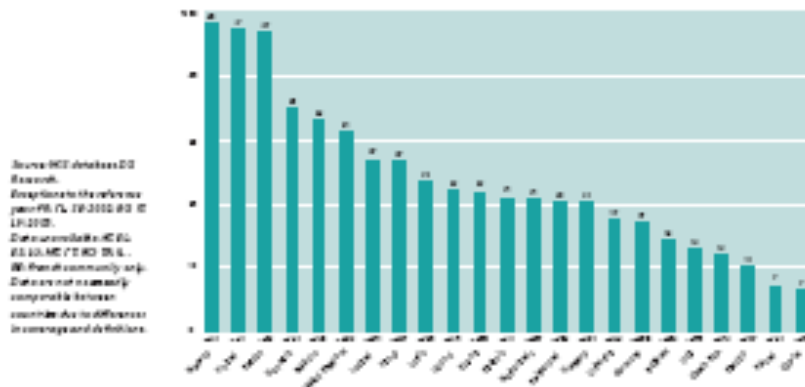
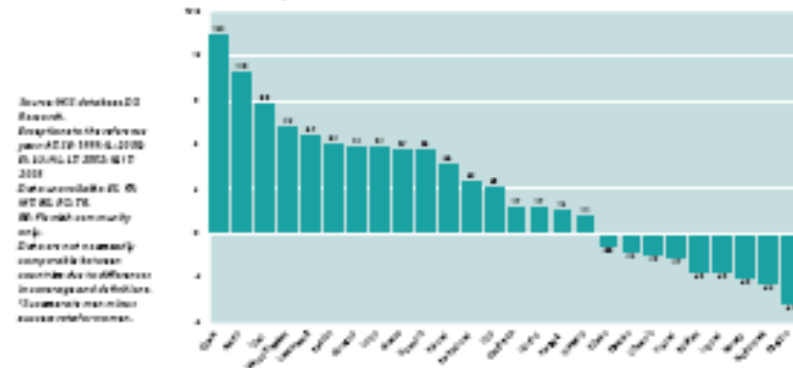
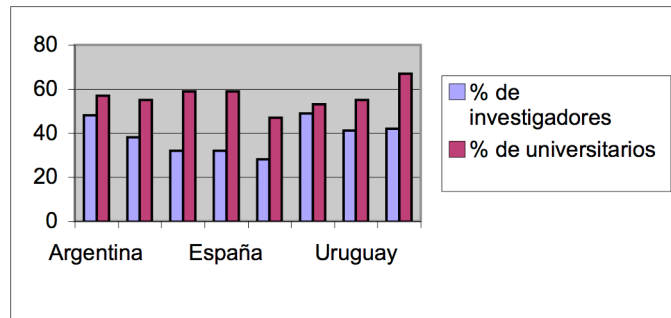


Figure 5.2: Research funding success rate differences¹ between women and men, 2004

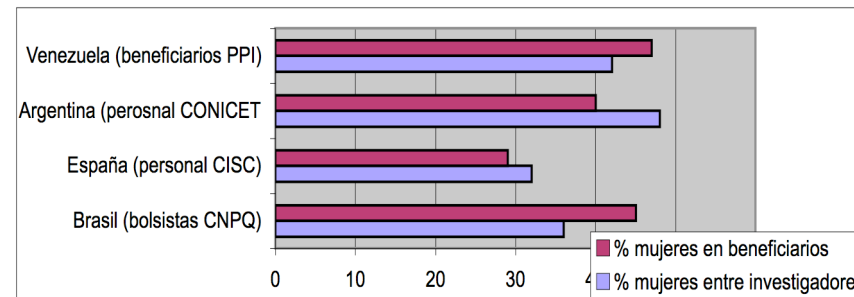


Success rate of men minus success rate of women

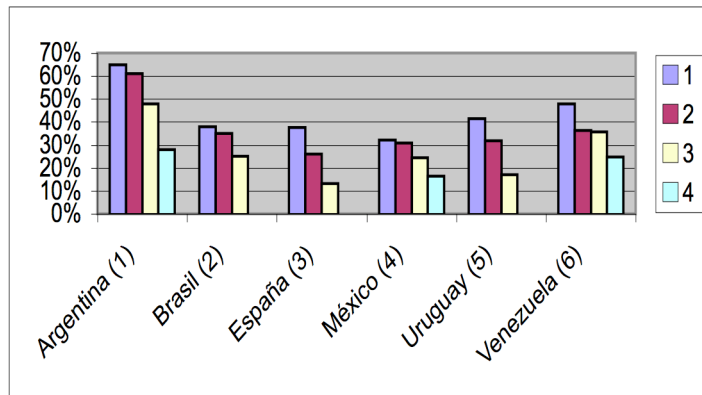
Some data on Latin America and Spain (Gentec Project)



%of female researchers and of female graduates



%of women researchers and %of women that receive financial support from national agencies



%of female researchers in each academic level

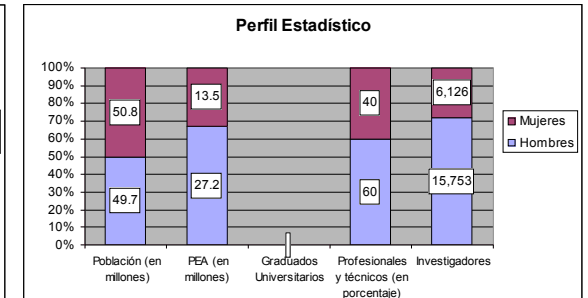
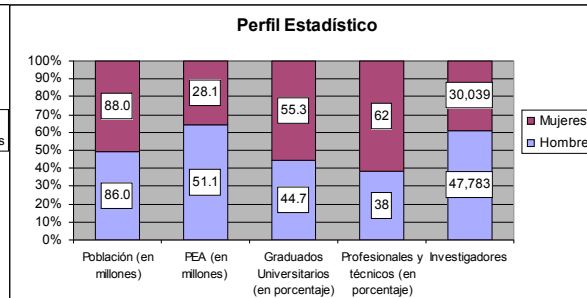
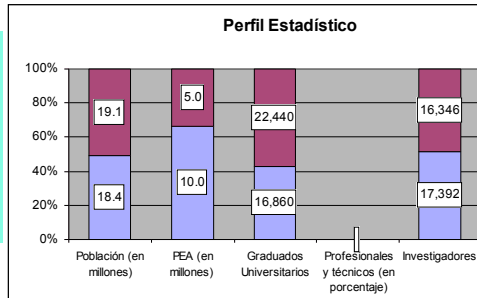
Comments on the UNESCO report single out the case of Argentina. They say that Argentina has a parity of 50%, but in the higher levels of scientific careers women are under-represented.

Argentina

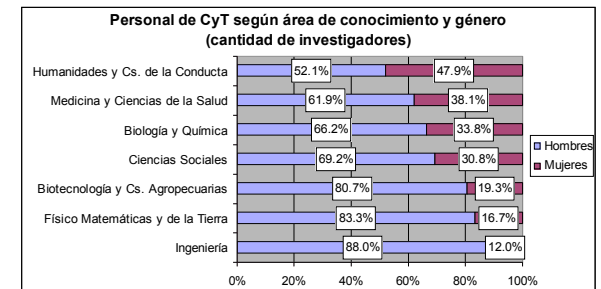
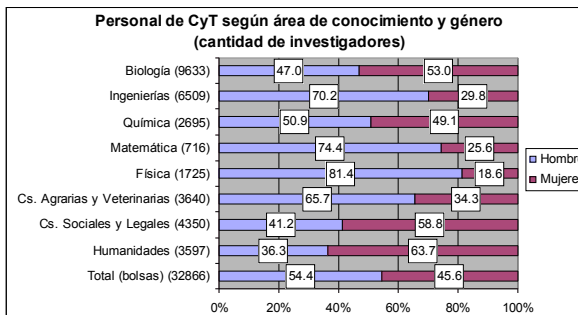
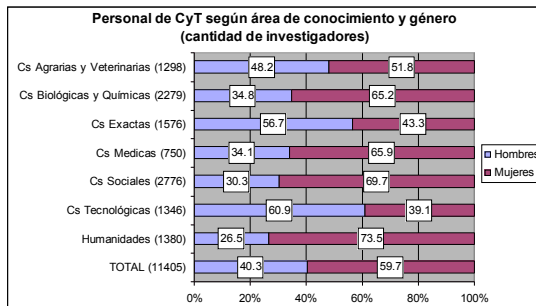
Brazil

Mexico

Total population



Resear chers



The situation in Argentina.

With data from:

INDICADORES
DE CIENCIA Y TECNOLOGIA
ARGENTINA 2003

Proyecto GENTEC

Funded by: UNESCO Oficina Regional

Montevideo - Programa de Ciencias Básicas e

Ingeniería

Survey conducted in 2002-2003 among 280 scientists in Argentina

GRAFICO N° 24: Porcentaje de Investigadores de jornada completa y parcial, según disciplinas de formación académica, al 31 de diciembre de 2003.

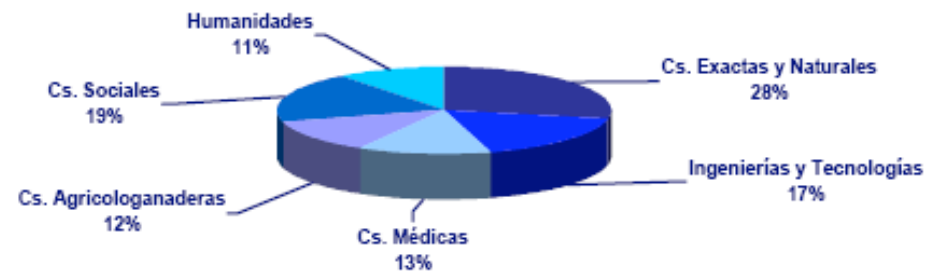
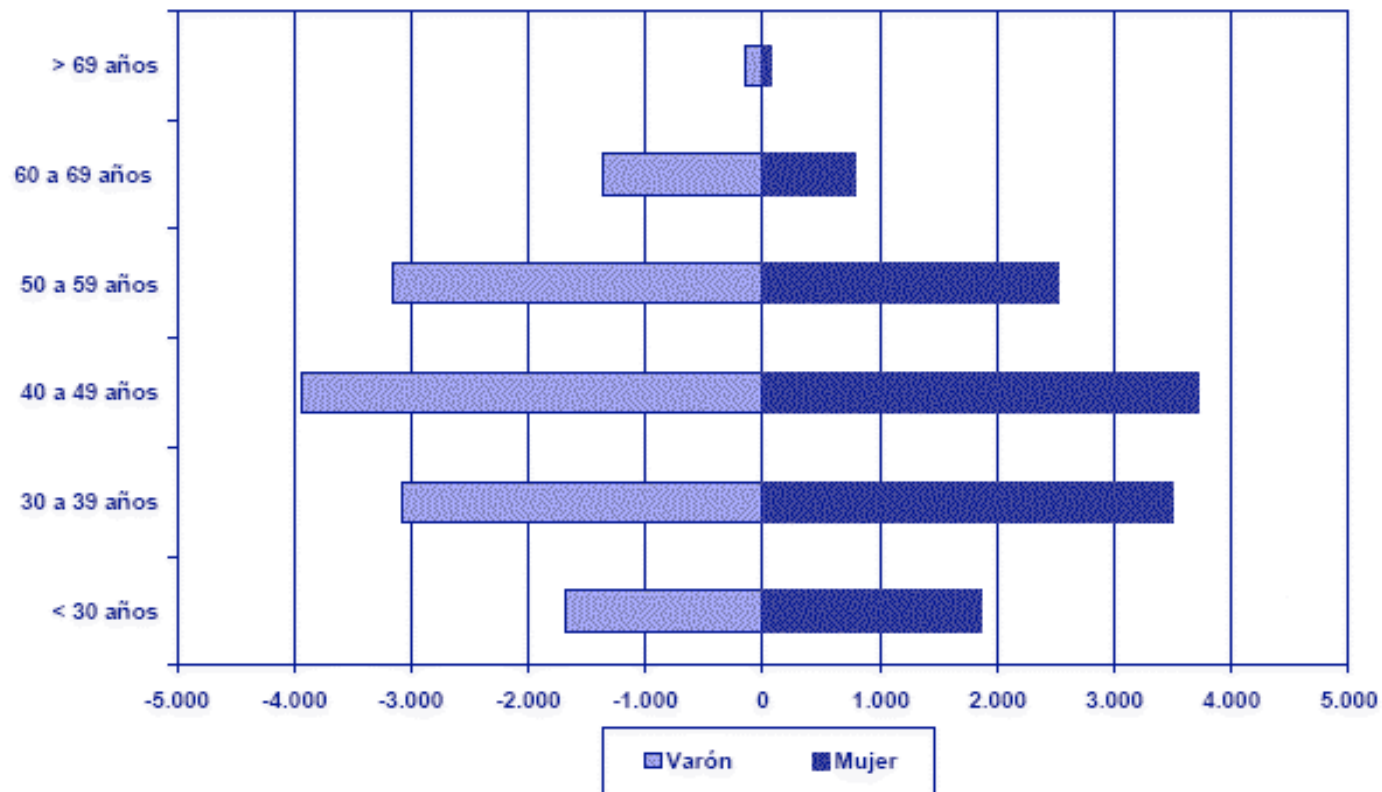


GRAFICO N° 29: Pirámide de edad de la población total de investigadores y becarios de jornada completa, dedicados a Investigación y Desarrollo, según género y grupos de edad, al 31 de diciembre de 2003.

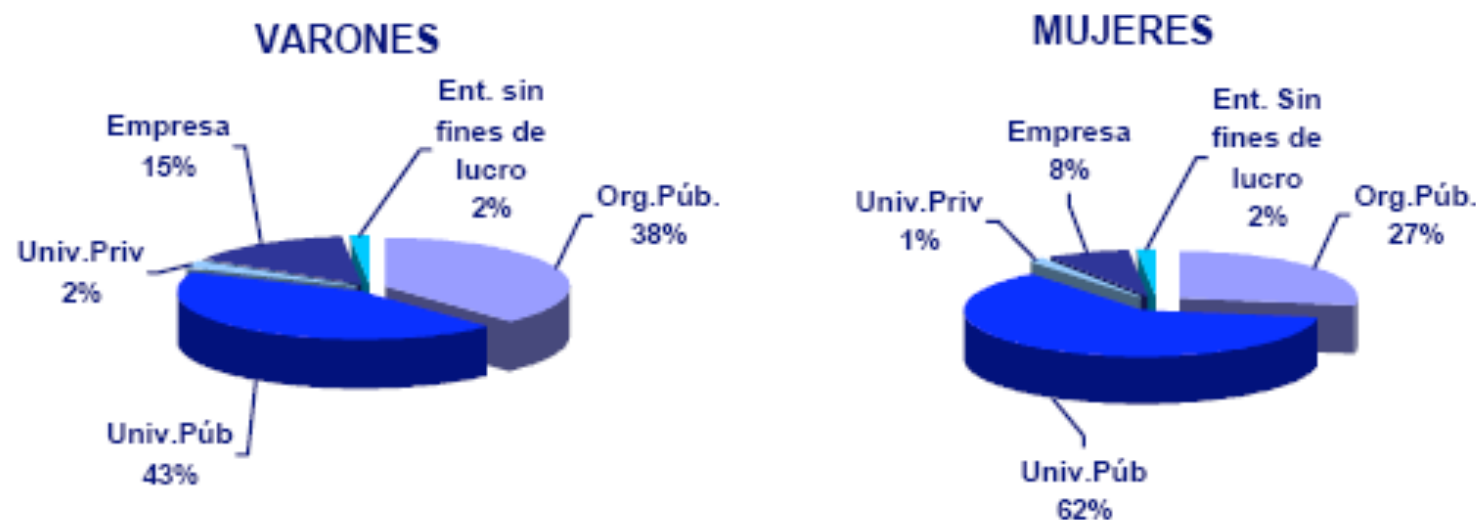


Researchers

CUADRO N° 27: Cargos de investigadores de jornada completa, dedicados a Investigación y Desarrollo, según género y tipo de entidad, al 31 de diciembre de 2003.

TIPO DE ENTIDAD	Varón	Mujer	TOTAL
TOTAL	10.942	9.329	20.271
Organismos Públicos	4.169	2.557	6.726
Universidades Públicas	4.740	5.800	10.540
Universidades Privadas	225	114	339
Empresas	1.620	713	2.333
Entidades sin fines de lucro	188	145	333

GRAFICO N° 30: Porcentaje de investigadores de jornada completa, dedicados a Investigación y Desarrollo, según género y tipo de entidad, al 31 de diciembre de 2003.

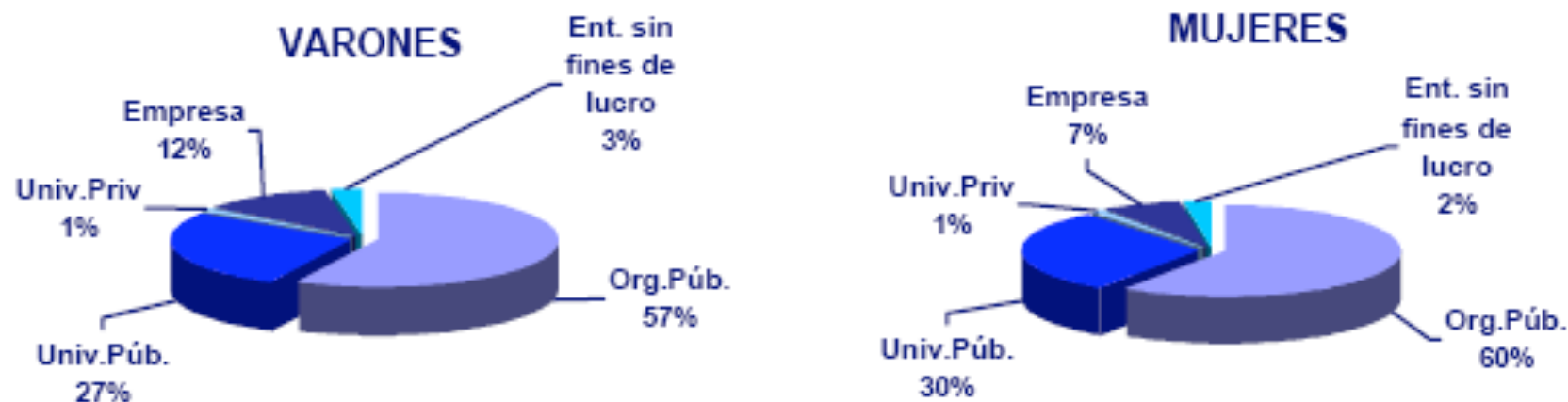


People on scholarships (usually, graduate students)

CUADRO N° 28: Cargos de Becarios de jornada completa, dedicados a Investigación y Desarrollo, según género y tipo de entidad, al 31 de diciembre de 2003.

TIPO DE ENTIDAD	Varón	Mujer	TOTAL
TOTAL	2.404	3.115	5.519
Organismos Públicos	1.378	1.856	3.234
Universidades Públicas	649	919	1.568
Universidades Privadas	33	36	69
Empresas	277	230	507
Entidades sin fines de lucro	67	74	141

GRAFICO N° 31: Porcentaje de becarios de jornada completa, dedicados a Investigación y Desarrollo, según género y tipo de entidad, al 31 de diciembre de 2003.



CUADRO N° 29: Cargos de Investigadores de jornada completa y parcial, dedicados a Investigación y Desarrollo, según género y grupos de edad, al 31 de diciembre de 2003.

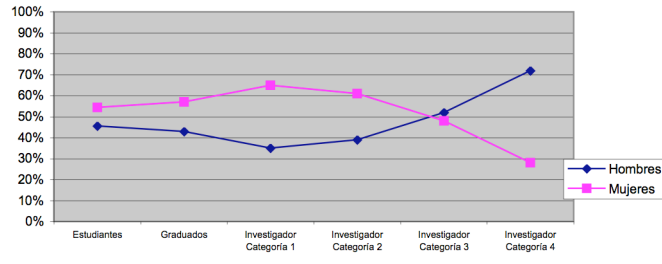
GRUPOS DE EDAD	Jornada Completa			Jornada Parcial		
	TOTAL	Varón	Mujer	TOTAL	Varón	Mujer
TOTAL	20.271	10.942	9.329	15.896	7.286	8.610
Menos de 30 años	768	428	340	1.149	522	627
30 a 39 años	4.048	2.016	2.032	4.908	2.153	2.755
40 a 49 años	7.455	3.854	3.601	4.994	2.214	2.780
50 a 59 años	5.663	3.147	2.516	3.401	1.564	1.837
60 a 69 años	2.135	1.355	780	1.229	686	543
70 y más años	202	142	60	215	147	68

CUADRO N° 30: Cargos de Becarios de jornada completa y parcial, dedicados a Investigación y Desarrollo, según género y grupos de edad, al 31 de diciembre de 2003.

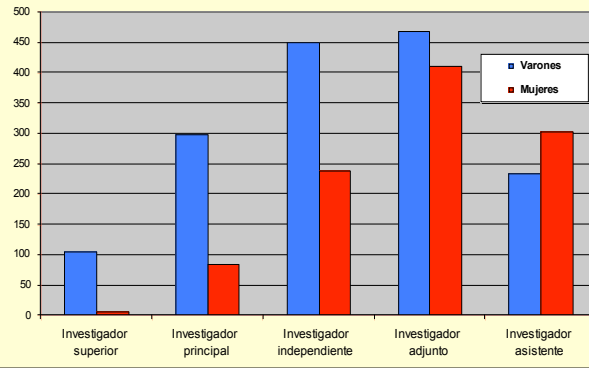
GRUPOS DE EDAD	Jornada Completa			Jornada Parcial		
	TOTAL	Varón	Mujer	TOTAL	Varón	Mujer
TOTAL	5.519	2.404	3.115	1.923	909	1.014
Menos de 30 años	2.792	1.259	1.533	1.393	651	742
30 a 39 años	2.518	1.057	1.461	468	225	243
40 a 49 años	196	80	116	56	29	27
50 y más años	13	8	5	6	4	2

Professional Development

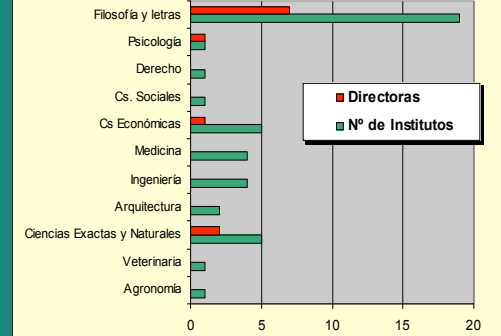
Evolución Profesional



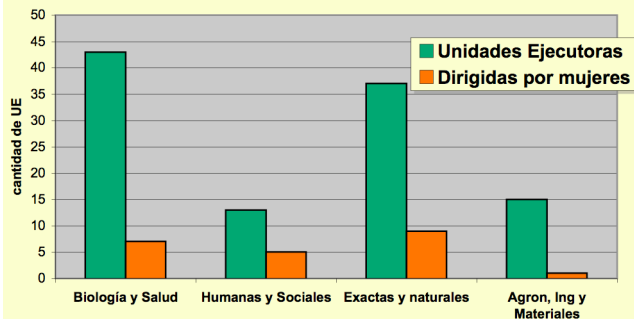
Investigadores del CONICET según categoría y género



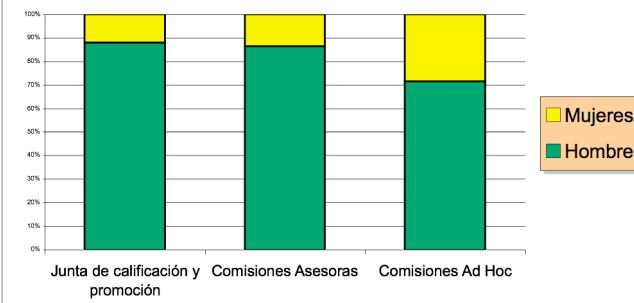
Relación entre el número de institutos y directoras



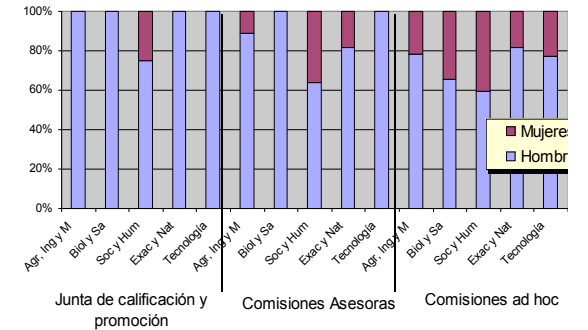
Relación entre la cantidad de UE y mujeres directoras



Distribución por sexo en instancias de evaluación



Distribución por sexo en órganos de evaluación y acreditación por campos del conocimiento



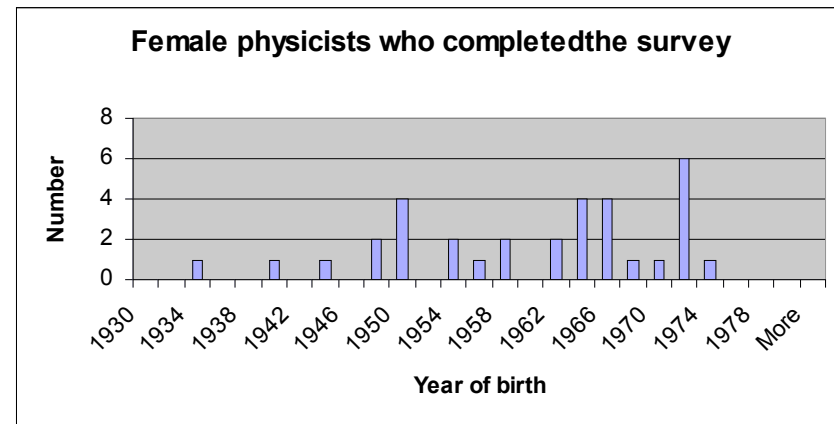
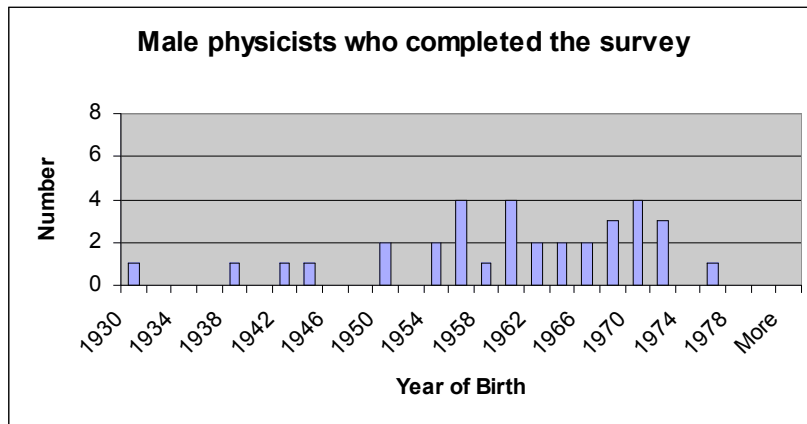
In 2002-2003 we conducted a survey aimed at investigating the situation of women in the natural sciences (see <http://www.fcen.uba.ar/gentec/>). To this end, we developed a questionnaire that was filled in by around 300 people in Argentina.

The survey had a series of questions to investigate to what extent family related issues could affect the advancement in the scientific career of men and women.

We asked: year of birth, marital status, moment of first marriage/union (related to academic career), kids, moment that kids were born, trips, number of times that place of residence had to be changed because of work, doctoral and postdoctoral activities (indicating institution). Mistake: we should have asked which year each of these events took place (rather than relate it to a specific step in the career path). There were some “qualitative” questions, such as whether marriage or kids had affected his/her career.

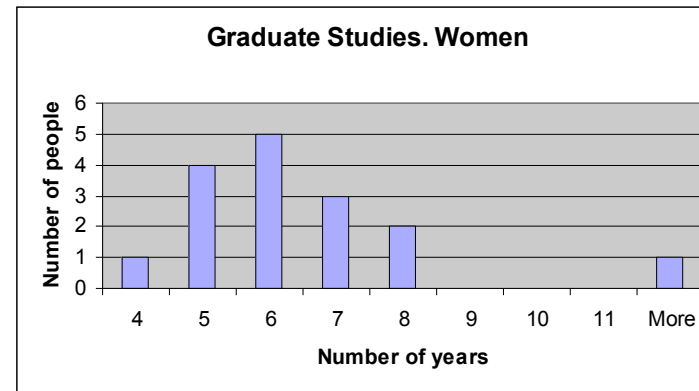
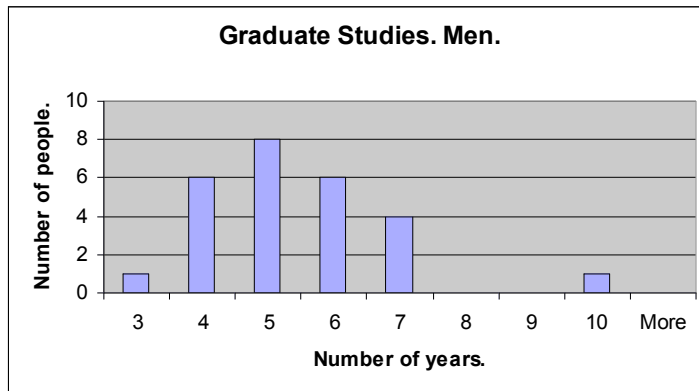
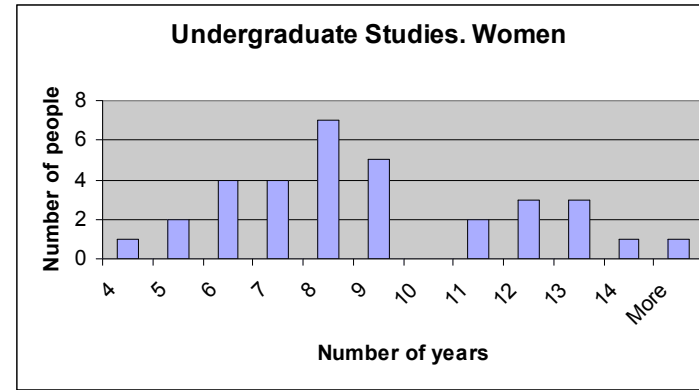
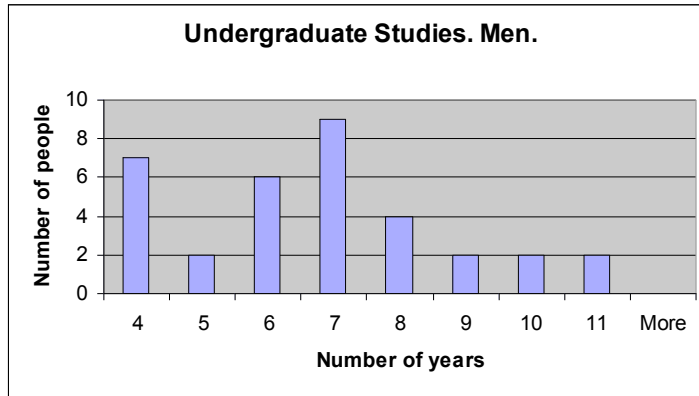
Results on “family” and career in the case of physicists.

The 67 “physicists” that answered the survey. (“Physicists”= the 34 men and 33 women who mentioned physics or material science as their area of expertise, regardless of their degree).



Distribution of physicists who completed the survey classified by gender and year of birth. We can observe that the male and female samples are quite similar in this regard.

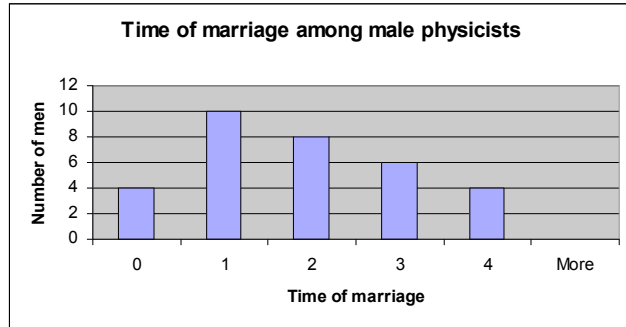
Physics: Graduate and undergraduate studies



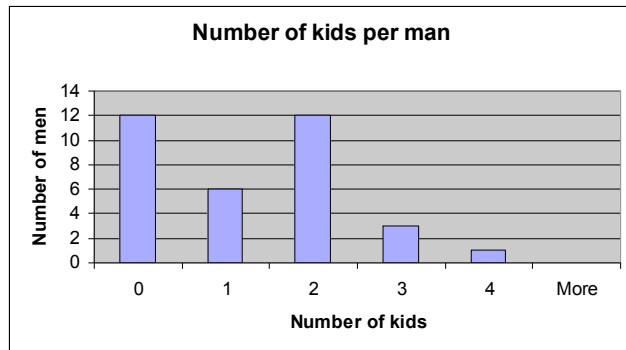
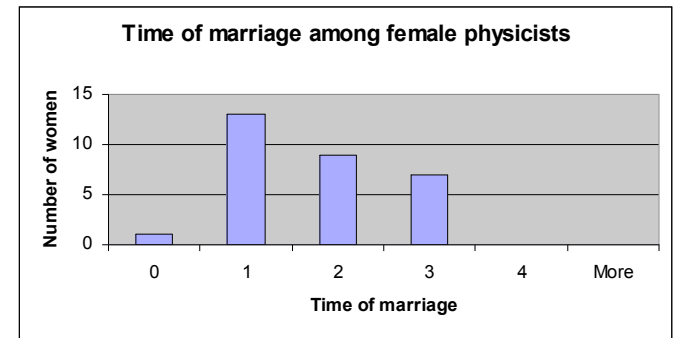
Number of years it took for each person to get his/her undergraduate and graduate degrees.

About the long tail in the duration of undergraduate studies in women: among the 10 women who spent over 10 years to get their undergraduate degrees, 5 of them had at least one child during that time period.

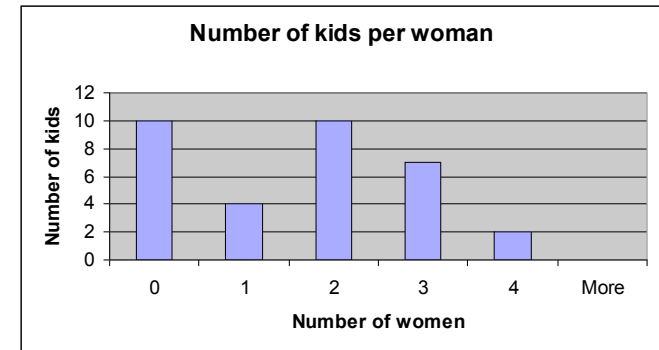
Physics: Career and family



Time of marriage:
 0: not yet (only PhD's); 1: before or during undergrad. studies; 2: between under and graduate school; 3: during graduate studies; 4: after PhD



Number of kids



# of kids	Mean	σ
0	5.7	2.1
≥ 1	0	0

Duration of undergrad studies and # of kids
 <-Men Women->

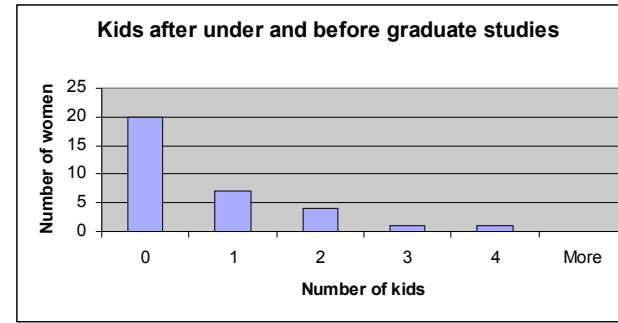
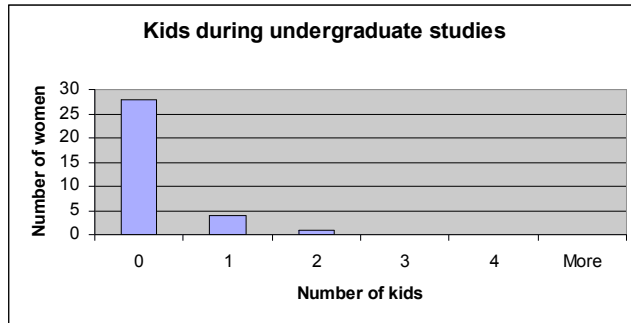
# of kids	Mean	σ
0	8.25	2.55
1	11.75	0.96

# of kids	Mean	σ
0	4.1	1.0
1	3.8	1.3
2	6.0	1.9
≥ 3	0	0

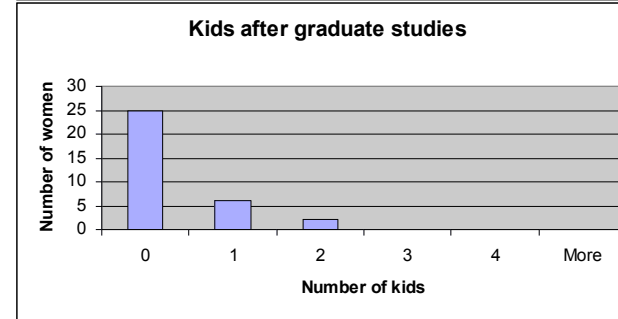
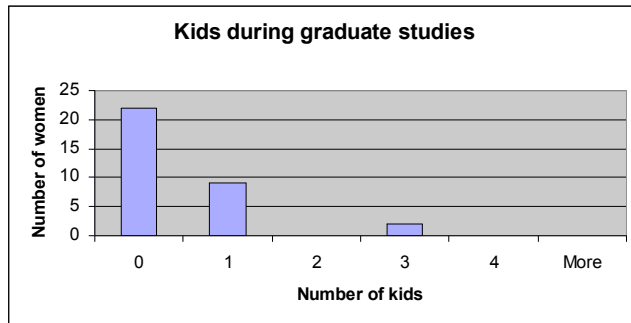
Duration of graduate studies and # of kids
 <-Men Women->

# of kids	Mean	σ
0	6.1	2.1
1	5.7	2.3
2	6.6	1.1
≥ 3	10.3	5.1

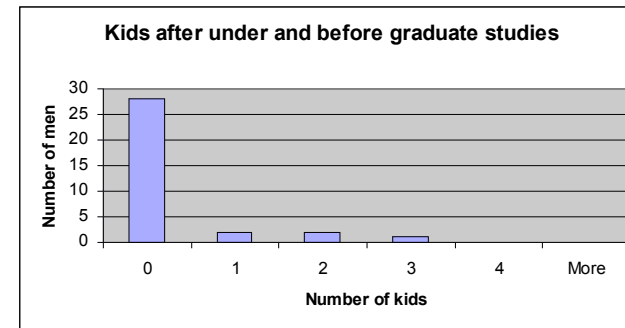
Physics: Career and family



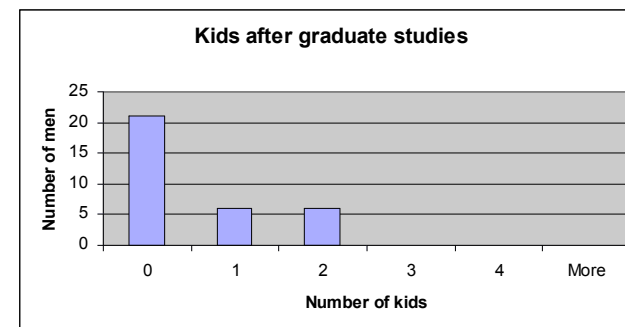
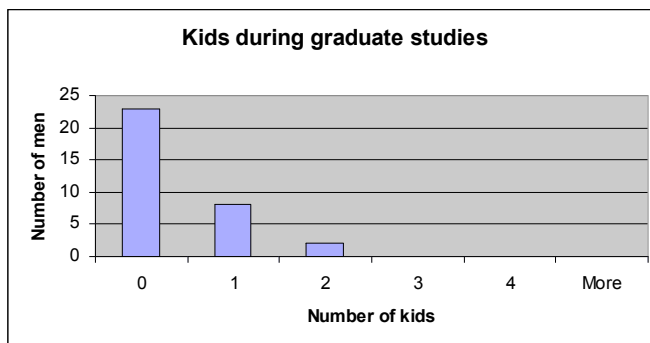
Women



Women tend to have kids earlier during their scientific careers than men. Is it because they have them younger?

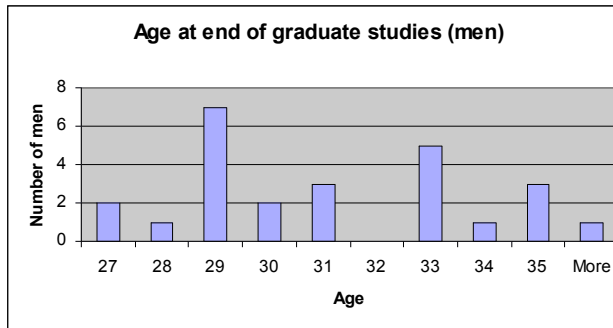
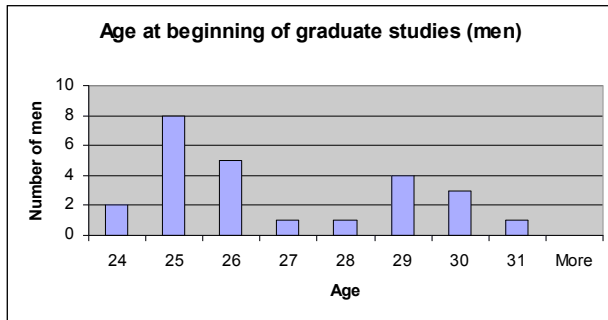
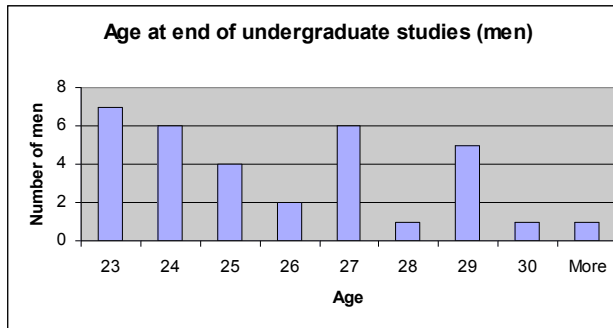
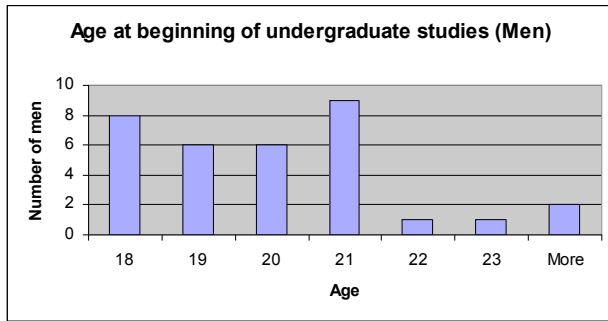


Men

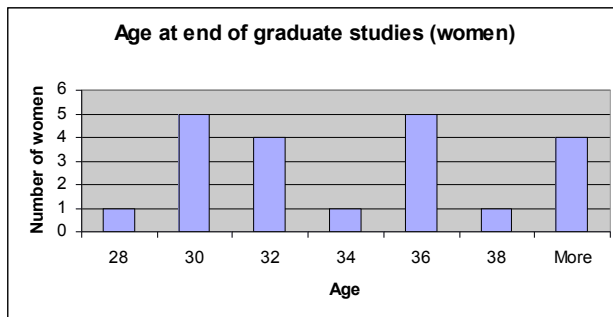
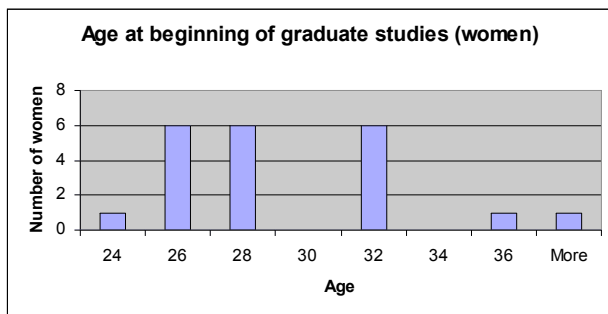
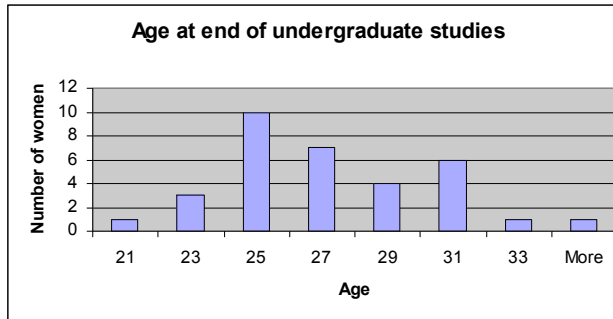
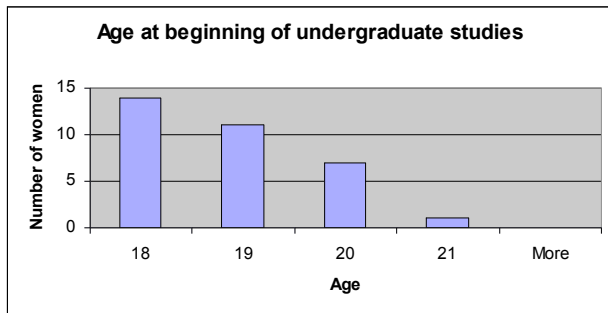


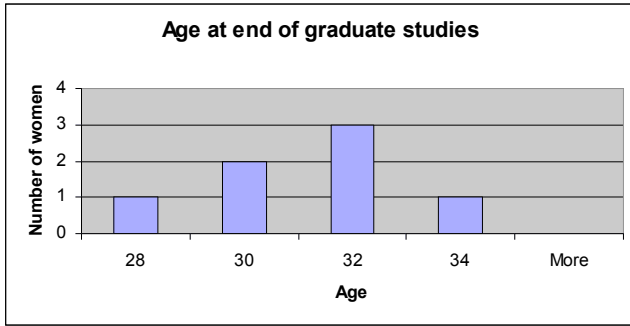
Physics: Career and age

Men

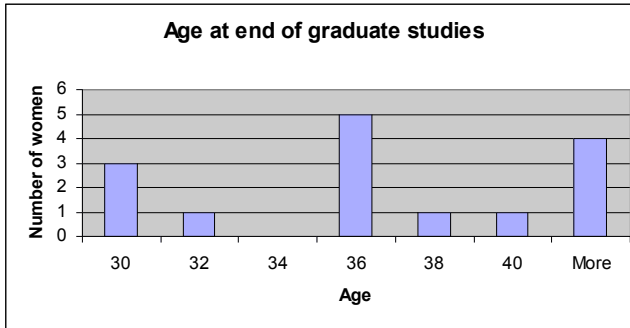
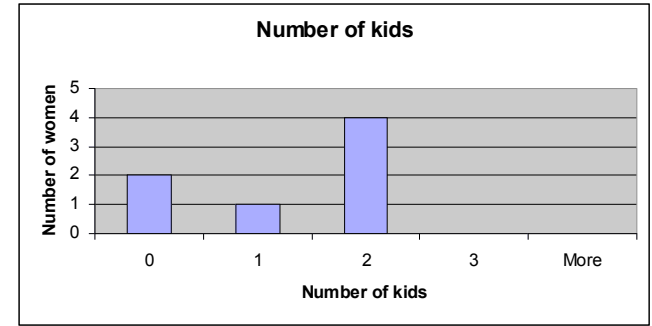


Women

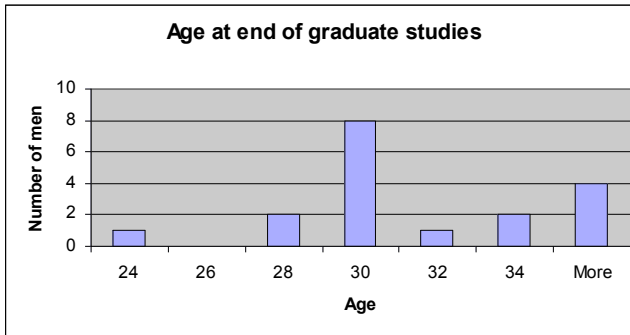
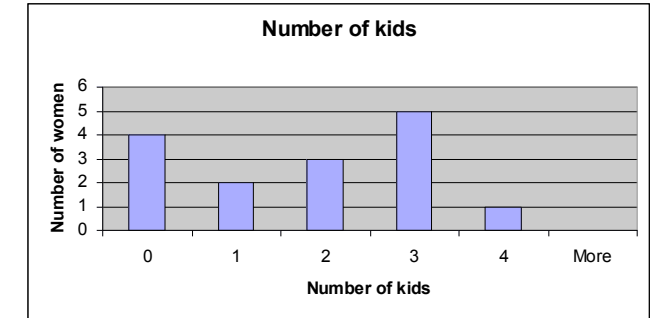




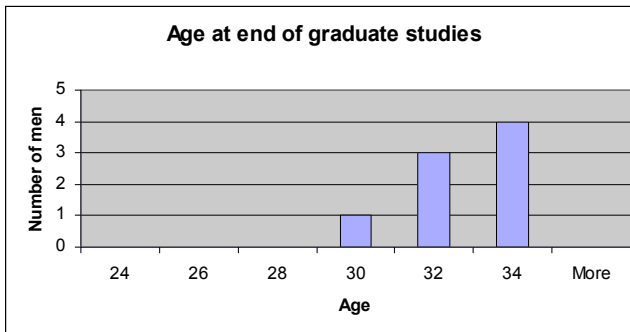
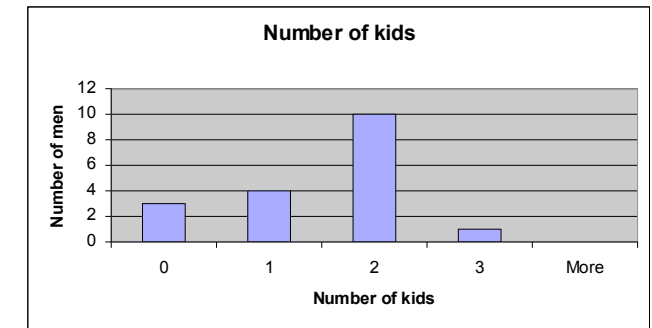
Female PhD's with post-docs abroad (7/22)



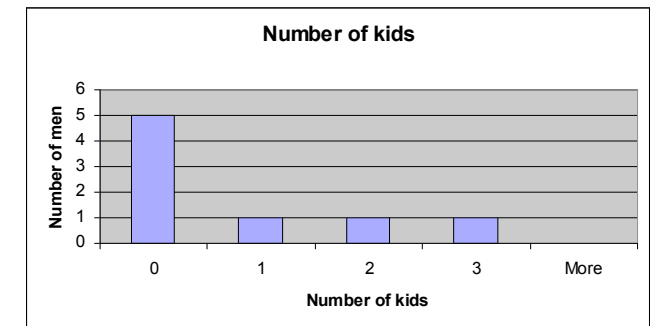
Female PhD's without post-docs abroad (15/22)



Male PhD's with post-docs abroad (18/26)



Male PhD's without post-docs abroad (8/26)



- 18/26 male PhD's were post-docs at a major institution abroad
- 7/22 female PhD's had such experience.
- Age at end of graduate studies sensibly larger for female PhD's without post-docs abroad than with post-docs abroad,
- Age at end of graduate studies slightly larger for women with post-docs abroad than for men.

- Average number of kids of female PhD's with children without post-docs abroad: 2.6
- For those with post-docs abroad: 1.8
- Percentage without children: 30% in both groups.

- Percentage of male PhD's with post-doc abroad and no kids: 16
- Average number of kids of male PhD's without post-docs abroad: 2
- For those with post-docs abroad: 1.8

Recent changes

Some (political) measures can be (and have been) taken to make having a successful scientific career with raising a family

The fact that the fraction of grants recently awarded by the National Agency for the Promotion of Science and Technology to groups headed by women in the area of physics, mathematics and astronomy is larger at the junior level than at that of consolidated groups (40% and 26%, respectively) may be an indication of a generational change in terms of group leadership in science.

However the society at large still does not accept women that try to impose their point of views with tactiques that are largely accepted in the case of men.

This addresses the issue on how to exert power. In any case, these cultural changes of the society take much longer to occur.



Red de Indicadores de Ciencia y Tecnología (RICYT)













