

Gender issue session CMD25 - JMC14

Wednesday 27th August 16h30



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The "Femmes et Physique" (F&P) commission of the French Physical Society (SFP) aims to promote women in physics, to help them to manage their career, to build links by many different actions (letters, articles, conferences etc.)

<http://www.sfpnet.fr/index.php?page=tpage&id=21>).

Women working in physics research, especially in decision-making positions, are still significantly underrepresented. Despite the fact that women represent more than 50% of EU students and earn 45% of EU doctoral degrees, women only hold 19% of senior academic positions on average [1]. F&P commission works to mobilize the community of physicists to achieve equal and full participation of women in physics research [2].

This session, organized by SFP in collaboration with the European Physical Society (EPS), will propose to deal with women physicist conditions in Europe: how do they manage their career? What is the main difference between European countries? ...

In introduction, we propose a general conference on the sociological aspect of women representation in science given by a specialist in gender research (*to be confirmed*).

For the round table, we invited:

- **Eileen Drew**, Professor in the School of Computer Science and Statistics and Centre for Gender and Women's Studies at Trinity College Dublin. She has undertaken extensive research in the analysis of national and EU data sets, including an international Comparative Leadership Survey of women and men in 27 industrialized countries. She will present a progress report of the INTEGER [3] project.
- **Flavia Zucco**, Head of Research at the Institute of Neurobiology and Molecular Medicine (CNR) in Rome. She is involved in the European Platform of Women Scientists (EPWS).

Both of them will share their experience and introduce discussions in order to exchange experience and good practice.

This session is supported by the « Mission pour la place des femmes au CNRS » (Anne Pépin) and by the « Femmes & Science » association.

[1] <http://www.epws.org/>

[2] <http://www.sfpnet.fr/Documents/Bibliotheques/36333.8d7c3/Reflets1.PDF>

[3] INstitutional Transformation for Effecting Gender Equality in Research, project financed by the European Commission within the « Science in society » programme of 7th PCRD)

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Commission Femmes&Physique

- 1/ survey in Europe
- 2/ stereotypes
- 3/ choices of girls



Presented at ICWIP-IUPAP August 2014 Waterloo Canada

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- 2/ stereotypes
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She Figures 2009

Statistics and Indicators on Gender Equality in Science



She Figures 2012

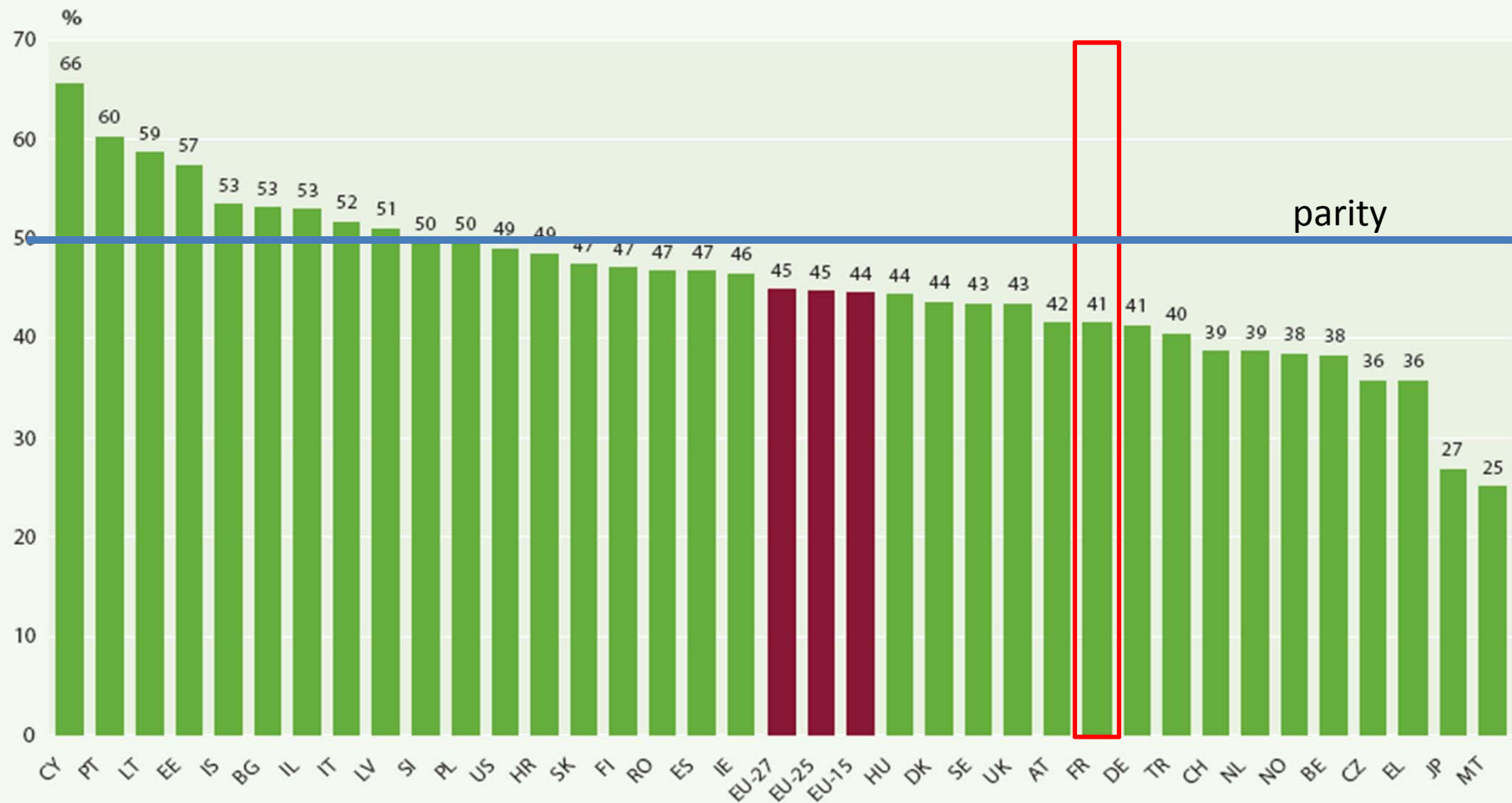
Gender in Research
and Innovation

“she figures 2012” is available on
http://ec.europa.eu/research/science-society/document_library/pdf_06/she-figures-2012_en.pdf

Europe, Japan (JP), United States (US)

PHD

Figure 2.1: Proportion of female PhD (ISCED 6) graduates, 2006



Source: Education Statistics (Eurostat), Central Bureau of Statistics (Israel), Norwegian Institute for Studies in Innovation, Research and Education

Exceptions to the reference year: EL, IT: 2005

Data unavailable: LU

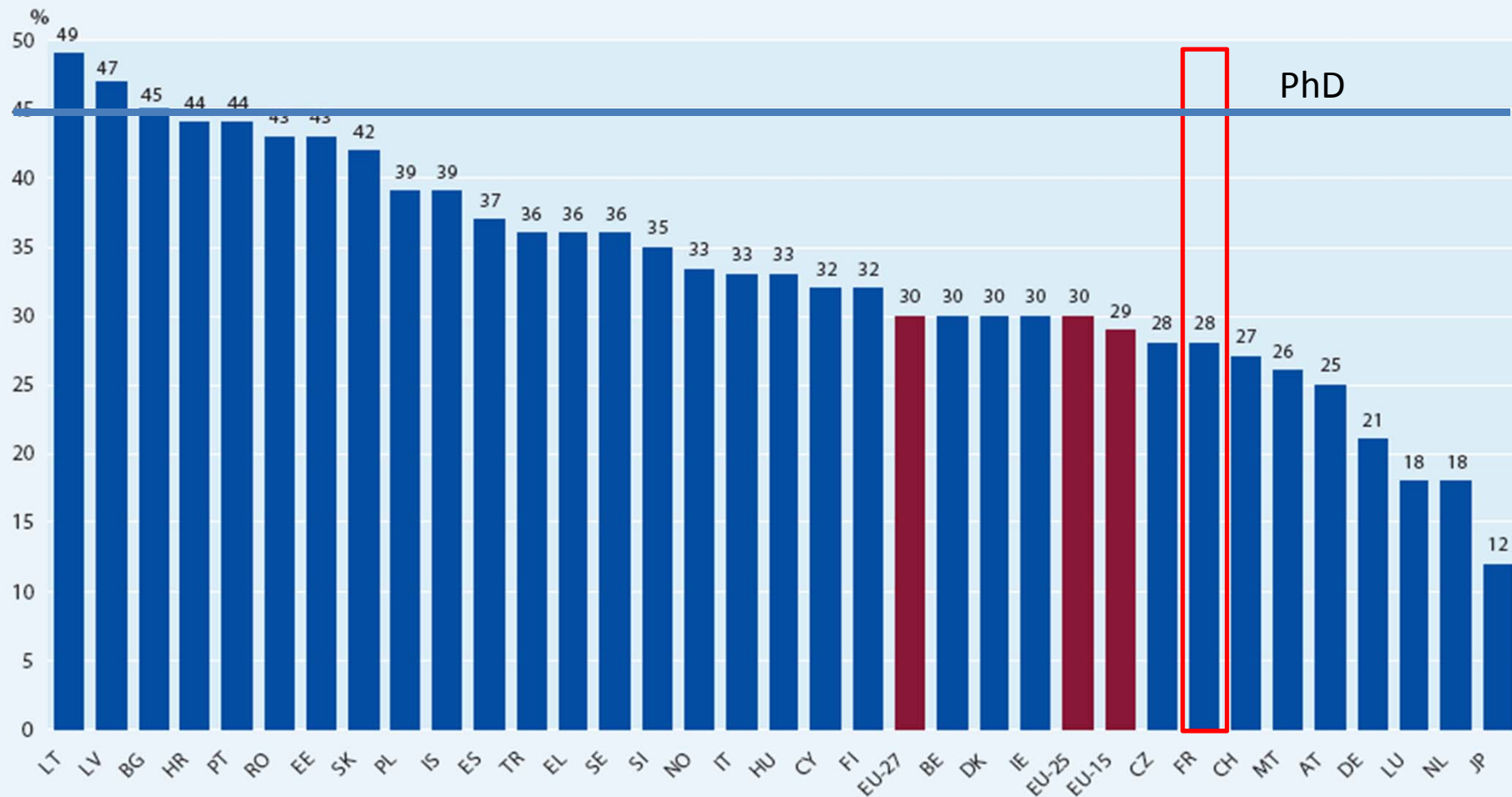
Data estimated: EU-27 (by Eurostat), EU-25, EU-15 (by DG Research)

Table 2.1: Proportion of female PhD (ISCED 6) graduates by broad field of study, 2006

	Education	Humanities & arts	Social sciences, business & law	Science, mathematics & computing	Engineering, manufacturing & construction	Agriculture & veterinary	Health & welfare
EU-27	64	52	47	41	25	51	54
EU-25	64	52	47	41	25	52	54
EU-15	64	52	47	40	25	52	54
BE	50	32	38	40	26	35	49
BG	52	68	58	56	33	54	56
CZ	62	42	41	39	20	41	43
DK	-	50	46	34	25	61	63
DE	53	51	37	35	14	60	51
EE	100	77	39	47	59	100	68
IE	64	52	57	45	26	61	57
EL	47	52	33	31	25	27	86
ES	57	48	46	48	25	44	54
FR	59	54	48	37	27	65	46
IT	68	59	52	52	36	55	62
CY	100	67	29	75	-	-	-
LV	67	69	54	36	43	50	48
LT	-	50	68	63	40	75	69
HU	61	49	52	39	29	45	39
MT	0	-	-	100	0	-	0
NL	:	40	44	29	20	38	51
AT	64	45	49	38	21	55	60
PL	:	54	51	57	24	54	54
PT	76	67	60	55	39	55	69
RO	30	47	47	62	35	46	49
SI	75	66	54	60	22	57	47
SK	54	46	52	44	33	38	65
FI	75	55	55	39	24	51	65
SE	58	54	42	37	29	46	62
UK	59	48	51	38	22	48	55
HR	64	48	54	58	38	42	44
TR	41	35	38	38	36	38	55
IS	100	0	0	60	100	-	40
NO	65	42	42	31	23	52	52
CH	67	49	38	33	19	68	46
JP	45	51	35	22	11	26	29
US	65	46	57	38	21	41	73

Source: S&T statistics (Eurostat)

Figure 1.4: Proportion of female researchers, 2006



Source: S&T statistics (Eurostat), Norwegian Institute for Studies in Innovation, Research and Education

Exceptions to the reference year: CZ, EE, SK, NO: 2007; BE, DK, DE, IE, EL, LU, NL, PT, SE, IS, JP: 2005; CH: 2004

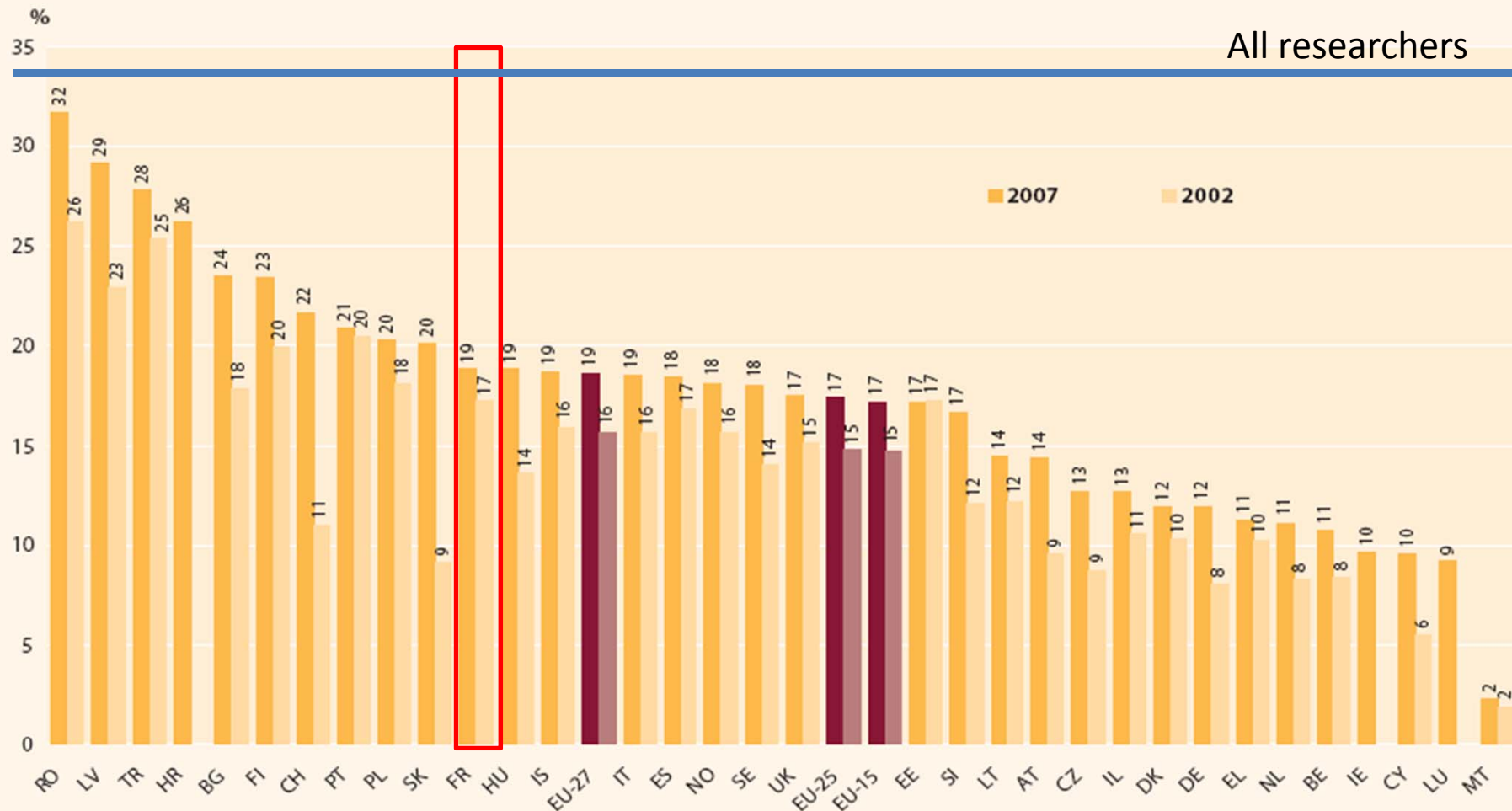
Data unavailable: UK, IL

Provisional data: NL

Data estimated: EU-27, EU-15 (by Eurostat), EU-25 (by DG Research), EE

Grade A : small progress...

Figure 3.3: Proportion of women in grade A academic positions, 2002/2007



Source: WiS database (DG Research); Higher Education Authority for Ireland

Exceptions to the reference year (s): 2007 HR: 2008; UK: 2007/2006; DK, FR, CY, LU, AT, IL: 2006; EE, MT: 2004; PT: 2003; IE: 2002-2003; EL: 2000; 2002 NO, UK, NL: 2003; IL: 2001; EL: 1999

Data estimated: EU-27, EU-25, EU-15 (by DG Research), SI

Head count
NO: before 2007 biannual data

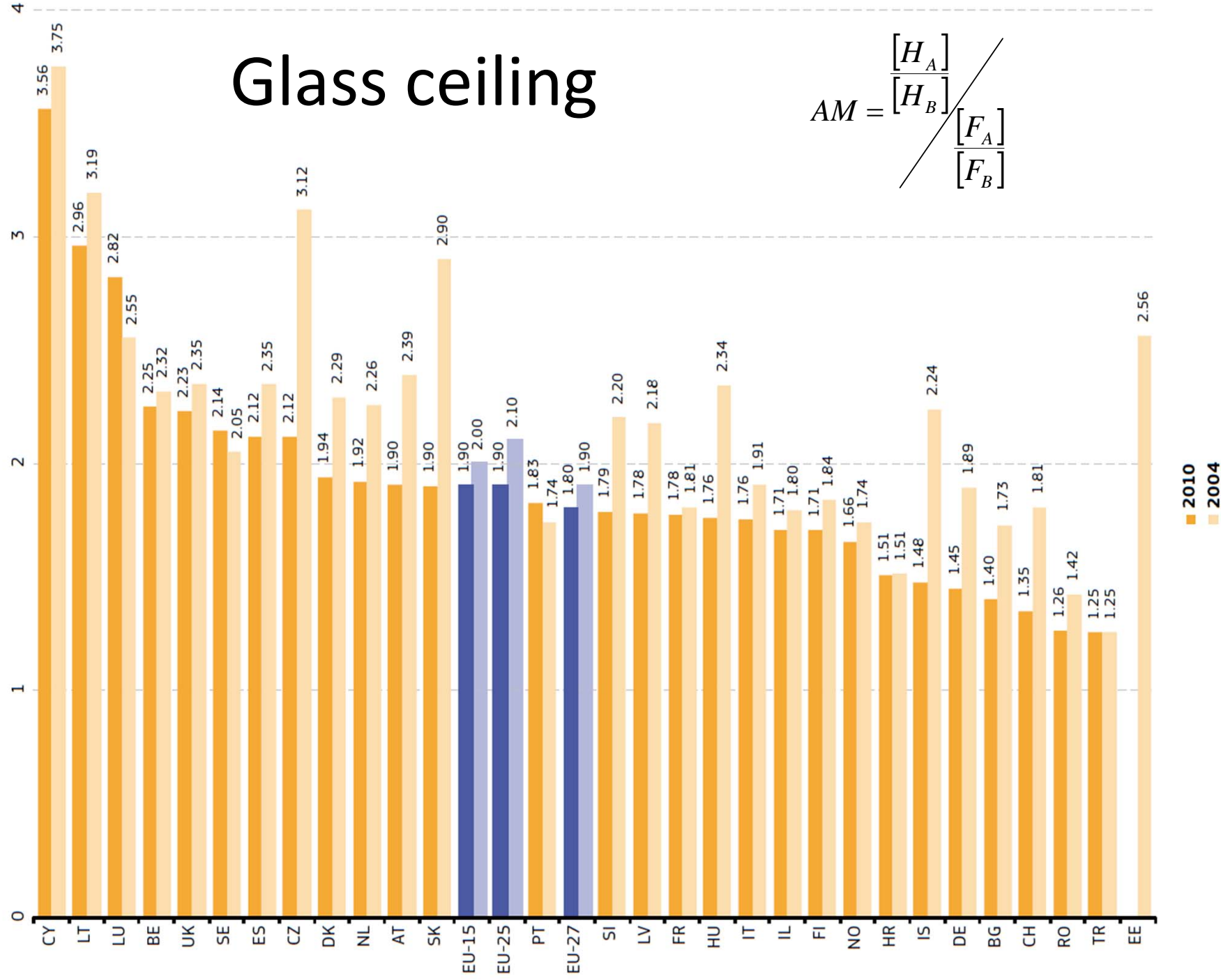
Table 3.2: Proportion of female grade A staff by main field of science, 2010

	Natural sciences	Engineering and technology	Medical sciences	Agricultural science	Social sciences	Humanities
EU-27	13.7	7.9	17.8	15.5	19.4	28.4
BE	11.4	6.3	12.3	8.5	15.4	15.2
CZ	10.6	7.4	19.7	11.3	15.6	17.9
DK	9.8	6.3	15.6	17.8	17.3	27.6
DE	9.8	5.9	9.2	13.5	12.6	25.2
ES	16.0	7.9	16.3	12.9	17.8	25.5
IT	19.8	9.5	12.2	15.0	20.1	36.5
CY	16.7	-	-	33.3	12.5	-
LT	6.8	4.5	22.6	10.3	17.8	26.5
NL	8.5	6.8	10.2	8.3	15.7	20.4
AT	7.6	7.7	14.4	18.2	20.9	28.1
PT	33.2	7.0	17.5	28.1	19.5	29.6
SI	7.5	8.7	28.1	32.3	18.8	28.7
SK	17.9	12.0	25.2	12.9	30.1	24.2
FI	11.8	7.4	27.0	32.9	30.5	39.5
SE	14.3	10.1	20.2	19.6	23.0	30.2
UK	9.0	7.0	23.2	12.4	22.7	10.8
HR	36.0	24.2	28.8	26.4	25.5	19.4
TR	25.7	19.1	35.4	19.5	27.1	25.5
NO	14.9	10.0	27.6	17.5	23.2	28.2
CH	11.8	15.2	26.3	11.3	35.6	32.0
IL	9.9	6.7	19.7	12.0	16.9	31.1 ⁸

Glass ceiling

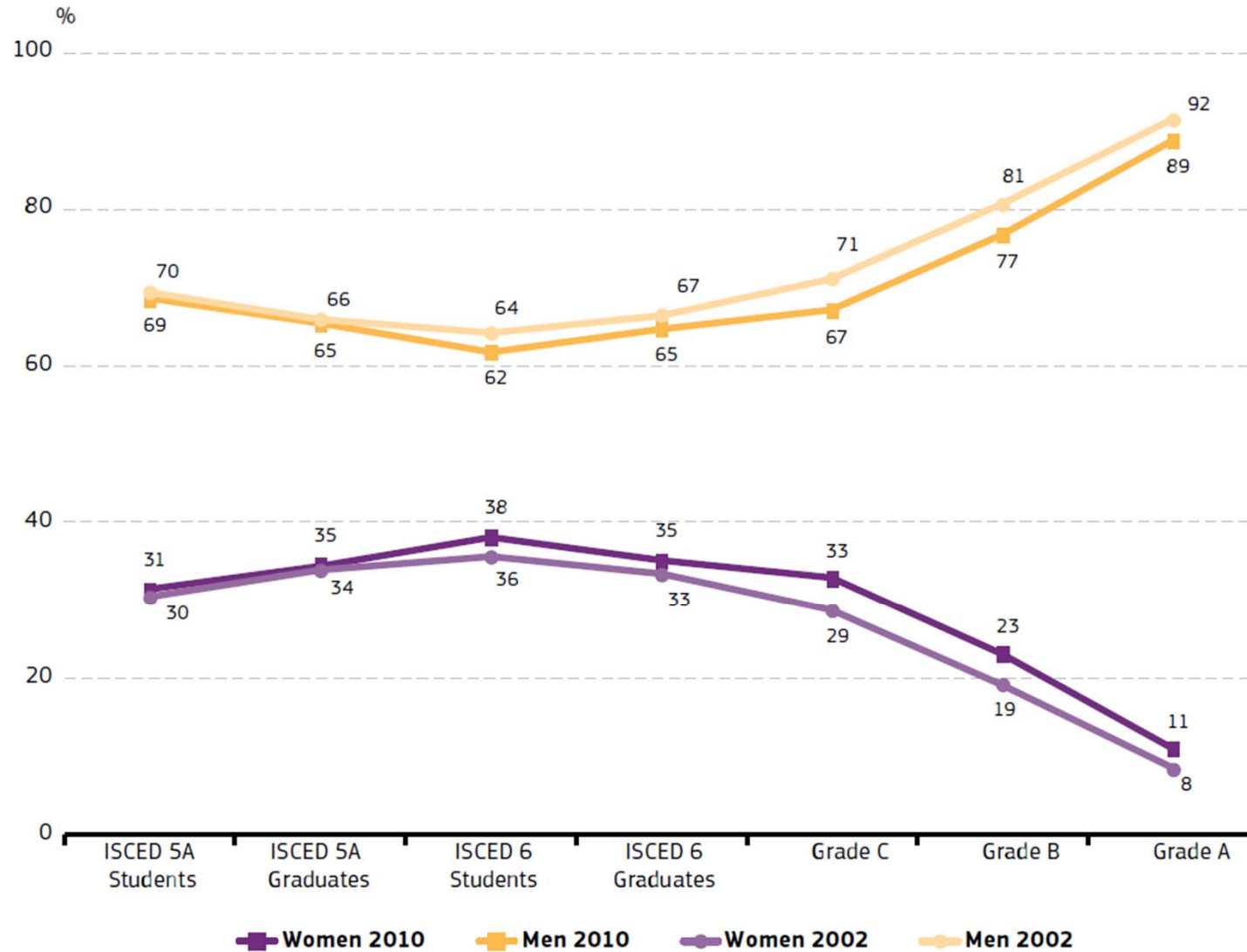
$$AM = \frac{\begin{bmatrix} H_A \\ H_B \end{bmatrix}}{\begin{bmatrix} F_A \\ F_B \end{bmatrix}}$$

Figure 3.6: Glass Ceiling Index, 2004-2010



Number through career in Science

Figure 3.2: Proportions of men and women in a typical academic career in science and engineering, students and academic staff, EU-27, 2002–2010



Explanation ?

Stereotypes

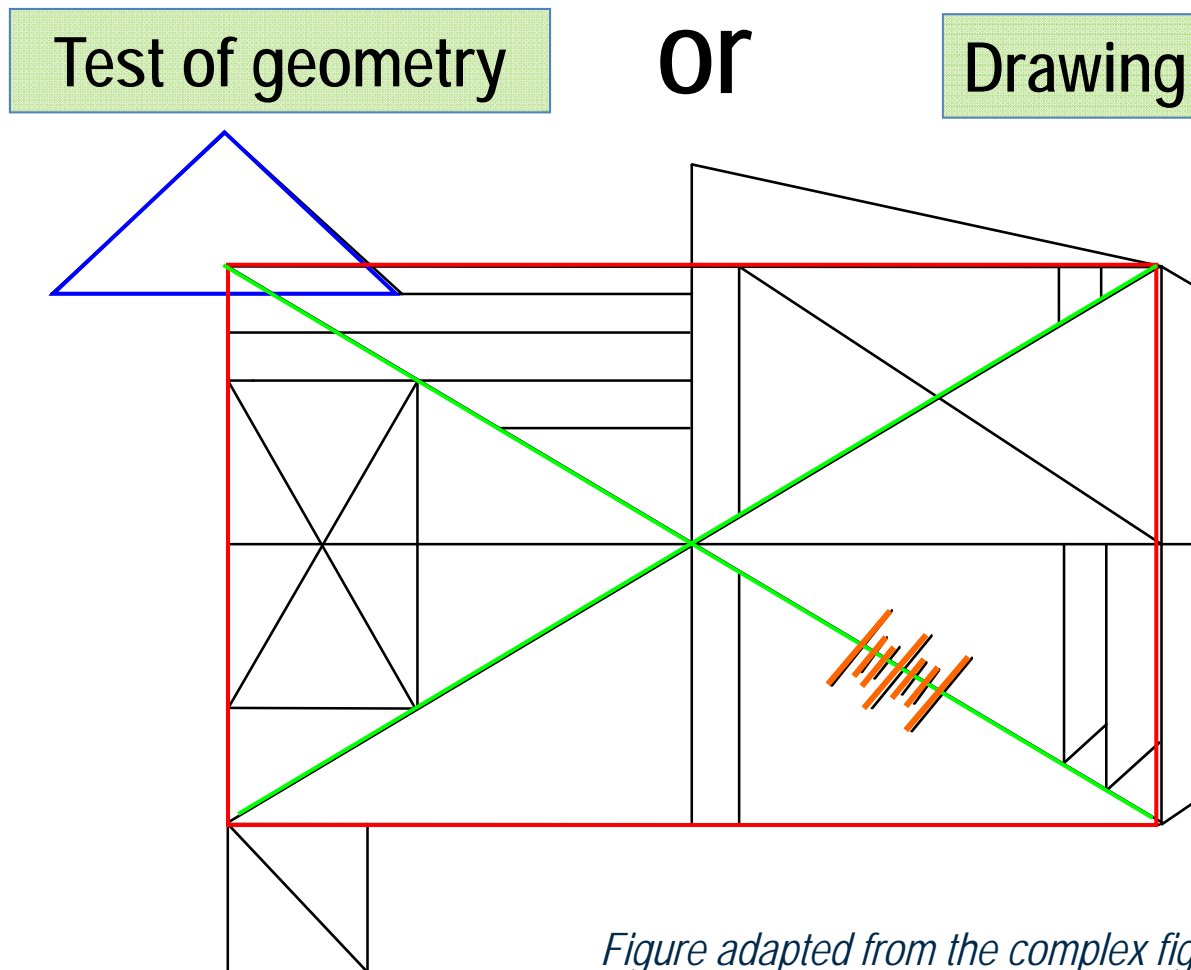
Choice of girls

- 1/ survey in Europe
- 2/ stereotypes
- 3/ choices of girls



STEREOTYPES : Test in primary school...

*HUGUET, P., & REGNER, I. (2007). Journal of Educational Psychology
speech of Catherine Thinus-Blanc (Montpellier 2012)
see <http://www.sfpnet.fr/commission/femmes-et-physique>*

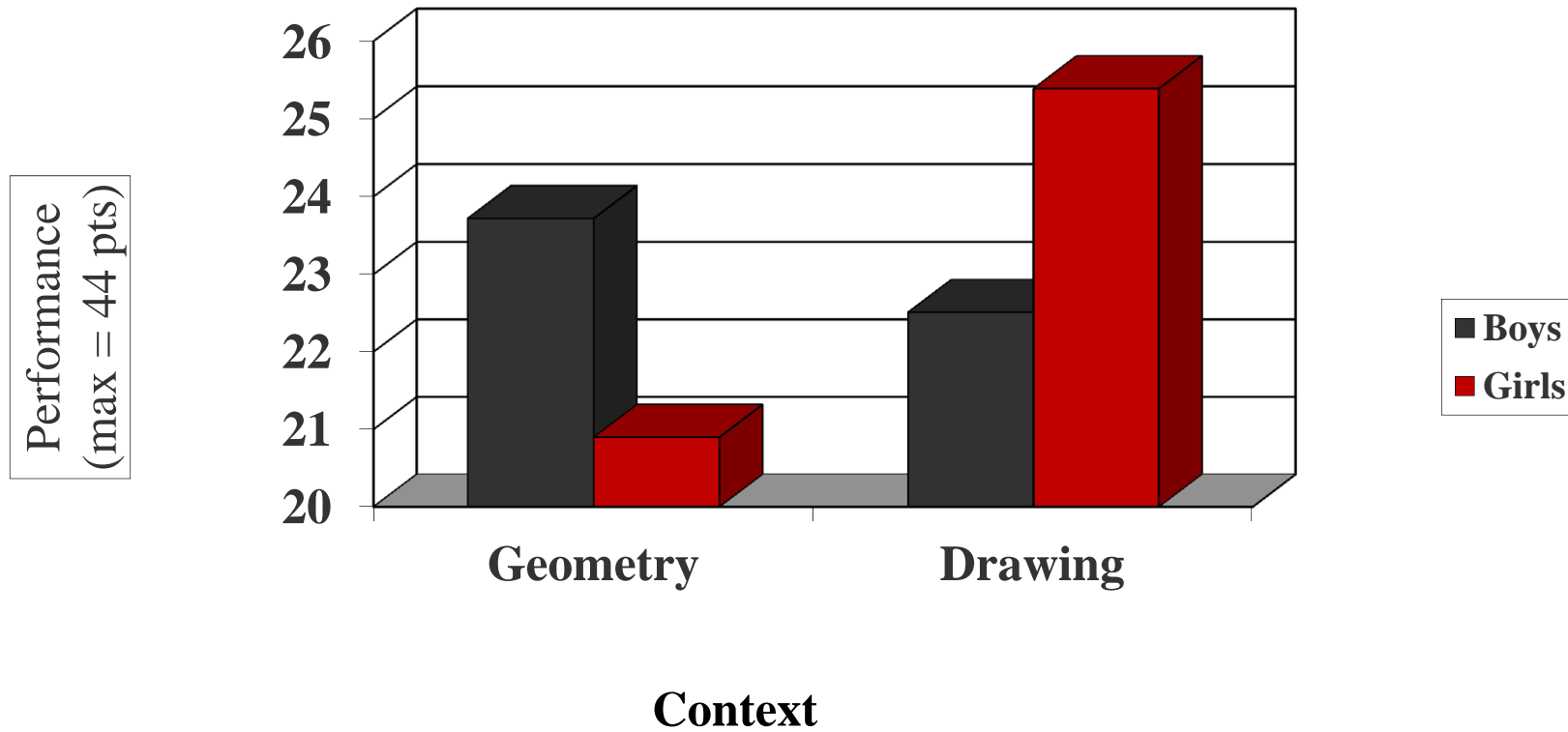


Test in primary school...

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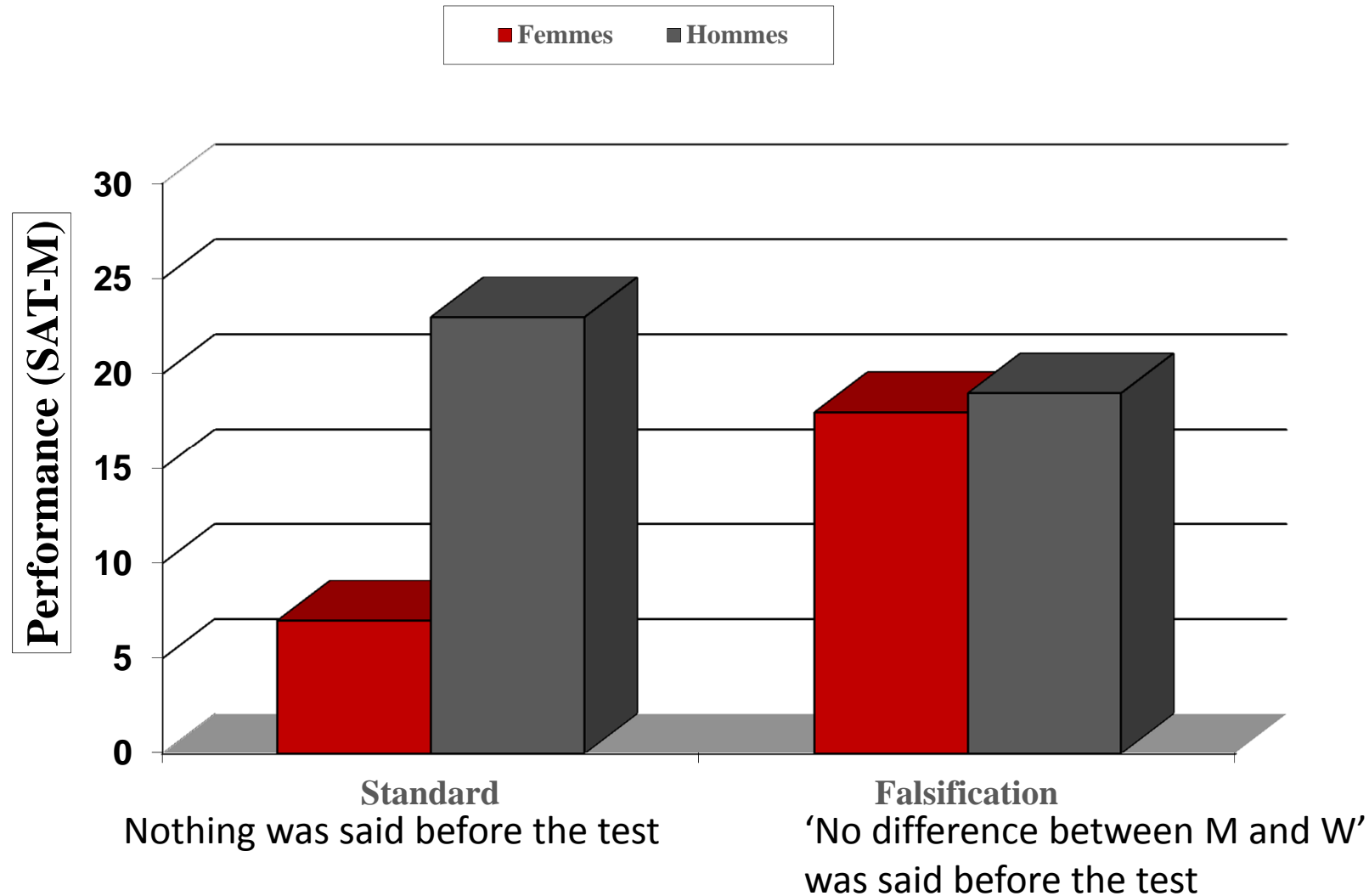
- 454 pupils, 10 and 11 years old (heterogenous level); 223 girls and 231 boys.
- The classes were either separated by gender or not. Each pupil worked separately on individual tables.
- The « figure de Rey » was presented to them for 1'30 then they had 5 ' to reproduce it by heart.
- For one group, it was presented as a test in geometry, for the second group, it was presented as a drawing game

Mixed Groups



HUGUET, P., & REGNER, I. (2007). Journal of Educational Psychology

To evidence the stereotype effect, 3 examples:
Stanford University for student in high level Math cursus
Spencer, Quinn, & Steele (1999), JESP
(SAT-M items difficult)



- 1/ survey in Europe
- 2/ stereotypes
- 3/ choices of girls



Choice of girls

In France, girls have
better results at school
whatever the level

DEPP:

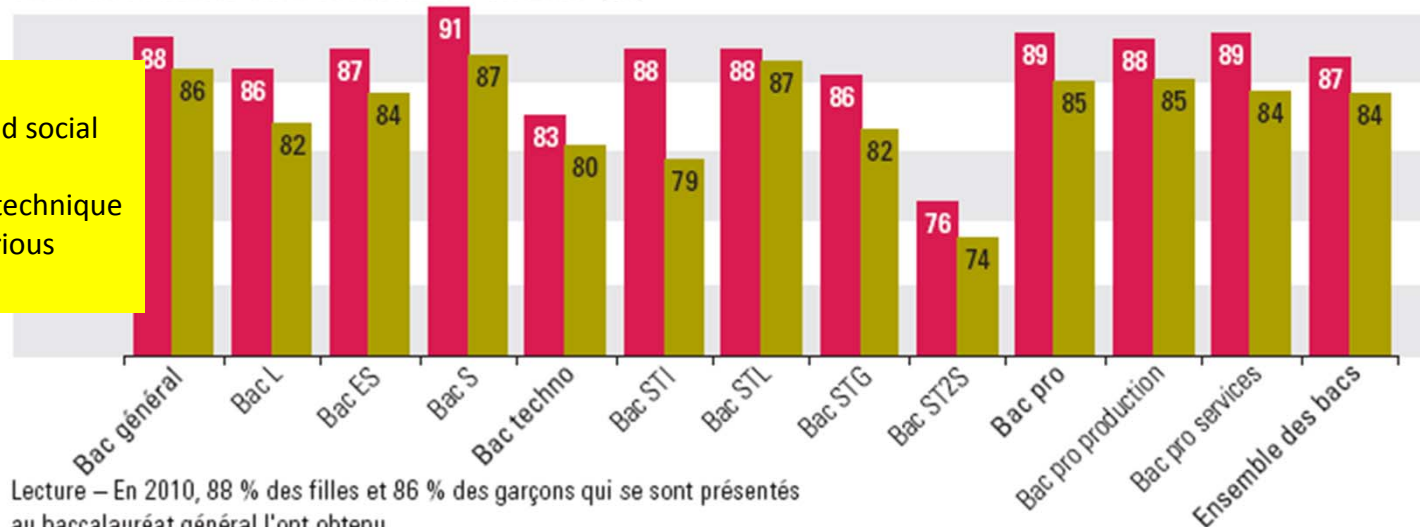


The success rate is higher for women, whatever the type of 'bac' (exam before university)

Taux de réussite au baccalauréat en 2010 (%)

Success rate

L=littérature
ES=economy and social
S=scientific
The others are technique studies with various specialities



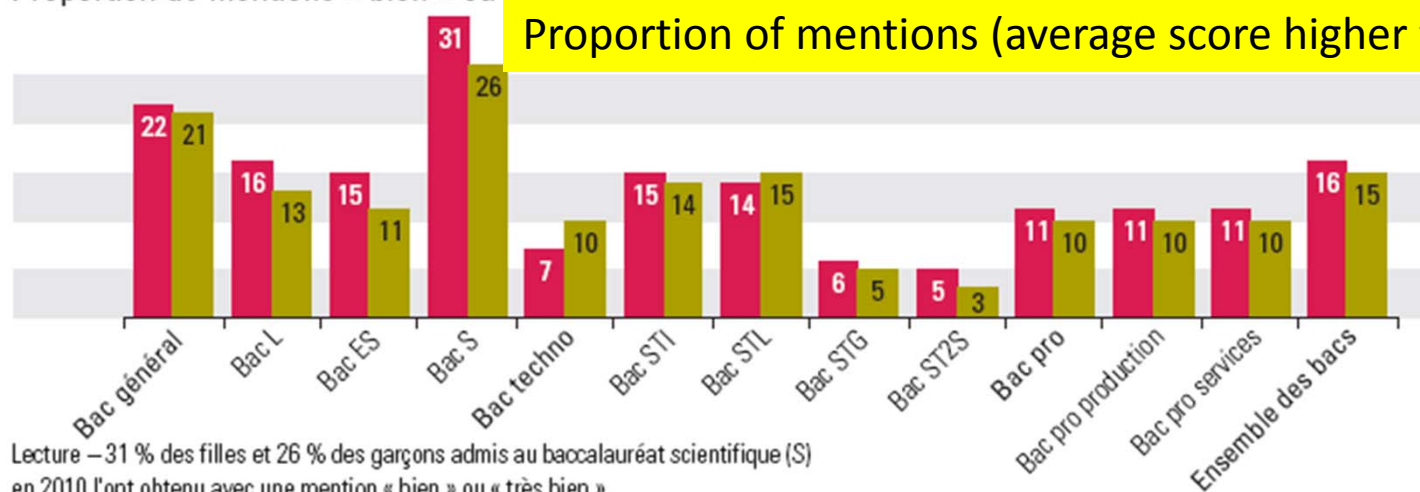
Lecture – En 2010, 88 % des filles et 86 % des garçons qui se sont présentés au baccalauréat général l'ont obtenu.

Champ : France métropolitaine + DOM

Source : MENJVA-MESR DEPP

Proportion de mentions « bien » ou « très bien » au baccalauréat en 2010 (%)

Proportion of mentions (average score higher than 14/20)



Lecture – 31 % des filles et 26 % des garçons admis au baccalauréat scientifique (S) en 2010 l'ont obtenu avec une mention « bien » ou « très bien ».

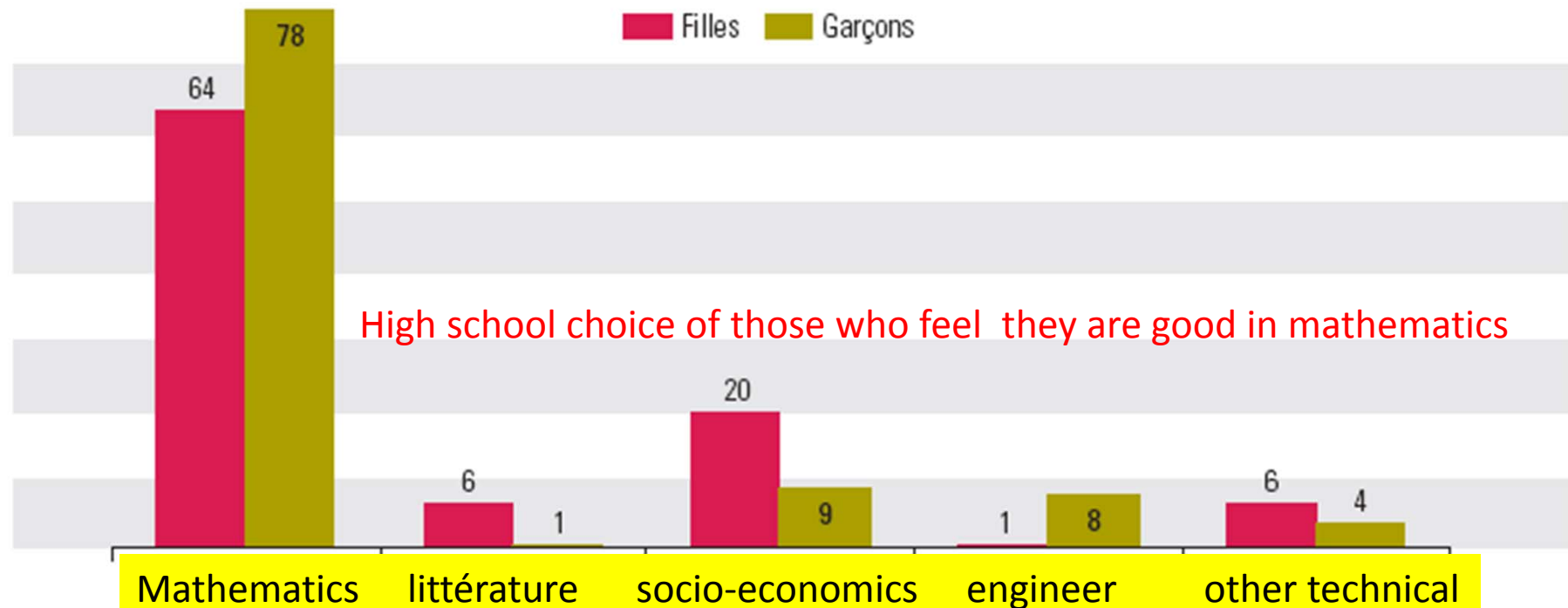
Champ : France métropolitaine + DOM

Source : MENJVA-MESR DEPP

but their choices is :

When they feel themselves as very good in Mathematics, at 15,
78% of boys choose to study Mathematics (scientific cursus) against 64% of girls

... en mathématiques (%)



High school choice of those who feel they are good in mathematics

Lecture – 64 % des filles qui se jugent très bonnes en mathématiques en fin de collège se sont orientées vers un baccalauréat scientifique (S).

À jugement identique, 78 % des garçons ont intégré la série S.

Champ : France métropolitaine

Source : MENJVA-MESR DEPP, panel de la DEPP – Élèves entrés en sixième en 1995

Actions of SFP-Commission « Femmes et Physique »

IMPROVE PLACE OF WOMEN IN PHYSICS

1. Minicolloquia « Gender issues » in SFP conferences
2. Mentoring
3. Gender ratio in conferences
4. Women ratio in hiring and promotion committees
5. Improve selection criteria of hiring committees
6. Contact with gender international associations

INCREASE VISIBILITY OF FEMALE PHYSICISTS

1. Create a French female physicist speaker data base
2. Special « Reflets » issue in 2014
3. Wikipedia pages on female physicists
4. Propose women for SFP prizes

To contact us (mentoring) or make suggestions (visibility), contact us by sending an e-mail to sfp-femmes@sfpnet.fr or on facebook: « femmes et physique »

<http://www.sfpnet.fr/commission/femmes-et-physique>



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