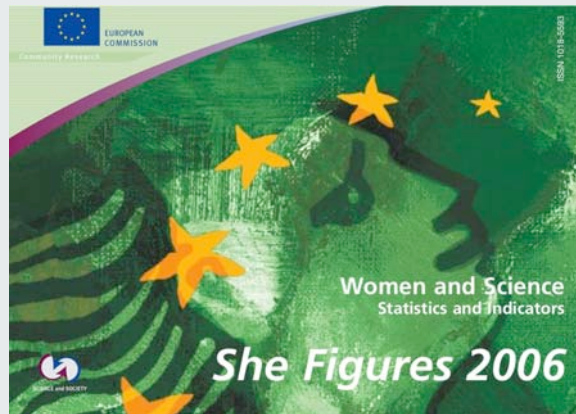


# Analysis of female and male applicants to the EMBO Long-Term Fellowship Programme

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Women in Science: The Way Forward  
9 - 11 May 2007, Heidelberg



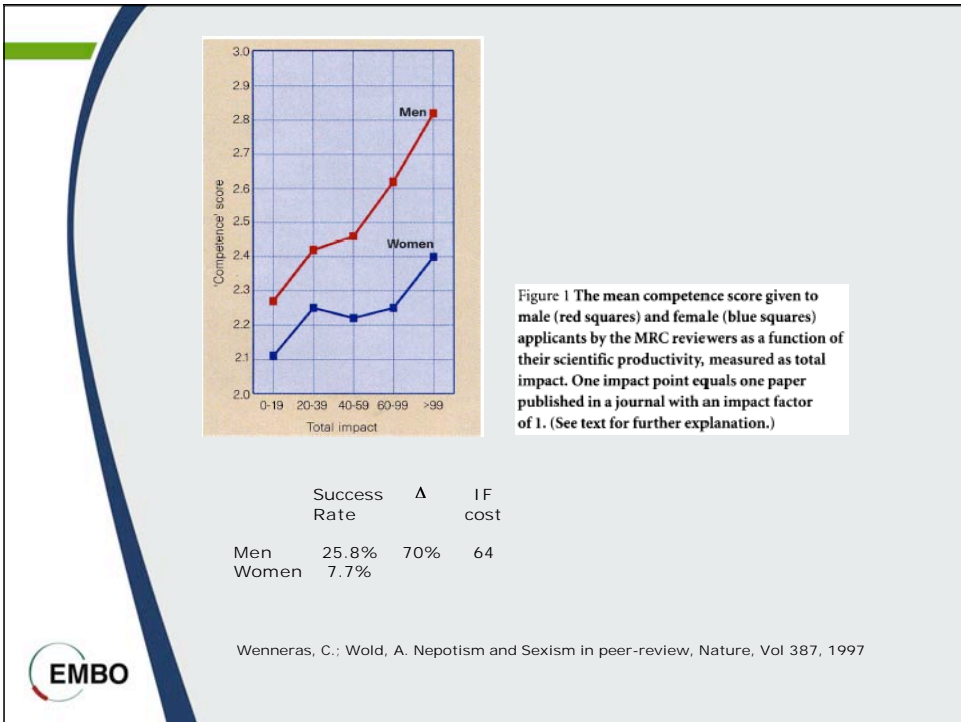
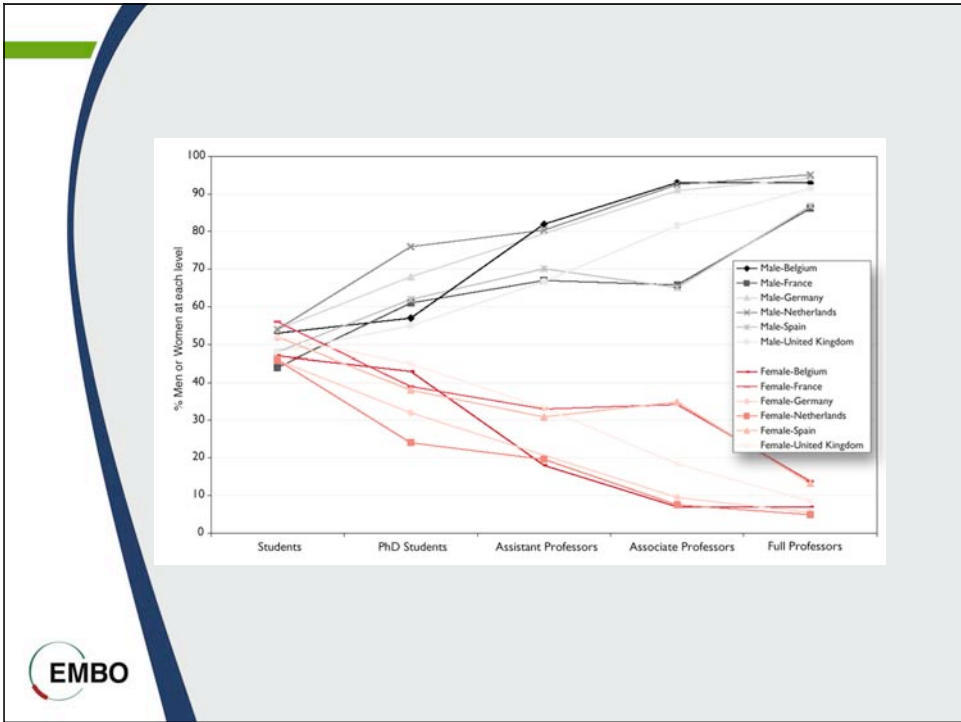
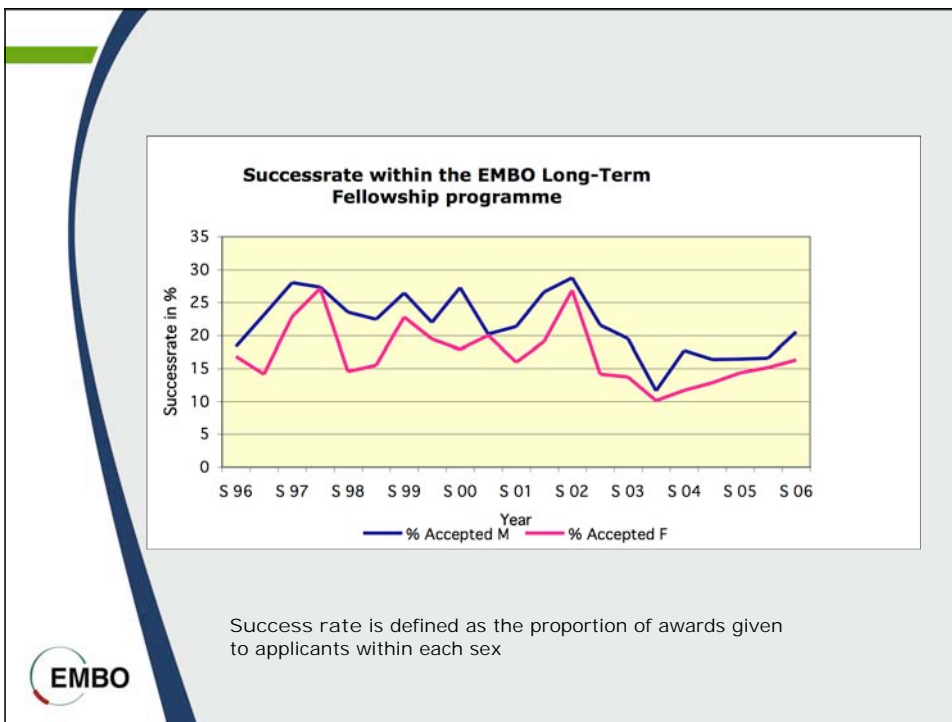
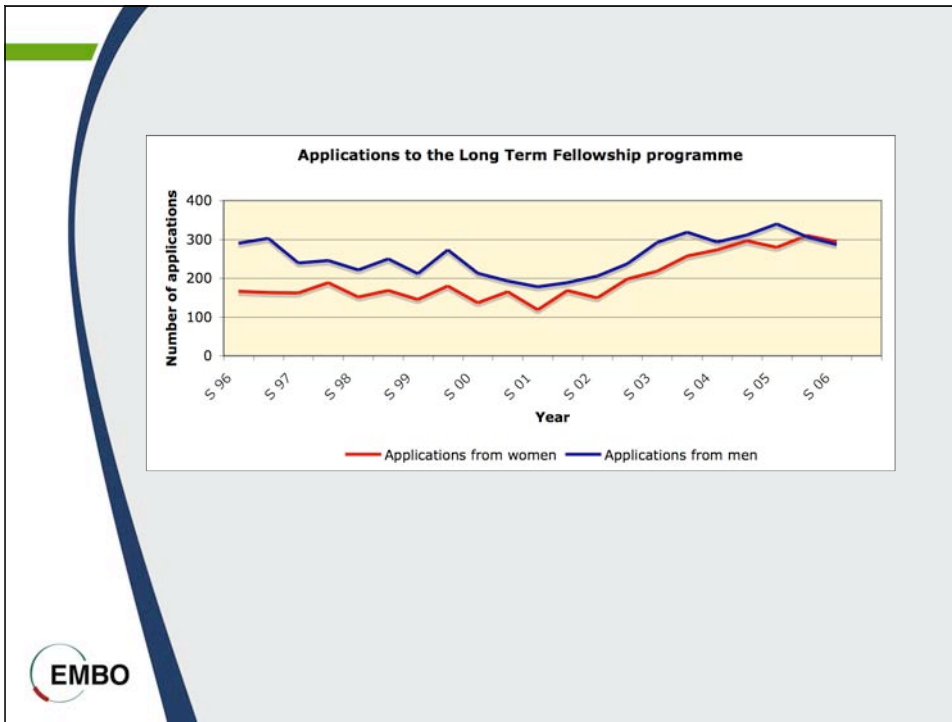


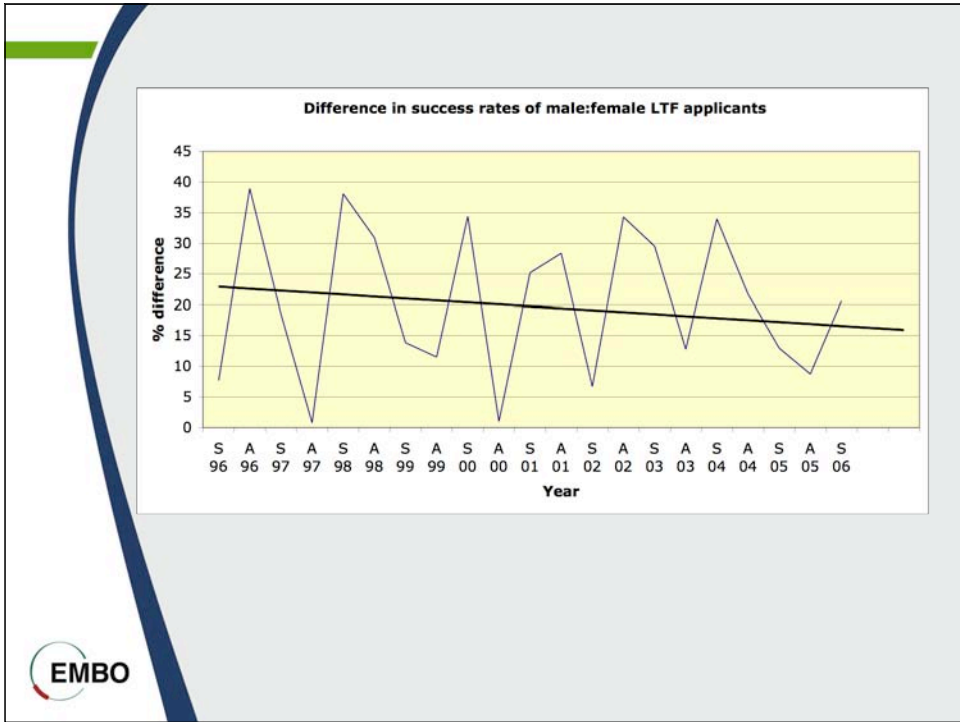
Figure 1 The mean competence score given to male (red squares) and female (blue squares) applicants by the MRC reviewers as a function of their scientific productivity, measured as total impact. One impact point equals one paper published in a journal with an impact factor of 1. (See text for further explanation.)

	Success Rate	$\Delta$	IF cost
Men	25.8%	70%	64
Women	7.7%		

Wenneras, C.; Wold, A. Nepotism and Sexism in peer-review, Nature, Vol 387, 1997







- Committee scores based on
- ✓Proposed research project
  - ✓Applicant's publication record
  - ✓Host laboratory
  - ✓Interview report
  - ✓Letters of reference
- EMBO

## Gender-blinding in 2006

	Total applicants		Success rate	
	#	%	overall	after
Women	593	48%	14.7 %	28 %
Men	644	52%	20.6 %	34.5 %
	1237		$\Delta$ : 29%	$\Delta$ : 19%



## Factors influencing the results

- ✓ Interview reports
- ✓ Choice of host laboratory
- ✓ Children
- ✓ Publication record



## Full bibliometric analysis of the EMBO Fellowship applicants 1998

	Applicants	Awards	Success Rate
Men	416	89	21.4%
Women	264	41	15.5%
Total	680	130	19.1%
			Δ 28%



Bibliometric data from all 680 applicants from **1993 - 2006**:

**10740 publications:** 15.8 pub/applicant

- 8494 articles
- 1316 meeting abstracts
- 630 reviews
- 95 letters
- 205 miscellaneous

**3135 journal impact factors**

Calculated for each applicant:

- Number of publications
- Type of publication
- Authorship rank
- Total impact factor
- Year of publication
- Cumulative citations

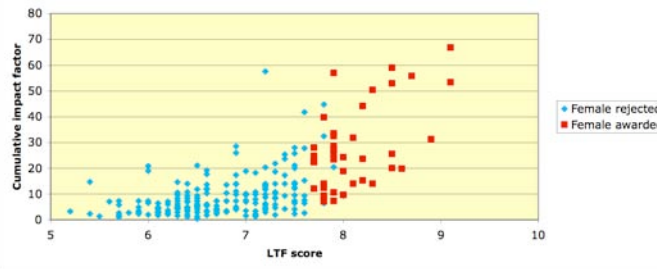


Median values for all applicants until 1998

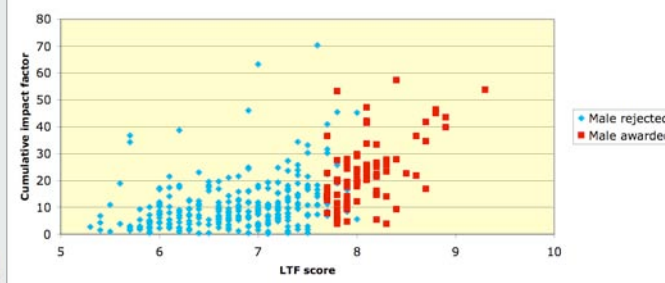
	Overall		Awarded	
	Women	Men	Women	Men
Number of publications	4	5	5	7
Number of articles	4	4	4	5
Number of first author articles	2	2	3	3
Total impact factor of all publications	21	26	43	45
Total impact factor of all articles	18	20	41	39
Total impact factor of first author articles	8	11	24	22
Total number of citations of articles	99	130	267	249
Total number of citations of first author articles	45	60	157	118



Females: impact factor of first author articles until 1998



Males: impact factor of first author articles until 1998



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### Why this difference in publication record quality?

due to

✓ age and experience

✓ children

✓ % of females from scientifically weaker countries?



Applicants from Greece, Italy, Portugal and Spain

	Applicants from countries that spend less than 1.2% of GDP on R&D.		Success rate
	#	%	out
Women	62	23%	17.0%
Men	76	18%	21%
			Δ 17%



In summary we investigated the influence of

- ✓Gender bias: no influence in 2006
- ✓Children: negatively effected women's success rates
- ✓Host laboratory: no difference
- ✓Age and experience: no difference
- ✓Home laboratory: some influence
- ✓Publication record



Why this persistent difference in success rate?



Median values for all applicants between 1999 and 2006;  
*from time of application and onwards*

	Overall		Awarded	
	Women	Men	Women	Men
Number of publications	6	9	8	10
Number of articles	5	7	5	8
Number of first author articles	2	3	2	4
Total impact factor of all publications	37	55	50	71
Total impact factor of all articles	31	46	41	57
Total impact factor of first or last author articles	12	18	18	21
Total number of citations of articles	81	117	123	164
Total number of citations of first or last author articles	31	45	46	62



## Summary from the bibliometric analysis:

- ✓ The female applicants loose out scientifically compared to the male applicants, as time goes by.



## Why do female applicants loose out ?

- Difference in career choices between male and female applicants?
- Due to children?
- Difference in motivation between male and female applicants?
- Other factors?

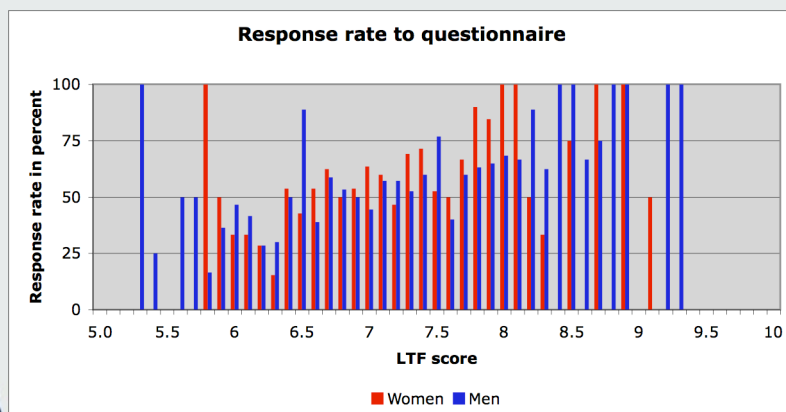


Questions need answers...

	Total applicants	E-mailed	Responded	Declined	True responses	Responses from all applicants
#	680	577	444	46	398	398
%	100	85	77	8	69	59

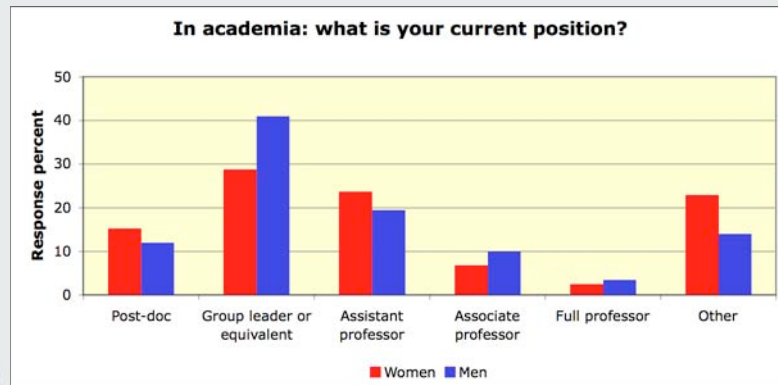


The answers are representative to the applicant group



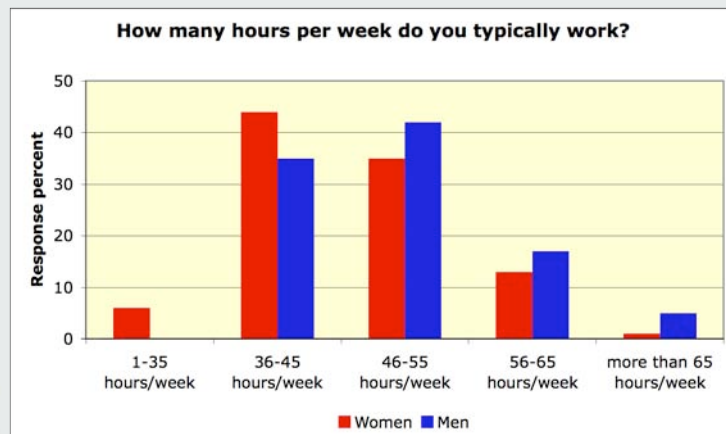
80% of all respondents are still in academia

– no difference between female and male respondents career choices



Most of the respondents work more than 36 hours/week

– a slight difference between male and female respondents

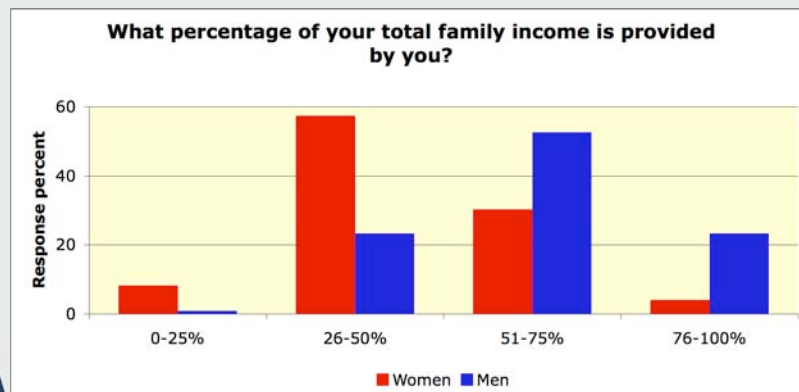


## Partners....

- 90% of both men and women have a partner
- Women more often have a partner who also has a PhD: 60% vs. 45%
- Also, women more often moved due to their partner's work: 50% vs. 19%
- And regarding the family income...



## Cash is king....



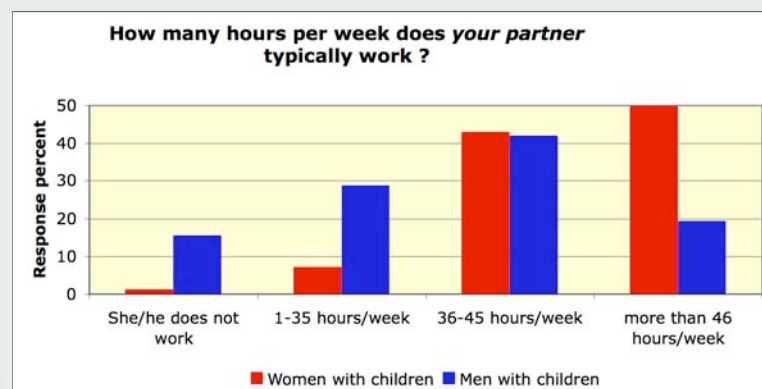
## Children!

- 60% of the female respondents have children vs 70% of the male respondents
- For women, the average maternity leave was 2-3 months per child, whereas paternity leave does not seem to be common at all
- Regarding parenting and working hours ...



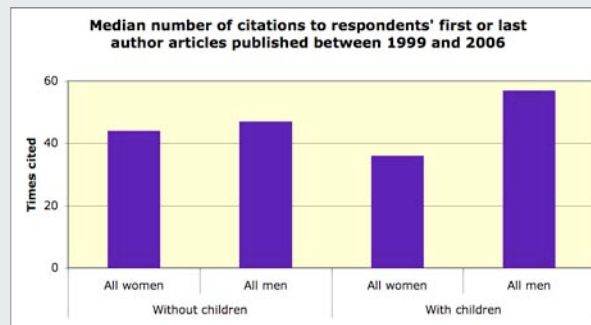
## Female respondents' partners work more:

–female respondents with children more frequently have a partner who work more than 46 hours/week



## Children's impact on publications:

- most respondents have children
- children have a positive effect to male respondents' publication record, in contrast to the female respondents



## Summary from the "8-years-after-study":

- ✓ Gender gap in publication quality increase as time goes by  
**Why?**
- ✓ Women more frequently have a partner with an equivalent education
- ✓ Women more frequently move due to their partners' career
- ✓ The female respondents work on average fewer hours than men/their partners
- ✓ Women frequently earn less than 50% of the total family income
- ✓ Children do not boost women's publication lists....



## ...but what about the 28% gap in 1998?

### Bibliometry!

influenced by group composition:

- ✓ Home laboratory/country
- ✓ Children
- ✓ Field of study?

### other possible factors

- ✓ move for partner influences choice of host lab
- ✓ discrimination (12-22% of questioned)
- ✓ lack of networking/mentoring



## Recommendations


- ✓ Committee must be aware of gender bias
- ✓ Committees must clearly define their criteria
- ✓ Institutes/universities/organizations should offer junior faculty support and develop gender policy
- ✓ Women must take their careers seriously.  
*If women do not respect their own careers - why should anyone else?*





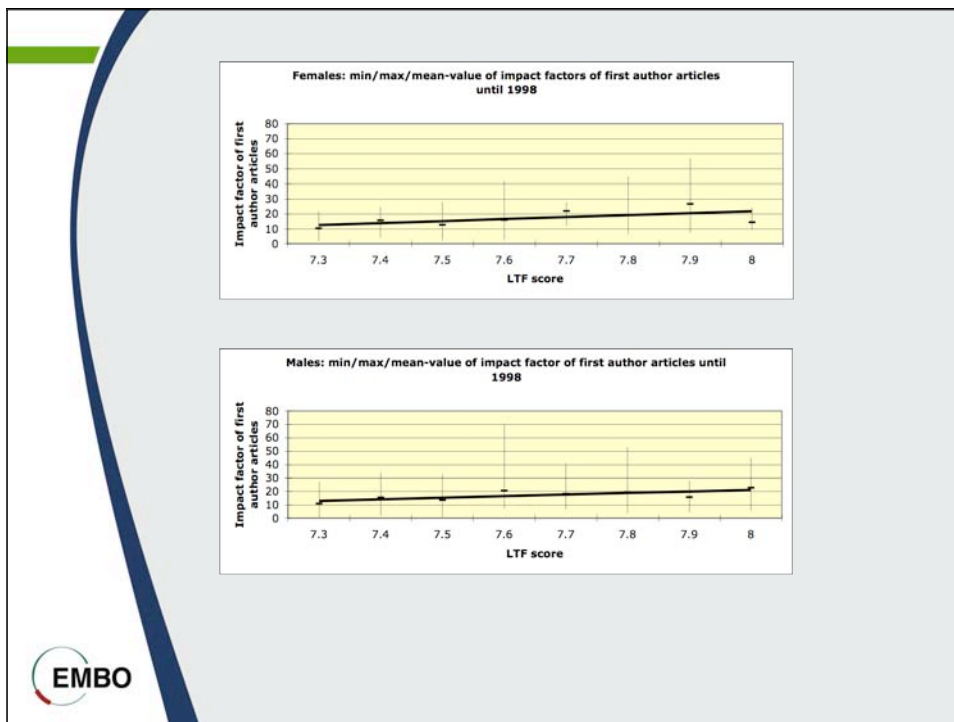
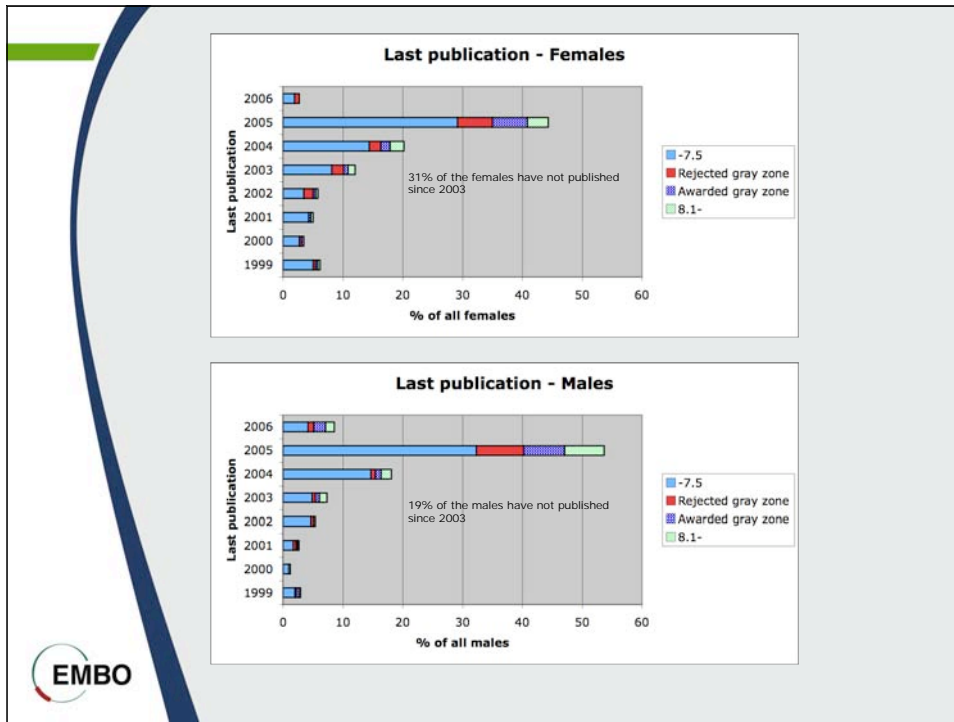
Further information?

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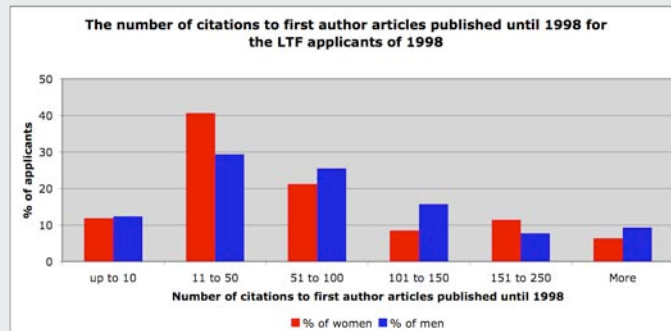


“Merit and talent are not sufficient conditions to become a successful scientist. Resources, time, social networks, encouragement - unevenly distributed between the sexes - are necessary prerequisites.”

“Gender and Excellence in the Making”, EC



Why?



## Do female respondents stand back due to their partners' careers?

- 80% of all female and male respondents work at least full-time
- 65% of all female respondents < 50% of family income; 77% of the male respondents > 50% of family income
- However, 50% of the female respondents' with children have a partner who work more than 46 hours/week compared to 19% of the male's partners
- Female respondents more often have a partner with a PhD-degree than the male respondents (60% vs. 45%)
- Female respondents more often moved due to their partner than the male respondents (50% vs. 19%)



### Summary of the - 8 years after - study:

- ✓ Gender gap in publication quality has increased
- Why?
  - ✓ Women more frequently have a partner with an equivalent education
    - ✓ More frequently move for their partners
    - ✓ Work on average fewer hours than men/their partners
    - ✓ frequently earn less than 50% of the family income
  - ✓ Children are not good for a woman's career



### Male and female respondents agree on career motivation:

- What personal characteristics or factors have helped you most during your career?
  - 80% of both male and female respondents marked:
    - Persistence and endurance
    - Self-motivation
    - Curiosity
    - Ambition and determination
- Three factors stood out when the respondents were asked to rank the importance of a variety of factors important for their motivation:
  - Inventing or discovering something significant
  - Being successful at work
  - Living close to family and relatives

