Women in Italian universities

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Abstract:

This paper provides an overview of the position of female academics at national level in Italy and within the University of Bologna in particular. Special reference is made to the scientific disciplines and faculties, usually considered the most difficult for women to penetrate. Both the percentage of women involved in academic activities and the status of their career advancement are examined.

Women's attitudes towards academic disciplines are also discussed, with reference to young women's perceptions of science. The enrolment percentages of female students and the percentage of female graduates from scientific faculties at the University of Bologna in the past ten years are highlighted.

The objective of this analysis is to identify the most appropriate targets for equal opportunity policies focused on higher education, at both national and local levels.

Keywords: women in science; women in universities; equal opportunities; Italy; University of Bologna.

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Female professors and researchers[1]

In looking at the position of women in Italian universities, we take as a first level of analysis the percentage of female academic staff in all disciplines and faculties, and their career status in terms of the three 'classes'[2] according to which academics are ranked in the Italian system. (Table 1).

At national level, women professors and researchers make up less than 29 % of total academic staff and only 13.32 % of academics who reach the highest class (*ordinari*) are women. There is clearly a steep decline in the representation of women in the more senior academic positions.

This general trend is confirmed by the figures for the University of Bologna, which are about the same.

It is generally accepted that the scientific disciplines are those in which women are least represented. Equal opportunity policies have therefore been concentrated on scientific faculties.

An analysis of the Italian case, however, shows that there are certain distinctions that should be made both among scientific disciplines and within the other academic fields (Table 2).

In scientific disciplines, the representation of women on the academic staff ranges from about 44% (Biological sciences) to about 9 % (Industrial Engineering). In other disciplines, the range is from 53% (Antiquity, Literature and Art) to 23 % (Economics).

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[1] Tables 1–9 were prepared using data provided by MIUR (the Italian Ministry of Education, University and Research).

[2] The Italian academic career is characterised by three classes: *ordinario* (the highest), *associato*, and *ricercatore*. The statistics on academic employees also include two other qualifications: *assistenti* and *incaricati*. The first relates to the old academic rankings and is equivalent to *ricercatori*; the second is not relevant to the academic career. Furthermore, the figures referring to *assistenti* and *incaricati* are very low in each faculty, or zero, so the analysis in this paper focuses on the classes *ordinari, associati, ricercatori*, even though all the qualifications are listed in the tables.

Thus there are also some non-scientific areas in which female under-representation is lower than it is in some scientific areas: for example, Socio-Political Sciences, Law, and Economics should be considered worthy of equal opportunity policies to a greater extent than Biological, Mathematical, Statistical, Veterinary, and Chemical Sciences.

The significantly lower representation of women in the higher academic ranks is evident across all disciplines.At the highest level (*ordinari*), in scientific areas the percentage of women ranges from 22% (Biological Sciences) to 2% (Industrial Engineering); in non-scientific disciplines, Economics emerges as the field with the lowest female representation (9.8%).
While these statistics can be helpful in defining the target of equal opportunity policies at national level, useful information for an appropriate policy at local level can be derived from an analysis of numbers of women academics by faculty (Table 3).
Women academics are under-represented in all scientific faculties in Italy: women professors and researchers make up less than 25% of the total academic staff, and fewer than 10% of academics who reach the highest class (*ordinari*) are women. The faculty with the highest proportion of women is Pharmaceuticals (45% of total academics) The lowest level of female representation is in Engineering (about 14%). The analysis at faculty level again shows a strong decrease in women's representation with increasing rank, with fewer than 21% in the *ordinari* class in Pharmaceuticals and none at all in Industrial Chemistry[3].
Comparison with data at local level shows that the imbalance between women and men in scientific faculties is similar at the University of Bologna: fewer than 25% of academic staff, and

[3] Apart from the Faculty of Physical Education, the figures for which are influenced by the fact that it was only recently established and its academic staff is drawn largely from other faculties.

fewer than 8% of *ordinari* are women (Table 4 and 5). The faculty with the highest proportion of women is Pharmaceuticals, in which female academics make up almost 50% of the academic staff. The faculties with the lowest female representation are Architecture (10%) and Engineering (10.71%). The faculties with the lowest percentages of women *ordinari* are Industrial Chemistry (none) and Engineering (about 2%)[4]. In Industrial Chemistry female academics make up 20% of the total, which may indicate that in this faculty the barriers to career progression for women are even higher than those in Engineering, where women account for about 11% of the total and about 2% of the *ordinari* are women. The highest numbers of women in the *ordinari* class are to be found in the Faculty of Statistics (25% of women) and the Faculty of Pharmaceuticals (20 %); the same faculties host the highest percentages of women as academics (apart from Physical Education), but it is worth mentioning that, while 49% of the academic staff of the Faculty of Pharmaceutical are women, only 20% of its *ordinari* are women. By contrast, in the Faculty of Statistics about 38% of the total academic staff and 25% of the *ordinari* are women. The implication is that it is harder for women to make progress in their academic careers in the Faculty of Pharmaceuticals than in the Faculty of Statistics.

To evaluate more accurately the imbalance between females and males, independently from the total number of men and women employed as academic staff, a comparison is made between the percentage of women academics who reach the highest class and the equivalent percentage of male academics (Table 6). As can be seen from the table, the percentage of women who reach the upper class (11%) is one-third of the percentage of men who reach it

[4] We exclude the Faculties of Physical Education and Architecture, which were established only recently.

(33%). More then 53% of women remain in the lower class (*ricercatori*), compared with 30% of men. The men are fairly evenly distributed among the three classes — *ordinari, associati, ricercatori* — while the women are concentrated in the lowest class and their presence declines markedly in the higher classes.

Within scientific faculties at the University of Bologna (Table 7), the percentage of women who reach the highest class is lower then at national level (8.59% versus 11.23%) and the percentage of men is higher (34.79% against 33%).

Looking all the faculties at the University of Bologna (Table 8), the percentage of women who reach the upper class (12.41%) is three times lower than the percentage of men who reach it (35.64%). Again, there is a concentration of women in the lowest class.

Taking each faculty individually, the difference in numbers of women and men at the top level is again evident (Table 9). At the University of Bologna, in Engineering and Mathematics, Physics and Natural Sciences the percentage of women who succeed in becoming *ordinari* is one-fifth of the percentage of men who reach that level. In Medicine and in Pharmaceuticals it is one-quarter. In Industrial Chemistry, Architecture and Physical Education there are no women *ordinari*. The imbalance is very noticeable also in non-scientific faculties: in the Faculty of Law, the percentage of women who become ordinari is one-quarter of the percentage of men who reach that class, and in Political Science it is less than one-third. At the University of Bologna, the Faculties of Statistics and Economics exhibit the least serious imbalance between women and men in this respect.

At national level, the percentage of the total women employed in each faculty who reach the highest class is about one-third of the percentage of men who reach that level; this applies to all faculties except Statistics, in which the percentage of women *ordinari* is about half of the percentage of men.

Female students[5]

In order to evaluate whether the women's attitudes to science had changed in recent years and to identify the choices women were making among different scientific areas, the number of female students enrolled in each scientific faculty over the last 10 years was considered (Table 10)[6].

For all faculties, the percentage of women who chose to enrol in their first year of study in a scientific faculty has been almost constant over the last 10 years, reaching about 38% in the latest academic year considered. The trend differed from faculty to faculty, sometimes increasing (Biotechnology, Medicine, Agriculture, Engineering), sometimes stable (Pharmaceuticals, Veterinary, Industrial Chemistry), sometimes decreasing (Statistics, Mathematics, Physics, Natural Sciences). Focusing on the last three academic years, it is worth mentioning that the following scientific faculties had more female than male student enrolments: Biotechnology, Pharmaceuticals, Medicine and Surgery, Veterinary Science. Other faculties, such as Agriculture, Industrial Chemistry, and Mathematics, Physics, Natural Sciences registered an average female enrolment of 36–39% in the same period. In the Faculty of Statistics, the average was 43% (within a decreasing trend). This suggests that a policy designed to attract young women to the scientific faculties should not focus on all scientific areas, but should concentrate its actions on specific areas, especially that of Engineering, where the proportion of women enrolled is about 18%.

[5] Tables 10 and 11 were prepared by Francesca Feletti, using data provided by the Statistical Observatory of the University of Bologna.

[6] The data for the University of Bologna might be considered as reflective of the data for the national level.

Female graduates.

A further indicator of women's attitudes to science is provided by the percentage of females who attained their degree in the last ten years (Table 11).

For all faculties taken as a whole, the trend is almost constant, as we have already seen in the context of enrolment. This trend is confirmed for almost every faculty, with some exceptions such as Medicine, Veterinary Science and Engineering, where the trend was found to be increasing. Engineering is the faculty with the lowest percentage of women obtaining a degree throughout the period examined (16% in the academic year 1999–2000). In the last four years the average proportion of females graduating was over 50% in the Faculties of Pharmaceuticals, Statistics, Medicine, Veterinary Science, and Mathematics, Physics, Natural Sciences.

In light of these graduation statistics, it seems that the equal opportunity policy should focus on Engineering (about 15% of females graduated in the last four years) and Agriculture.

Conclusion

In Italian universities female academics are under-represented in all disciplines and faculties; in only one discipline (Antiquities, Literature and Art) do they make up more than half of the total academics employed (53%), and, even in that discipline, discrimination is evident at the higher level: women account for only one-third of the total *ordinari.* Apart from the discipline of Biological Sciences and the Faculty of Pharmaceuticals, the proportion of women academics is less than 40% of the total in every discipline and faculty — with the lowest figures of around 9% in the discipline of Industrial Engineering and about 14 % in the Faculty of Engineering. In all disciplines and faculties the imbalance between women and men increases with increasing rank,

so that the percentage of women in the highest class ranges between zero to 22% of total *ordinari.*

A further indicator of this strong vertical discrimination is the percentage of the total women academics in a faculty who reach the *ordinario* class. This is usually one-third of the equivalent percentage for males: for some faculties at the University of Bologna, the imbalance is even higher.

An equal opportunity policy for the better representation of female academics should focus not only on scientific disciplines and faculties, even if they do, as a whole, constitute the most difficult problem area in terms of the employment and career development of women. Disciplines such as Economics and Law have lower percentages of women on their academic staffs than some scientific faculties and, furthermore, demonstrate a similar vertical discrimination at the top level.

Equal opportunities policies aimed at young women enrolling in university focus on promoting the scientific disciplines; in Italy such policies should, however, take into account the fact that in some scientific faculties, such as Pharmaceuticals, Biotechnology, Medicine and Veterinary Science, women are in fact over-represented. In areas such as these, policies should concentrate on the career opportunities of women scientists in order to guarantee the use of their skills in employment.

Table 1. Percentage of women in total academic staff, for all disciplines and faculties, in Italy and at the University of Bologna (as at 1 January 2001).

Class	Italy	Bologna
Ordinari	13.32	13.28
Associati	27.70	30.42
Ricercatori	41.62	44.63
Assistenti	31.96	27.5
Incaricati	100	20.0
Total	**28.88**	**30.53**

Table 2. Percentage of women in total academic staff in each class, for each discipline; Italy, as at 1 January 2001.

Discipline	Class (%)					
	Ordinari	*Associati*	*Ricercatori*	Assistenti	Incaricati	**Total**
Scientific disciplines:						
Biological Sciences	22.06	44.79	57.80	63.89	Nil	**43.25**
Mathematical Sciences	13.52	38.58	49.88	47.73	0	**35.51**
Statistic Sciences	18.15	36.19	46.76	37.93	Nil	**34.35**
Veterinary Sciences	12.17	32.21	49.64	60.00	Nil	**32.73**
Chemical Sciences	11.01	28.18	51.05	42.86	50.00	**31.04**
Agricultural Sciences	7.27	20.37	37.18	25.00	Nil	**22.64**
Earth Sciences	9.02	20.04	36.06	22.22	Nil	**22.24**
Medical Sciences	6.64	18.24	30.92	18.62	Nil	**20.77**
Civil Engineering and Architecture	9.30	16.99	27.24	9.46	Nil	**18.63**
Physical Sciences	4.96	14.97	25.59	35.71	Nil	**15.41**
Information Sciences	8.82	14.54	20.75	14.28	0	**14.78**
Industrial Engineering	2.19	8.36	17.26	5.26	Nil	**8.95**
Other disciplines:						
Antiquities, Literature and Art	33.40	53.90	65.31	57.63	Nil	**53.06**
Philosophy, History, Pedagogical and Psychological Sciences	21.72	36.43	52.82	44.44	Nil	**39.27**
Socio-Political Sciences	14.75	30.09	40.84	42.86	Nil	**30.02**
Law	11.10	24.91	42.31	23.43	0	**26.80**
Economics	9.80	21.36	37.33	25.81	0	**23.28**
Total	**13.32**	**27.70**	**41.62**	**31.96**	**100**	**28.88**

Table 3. Percentage of women in total academic staff in each class, for each faculty; Italy, as at 1 January 2001.

Faculty	Class (%)					
	Ordinari	Associati	Ricercatori	Assistenti	Incaricati	**Total**
Scientific faculties:*						
Pharmaceuticals	20.83	43.00	62.81	63.64	0	**44.94**
Physical Education	38.46	35	41.67	nil	Nil	**37.78**
Statistics	20.37	39.65	41.38	20	Nil	**33.02**
Veterinary Science	12.09	29.78	48.13	50.00	0	**31.59**
Mathematics, Physics and Natural Sciences	13.23	28.70	44.32	43.95	25.00	**29.51**
Architecture	14.81	24.48	35.49	33.33	20.00	**26.37**
Medicine and Surgery	8.40	21.51	33.82	25.67	0	**23.33**
Agriculture	7.77	20.93	36.24	22.73	0	**22.40**
Industrial Chemistry	0	17.78	34.48	100	Nil	**20.00**
Engineering	4.69	13.51	22.56	21.62	13.33	**13.89**
Total scientific faculties	**9.91**	**23.46**	**36.25**	**29.19**	**16.67**	**24.41**
Political Sciences	14.44	32.22	47.04	32.14	75.00	**32.60**
Economics	12.21	27.64	41.57	31.41	27.27	**28.14**
Law	9.62	23.49	41.35	23.68	0	**25.76**

*Some minor faculties are not listed here: Nautical Sciences, Environmental Sciences, Class of Science at Pisa, Class of Experimental Science at Pisa, Class of Physics and Mathematics at Trieste, School of Aerospace Engineering.

Table 4.	Percentage of women in total academic staff in each class, for each faculty; University of Bologna; as at 1 January 2001.

Faculty	**Class (%)**					
	Ordinari	Associati	Ricercatori	Assistenti	Incaricati	**Total**
Scientific faculties:						
Pharmaceuticals	20.00	52.78	68.29	Nil	nil	**49,53**
Physical Education	0	42.86	100	Nil	nil	**44.44**
Statistics	25.00	42.86	45,83	Nil	nil	**38.46**
Veterinary Science	14.81	41.38	47.22	nil	nil	**35.87**
Mathematics, Physics and Natural Sciences	7.14	29.45	42.55	40	0	**27.96**
Medicine and Surgery	7.89	22.22	40.36	22.22	nil	**25.16**
Agriculture	7.55	19.30	41.42	0	nil	**24.17**
Industrial Chemistry	0	17.78	34.48	100	nil	**20**
Engineering	2.34	9.00	21.67	0	0	**10.71**
Architecture	0	0	50	nil	nil	**10**
Total scientific faculties	**7.57**	**24.46**	**39.68**	**25.00**	**0**	**24.92**
Political Science	13.04	40.00	48.15	0	nil	**34.39**
Economics	18.37	26.09	45.10	14.28	50.00	**29.68**
Law	7.69	33.33	38.18	50.00	nil	**25.00**

Table 5. Percentage of women in total academic staff of scientific* faculties; Italy and the University of Bologna, as at 1 January 2001.

Class	Italy	University of Bologna
Ordinari	9.91	7.57
Associati	23.46	24.46
Ricercatori	36.25	39.68
Assistenti	29.19	25
Incaricati	16.67	0
Total	**24.41**	**24.92**

*The same faculties have been considered at national and at local level: Agriculture; Architecture; Engineering; Industrial Chemistry; Mathematics, Physics, Natural Sciences; Medicine and Surgery; Pharmaceutics; Physical Education; Statistics; Veterinary Science.

Table 6. Percentages of men and women in each academic class out of total male and female academic staff in scientific faculties, Italy, as at 1 January 2001.

Class	Number		Percentage	
	Female	Male	Female	Male
Ordinari	949	8,624	11.23	32.97
Associati	2,799	9,131	33.13	34.91
Ricercatori	4,520	7,947	53.50	30.38
Assistenti	174	422	2.06	1.62
Incaricati	6	30	0.08	0.12
Total	**8,448**	**26,154**	**100**	**100**

Table 7. Percentages of men and women in each academic staff Out of total academic male and female staff in scientific Faculties, University of Bologna, as at 1 January 2001.

Class	Number		Percentage	
	Female	Male	Female	Male
Ordinari	39	476	8.59	34.79
Associati	160	494	35.24	36.11
Ricercatori	250	380	55.07	27.78
Assistenti	5	15	1.10	1.10
Incaricati	0	3	0	0.22
Total	**454**	**1,368**	**100**	**100**

Table 8. Percentages of men and women in all faculties, University of Bologna, as at 1 January 2001.

Class	Number		Percentage	
	Female	Male	Female	Male
Ordinari	109	712	12.41	35.64
Associati	300	686	34.17	34.33
Ricercatori	457	567	52.05	28.38
Assistenti	11	29	1.25	1.45
Incaricati	1	4	0.12	0.20
Total	**878**	**1989**	**100**	**100**

Table 9. Percentages of male and female *ordinari* out of total male and female academic staff by faculty, University of Bologna and Italy, as at 1 January 2001.

Faculty	University of Bologna		Italy	
	Female	**Male**	**Female**	**Male**
Scientific faculties:				
Statistics	20	37.5	20.75	40.00
Agriculture	9.09	35.51	10.67	36.53
Architecture	0	33.33	13.77	28.38
Industrial Chemistry	0	26.31	0	26.31
Pharmaceuticals	11.32	44.44	11.74	36.41
Engineering	7.7	38.46	10.55	34.60
Medicine and Surgery	7.63	29.91	8.81	29.23
Veterinary Science	12.12	38.98	11.62	39.02
Mathematics, Physics and Natural Sciences	6.78	34.21	12.97	35.60
Physical Education	0	11.11	29.41	28.57
Total scientific faculties	**8.59**	**34.79**	**11.23**	**32.97**
Economics	19.56	36.69	12.93	36.42
Law	13.33	53.33	14.32	43.68
Political Science	11.11	38.83	12.97	37.00

Table 10. **First-year female students as a percentage of total first-year enrolments in each scientific faculty, University of Bologna, 1990-2000.**

Faculty	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–2000
Agricultural	17.94	21.91	30.30	35.61	29.97	35.66	42.16	38.50	39.51	29.54
Biotechnology	n.a.	n.a.	n.a.	n.a.	61.90	56	61.96	63.11	63.92	68.37
Industrial Chemistry	32.53	43.60	46.10	33.61	32.54	35.96	39.51	36.67	32.80	42.31
Pharmaceuticals	65.28	72.04	70.82	67.06	69.49	69.56	68.42	68	67.72	70.98
Engineering	10.82	14.40	11.70	14.75	15.10	16.67	16.47	18.52	18.6	17.21
Medicine and Surgery	52.85	49.34	59.28	60.90	60.10	61.65	53.68	58.46	60.68	65.78
Veterinary Science	58.95	61.78	59.73	58.24	56.08	57.30	59.56	57.74	64.81	61.02
Mathematics, Physics and Natural Sciences	46.93	48.37	46.66	47.11	43.96	43.02	41.06	41.34	39.66	37.34
Statistics	53.04	50.31	48.12	49.37	43.60	38.17	47.53	46.75	44.41	38.13
Total	33.95	36.60	34.15	36.08	34.48	36.47	36.78	38.28	43.32	38.37

Table 11. Women graduates as a percentage of total graduates in each scientific faculty, University of Bologna, 1990 –2000.

Faculty	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98	1998–99	1999–2000
Agriculture	17.68	21.84	21.87	21.88	26	23	22.2	17.4	18.5	31.5
Industrial Chemistry	41.47	34	43.48	41.56	40	40.4	56.3	43.9	45.65	44.12
Pharmaceuticals	68.23	71.35	68.6	68.37	67	68.10	69.60	72	74.80	75.09
Engineering	8.85	8.74	10.20	12.30	13	11.9	15.30	14.80	14.10	16.29
Medicine and Surgery	43.23	46	43.31	42.45	43	48.3	52.5	48.2	55.85	57.30
Veterinary Science	36	30.36	37.81	39.40	38	41.4	51.50	51.40	55.74	53.91
Mathematics, Physics and Natural Sciences	52.17	56.24	47.60	56.60	52	57.70	53.70	n.a.	52.48	50.21
Statistics	57.42	61.60	52.35	63.74	58	64.1	42.6	n.a.	51.57	65.43
Total	35.41	38.02	34.94	38.57	38	39.24	40.19	32.39	39.23	40.11