

**acatech – NATIONAL ACADEMY OF SCIENCE
AND ENGINEERING**

**GENDER ROLES AND GENDER
STEREOTYPES IN SCIENCE**

AND HOW THEY COULD BE RESOLVED

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Images of Roles – Stereotypical Roles



Housewife and mother



Family upholder and career
builder



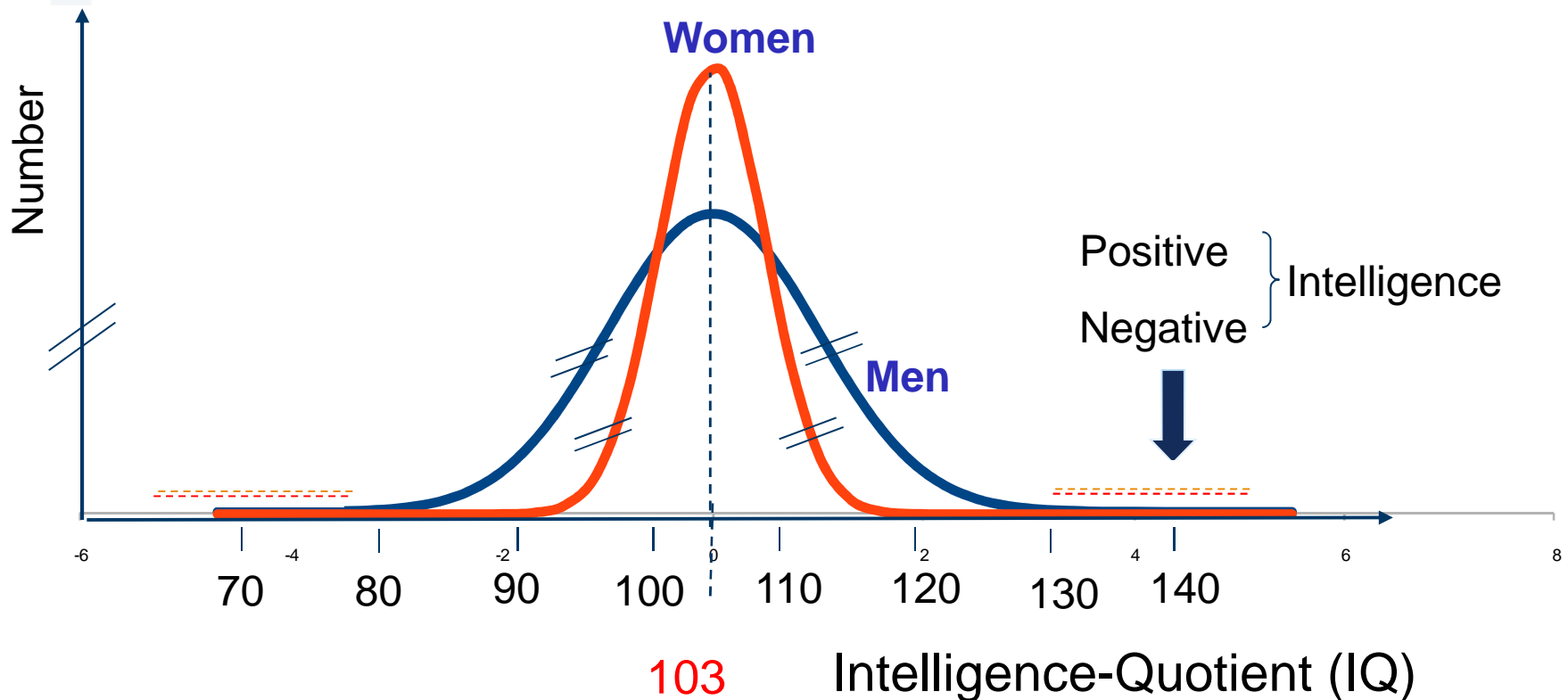
**Are women and men different, and therefore,
assume naturally different gender roles**

or

**Are men and women not so different but
nevertheless assume different stereotypic
gender roles**

Women and men are equal, but women are more equal

Schematic Representation; Scottish Mental Survey







Women and men are different

Category	Women	Men	Total
Nobel prize winners	41 ¹ (5.4%)	765	806
Prisoners in Germany	3.800 (5.3%)	67.000	70.800

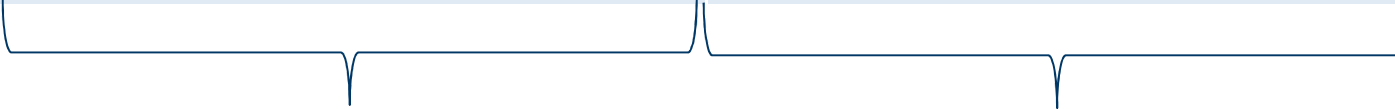
¹ 24 for Peace and Literature

Images of Roles – Stereotypical Roles

Girls	Boys
Maniacs for reading 	Passion for computer games (10 x more than girls) 
Weakness for glamour 	Affection for sports (cars, motor cycles)
Muscular weakness	Muscular strengths
Love for animals (horses!)	Violation: actor and victim (50% more than girls) 

Development of personality influenced by genes, hormones, education, and environment

Images of Roles – Stereotypical Roles

Women	Men
Consideration of social environment	Love of adventure (attack mentality)
Care for common wealth (public welfare)	Competition-oriented and assertiveness
Less interest in boards or panels	Striving for public recognition (ambition)
	
Housewife and role as mother	Career and top position



The Myth of the German Mother (Barbara Vinken)

**Religion (Luther), philosophy (Rousseau),
pedagogy (Pestalozzi), politics (Hitler)**

- Marriage and family → Mother represents centre
- Focus on mother instead of women
- Rather polarization, no balance between male and female sex

No role or gender stereotype



The female post-war heroes

- Incredible accomplishments
- Basis for today's society
- They were everything
 - *Mothers*
 - *Workers*
 - *Independent*

During the post-war period, in particular after 1968 and the birth control pill

Development of a female generation

A sense of entitlement – in a non-revolutionary way – to

- Liberté
- Egalité
- Fraternité





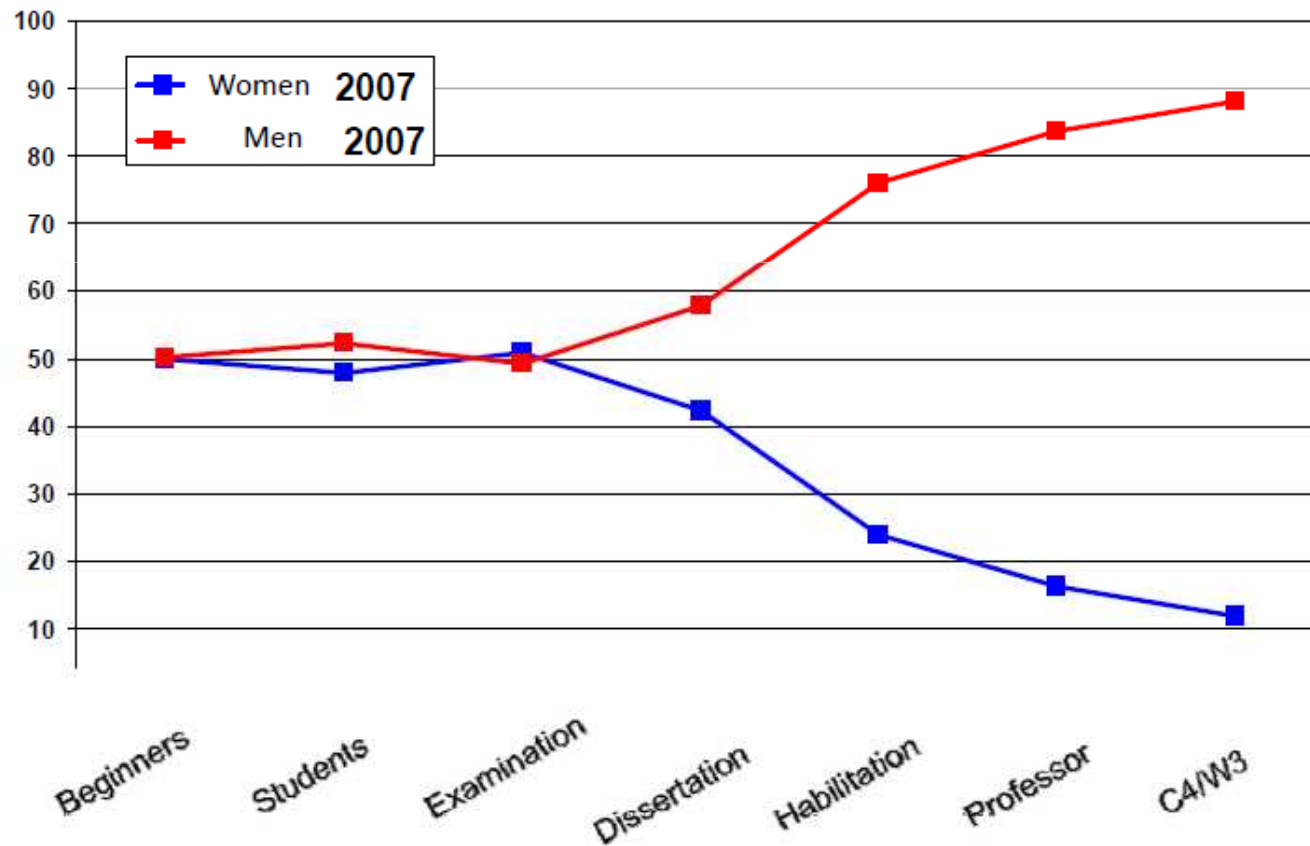
Today's auto-portrait of young women with examinations qualifying for university studies

- > **Not a** successor generation of feminist movement
- > **No** bellicose attitude towards men
- > **Self-confident** gender identity
- > **Consistent pursuit** of own life design
- > **Elemental** feeling of equal rights

Female Students in German Universities

Discipline	Number [%] per Year	
	1975	2005
Languages and cultural studies	56	70
Law, economics, social sciences	27	49
Mathematics and natural sciences	33	37
Human medicine	29	61
Dental medicine	20	60
Veterinary medicine	34	85
Forestry, agricultural and nutritional sciences	44	56
Engineering	7	20
Art, art sciences	52	64

Career Development of Men and Women in the German Science System



Conclusions for Germany (I)

- > The better endowed and the more influential a position, the smaller the percentage of female participation (although the potential of the rising generation is enormous)
- > Share of women in scientific top positions is low (14-16%)
 - Actually it increases by about 1% per year- this is unacceptable
- > The scandalous position of Germany is - in Europe - only topped by Belgium and Malta

Conclusions for Germany (II)

- > Young women do not (wish) to realize the problems of gender inequality and injustice.
- > Young women have to be aware of the fact that their professional career plan in life will be met by serious problems.
- > This must be realized and analysed in order to develop strategies to overcome these obstacles.

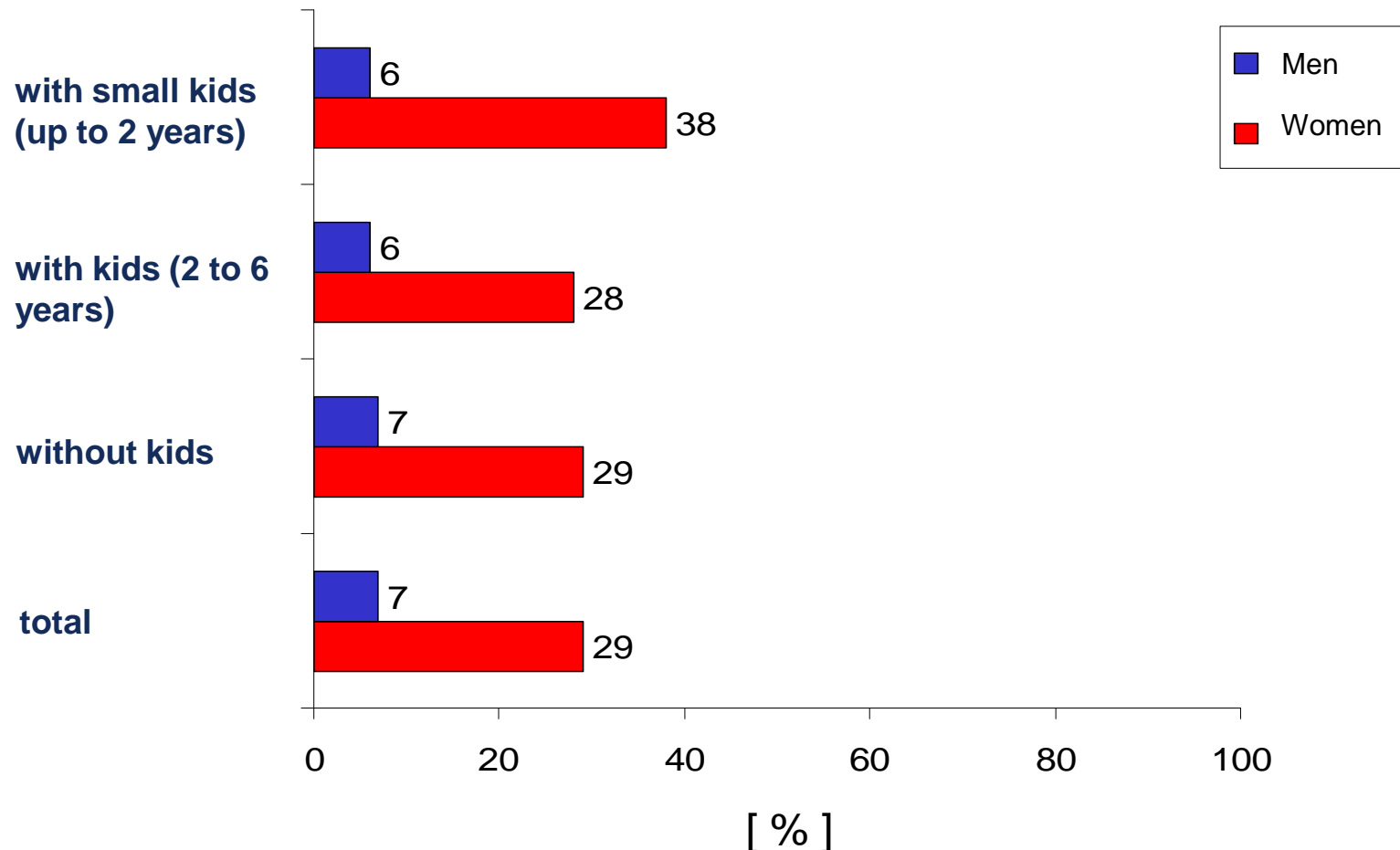


Why do the careers of female scientists crack?

Three essential causes:

- > Children and family
- > Usances of Science
- > Roped parties of men

Dilemma 1 of young women: children and family “For raising children I would stop working”.



Source: Brigitte (2009)

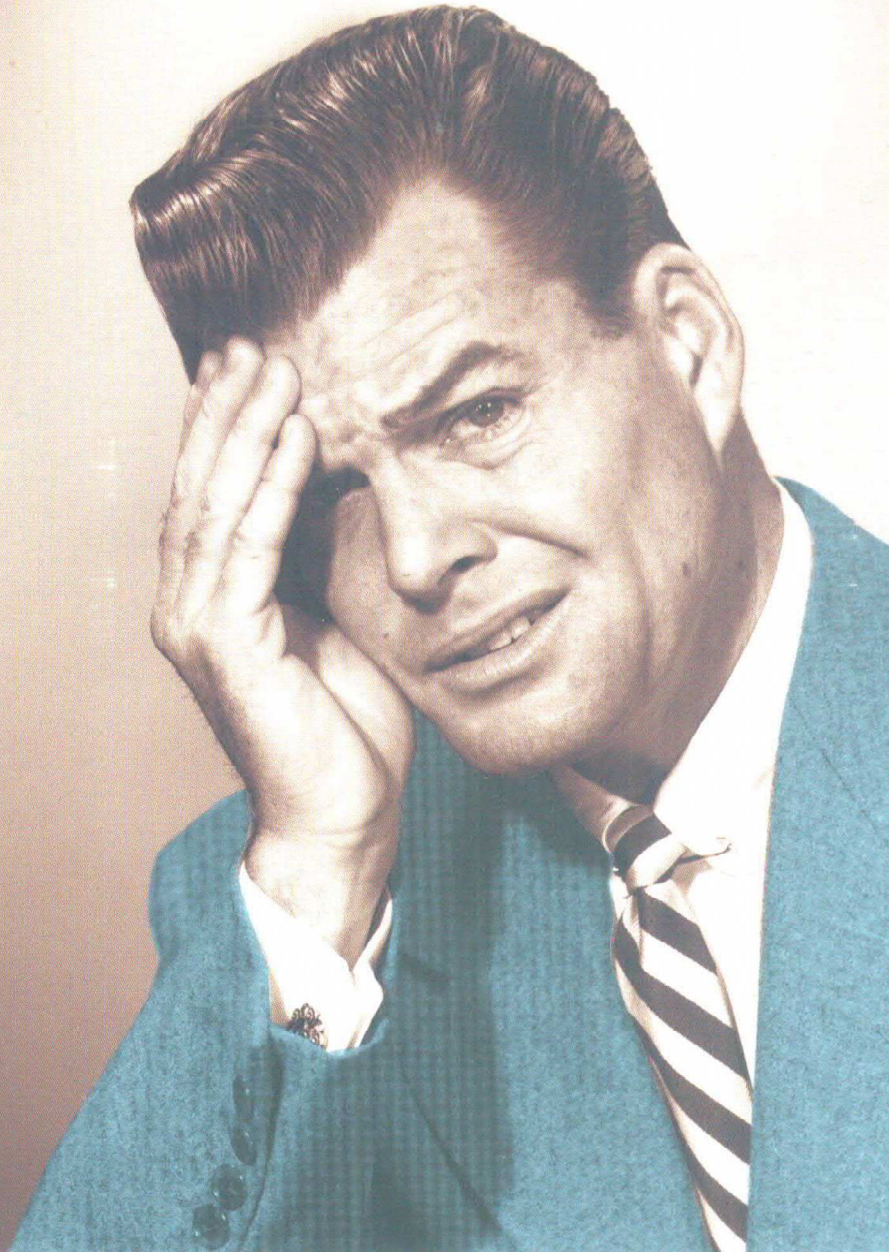
Dilemma 1 of young women

Family: unit of man and woman (in general married) as well as **children** (not married) under one roof

As the **essence of happiness** instead of

- > Independence → Income
- > Self-fulfilment → Profession
- > Power, honour, respect → Career

**Ich weiß überhaupt nicht mehr, wie ich
Familie und Karriere vereinbaren soll.**



Why do the careers of female scientists crack?

Three essential causes:

- > Children and family
- > Usances of Science
- > Roped parties of men

Dilemma 2 of young women

Unrealistic expectations towards female scientists

- > **Competence and performance** vs. recognition by male colleagues (nurse and doctor)
- > **Physical presence and flexibility** vs. regular child care
- > **Career and leadership** vs. multioptionality (children, marriage, employment)

Dilemma 3 of young women

Power and male dominated networks

University nomination committees for 900 Professors in the Netherlands between 1999 und 2005 *

- > 36% appointed after open advertisement of position, 64% appointed in closed procedures (thereof 63%: only one candidate)
- > Nomination committees **without** women (>50%): 7% of the nominees were female.
- > Nomination committees with only **one** female member: 14% of the nominees were female.
- > Nomination committees with **two or more** women : **22% of the nominees were female.**



Three Essential Obstacles for Women in Science

- > **Power of men and roped parties of men**
 - a **cultural** problem, can only be resolved politically (quota and laws)
- > **Science immanent habits**
 - a **structural** problem, can be resolved organisationally (dual career etc.)
- > **Family inadequate working conditions**
 - a **practical** problem, can be resolved financially (university, kindergarden, etc.)

The Quota: a terrible term

> **Alternative terms**

- Quantitative agreement
- Model of cascade (Wissenschaftsrat, DFG)

> **Introduction of a quota**

- Legal regulation
- Voluntary commitment

We live with Quotas without objecting to (and without realizing) them

- > **Special research areas (SFBs)**
 - 2/3 projects of university origin
 - 1/3 projects of non-university institutions
 - “*quota projects*” → *therefore less quality?*
- > **ZVS, quota for citizens of a federal state**
- > **Quota for radio music: 35% German musicians (DB, 17/12/2004)**

Arguments against quotas (seemingly)

- > Constitutional aspects
- > Science criteria are exclusively quality and originality oriented
- > Quota are an insult for successful women
- > If a quota for support of women would be introduced, other social groups would also claim the right for a quota
- > If female scientists do not reach top positions despite a quota, they are marked as deadbeats

Proposal: a men and women quota (40 ± 10 %)

Examples for gender adequate nominations ($40 \pm 10 \%$)

- > Executive and supervisory boards (curatorial, senate)
- > University nomination committees
- > Evaluation committees
- > External peer reviewers of publications
- > Scientific advisory boards
- > Discussion fora
- > Speakers list of symposia

Examples for institutional quotas (40 ± 10 % men or women)

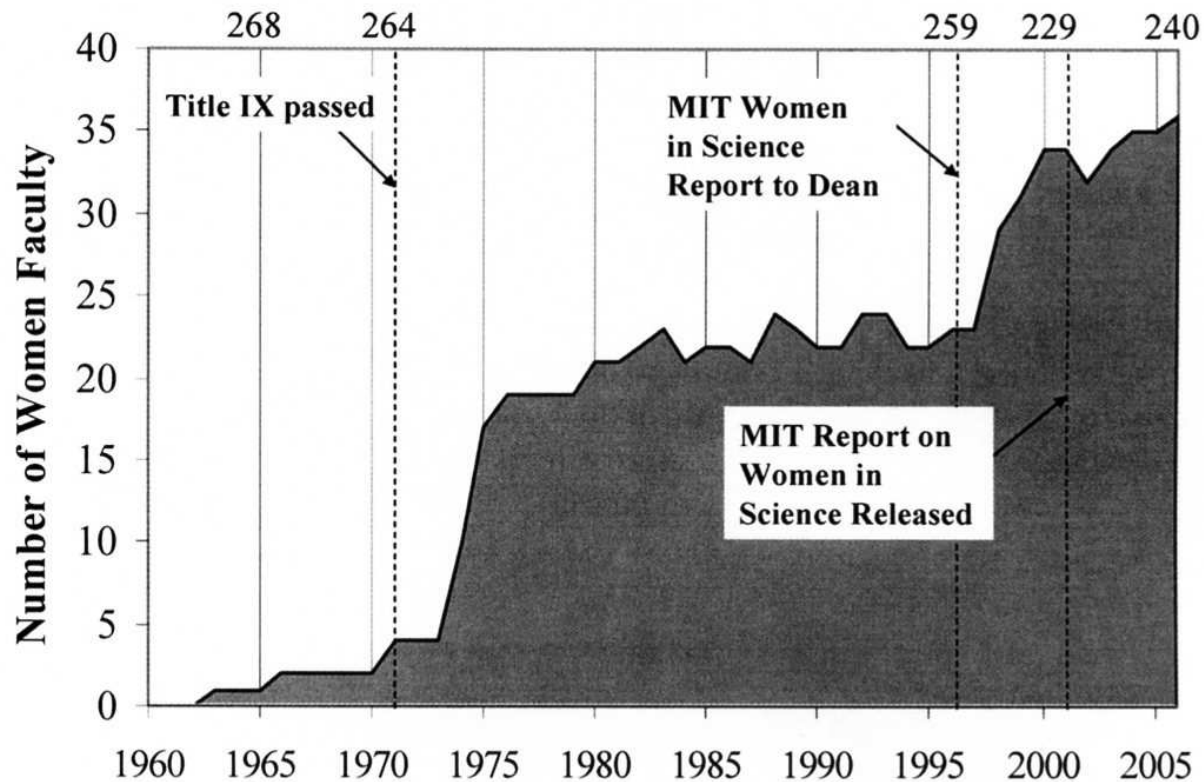
- > Leaders of projects of special research areas (SFB)
- > Leading positions (directorates, department heads, university chairs)
(C4, C3, W3, W2)



Conclusion

- > A temporary quota has to be introduced until gender equality in top positions is achieved
- > During this phase, women have to build up their own female networks
- > These female networks will later mix with male networks rendering quotas obsolete

Institutions respond to pressure MIT



The increases in the representation of women and minorities don't just "happen" but result from specific pressures, policies and positive initiatives designed to increase the hiring of women or minorities: and that when these pressures abate or expire hiring progress stops or even reverses.



A possible path to resolve gender roles and gender stereotypes

The new multi-optionality of women

The new multi-optionality of women (I)

- > Women refuse to match traditional roles
- > They want to decide for themselves how to plan and construct their life on the basis of their individual intelligence, talent, energy and education
- > ...with the option to combine
 - Family (partnership) and
 - Profession (financial independence)

in a sometimes - not always - different way than men

The new multi-optionality of women (II)

- > The duty of society and politics is to establish conditions which allow the development of female multi-optionality
- > Today's decision-makers of society and politics are males who do not act voluntary in the fulfilment of this duty
- > Therefore, society and politics have to be gently guided in the "right" direction.
- > Quotas are the most efficient means to guarantee this right direction

Gender parity ($40 \pm 10\%$) in science and female multi-optionality presuppose

- > Gender parity as a civil obligation (constitution)
- > Gender parity as a directorate priority issue of a scientific institution (university, institute)
- > Gender parity is different from subsidy politics for women
- > Gender parity as criterion of quality (evaluation)
- > Gender models (mentoring)

The importance of role models

Marie Skłodowska Curie

1867-1934



1903 Nobel Prize for physics
1911 Nobel Prize for chemistry
“Discovery of Radium and Polonium, Isolation of Radium”

Irène Joliot-Curie

1897-1956

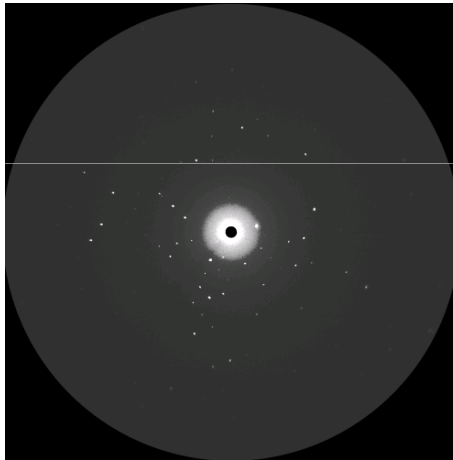
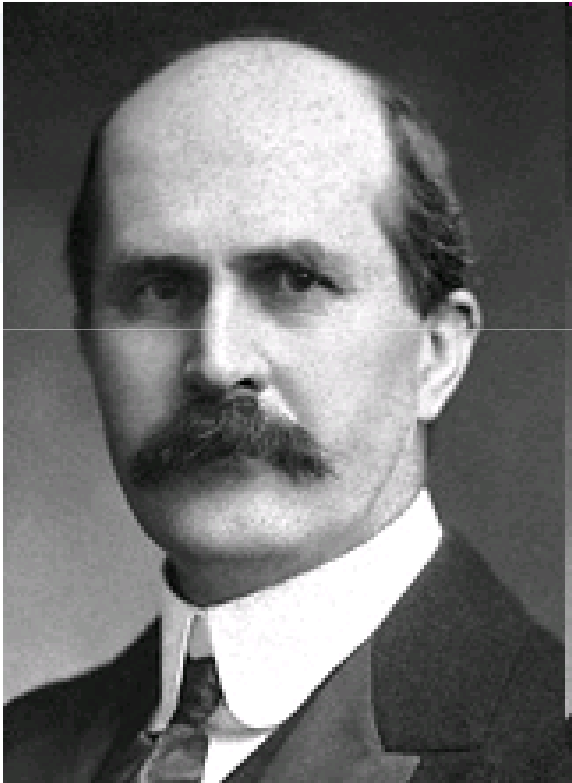


1935 Nobel Prize for chemistry
“Discovery of Artificial Radioactivity”

The importance of role models

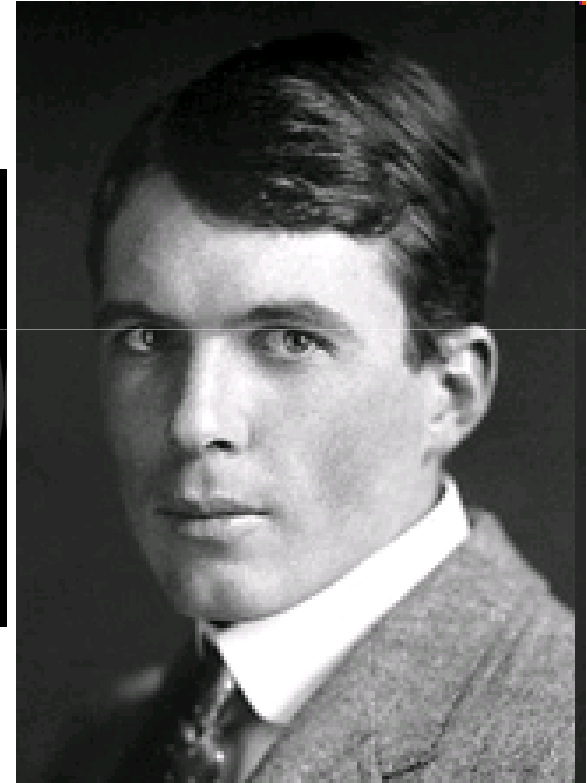
William Henry Bragg

1862-1942



William Lawrence Bragg

1890-1971



1915 Nobel Prize for physics for the “Investigation of Crystal Structures by means of X-ray Spectroscopy”

Progress in respecting the scientific achievements of female scientists

- > Nobel Prize 2008 (Medicine)
Luc Montagnier **and** Françoise Barré-Sinoussi

in contrast to

- > Physics 1944 Otto Hahn **without** Lise Meitner
- > Medicine 1962 Watson, Crick, Wilkins **without** Rosalind Franklin

Recognition of achievements of female and young female scientists

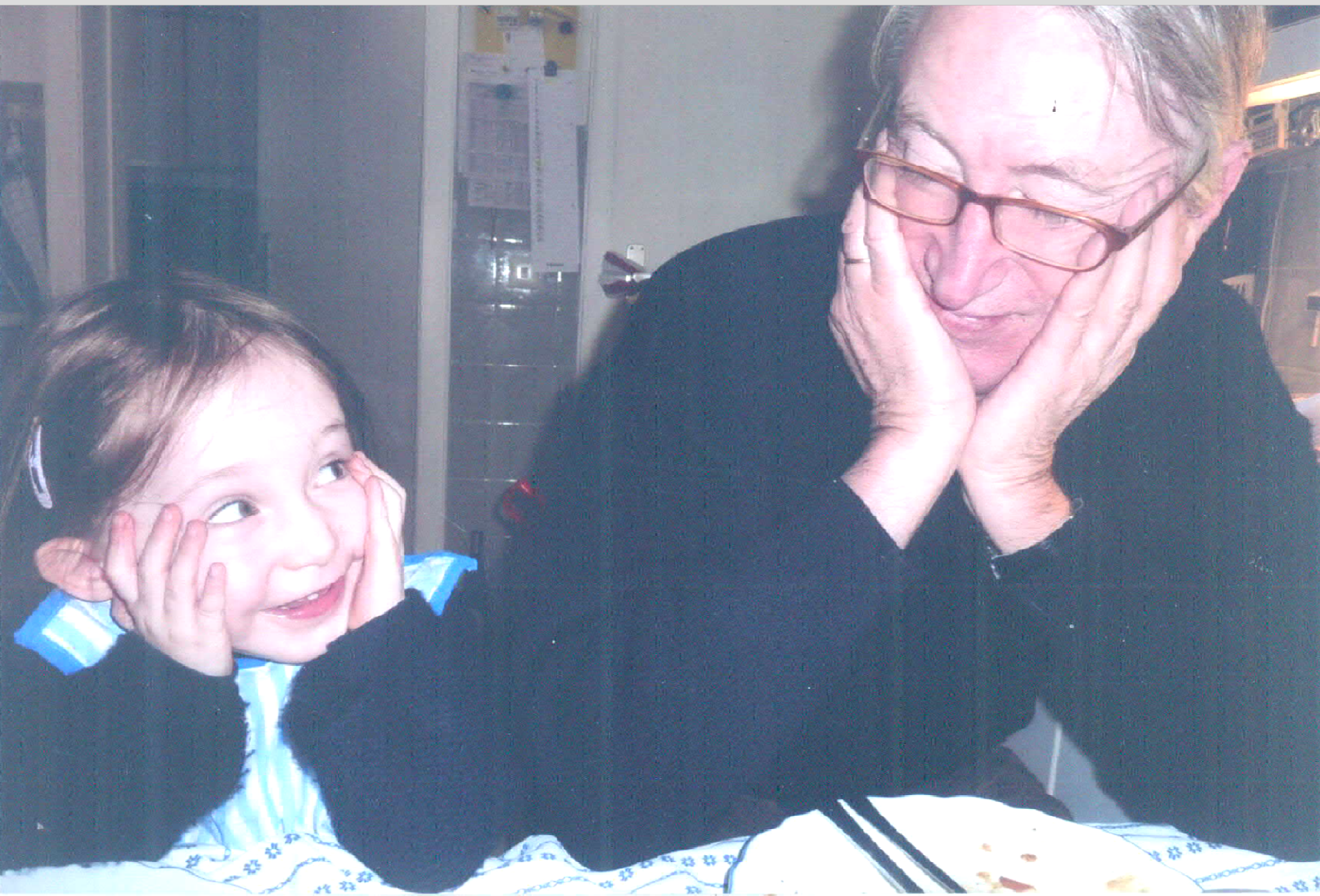
Nobel price Medicine 2009: These U.S. biologists have discovered that the ends of chromosomes (telomeres) play an important role in ageing



Elisabeth Blackburn



Carol Greider



Thank you for your attention!



Problem:

Young women do not (wish to) realize:

**That in reality an equalization has not yet
been achieved!**